

Actions speak: personality, nonverbal behaviors, and self-perceptions of vulnerability in college-aged women

Jayne Stewart, Jessie Swanek and Adelle Forth

Abstract

Purpose – Despite representing a relatively small portion of the population, those who experience repeat victimization make up a significant share of all sexual and violent crimes, implying that perpetrators target them repeatedly. Indeed, research reveals specific traits (e.g. submissiveness) and behaviors (e.g. gait) related to past victimization or vulnerability. The purpose of this study is to explore the link between personality traits, self-assessed vulnerability and nonverbal cues.

Design/methodology/approach – In all, 40 undergraduate Canadian women were videotaped while recording a dating profile. Self-report measures of assertiveness, personality traits and vulnerability ratings for future sexual or violent victimization were obtained following the video-recording. The videotape was coded for nonverbal behaviors that have been related to assertiveness or submissiveness.

Findings – Self-perceived sexual vulnerability correlated with reduced assertiveness and dominance and increased emotionality (e.g. fear and anxiety). Additionally, nonverbal behaviors differed based on personality traits: self-touch was linked to lower assertiveness, dominance and extraversion and higher submissiveness, emotionality and warm-agreeableness.

Originality/value – To the best of the authors' knowledge, this is the first study of its kind to consider the relationships between personality, self-perceived vulnerability and nonverbal behaviors among college-aged women. Potential implications, including enhancing autonomy and self-efficacy, are discussed.

Keywords Personality, Vulnerability, Sexual victimization, Violent victimization, Nonverbal behavior

Paper type Research paper

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Every day, we engage in nonverbal decoding during social interactions, where a significant portion of our exchanges can be understood through nonverbal behaviors (Burgoon *et al.*, 1996). Nonverbal evaluations not only help us identify potential threats but also act as one of the primary mechanisms of judgement in the decision to form bonds and relationships. For example, the ability to determine what emotion people are feeling and whether those emotions are genuine often provides us with our first indicator of trustworthiness or authenticity. Personality traits, conveyed through nonverbal cues such as emotional displays, eye contact, body movements and gestures (Argyle, 1975; Simpson *et al.*, 1993), contribute to this assessment process, aiding in predicting future behavior and affective states (Berger and Calabrese, 1975).

Unfortunately, these skills may also be used by some to identify the most suitable candidates for potentially dangerous and/or criminal situations (e.g. assault, theft and scams). Research suggests that depending on victimization type, 0.7%–39.2% of people experience repeat victimization throughout their lifetime (i.e. more than one occurrence of victimization; Daigle *et al.*, 2008; Gabor and Mata, 2004). These individuals comprise a disproportionate amount of all sexual and violent victimization, ranging from approximately

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27.7% to 72.4% of events (Daigle *et al.*, 2008; Gabor and Mata, 2004; for a review see Wager *et al.*, 2021), indicating that perpetrators often target/identify vulnerable peoples. Given the potential negative outcomes (e.g. depression, anxiety and suicidal ideation; Debowska *et al.*, 2024; Thornton *et al.*, 2023; Zinzow *et al.*, 2012) that sexual and physical abuse may have upon those affected, researchers have sought to examine the potential correlates of victimization and vulnerability.

Extant literature has primarily focused on the characteristics of those who perpetrate sexual and violent offences, with fewer studies considering how victim's personality variables or nonverbal behaviors relate to victimization. This said, previously victimized individuals are more neurotic, anxious, depressed and fearful than nonvictims and, in social situations, may show signs of submissiveness and low confidence (Blackburn *et al.*, 2023; Conley *et al.*, 2017; Dworkin *et al.*, 2017). Interestingly, the perceptions of personality in victims vary between incarcerated versus community samples. Researchers have suggested that incarcerated individuals target persons demonstrating extraverted, caring or naïve behaviors (e.g. smiling and affectionate; Beauregard *et al.*, 2007; Stevens, 1994), while in community samples, previously victimized women appear less confident to others (Goetz *et al.*, 2012). Multiple studies have reported that low sexual assertiveness is not only associated with previous sexual victimization but can act as a predictor of future sexual victimization (Greene and Navarro, 1998; Kelley *et al.*, 2016; VanZile-Tamsen *et al.*, 2005).

In the studies that have examined the relationships between nonverbal behaviors, personality and victimization, a few patterns have begun to emerge. Submissiveness, for instance, may manifest by engaging in arm-crossing behaviors and isolated hand or foot movements (Fetterman *et al.*, 2015; Richards *et al.*, 1991). Conversely, expressions of dominance may be characterized by expressive or intense facial expressions, direct gaze, nodding, bodily openness and a tendency to engage in less self-touch (Hall *et al.*, 2005). This is in alignment with the internal states model, which suggests that external behaviors are a result of dynamic (e.g. mood) and static (e.g. personality) internal factors (Gillespie and Leffler, 1983). Specific to victimization, much of what we know regarding nonverbal behaviors and vulnerability comes from research using gait. Stemming from Grayson and Stein's (1981) work where vulnerability to future victimization was associated with distinct and identifiable patterns (e.g. long or short strides, moving unilaterally and gazing downwards), this line of inquiry has demonstrated that previously victimized individuals exhibit more vulnerable gait cues than nonvictims (Blaskovits and Bennell, 2019; Ritchie, 2016).

Currently, there has been relatively limited empirical attention regarding the relationship between victimization and nonverbal behaviors other than gait. Of the existing literature, one study found that women who were victims of childhood sexual assault demonstrated fewer head movements and were less animated with their movements than women who did not experience childhood sexual assault (Parks *et al.*, 2008). For incarcerated individuals, nonverbal behaviors serve as indicators of not only another's personality but also their vulnerability as well. For instance, Stevens (1994) conducted a study involving sexual offenders, where 66% expressed a preference for victims who appeared "easy prey," often emphasizing how their victims carried themselves. For example, one participant stated that "when a woman answered [my] question and glanced down or [looked] away, [I] knew she could be victimized" (Stevens, 1994, p. 426).

In general, women are more likely than men to worry about victimization because of factors including perceived likelihood of occurrence and lower perceived self-efficacy (Jackson, 2009). Gender roles and stereotypes, including societal norms encouraging submissive, fearful, warm and nurturing women and dominant, fearless and aggressive men, may contribute to this (Angelone *et al.*, 2020; Casad and Lee, 2014). Despite these influences, to our knowledge, no empirical study has explored how self-perceived vulnerability relates to personality and nonverbal behaviors. Yet, this perception of personal vulnerability could

significantly impact victimization risk. For example, research suggests that women who have been sexually assaulted have delayed response latency, that is, they take longer to decipher when a situation has become unsafe and, as such, are at an increased risk for sexual (re)victimization (Soler-Baillo *et al.*, 2005; Wilson *et al.*, 1999). However, in their sample of 66 undergraduate women who had experienced sexual victimization, Marx *et al.* (2001) found that, during a two-month follow-up, there was no difference in response latency between women who received victimization preventative programming and those who did not. This said, women who experienced sexual revictimization exhibited a longer response latency compared to those who did not, suggesting a potential underlying mediating factor between these two groups. It is possible that women who do not view themselves as sexually vulnerable exhibit increased response latency, as they are not actively attuned to their environment searching for signs of potential risk and, as such, are at an increased risk for victimization. Therefore, the exploration of self-perceptions of vulnerability may offer valuable insights for developing nuanced programs to prevent victimization or repeat victimization.

The present study

Recent survey data suggests that approximately 30% of Canadians have experienced sexual assault at some point during their life, with women being five times more likely than men to report experiencing this form of violence (Cotter, 2021). This number increases in samples of North American college-aged women, who have historically been considered the most at-risk group for sexual violence, with prevalence estimates of 24%–58% (Muehlenhard *et al.*, 2017; Mumford *et al.*, 2020; Senn *et al.*, 2014); however, this line of research tends to focus on situational rather than individual level factors. In response to this, this study used an exploratory design to examine how personality relates to nonverbal behaviors and reports of self-perceived vulnerability to both sexual and nonsexual violent (herein known as violent) victimization in a sample of university-aged women. Although past research has predominately considered the interplay between personality, gait and victimization history or other-perceptions of vulnerability, the present study is distinct, as it examined the relationships between personality traits and both self-perceptions of vulnerability as well as nonverbal behaviors other than gait. Though the relationships between personality and vulnerability to nonsexual violence were exploratory, we predicted that vulnerability to sexual victimization would be negatively related to assertiveness and positively related to submissiveness. We further hypothesized that submissiveness and low levels of assertiveness would be positively correlated with self-touch, body crossing behaviors and isolated foot movements and negatively correlated with energetic or animated behaviors. Finally, we also conducted exploratory analyses to examine how other personality traits related to sexual vulnerability and nonverbal behaviors.

Importantly, this research was in no way meant to blame victims of sexual and/or violent assault; this responsibility lies with the perpetrator and the perpetrator alone. Rather, this research was conducted with the intention of fostering a sense of empowerment by helping to enhance the skills necessary to hold autonomy over one's future in social interactions where they may have otherwise felt anxiety, discomfort or worry. Smodis (2023) found that participants with past sexual victimization experiences reported elevated levels of anxiety. Moreover, those high in neuroticism perceived a greater vulnerability to future sexual victimization, with women expressing higher risk susceptibility compared to men. Smodis (2023) noted that potential victims are more inclined to mitigate their risk of being victimized than perpetrators. Through this study, we hope to empower survivors of sexual or violent abuse by increasing awareness of potentially unnoticed behaviors. This awareness may facilitate the development of skills needed to regain a sense of control in interpersonal relationships and communication.

Method

Participants

In all, 41 undergraduate women from a Canadian university were recruited for the present study. To ensure a range of assertiveness scores, women scoring in the upper and lower quartiles of a pre-screened measure of assertiveness (Rathus Assertiveness Schedule; Rathus, 1973), as completed during mass testing at the beginning of the academic year, were invited to participate within the present study. Of the original 41 participants, one did not provide consent. The final sample consisted of 40 undergraduate women ($M_{age} = 19.35$, $SD_{age} = 2.67$ and $range_{age} = 17-31$) of predominately Caucasian (70%; $n = 28$), followed by Asian (10%; $n = 4$), Black (5%; $n = 2$), Arab (5%; $n = 2$), Mixed (5%; $n = 2$), Latin American (2.5%; $n = 1$) and West Indian (2.5%; $n = 1$) descent.

Materials

Videos

Consistent with past research examining vulnerability assessments and mimicry of favorable traits in dating contexts (Black *et al.*, 2014; Brazil *et al.*, 2023), participants were instructed to imagine they were recording a dating profile and to provide information about themselves for approximately 2 min (for more detail, see the procedure). Videos were recorded using a GoPro HERO3 camera. The camera was positioned on a tripod at a standardized position from participants. All videos were full body from a seated position, taken against a white backdrop and participants were asked to remove any obstructions from their face and body (e.g. purse, hat and coffee). Each video was between 1 and 2 min in length. For standardization purposes, each video was cut to 45 s long, starting immediately after the participant introduced themselves, and did not contain audio.

Measures

Rathus assertiveness schedule

The Rathus Assertiveness Schedule (Rathus, 1973) is a 30-item self-report questionnaire used to assess an individual's level of assertiveness. Participants respond to all items (e.g. "I have hesitated to make or accept a date because of 'shyness'") on a six-point scale ranging from -3 ("very much unlike me") to 3 ("very much like me"). Following the recoding of 17 reverse-scored items, total assertiveness scores (ranging from -90 to 90) are computed by summing all items.

Hexaco-60

The Honesty-humility, Emotionality, eXtraversion, Agreeableness, Conscientiousness, Openness - 60 (HEXACO-60; Ashton and Lee, 2009) is a 60-item self-report questionnaire used to assess varying personality traits, where respondents were asked to indicate the extent to which they agree with each statement on a scale from 1 ("strongly disagree") to 5 ("strongly agree"). The HEXACO-60 encompasses six subscales: honesty-humility, emotionality, extraversion, agreeableness, conscientiousness and openness, each containing 10 items. After recoding 29 reversed scored items, subscale scores (ranging from 1 to 5) are derived by averaging all items within each subscale.

IAsr-b5

The Revised Interpersonal Adjectives Scale - Big Five (IASR-B5; Trapnell and Wiggins, 1990) is a 124-item self-report questionnaire used to assess interpersonal traits. The IASR-B5 is composed of five factor scales (DOM [surgency/extraversion], LOV [agreeableness], conscientiousness, openness to experience and neuroticism) and eight interpersonal

octants (warm-agreeable, gregarious-extraverted, assured-dominant, arrogant-calculating, cold-hearted, aloof-introverted, unassured-submissive and unassuming-ingenuous). In the present study, only the interpersonal octants “unassured-submissive,” “assured-dominant” and “warm-agreeable” were used as proxy measures of submissiveness, dominance and nurturance, respectively. Each octant contains eight items and participants responded to each personal adjective (e.g. “Domineering”) using a seven-point scale ranging from 1 (“extremely inaccurate”) to 7 (“extremely accurate”). Octant scores are computed by averaging all responses pertaining to each subscale, with factor scores ranging from 1 to 8.

Vulnerability questionnaire

Adapted from [Wheeler et al. \(2009\)](#), where participants were asked to rate a target’s perceived vulnerability, the Vulnerability Questionnaire is a two-item self-report survey used to assess self-perceived vulnerability to future sexual (e.g. sexual coercion and sexual assault) and nonsexual violent (e.g. physical abuse and armed robbery) victimization. Participants were asked to indicate how vulnerable they felt they were to future victimization using a scale ranging from 0% (“not vulnerable”) to 100% (“very vulnerable”).

Nonverbal behavior coding guide

Designed for this study, the Nonverbal Behavior Coding Guide assessed 20 nonverbal behaviors (e.g. gaze ahead and crossed arm) that have been identified in past research as being related to assertiveness, submissiveness and/or dominance ([Grayson and Stein, 1981](#); [Hall et al., 2005](#); [Richards et al., 1991](#)). Nonverbal cues were scored using a three-point scale ranging from 0 (“not at all”) to 2 (“a lot”). Four independent, university aged female raters coded the nonverbal behaviors, achieving good interrater agreement for all cues (two-way random effects intraclass correlation ranged from 0.82 to 0.84) [1].

Procedure

Upon arriving to the university lab, participants provided consent and then filmed their dating profiles. For their dating profile, participants were instructed to discuss their interests and/or hobbies and were told to act as naturally as possible, as if they were going to use their video to find a potential partner on a dating website or as an audition tape for a dating show. Participants were informed that while the content of their video was up to their discretion, they would be provided with several potential topics (e.g. “If I could describe myself in four words, they would be [...]” and “My favorite food(s)/restaurant(s) are [...]”) to base their responses. To ensure authenticity of gaze, once filming commenced, the researcher stepped out of view to ensure that participants would not interact or engage with the researcher during filming. All participants used the provided prompts; covered topics included biographical information, interest/hobbies, family structure, personal qualities, preferences regarding future partners and ideal dates, pets and employment status. Four participants experienced moments of silence lasting approximately 4 s before transitioning to discussing their interests. Once filming was finished, participants completed a brief demographic questionnaire, Rathus Assertiveness Schedule, IASR-B5, HEXACO-60 and the Vulnerability Questionnaire, in randomized order. Upon completion of the study, participants were provided debriefing materials and granted their choice of either 1% course credit or \$20 CAD.

Ethics

The Research Ethics Board of the host institution granted ethics clearance for this research project (Ethics Protocol Clearance ID: Project # 111586). The Research Ethics Board is constituted and operates in compliance with the Tri-Council Policy Statement: Ethical

Conduct for Research Involving Humans. Participants were fully informed that their participation was voluntary and that they could choose not to respond to any presented item or withdraw from the study at any point without facing retribution or loss of compensation. Additionally, although no participant asked to have their data removed, they were assured that their data could be deleted upon request. To maintain confidentiality, participants' videos and associated survey data were linked solely by a code number, with no association to their names or other personally identifying information.

Data management

Before the main analysis, data were screened for outliers via a visual inspection of boxplots and standardized z-scores, to which one case on the warm-agreeable octant of the IASR-B5 was identified. The outlier was changed to one raw score above the next highest score to reduce the effect but maintain its rank order [2]. No issues related to normality (assessed via Q-Q plots and histograms) or homoscedasticity (assessed via visual inspections of standardized residuals plotted against predicted values for each variable) were observed.

Although alpha adjustments (e.g. Bonferroni adjustment) are recommended when multiple tests are conducted to reduce Type-1 error, some researchers have argued that under certain circumstances (e.g. exploratory studies and studies with specific hypotheses), investigators should instead include effect and power sizes, make logical and reasonable conclusions and encourage replication studies (Bender and Lange, 2001; Moran, 2003; Perneger, 1998). Therefore, given the exploratory rather than confirmatory nature of the present study, in addition to specific predictions being made for some research questions, the traditional alpha value of 0.05 was used as the threshold for determining significance. To reduce the total number of tests conducted, similar behaviors that did not have a specific hypothesis were collapsed into one variable, producing five new behavior variables: smile/laugh, engaged/animated, moved arm/leg, open/relaxed posture and crossed body (crossed leg, crossed feet, tucked leg, crossed leg on chair, crossed arm and crossed hands). The bias-corrected and accelerated method was chosen to generate 95% confidence intervals. This method is widely recommended for its effectiveness in diverse contexts and its ability to generate accurate intervals without requiring assumptions about distributions (Carpenter and Bithell, 2000; Puth *et al.*, 2015).

Additionally, given the potential power issues present within this study because of a small sample size, Bayesian analyses were also conducted, as this method is not constrained by sample size and provides a highest density interval, giving researchers a true 95% credibility interval (O'Connor, 2017). Though it is beyond the scope of the study to provide an in-depth explanation of Bayesian analyses, interested readers are encouraged to review Kruschke *et al.* (2012), Wagenmakers *et al.* (2016) and Zyphur and Oswald (2013). Bayesian analyses have been successfully used in past research with small sample sizes (Williamson and Serna, 2018). Given that this study is exploratory and little data exists that can be used for prior estimations, a noninformative, uniform prior distribution was used (O'Connor, 2017; Zyphur and Oswald, 2013). All analyses were conducted using IBM SPSS Statistics, version 28.0. For the purpose of the present study, only credibility intervals not containing 0 are reported (see supplementary tables for a detailed review of all Bayesian analyses).

Results

Scale descriptive statistics as well as correlations between key variables are presented in Table 1. A paired samples *t*-test and bivariate correlation were first conducted to determine the relationship between self-perceived vulnerability to sexual and violent victimization, where according to Cohen (1988, 1990), *r*'s of 0.1, 0.3 and 0.5 denote a small, moderate and large effect size, respectively. Sexual vulnerability ratings were

Table 1 Means, standard deviations, internal consistencies and bivariate correlations between study variables

Scale	M	SD	α	As ^a	S ^a	D ^a	N ^b	Correlations					
								HH ^a	E ^a	X ^a	Ag ^a	C ^a	O ^a
<i>Vulnerability</i>													
Sexual	46.95	27.45	–	–	–	–	–	–	–	–	–	–	–
Violent	38.03	24.90	–	–	–	–	–	–	–	–	–	–	–
<i>RAS</i>													
Assertiveness ^a (As)	–14.59	36.68	0.95	–									
<i>IASR-B5</i>													
Submissive ^a (S)	36.33	12.20	0.91	–0.75**	–								
Dominant ^a (D)	34.30	11.75	0.89	0.78**	–0.77**	–							
Nurturance ^b (N)	52.20	8.18	0.94	–0.38*	0.30	–0.25	–						
<i>HEXACO-60</i>													
Honesty-Humility ^a (HH)	34.65	6.55	0.76	–0.05	0.09	–0.09	0.48**	–					
Emotionality ^a (E)	36.35	6.57	0.77	–0.55**	0.45**	–0.42**	0.35*	–0.06	–				
Extraversion ^a (X)	32.01	8.69	0.89	0.68**	–0.78**	0.76**	0.08	0.19	–0.32*	–			
Agreeable ^a (Ag)	30.88	7.25	0.83	–0.34*	0.17	–0.21	0.53**	0.32*	0.12	–0.03	–		
Conscientious ^a (C)	36.65	6.67	0.82	–0.02	0.15	0.19	0.23	0.36*	0.23	0.17	–0.02	–	
Openness ^a (O)	34.96	5.96	0.68	0.33	–0.19	0.30	–0.01	0.04	0.04	0.18	0.03	0.02	–

Notes: – = Information not applicable; α = Cronbach's alpha; Submissive = Unassured-submissive; Dominant = Assured-dominant; Nurturance = Warm-agreeable; N = 40; ^aPearson's *r*, ^bSpearman's rho; **p* < 0.05; ***p* < 0.01

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not significantly different from violent vulnerability ratings, $t(39) = 2.01$, $p = 0.051$ and $d = 0.32$, but they were significantly positively correlated ($r = 0.43$, $p = 0.006$, bias-corrected and accelerated (BC_a) and 95% CI [0.08, 0.71]; Bayesian posterior mean (BPM) $r = 0.40$ and 95% credibility interval [0.14, 0.61]), with a moderate effect.

Pearson bivariate (Table 2) and Bayesian correlations (supplementary tables) were conducted to determine the relationships between vulnerability ratings and personality variables. Pearson correlations are presented first, followed by Bayesian correlations. Sexual vulnerability was positively associated with emotionality ($r = 0.41$, $p = 0.009$ and BC_a 95% CI [0.06, 0.69]) and negatively correlated to both dominance ($r = -0.35$, $p = 0.026$ and BC_a 95% CI [–0.63, –0.02]) and assertiveness ($r = -0.39$, $p = 0.012$ and BC_a 95% CI [–0.52, –0.06]), with moderate effect sizes. In terms of Bayesian correlations, sexual vulnerability was similarly positively related to emotionality (BPM $r = 0.38$ and 95% credibility interval [0.12, 0.63]) and negatively associated with dominance (BPM $r = -0.33$ and 95% credibility interval [–0.58, –0.06]) and assertiveness (BPM $r = -0.37$ and 95% credibility

Table 2 Bivariate correlations between vulnerability ratings and personality variables

Personality trait	Sexual	Violent
Assertive ^a	–0.39*	–0.14
Submissive ^a	0.21	0.10
Dominant ^a	–0.35*	–0.25
Nurturance ^b	0.11	0.01
Honesty-humility ^a	0.12	0.07
Emotionality ^a	0.41**	0.26
Extraversion ^a	–0.25	–0.21
Agreeable	0.05	0.24
Conscientious ^a	0.01	–0.19
Openness ^a	0.05	0.06

Notes: Submissive = Unassured-submissive; Dominant = Assured-dominant; Nurturance = Warm-agreeable; N = 40; ^aPearson's *r*, ^bSpearman's rho; **p* < 0.05; ***p* < 0.01

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interval [-0.62, -0.10]). No significant correlations between personality variables and self-perceived violent vulnerability were found.

The next set of Pearson bivariate (Table 3) and Bayesian correlations were (supplementary tables) conducted to determine how personality variables relate to nonverbal behaviors. Self-touch was positively correlated with submissiveness ($r = 0.56, p < 0.001$ and BC_a 95% CI [0.34, 0.75]), nurturance ($r = 0.47, p = 0.002$ and BC_a 95% CI [0.18, 0.69]), emotionality ($r = 0.54, p < 0.001$ and BC_a 95% CI [0.33, 0.71]) and agreeableness ($r = 0.36, p = 0.025$ and BC_a 95% CI [0.06, 0.61]) and negatively related to assertiveness ($r = -0.76, p < 0.001$ and BC_a 95% CI [-0.87, -0.61]), dominance ($r = -0.56, p < 0.001$ and BC_a 95% CI [-0.74, -0.33]) and extraversion ($r = -0.37, p = 0.018$ and BC_a 95% CI [-0.65, -0.08]). Smiling/laughing was negatively correlated with submissiveness ($r = -0.32, p = 0.047$ and BC_a 95% CI [-0.61, -0.05]). Body crossing behaviors were positively correlated with honesty-humility ($r = 0.41, p = 0.010$ and BC_a 95% CI [0.07, 0.64]). Moving one's feet was negatively associated with dominance ($r = -0.35, p = 0.027$ and BC_a 95% CI [-0.58, -0.06]). Moving one's arms/legs were negatively related to both assertiveness ($r = -0.41, p = 0.008$ and BC_a 95% CI [-0.63, -0.16]) and dominance ($r = -0.40, p = 0.010$ and BC_a 95% CI [-0.61, -0.16]) and positively correlated to agreeableness ($r = 0.35, p = 0.029$ and BC_a 95% CI [0.03, 0.59]).

Similar patterns emerged through Bayesian analyses: self-touch was positively related to submissiveness (BPM $r = 0.53$ and 95% credibility interval [0.31, 0.74]), nurturance (BPM $r = 0.41$ and 95% credibility interval [0.16, 0.66]), emotionality (BPM $r = 0.51$ and 95% credibility interval [0.28, 0.71]) and agreeableness (BPM $r = 0.33$ and 95% credibility interval [0.08, 0.59]) and negatively associated with assertiveness (BPM $r = -0.73$ and 95% credibility interval [-0.86, -0.57]), dominance (BPM $r = -0.53$ and 95% credibility interval [-0.73, -0.30]), extraversion (BPM $r = -0.34$ and 95% credibility interval [-0.60, -0.08]) and openness (BPM $r = -0.28$ and 95% credibility interval [-0.55, -0.001]). Smiling/laughing was negatively related to submissiveness (BPM $r = -0.29$ and 95% credibility interval [-0.55, -0.01]). Body crossing behaviors were positively associated with honesty-humility (BPM $r = 0.38$ and 95% credibility interval [0.10, 0.62]) and nurturance (BPM $r = 0.40$ and 95% credibility interval [0.15, 0.65]). Moving one's feet was negatively related to dominance (BPM $r = -0.33$ and 95% credibility interval [-0.59, -0.05]). Finally, moving one's arms/legs were negatively associated with assertiveness (BPM $r = -0.38$ and 95% credibility interval [-0.63, -0.12]) and dominance (BPM $r = -0.38$ and 95% credibility interval [-0.63, -0.12]) and positively related to agreeableness (BPM $r = 0.32$ and 95% credibility interval [0.04, 0.58]). No other behavioral cues were associated with personality.

Table 3 Bivariate correlations between nonverbal behaviors and personality variables

Nonverbal behavior	As ^a	S ^a	D ^a	N ^b	HH ^a	E ^a	X ^a	Ag ^a	C ^a	O ^a
Gaze Ahead	-0.12	0.05	0.08	0.22	0.06	0.08	0.08	-0.02	0.14	-0.06
Gaze Away	-0.22	0.13	-0.14	-0.05	-0.09	0.14	-0.18	-0.06	0.08	-0.02
Frown	-0.19	0.20	-0.22	0.02	0.13	-0.03	-0.27	-0.031	-0.02	0.13
Smile/Laugh	0.08	-0.32*	0.15	0.09	-0.17	-0.03	0.27	0.25	-0.21	-0.05
Engage/Animated	0.18	-0.31	0.25	0.01	-0.19	-0.07	0.20	0.13	-0.13	-0.04
Moved Feet	-0.23	0.20	-0.35*	0.02	-0.23	0.25	-0.29	0.09	-0.13	-0.20
Moved Arm/Leg	-0.41**	0.13	-0.40*	0.22	-0.04	0.29	-0.29	0.35*	-0.16	-0.13
Crossed Body	-0.15	0.24	-0.19	0.25	0.41**	0.05	-0.05	0.04	0.09	-0.08
Open/Relaxed Posture	-0.02	-0.24	0.11	0.07	-0.22	0.13	0.16	0.11	-0.28	-0.09
Tense Posture	-0.14	0.21	-0.28	0.13	0.29	-0.08	-0.15	-0.09	0.24	-0.14
Self-touch	-0.76**	0.56**	-0.56**	0.47**	0.09	0.54**	-0.37*	0.36*	0.08	-0.31

Notes: – = Could not be computed because at least one variable is constant (i.e. all scores were rated as 0); As = Assertive; S = Unassured-submissive; D = Assured-dominant; N = Warm-agreeable; H = Honesty-humility; E = Emotionality; X = Extraversion; Ag = Agreeableness; C = Conscientiousness; O = Openness to Experience; N = 40; ^aPearson's r ; ^bSpearman's ρ ; * $p < 0.05$; ** $p < 0.01$

Source: Created by authors

Effect sizes were large for emotionality, moderate to large for assertiveness, submissiveness and dominance and moderate for nurturance, honesty-humility, extraversion and agreeableness.

The final set of bivariate Pearson (Table 4) and Bayesian correlations (supplementary tables) were conducted as a follow-up to determine which specific nonverbal behavior in each collapsed variable (i.e. smile/laugh, moved arm/leg, crossed body, animated/engaged and open/relaxed posture) were related to personality traits. Notably, only personality traits that demonstrated significant relationships with the collapsed variables were used. Full leg movements were negatively related to assertiveness ($r = -0.40, p = 0.011$ and BC_a 95% CI [-0.62, -0.10]) and dominance ($r = -0.39, p = 0.012$ and BC_a 95% CI [-0.64, -0.10]), both to a moderate effect. Crossing one's hands was positively associated with honesty-humility ($r = 0.57, p < 0.001$ and BC_a 95% CI [0.27, 0.78]) to a strong effect. Finally, laughing was moderately negatively related to submissiveness ($r = -0.31, p = 0.049$ and BC_a 95% CI [-0.90, -0.06]), such that individuals scoring high on submissiveness laughed less frequently than their lower scoring counterparts. Similar relationships were observed through Bayesian methods, with negative relationships occurring between full leg movements and assertiveness (BPM $r = -0.37$ and 95% credibility interval [-0.62, -0.10]) and dominance (BPM $r = -0.36$ and 95% credibility interval [-0.61, -0.10]). Positive relationships were noted between crossing one's hands and honesty-humility (BPM $r = 0.54$ and 95% credibility interval [0.33, 0.74]) and laughing and submissiveness (BPM $r = -0.29$ and 95% credibility interval [-0.57, -0.01]).

Discussion

This exploratory study sought to determine how personality traits relate to self-perceptions of sexual and violent vulnerability and to establish the associations between personality traits and nonverbal behaviors. The authors hope that the information obtained from this study will help formulate and strengthen effective intervention and prevention methods for those at risk of (sexually) violent victimization.

We found no relationships between personality traits and self-perceived vulnerability to violent victimization. Evidence suggests that college-aged women are the most at-risk group for sexual victimization (Muehlenhard *et al.*, 2017). With an increased awareness of sexual violence on campus, sexual vulnerability may have been a more salient concern over violent vulnerability given the age and educational status of the sample. That is, the women in our study may have viewed the actions of being mugged, hit or physically attacked as

Table 4 Bivariate correlations between significant non-collapsed nonverbal behaviors and personality variables

Nonverbal behavior	As ^a	S ^a	D ^a	HH ^a	Ag ^a
Smile	–	–0.24	–	–	–
Laugh	–	–0.31*	–	–	–
Moved arm	–0.21	–	–0.20	–	0.26
Moved leg	–0.40**	–	–0.39*	–	0.25
Crossed leg	–	–	–	0.20	–
Crossed feet	–	–	–	–0.06	–
Tucked leg	–	–	–	0.03	–
Crossed leg on chair	–	–	–	–	–
Crossed arm	–	–	–	–0.16	–
Crossed hands	–	–	–	0.57**	–

Notes: – = information not applicable or could not be computed because at least one variable is constant (i.e. all scores were rated as 0); As = Assertive; S = Unassured-submissive; D = Assured-dominant; H = Honesty-humility; Ag = Agreeableness; N = 40; ^aPearson's r ; * $p < 0.05$; ** $p < 0.01$

Source: Created by authors

being less likely to occur than sexual assault. In fact, although not statistically significant, women were more likely to perceive themselves as being vulnerable to sexual victimization than violent victimization.

As expected, low levels of assertiveness were associated with self-perceived vulnerability to sexual victimization. This parallels past research indicating that women who have experienced sexual violence are likely to have difficulties being sexually assertive (Classen *et al.*, 2001; Corbin *et al.*, 2001; Greene and Navarro, 1998; VanZile-Tamsen *et al.*, 2005). Scoring high on emotionality and low on dominance was also associated with self-perceived sexual vulnerability. These findings are not altogether surprising considering that emotionality represents characteristics such as anxiousness, fearfulness and dependence (Ashton *et al.*, 2014), while dominance may be defined as the self-perceptions of one's ability to control others (Hall *et al.*, 2005). Counter to our predictions, submissiveness went unrelated to sexual vulnerability. On one hand, this aligns with Blaskovits and Bennell (2019) who found that submissiveness was not related to past sexual victimization. On the other hand, other researchers have noted a relationship between submissiveness and past sexual victimization (Beauregard *et al.*, 2007; Ritchie, 2016; Stevens, 1994). This said, this prior research has either examined submissiveness in the context of past victimization or perpetrator selection techniques, while the present study examined *self*-perceptions of vulnerability to *future* sexual victimization. Given that assertiveness corresponds to social or communication skills while submissiveness is related to compliance or conformity (Merriam-Webster, 2024), the women in our study may have viewed their ability to verbally defend themselves (assertiveness) or control others (dominance) as more pertinent in their self-assessments of vulnerability than how likely they are to conform with the status quo (submissiveness).

Alternatively, it is also plausible that another variable mediates the relationship between submissiveness and victimization. For example, individuals who have perpetrated sexual offences have cited relying on how a woman carries herself, often opting for those who appear like "easy prey" (Beauregard *et al.*, 2007; Stevens, 1994). Therefore, it may be that individuals with submissive personality traits demonstrate behavioral cues that inadvertently exacerbate the likelihood of victimization; that is, they may exhibit certain cues that perpetrators intentionally target. Indeed, our research suggests that there are behavioral differences between assertive and submissive personality traits. For example, submissive women were less likely to laugh, which is congruent with Hall and colleagues (2005) finding that perceptions of dominance and power is related to more conversational laughing. Conversely, lower levels of assertiveness and dominance were related to more full leg movements.

Body crossing behaviors (e.g. crossed arms and crossed legs) went unrelated to both assertive and submissive personality traits, which was unexpected given that past researchers have found submissive individuals engage in body-wrapping behaviors when seated (Fetterman *et al.*, 2015). In a recent study, in comparison to controls, when arm-crossing was induced, both men and women endorsed greater feelings of submissiveness and were more likely to engage in escape or defensive avoidance techniques when presented with a scenario involving potential physical harm (Fetterman *et al.*, 2015). This suggests that some behaviors may be more relevant or occur in situations when someone feels as though they are unsafe or in harm's way and may need an extra layer of protection. In our study, submissive and unassertive women may not have felt any imminent threat to their safety or security and, as such, did not feel the need to engage in arm-crossing or other body-wrapping behaviors.

Though most relationships between personality and nonverbal behaviors went unrelated, self-touch was associated to most of the personality variables measured in our study and, when significant, tended to be the largest effect size for that personality trait. Notably, the strongest effect sizes between self-touch and personality traits were seen with

assertiveness, submissiveness, dominance and emotionality. Specifically, greater self-touch was related to lower assertiveness and dominance and higher submissiveness and emotionality. Our findings suggest that not only may there be key personality differences between those who self-perceive as being sexually vulnerable (i.e. low assertiveness and dominance and high emotionality), but that there may be key behaviors indicative of this vulnerability, including full leg-movements and self-touch (when seated).

Implications

As a result of victimization, survivors may engage in avoidance-type behaviors and experience increased levels of anxiety, distress and depression (Zinzow *et al.*, 2012). Additionally, they may develop an external *locus* of control, such that they may feel that they are unable to act upon their own volition but rather, must behave in accordance with what they believe others expect of them (Classen *et al.*, 2001; Goetz *et al.*, 2012). Given that sexual assertiveness reduces the risk for sexual exploitation and assault (Brecklin and Ulman, 2005; Simpson Rowe *et al.*, 2012; Simpson Rowe *et al.*, 2015), our results suggest that it may be particularly suitable and necessary for universities and colleges to implement workshops targeted at increasing assertiveness in undergraduate women, especially those who feel vulnerable to sexual victimization. We would like to acknowledge that this recommendation is being made from an exploratory study using a small sample size; however, we believe this type of training should be a priority; historically, assertiveness training has reduced levels of anxiety and helplessness, increased self-efficacy, awareness and detection of situation relevant cues unique to sexual victimization and, ultimately, helps curb sexual (re)victimization (Brecklin, 2004; Simpson Rowe *et al.*, 2012; Simpson Rowe, *et al.*, 2015; Weitlauf *et al.*, 2000). Notably, victimization need neither occur nor does one have to be a woman or feel vulnerable to partake in assertiveness or behavioral training. It would be beneficial for people of all demographics to engage in assertiveness building programs to encourage the development of positive self-esteem and emotions, self-efficacy, autonomy (e.g. internal control) and boundary setting; preventing victimization may emerge as a secondary outcome of such programs.

Further, despite small sample sizes, key personality variables (i.e. assertive, dominant, submissive and emotionality) were significantly related to self-touching behaviors to a large effect. With evidence to suggest that self-defense training decreases negative feelings (e.g. spinelessness or gullibility) and increases feelings of physical and general self-efficacy (Brecklin, 2004; Weitlauf *et al.*, 2000), it may be fitting to implement behavior specific intervention programs. Specifically, training targeted at decreasing self-touch *may* prove to be an incredibly fruitful endeavor for those who feel vulnerable to sexual victimization or feel as if they are lacking in assertiveness or dominance; however, research would be needed to examine the outcomes of this type of training on the development of positive self-esteem and emotions.

Limitations and future directions

While this study has several strengths including being one of the first of its kind to examine self-perceptions of vulnerability, it is not without its limitations. First, despite some researchers using comparable sample sizes (Blaskovits and Bennell, 2019; Fulham *et al.*, 2020), a sample size of 40 may limit the power to identify significant differences. Subsequently, it is a salient possibility that some relationships between nonverbal behaviors and personality traits went undetected. However, Bayesian analyses, which are not constrained by sample size, produced similar results to those found using Pearson correlations (null hypothesis significance testing). Second, it would be remiss to ignore the potential generalizability concerns given the sample demographics. Notably, all participants were women, the majority of whom identified as Caucasian in their early 20s. Therefore, the current findings may not extend to people of other genders, ethnicities or age

groups. Future researchers should seek to expand their sample size and demographic profiles. Specifically, with research to suggest that men are more likely to be a victim of violent victimization (Vaillancourt, 2010), future research could examine men and perceived vulnerability to violent victimization.

Generalizability concerns may be further compounded by the focus on subjective self-perceptions of vulnerability in this study, as opposed to other-perceptions (Ritchie *et al.*, 2018; Wheeler *et al.*, 2009) or multiple-item self-report measures used in previous research (e.g. Social Vulnerability Scale; Pinsker *et al.*, 2006; Chung and Charles, 2016). As such, caution is warranted when extending results beyond self-perceived vulnerability and future studies should incorporate multiple definitions of vulnerability to capture potential inherent nuances. Moreover, as women were seated in their videos, results may have differed if they were standing or walking. Future research should consider varying positions to enhance validity. It is also possible that the verbal content expressed by participants in their videos influenced their corresponding body language. For instances, if one were to repeatedly express feelings of anxiety, then they may also exhibit distinct nonverbal cues compared to those discussing their hobbies and interests. As such, it would be important for future research to consider the interplay between verbal content and nonverbal cues in understanding human communication dynamics. Holistic approaches such as this will provide deeper insight into how verbal expressions shape and are reflected in non-verbal behaviors, enriching our understanding of communication processes.

Third, using a cross-sectional approach limits, our ability to determine any possibly causal relationships between behaviors and personality traits; we are unable to ascertain whether certain behaviors foster traits such as submissiveness, dominance or assertiveness or whether these behaviors are inherent to these traits. Additionally, collecting data at a single time point overlooks the impact of dynamic factors such as mood or response style. Future research should use longitudinal designs to examine how personality traits, nonverbal behaviors and vulnerability evolve over time.

Finally, although similar stimuli methodologies have been used in past research, the artificial setup of the video recordings (i.e. conducted in a laboratory environment with a researcher present) may have influenced participants' feelings (e.g. anxiety and nervousness) and behaviors (inhibition or exacerbation of). Indeed, research suggests that awareness or hypervigilance may decrease vulnerability cues (Fulham *et al.*, 2020; Johnston *et al.*, 2004). Further, vulnerability assessments typically occur in dyadic interactions, where participants actively responding to one another's verbal and nonverbal cues. Consequently, certain nonverbal behaviors might not have been captured in the current study because of its non-dyadic nature. Future research should consider more naturalistic designs, possibly including dyadic pairs, to enhance ecological validity. Future studies should also explore differences between individuals who perceive themselves as vulnerable and those who do not, particularly in relation to victimization experiences.

Conclusion

Overall, this exploratory study provides suggests that the subjective self-perception of sexual vulnerability is related to low levels of assertiveness. Further, it provides preliminary evidence that higher emotionality and lower dominance may be key personality traits related to feelings of sexual vulnerability in women. Although further research is needed to corroborate the findings of this study, our results suggest a few behaviors that may be indicative of subjective self-perceptions of vulnerability because of their association with key personality traits, including self-touch and leg movements. With research indicating that behavior and personality are malleable features (Fulham *et al.*, 2020; Simpson Rowe *et al.*, 2015; Weitlauf *et al.*, 2000), this study provides preliminary evidence for the potential use of different behavioral and personality interventions that may be beneficial in increasing positive feelings related to self-efficacy, esteem and autonomy that not only may aid in

reducing feelings of vulnerability but may also act as a steppingstone in the prevention of (sexual) victimization.

Notes

1. The original Nonverbal Behavior Coding Guide contained 25 behaviors, but three items (i.e. moved head, moved hands and fidget) were removed because of low percent agreement (> 50%). Further, while three gaze-based movements (i.e. gaze down, gaze side and gaze up) scored above 50% on average agreement, this was marginal (i.e. 52%, 55% and 50%, respectively). As such, all three gaze behaviors were averaged into one new behavior, gaze away, to generate a more consistent score.
2. As one data point was modified to reduce the effect of the outlier, Spearman's Rho was used for all analyses with the warm-agreeable octant.

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Further reading

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Supplementary material

The supplementary material for this article can be found online.

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