










Examination of the Sexual and Negative Dating Inventory (SANDI) Among Sexual and Gender Minorities: An Analysis of Psychometrics and Outcomes

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Objective: Adverse sexual experiences (ASE), including sexual violence, sexual risk behaviors, and regretted sex, are highly prevalent among sexual and gender minorities (SGM) compared to cisgender and heterosexual individuals. Research indicates ASEs are associated with increased mental health symptomatology and decreased subsequent protective behavior use. The Sexual and Negative Dating Inventory (SANDI) measures dating and sexual protective strategies and includes five factors: Location Sharing, Assertiveness, Self-Protection, Risk Reduction and Privacy. SANDI total scores are linked to lower ASEs in heteronormative samples. *Method:* SANDI was previously validated in a sample of $n = 1,289$ college students. Data were examined from $n = 313$ (24.28%) SGM individuals at baseline, and $n = 95$ at one-month follow-up. Individuals were 19.70 (2.98 SD) years old,

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and 25% were non-white. Model fit was adequate for SGM: $\chi^2(484) = 1729.621$, $p < .001$, CFI = .947, RMSEA = .063 (90% CI = .060, .066), SRMR = .048. *Results:* Non-cisgender men and non-heterosexual individuals endorse using more of the SANDI at the factor level. Using logistic regression, SANDI was not associated with history of sexual violence or sexual violence over the next month. SANDI is inversely associated with history of sexual risk and prospectively associated with less sexual risk over the next month. Negative binomial regression analyses showed SANDI was not associated with a history of regretted sex; however, SANDI was moderately associated with decreased regretted sex over the next month. *Conclusion:* Findings highlight the importance of dating and sexual protective behaviors across dimensions of gender and sexual orientation.

Adverse sexual experiences (ASEs; e.g., sexual violence, sexual risk behaviors, and regretted sex) are highly prevalent in U.S. college populations (Fedina et al., 2018). One in four undergraduate women at 33 of the nation's major universities reports experiences of sexual assault and misconduct (Westat, 2019), and between 15% and 25% of all college-aged individuals reported experiences of forced sexual violence (Cullen et al., 2000). Sexual risk such as engaging in sex without making plans to protect against unwanted pregnancy, HIV, and other sexually transmitted infections, engaging in substance use before sex, and having multiple casual sex partners (Buhi et al., 2010; Cerwonka et al., 2000; Leigh et al., 2008; Perkins, 2002; Wechsler & Kuo, 2000) and regretted sex may be even more common. For example, roughly half (53%) of college students endorse engaging in casual sex (Grello et al., 2006), and lifetime rates of regretted sex for college students are as high as 71.9% (Merrill et al., 2018; Oswalt et al., 2005).

The high prevalence rates of ASEs are even more concerning when the impacts of ASEs are considered. Broadly, ASEs are associated with increased rates of mental health symptomatology. Studies show that individuals who report a history of sexual assault have higher rates of psychopathology, including PTSD and suicidality, particularly when those assaults involved strangers, weaponry, or physical injury (Dworkin et al., 2017). Among first-year college women, experiencing a sexual assault during

the first semester of college was significantly associated with increased anxiety and depression (Carey et al., 2018).

For sexual and/or gender minorities (SGM; DiLillo et al., 2023) these adverse outcomes appear to be compounded. To note, SGM experience ASEs at disproportionately higher rates than their heterosexual or cisgender counterparts (DiLillo et al., 2023; Edwards et al., 2015; Messinger, 2011). In a 2017 national survey, SGM individuals were approximately 10 times more likely to report experiencing rape or sexual assault than non-SGM individuals (Flores et al., 2020). Subgroups within SGM populations may be at even greater risk of experiencing sexual violence, with up to 46% of bisexual women having been victims of forced or substance-facilitated rape and 47% of transgender individuals having been sexually assaulted at some point in their lifetime (James et al., 2015; Walters et al., 2013). SGM college students may also engage in more frequent risky sexual behaviors (Li et al., 2022). This, in turn, leads to worsening mental health symptomatology. One study examining risk among lesbian, gay, and bisexual undergraduates found heightened risk for sexual harassment and assault compared to their heterosexual peers and had poorer mental health outcomes, when controlling for history of ASEs (Smith et al., 2016). Sexual victimization is correlated with significantly higher risk of suicidal ideation and history of attempts among transgender and gender nonconforming individuals (Drescher et al., 2021). SGM has been

shown to moderate the effects of sexual victimization on depressive symptoms, such that a significantly higher number of depressive symptoms was reported, compared to their heterosexual or cisgender counterparts (Kammer-Kerwick et al., 2021).

Given these deleterious outcomes, the identification of possible factors that may protect against ASEs and their impact on this population is critical. Although ASEs only occur due to the actions of a perpetrator (as Orchowski & Gidycz [2018] highlight, “an intoxicated woman is at risk solely due to the actions of a perpetrator who takes advantage of her intoxication. She is certainly not to blame for her victimization”), it is possible that the use of PBS may decrease the risk of ASEs. Broadly, PBS are methods by which an individual can mitigate risk while engaging in a given behavior (Peterson et al., 2021). To date, most research on PBS has been focused on alcohol consumption (Martens et al., 2005), however, recent research has found that sexual or dating PBS (Peterson et al., 2023) including condom use, birth control utilization (Lewis et al., 2010b), and self-protective dating behaviors (Hanson & Gidycz, 1993; Moore & Waterman, 1999) may all reduce risks of experiencing poor outcomes following sex or an ASE.

The development of reliable and valid measures examining whether PBS in fact protect against ASEs is imperative. The Sexual and Negative Dating Inventory (SANDI) is a recently developed measure of dating and sexual PBS (Peterson et al., 2023). The SANDI was developed through updating and modernizing items from previous measures of dating and sexual PBS (Hanson & Gidycz, 1993; Lewis et al., 2010; Moore & Waterman, 1999; O’Hare, 2001) and is thought to improve on these measures in a few key ways. First, while previous measures of dating and sexual PBS promote some behaviors for safe dating, they are often limited in their ability to capture the milieu of modern dating, which

requires contemporary vocabulary and the inclusion of location-sharing services via smart technology. Second, as compared to previous measures, the SANDI is broader in its inclusion of strategies that span a variety of dating risk domains which may account for discrepancies in the sexual PBS literature (Hanson & Gidycz, 1993; Lewis et al., 2010; Moore & Waterman, 1999; O’Hare, 2001). Finally, the factor structures and the behaviors they assess vary greatly across these measures, which may also contribute to inconsistencies in the literature. The SANDI was previously validated in a sample of $n = 1,289$ college students and showed acceptable reliability and adequate convergent and discriminant validity within a college population (Peterson et al., 2023). In addition, the SANDI shows consistent inverse associations with adverse sexual outcomes, including a decreased likelihood of concurrent and prospective sexual regret and sexual risk, which was not the case for the other three most common measures of dating and sexual PBS (Peterson et al., 2023).

Thus, dating and sexual PBS are critical in protecting against ASEs and their impact on individuals. Research has wholly under-investigated sexual and dating PBS among SGMs, with most research thus far focusing on non-SGM populations. This is particularly concerning, given that SGMs likely require different strategies for both dating (Greene et al., 2015) and ASE prevention (McCauley et al., 2018). Additionally, the dearth of research that *does* exist thus far investigating sexual and dating PBS among SGMs is decades old, which is problematic for several reasons. First, programming for PBS based on this research often includes significant bias or stigma, which may ultimately dissuade SGMs from engaging in these methods effectively (Layland et al., 2020; Rubinsky & Cooke-Jackson, 2017). Second, programming for PBS based on this research frequently and primarily emphasizes HIV/AIDS avoidance, without much consideration of other potential PBS that may ameliorate unique risks for this population.

Finally, most measures of dating and sexual PBS, including the SANDI, are not validated for use with SGM populations, who may be most at risk for both ASEs and subsequent negative outcomes.

CURRENT STUDY

The current study had two primary aims: to validate the psychometrics of the SANDI within an SGM sample and to examine whether the SANDI and its associated factors are appropriate to implement within an SGM sample. Model fit of the SANDI was proposed to remain adequate for SGMs; however, it was proposed that factors within the SANDI would function differently across different demographic groups (e.g., gender, sexual orientation, sex assigned at birth). The SANDI was proposed to have *concurrent* predictive associations with sexual victimization, regretted sexual experiences, and sexual risk behaviors for SGMs and was proposed to have *prospective* predictive validity with sexual victimization, regretted sexual experiences, and sexual risk at one-month follow-up for SGMs.

METHODS

The SANDI was originally validated in a sample of $n = 1,289$ college students (Peterson et al., 2023). For the current study, data were examined from $n = 313$ (24.28%) SGMs at baseline, and $n = 95$ at one-month. Individuals were an average of 19.70 (2.98 SD) years old and 25% were non-white. Regarding gender, participants were women ($n = 223$), men ($n = 45$), genderqueer or gender non-conforming ($n = 28$), transgender men ($n = 7$), questioning ($n = 6$) transgender women ($n = 2$), or other ($n = 2$). Regarding sexual orientation, individuals were bisexual ($n = 191$), lesbian ($n = 33$), pansexual ($n = 25$), other ($n = 23$), gay ($n = 21$), asexual ($n = 18$), or heterosexual ($n = 2$).

Participants were recruited through the university SONA research pool, flyers, and

emails. Participants responded to an online survey via Qualtrics at baseline and one-month follow-up. Participants received class-credit for completing the baseline survey and a \$10 Amazon gift card at completion of follow-up. The current study was approved by the IRB of a large Southeast University (STUDY00002621) to provide crisis resources in the moment to participants.

Measures

Demographics

Participants reported age, sex assigned at birth, gender, Hispanic origin, race, and sexual orientation.

Sexual Experiences Survey-Short Form Victimization (SES-SFV)

The Sexual Experiences Survey-Short Form Victimization (SES-SFV) assesses lifetime sexual victimization (Koss et al., 2007). Participants were asked, both at baseline and one-month follow-up, to respond whether they had experienced any of the scenarios of victimization either “in the past 12 months” or “from age 14 until 1 year ago.” The SES is one of the most commonly used and accepted measures of adult sexual victimization (Koss et al., 2007). One example of a question is: “*Someone fondled, kissed, or rubbed up against the private areas of my body (lips, breast/chest, crotch, or butt) or removed some of my clothes without my consent (but did not attempt sexual penetration) by:*” with the response options of, *a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn’t want to. b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn’t want to. c. Taking advantage of me when I was too drunk or out of it to stop what was happening. d. Threatening to physically harm me or*

someone close to me. e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon. The SES-SFV is scored on a dichotomous options were rated on a dichotomous (0 = no, 1 = yes) scale. Typically, the SES-SFV is coded ordinally by six mutually exclusive groups: nonvictim, unwanted sexual contact, attempted coercion, coercion, attempted rape and rape; for the purposes of this study, one outcome was dichotomized to represent any sexual victimization versus no sexual victimization. These questions were assessed both at baseline and one-month follow-up. Overall internal consistency in the current study for the SES-SFV was excellent at baseline ($\alpha = .95$) and follow-up ($\alpha = .95$).

Sexual Risk Behaviors

A total of six single-item “yes” or “no” questions were asked and summed to assess sexual risk (e.g., “Was alcohol involved in your most recent sexual experience?”), both at baseline and one-month follow-up. These items represent previous constructs used to assess sexual risk (Buhi et al., 2010; Cerwonka et al., 2000; Dermen & Thomas, 2011; Grello et al., 2006; Kaly et al., 2002; Leigh et al., 2008; Perkins, 2002; Wechsler & Kuo, 2000). This outcome was heavily skewed; approximately 74% endorsed none, 14% endorsed one, roughly 7% endorsed two, and only 5% endorsed three or more. Therefore, this item was dichotomized for analysis.¹

Regretted Sexual Experiences

At baseline, regretted sexual experiences were assessed using a single “yes” or “no” question, “Have you ever had a sexual experience that you later regretted?” At one-month follow-up, the question asked, “Have you had a regretted sexual experience that occurred in the last month?” These items were adapted from the Young Adult Alcohol Consequences Questionnaire (YAACQ; Read et al., 2006) and a modified version of

the sex-related alcohol negative consequences subscale (e.g., Larimer et al., 1999; Lewis et al., 2010a; Wood et al., 2001) of the Young Adult Alcohol Problem Screening Test (YAAPST; Hurlbut & Sher, 1992). This single-consequence item has been utilized in past research to analyze previous regretted sexual experiences (Peterson et al., 2020; Simons et al., 2010). The YAACQ and the YAAPST have been validated for use with college populations (Hurlbut & Sher, 1992; Read et al., 2006).

Sexual and Negative Dating Inventory (SANDI)

The SANDI is a measure of dating and sexual PBS (Peterson et al., 2023). The SANDI includes five factors: Location Sharing, Assertiveness, Self-Protection, Risk Reduction, and Privacy. Due to correlations among subscales and differential associations with experiences across subscales, it is recommended to use a combined mean score of subscale means rather than individual subscale scores or total sum score. The overall internal consistency in the current study for the SANDI was excellent at baseline ($\alpha = .95$) and follow-up ($\alpha = .95$).

Data Analysis Plan

Aim 1: Psychometric Outcomes

Aim 1A. Consistent with the main outcomes, and to understand the factor structure, an Exploratory Structural Equation Model (ESEM; a structural equation model approach to exploratory factor analysis) was conducted in Mplus version 8.6 (Muthén & Muthén, 2017). It was proposed model fit would remain adequate for SGMs. To assess the model fit, the standards of SRMR $\leq .08$, RMSEA $\leq .06$, and CFI $\geq .96$ were utilized (Hu & Bentler, 1999). Analysis of measurement invariance was conducted to examine invariance across SGM. Chen (2007) outlines guidelines for determining invariance that rely

on other model fit indices (Chen, 2007). Specifically, a change of ≤ -0.005 in CFI, a change of ≥ 0.010 in RMSEA OR, and a change of ≥ 0.025 in SRMR, when comparing configural to metric models, would indicate metric non-invariance. For scalar invariance (comparing the scalar to metric model), a change in CFI ≥ -0.005 , a change in RMSEA of ≥ 0.010 OR and a change in SRMR ≥ 0.005 indicate scalar non-invariance.

Aim 1B. It was proposed that although the factor structure would not function differently (see **Aim 1A**) across different demographic groups (e.g., gender, sexual orientation, sex assigned at birth), there may be mean differences within factors as a function of demographic characteristics. **Aim 1B** examines whether factors on the SANDI function differently across demographic groups (e.g., gender, sexual orientation, sex assigned at birth). One-way ANOVAs were run for nominal variables with discrete groups that cannot be ordered in some hierarchical way (i.e., gender, sexual orientation). One-sample t-tests were run for nominal variables with two parameters that cannot be ordered in some hierarchical way (i.e., sex assigned at birth). Given previous findings that women/females and sexual or gender minorities experience greater rates of sexual violence, it was proposed factors will function differently across different demographic groups.

Aim 2: Predictive Validity

It was proposed logistic regression would reveal the SANDI to have concurrent predictive associations with ASEs for SGMs, including sexual victimization, sexual risk, and regretted sexual experiences. It was projected predictive validity would include whether scores on the SANDI have concurrent predictive validity for those with a history of ASEs (**A2A**), as well as prospective validity for those who may experience an

adverse sexual outcome within a one-month follow-up timeframe (**A2B**).

RESULTS

Univariate Statistics

Regarding ASEs among SGMs in this sample, the following were observed at baseline: self-reported rape: $n = 55$ (18.15%), unwanted sexual experience: $n = 172$ (52.92%), sexual risk behaviors: $n = 85$ (26.15%), and regretted sexual experiences: $n = 195$ (64.14%). The following were observed at one-month follow-up regarding ASEs: self-reported rape: $n = 12$ (3.83%), unwanted sexual experience: $n = 49$ (15.65%), sexual risk behaviors: $n = 15$ (4.79%), and regretted sexual experiences: $n = 32$ (10.22%).

Aim 1: Psychometric Outcomes

Aim 1A. Invariance testing metrics are in **Table 1**. A three-step approach was used to test for measurement invariance. First, the highest factor loading on each factor was set to 1 with factor means in each group set to zero (configural invariance). A model has configural invariance if the model fit is adequate. Next, all factor loadings were constrained to be equal across SGMs to test metric invariance; changes

TABLE 1. Measurement Invariance by Sexual and Gender Minority

Model	RMSEA	CFI	TLI	SRMR
Configural Invariance	.063	.947	.940	.048
Metric Invariance	.061	.948	.943	.049
Δ from Configural	.002	-.001	-.003	-.001
Scalar Invariance	.055	.950	.954	.049
Δ from Metric	.006	-.002	-.011	-.001

Specifically, a change of ≤ -0.005 in CFI, a change of ≥ 0.010 in RMSEA OR and a change of ≥ 0.025 in SRMR, when comparing configural to metric models, would indicate metric non-invariance. For scalar invariance (comparing the scalar to metric model), a change in CFI ≥ -0.005 , a change in RMSEA of ≥ 0.010 OR, and a change in SRMR ≥ 0.005 indicate scalar non-invariance.

in fit indices were compared to the configural model. Lastly, factor loadings and intercepts were constrained to be equivalent across SGMs, and scalar invariance was tested by comparing this model to the metric invariance model. Chen (2007) notes χ^2 tests for invariance are sensitive to sample size and violations of normality, and consequently small discrepancies may result in model rejection. Thus, in larger samples with unequal group size and/or non-normal data (such as this data), Chen outlined guidelines for determining invariance relying on other model fit indices (Chen, 2007). Specifically, (1) a change of ≤ -0.005 in CFI and a change of ≥ 0.010 in RMSEA OR, (2) a change of ≥ 0.025 in SRMR, when comparing configural to metric models, would indicate metric non-invariance. For scalar invariance (comparing the scalar to metric model) (1) a change in CFI ≥ -0.005 and a change in RMSEA of ≥ 0.010 OR, (2) a change in SRMR ≥ 0.005 indicate scalar non-invariance. The configural invariance model examines if the factor structure is similar across SGMs. This model fit the data well with significant factor loadings for all items, $\chi^2(484) = 1729.621$, $p < .001$, CFI = .947, RMSEA = .063 (90% CI = .060, .066), SRMR = .048. Constraining factor loadings to be equivalent across sex did not result in changes to fit, relative to the configural model, indicating metric invariance. Finally, there was no substantial decreases in model fit, relative to the metric model, after constraining factor loadings and item intercepts to be identical and allowing factor means to vary across sex, indicating no scalar variance.

Aim 1B. Using the full sample of $n = 1,289$ participants for comparison, mean levels of the factors differed across demographic groups. For variables analyzed using one-way ANOVAs (with discrete groups that cannot be ordered in some hierarchical way; i.e., gender, sexual orientation), significant differences were found among the following factors. Cisgender women ($M = 5.15$, $SD = 0.92$), transgender men ($M = 4.76$, $SD = 1.37$), and genderqueer ($M = 5.26$, $SD = 0.88$) individuals endorsed significantly higher rates of Location Sharing

relative to cisgender men ($M = 3.48$, $SD = 1.22$). Cisgender women ($M = 5.33$, $SD = 0.75$) and genderqueer ($M = 5.63$, $SD = 0.46$) individuals endorsed significantly higher rates of Assertiveness relative to cisgender men ($M = 4.87$, $SD = 1.10$). Cisgender women ($M = 4.26$, $SD = 1.20$) and genderqueer ($M = 4.46$, $SD = 1.20$) individuals endorsed significantly higher rates of Self-Protection relative to cisgender men ($M = 3.33$, $SD = 1.35$). Cisgender women ($M = 4.82$, $SD = 1.05$) endorsed significantly higher rates of Risk Reduction relative to cisgender men ($M = 4.33$, $SD = 1.22$). Cisgender women ($M = 4.75$, $SD = 1.01$), transgender men ($M = 5.32$, $SD = 0.28$), and genderqueer ($M = 5.16$, $SD = 0.83$) individuals endorsed significantly higher rates of Privacy relative to cisgender men ($M = 3.47$, $SD = 1.08$).

As shown in Table 2, one-way ANOVAs revealed significant differences for bisexual individuals ($M = 4.99$, $SD = 1.12$), who endorsed significantly higher rates of Location Sharing relative to heterosexual individuals ($M = 4.51$, $SD = 1.31$). Bisexual individuals ($M = 5.39$, $SD = 0.58$) endorsed significantly higher rates of Assertiveness relative to heterosexual individuals ($M = 5.13$, $SD = 0.94$). Bisexual individuals ($M = 4.30$, $SD = 1.25$) endorsed significantly higher rates of Self-Protection relative to heterosexual individuals ($M = 3.86$, $SD = 1.33$). In addition, lesbian individuals ($M = 5.00$, $SD = 1.09$) and bisexual individuals ($M = 4.79$, $SD = 0.98$) endorsed significantly higher rates of privacy relative to heterosexual individuals ($M = 4.28$, $SD = 1.12$).

For variables analyzed using a one-sample t-test (indicating two parameters that cannot be ordered in some hierarchical way), females reported higher rates of all factors compared to males, as shown in Table 3.

Aim 2A: Concurrent Predictive Validity

Logistic regression revealed that SANDI was not associated with a history of sexual violence ($OR = 1.23$, $p = .153$). Logistic regression revealed the SANDI to be inversely

TABLE 2. Factor Differences Across Cis and SGM Groups

	Gender	Sexual Orientation
F1: Location Sharing	Cis. women-Cis. Men: $\Delta 1.67, p < .001$ Transgender men-Cis. Men: $\Delta 1.29, p = .023$ Genderqueer-Cis. Men: $\Delta 1.79, p < .001$	Bisexual-Heterosexual: $\Delta 0.48, p = .001$
F2: Assertiveness	Cis. Women-Cis. Men: $\Delta 0.46, p < .001$ Genderqueer-Cis. Men: $\Delta 0.77, p < .001$	Bisexual-Heterosexual: $\Delta 0.27, p = .004$
F3: Self-Protection	Cis. Women-Cis. Men: $\Delta 0.93, p < .001$ Genderqueer-Cis. Men: $\Delta 1.13, p < .001$	Bisexual-Heterosexual: $\Delta 0.44, p < .001$
F4: Risk Reduction	Cis. Women-Cis. Men: $\Delta 0.50, p < .001$	No differences observed
F5: Privacy	Cis. Women-Cis. Men: $\Delta 0.88, p < .001$ Transgender men-Cis. Men: $\Delta 1.45, p = .005$ Genderqueer-Cis. Men: $\Delta 1.29, p < .001$	Lesbian-Heterosexual: $\Delta 0.62, p = .032$ Bisexual-Heterosexual: $\Delta 0.41, p < .001$

Group with the highest value is always listed first. Δ indicates the change between first group (the highest group) from the comparison group.

TABLE 3. Differences Across Sex Assigned at Birth

	Sex assigned at birth		<i>t</i>
	Assigned Female Mean (SD)	Assigned Male Mean (SD)	
F1: Location Sharing	5.14 (0.93)	3.47 (1.22)	27.17*
F2: Assertiveness	5.34 (0.73)	4.87 (1.10)	9.21*
F3: Self-Protection	4.27 (1.20)	3.33 (1.35)	12.68*
F4: Risk Reduction	4.83 (1.04)	4.33 (1.22)	7.59*
F5: Privacy	4.77 (1.01)	3.87 (1.08)	14.68*

One-sample t-tests were examined for sex assigned at birth.

* $p < .001$

associated with history of sexual risk behaviors ($OR = 0.645, p = .005$). Regarding regretted sex, negative binomial regression analyses showed that SANDI was not associated with history of regretted sex ($IRR = 0.934, p = .619$).

Aim 2B: Prospective Predictive Validity

Logistic regression revealed that SANDI was not associated with sexual violence over the following month ($OR = 1.060, p = .774$). Logistic regression revealed the SANDI to be prospectively, though only marginally, associated with less sexual risk behavior over the following month ($OR = 0.528, p = .056$). Similarly, regarding regretted sex, the SANDI was

marginally associated with decreased regretted sex over the next month ($IRR = 0.712, p = .069$), though this did not reach conventional levels of significance.

DISCUSSION

The present study evaluated psychometric outcomes and predictive validity of the SANDI among a sample of SGMs. The SANDI is a new 24-item measure utilized to assess dating and sexual protective behaviors across five factors: 1) Location Sharing, 2) Assertiveness, 3) Self-Protection, 4) Risk Reduction, and 5) Privacy (Peterson et al., 2023). Previous research found the SANDI showed adequate reliability, convergent and discriminant validity, as well as good fit within a population of college students (Peterson et al., 2023). The current study proposed model fit for the SANDI would remain adequate for SGM (Aim 1A), and factors would function differently across different demographic groups (Aim 1B). These aims were fully supported. Additionally, it was proposed that SANDI would have concurrent (Aim 2A) as well as prospective (Aim 2B) predictive validity with the SES-SFV survey and measures of regretted sexual experiences and sexual risk

for SGMs. These aims were partially supported. Overall, these findings provide salient nuanced findings regarding the importance of dating and sexual PBS across SGM.

Regarding psychometric outcomes of the SANDI, model fit remained adequate for SGMs, such that factor loadings and structure remained the same for SGMs relative to the full sample of college students the measurement was normed and validated on (Peterson et al., 2023). No substantial decreases in model fit relative to the metric model were observed. Findings suggest SANDI is appropriate for individuals across diverse gender and sexual orientations. This is crucial, given the fact that previous research has consistently found higher rates of sexual violence among SGMs compared to cisgender and heterosexual individuals, yet there is limited research on how sexual violence can be prevented in this population (Edwards et al., 2015; Flores et al., 2020; James et al., 2015; Messinger, 2011; Walters et al., 2013). The SANDI may serve as a springboard in this area of literature, as it may be utilized to not only thoroughly assess dating and sexual risk among SGMs but also to measure the implementation and utilization of PBS to mitigate ASEs.

Factors of the SANDI were found to function differently across gender, sexual orientation, and sex assigned at birth. In terms of gender, cisgender women, transgender men, and genderqueer individuals endorsed using more Privacy and Location Sharing strategies relative to cisgender men. Cisgender women and genderqueer individuals endorsed using more Self-Protection and Assertiveness strategies than cisgender men. Cisgender women also endorsed using higher rates of Risk Reduction strategies compared to cisgender men. Regarding sexual orientation, bisexual women endorsed using more Location Sharing, Assertiveness, and Self-Protection strategies compared to heterosexual individuals. Lesbian and bisexual individuals endorsed using more privacy strategies compared to heterosexual individuals. Lastly, regarding sex assigned at birth,

females endorsed significantly higher utilization of all five factors relative to males. These findings are important to consider within the context of the current literature, which (a) has been limited by heteronormative bias (Rothman et al., 2011), (b) indicates high rates of sexual violence experienced by SGM individuals is perpetuated by cisgender heterosexual men (Rothman et al., 2011), and (c) has found drinking environments to play a significant role in sexual violence perpetration (Testa & Cleveland, 2017). The aforementioned findings take all of this into consideration, as it not only shows the heterogeneity of SGM groups in their utilization of sexual and dating PBS but also provides crucial information regarding which strategies may be important to target in interventions across SGMs.

Predictive validity outcomes were partially supported for both concurrent and prospective validity. Regarding concurrent predictive validity, the SANDI was not associated with a history of sexual violence nor regretted sex, however, it was inversely associated with a history of sexual risk behaviors. Thus, while a history of sexual violence and regretted sex did not impact endorsement of strategies in the SANDI across SGM, those with a history of sexual risk endorsed less utilization of strategies in the SANDI. This may be due to potential positive reinforcement that may be obtained from engaging in sexual risk (e.g., positive mood, social affiliation, etc.), or it may be the case SGMs who engaged in sexual risk behaviors in this study operationalize sexual violence differently. The SANDI was not associated with sexual violence over the next month, but it was prospectively associated with less sexual risk over the next month and was marginally associated (not statistically significant) with a decrease in regretted sex over the next month. This indicates that the potentially protective associations of the SANDI against sexual risk and regretted sex among SGMs, though these associations did not reach conventional levels of statistical significance. Future research should strive to

understand the mechanisms competing against the utilization of protective sexual strategies among SGM individuals with a history of sexual risky behaviors. Future research should also assess the longitudinal associations of the SANDI across different sexual violence factors (e.g., history of sexual violence, sexual risk, regretted sex) in this population in order to properly delineate the protective associations of the SANDI. Finally, future research should seek to examine which factors are primarily important for individual risk behaviors such as alcohol use, condom use, STIs and unintentional pregnancy.

Investigating different facets of sexual violence and harm reduction in underrepresented populations is important, as is understanding the heterogeneity of SGM groups regarding sexual protective strategies. These findings should take into consideration the development and implementation of interventions aimed at reducing sexual violence. The role of cultural beliefs, such as sexual identity and sexual risk behaviors and intersecting identities should be considered (e.g., race, ethnicity, socio-economic status), as it is likely individuals with multiple minoritized intersecting identities might differ in their engagement of sexual risk behaviors and utilization of PBS (De Leon et al., 2022, November 19). Continuing to investigate how the SANDI impacts the prevalence of sexual violence in the long term and therefore can be integrated within adverse sexual outcome prevention programs for SGMs remains crucial.

Limitations

The findings of the present study should be interpreted within the context of a few limitations. Although the SANDI has continued to demonstrate respectable reliability and validity in the present study and within prior research (Peterson et al., 2023), continued evaluation of this measure in diverse populations is still needed. Critically, future research may seek to examine how the SANDI functions in populations with in-

tersecting identities (i.e., individuals who identify as both racial minorities, as well as SGM; Cathey et al., 2014). Individuals with multiple marginalized identities are consistently found to be at an increased risk for ASEs (Coulter et al., 2017; De Schrijver et al., 2022). Little research has specifically examined the use of dating and sexual PBS in this population. Potential differences in dating and sexual PBS by intersecting identities were unable to be examined fully, as the majority (i.e., 75%) of the present study's participants were white.

Since the present study aimed only to examine the direct relationship between sexual PBS and ASEs in a sample of SGMs, few other potentially important factors were included in the overall model. For example, SGM (and individuals with multiple-marginalized identities) are often impacted by additional socioecological factors compared to their cis-gender or heterosexual counterparts (e.g., acute and chronic minority stress, stigmas about gender identity, sexual prejudice, disparities within education on adverse and non-adverse sexual experiences; DiLillo et al., 2023). These socioecological factors may impact their engagement in dating and sexual protective behaviors and, ultimately, compound their risk of ASEs such as sexual violence, sexual risk behaviors, and regretted sex. Including these variables as potential moderators will be an important avenue for future research within SGM samples. Furthermore, DiLillo et al. (2023) previously highlighted the need for additional research examining proximal and temporal associations between sexual PBS, ASEs, and current known risk factors for ASEs (DiLillo et al., 2023). Methods such as ecological momentary assessment may be advantageous to examining proximal and temporal associations. Qualitative interviews may be helpful in obtaining more nuanced information regarding these factors and should be considered for future research, as opposed to the present study's current approach of using more brief, self-report assessments.

Examinations of these factors may serve not only to reinforce the SANDI as a

valid and reliable research measure but to further improve its clinical utility and real-world implementation through the identification of various behavioral and clinical factors associated with different scores. Research on what a score signifies or indicates, clinically and behaviorally, is needed. Extending the follow-up time frame has its pros and cons, a pro being that it would allow for observation of more ASEs, as well as more use of dating and sexual PBS; a con of extending the follow-up time frame being potentially increased drop-out rates.

CONCLUSIONS

Findings from the present study highlight the importance of dating and sexual PBS across dimensions of gender and sexual orientation and further add support to the SANDI as a valid and reliable measure of dating and sexual PBS. The SANDI may be a useful measure for future sexual health research and, potentially, in intervention efforts aimed at decreasing the experiences of ASEs.

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NOTE

1. The analysis was also done using a negative binomial distribution, and the results were nearly identical (a 1 unit increase in SANDI was associated with a 30% decreased ratio of sexual risk incidents, $p = .012$).

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