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Identifying vulnerability to violence: the role of psychopathy and gender

Mary B. Ritchie, Julie Blais, Adelle E. Forth and Angela S. Book

Abstract

Purpose – Recent research has suggested that a heightened sensitivity to nonverbal cues may give individuals with psychopathic traits an advantage when selecting potential victims. The purpose of this paper is to examine the effect of gender on the association between psychopathy and perceptions of vulnerability to violent victimization.

Design/methodology/approach – A sample of 291 undergraduate students viewed a series of eight videos depicting individual female targets walking down a hallway from behind. Participants rated each target's vulnerability to violent victimization and provided a justification for each rating. In addition to these ratings, participants completed the Self-Report Psychopathy Scale.

Findings – A series of hierarchical linear regressions revealed gender differences in the association between psychopathy and accuracy. Among male observers, total psychopathy scores, Factor 2 psychopathy scores, and scores on the antisocial behavior facet were positively associated with accuracy in perceiving vulnerability to violent victimization. Conversely, no associations were identified between psychopathy (total, Factors, and facets) and accuracy among female observers. This suggests that the adept ability to accurately perceive nonverbal cues signalling vulnerability is specific to males exhibiting psychopathic traits.

Originality/value – The results of the current study highlight the importance of distinguishing male and female psychopathy in research and practice. Moreover, with an understanding of individual differences in the ability to accurately perceive nonverbal cues associated with vulnerability, we may begin to develop intervention strategies aimed at reducing future incidences of victimization.

Keywords Gender, Vulnerability, Victimization, Psychopathy, Nonverbal cues, Victim selection

Paper type Research paper

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According to the US Department of Justice, in 2010, the accused was a stranger to the victim in approximately 38 percent of all nonfatal incidents (Harrell, 2012). Of these nonfatal incidents involving strangers, 60 percent were simple assaults, 20 percent were aggravated assaults, 17 percent were robberies, and 2 percent were sexual assaults or rape (Harrell, 2012). Given the relatively high rate of violent crime committed by strangers, it is important to explore the process of victim selection among perpetrators of stranger crime. It is possible that these perpetrators exploit certain cues associated with vulnerability when selecting potential victims. For example, studies have established cues associated with nonverbal behavior (e.g. gait) as indicators of vulnerability (e.g. Grayson and Stein, 1981; Murzynski and Degelman, 1996). Recently, individual differences have been identified in the ability to accurately perceive others' vulnerability based on these nonverbal cues (Book *et al.*, 2013; Wheeler *et al.*, 2009). These studies provide evidence that individuals scoring higher on psychopathy are more proficient in correctly identifying vulnerability among victims and nonvictims compared to individuals scoring lower on psychopathy (Book *et al.*, 2013; Wheeler *et al.*, 2009). With evidence of an association between psychopathy and accuracy in perceiving vulnerability to victimization, the present study sought to expand the current understanding of this relationship by examining the impact of observer gender and identifying the most salient facet(s) of psychopathy. This study also utilized a more specific definition of violent victimization than had previously been used.

Nonverbal cues to vulnerability

Across studies, researchers have suggested that certain traits, such as submissiveness and dominance, are distinguishable based on nonverbal cues such as body language and gait

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(Hall *et al.*, 2005; Richards *et al.*, 1991). For example, Richards *et al.* (1991) identified that women perceived as submissive were more likely to maintain sitting positions and use their hands and feet during conversation, while those perceived as dominant were more likely to change sitting positions and use their arms and legs during conversation. These findings persist even after controlling for factors beyond the nonverbal cues assessed (e.g. clothing, attractiveness; Montepare and Zebrowitz-McArthur, 1988). With consistent evidence supporting nonverbal cues as predictors of perceived dominance and assertiveness, it is not surprising that gait has also been identified as a cue for vulnerability (Corbin *et al.*, 2001; Grayson and Stein, 1981; Johnston *et al.*, 2004; Murzynski and Degelman, 1996).

A study conducted by Grayson and Stein (1981) established that specific components of gait (i.e. walking movement) were associated with vulnerability, where individuals perceived by male offenders as potential victims significantly differed from those not perceived as potential victims across five movement categories: stride length (i.e. medium vs long stride), type of weight shift (i.e. transfer of weight from one foot to another), type of walk (i.e. postural, gestural, or nonspecific), body movement (i.e. contralateral vs unilateral), and foot movement (i.e. swung/lifted). Results were consistent across subsequent studies which measured these movement categories, where typical victim movement profiles were rated as significantly more vulnerable to attack than typical nonvictim movement profiles (Murzynski and Degelman, 1996; Sakaguchi and Hasegawa, 2006). Gunns *et al.* (2002) provided additional support for gait as a cue for vulnerability, noting that a large proportion of variability in vulnerability ratings appeared to be accounted for by gait characteristics. Thus, it may be possible to reduce the likelihood of victimization by adapting gait to reflect less vulnerable cues (Johnston *et al.*, 2004). In addition to identifying the cues consistently associated with vulnerability to victimization, researchers have also focused on examining whether individuals with certain personality traits are more proficient in identifying these cues than others. More specifically, given that psychopathy is associated with increased manipulation and victimization of others, it is possible that people with high levels of psychopathic traits would be better at victim selection than people with low levels of these traits, partly because they engage more often in victimization.

Psychopathy and victim selection

Psychopathy is a personality disposition characterized by affective (e.g. shallow affect, lack of remorse), interpersonal (e.g. grandiose, manipulative), behavioral (e.g. sensation seeking, impulsive), and antisocial features (e.g. early onset and diverse criminal behaviors; Hare, 2003) and has consistently been related to general and violent offending (e.g. Leistico *et al.*, 2008; Olver and Wong, 2015; Yang *et al.*, 2010). The association between psychopathy and violence found among offender samples also persists among nonoffender samples (e.g. Coid and Yang, 2011; Walters, 2003a, b; Vitacco *et al.*, 2014). The fact that some psychopathic individuals can engage in antisocial behavior (ASB) within the community and remain undetected emphasizes the need to explore psychopathy within the general community (Mahmut *et al.*, 2011).

With an understanding of factors contributing to perceptions of vulnerability, researchers have recently identified an association between psychopathy and accuracy in perceiving others' assertiveness (Book *et al.*, 2007) and vulnerability to victimization (Book *et al.*, 2013; Wheeler *et al.*, 2009). As psychopathy is related to increased manipulation and victimization of others, it is possible that this increased success is due to the fact that they engage in these behaviors more frequently. In fact, the adept ability of psychopathic individuals in identifying submissive or vulnerable individuals for exploitation can be considered an evolutionarily adaptive quality (Frank, 1988). For example, Frank (1988) theorized that the ability of social predators (e.g. psychopathic individuals) to accurately interpret the nonverbal behavior of strangers provided a competitive advantage to these individuals. In support of this theory, research has confirmed that psychopathy is related to a fast life strategy (i.e. risk taking, Jonason *et al.*, 2010) including short-term mating strategies (Jonason *et al.*, 2009) and the use of sexual deception (Seto *et al.*, 1997).

Using assertiveness ratings as a proxy for vulnerability to victimization, Book *et al.* (2007) demonstrated that men scoring higher on psychopathy in both a community sample and an

offender sample were more accurate in judging the assertiveness of targets compared with those scoring low on psychopathy. Extending these findings, Wheeler *et al.* (2009) explored the relationship between psychopathy and perceptions of vulnerability in a sample of male university students. Male and female students (i.e. walkers) were unknowingly filmed walking down a hall from one room to another allowing for the capture of the natural walk of each walker. Consenting walkers were then asked to indicate whether they had been victimized at any point in their life (i.e. any victimization including or greater than bullying) and if so, how many times. Researchers then coded the video clips based on the gait cues identified by Grayson and Stein (1981). A sample of male students (i.e. observers) were then asked to rate how vulnerable they believed each walker was to being mugged (i.e. an assault with the intent to rob or steal) and provided a justification for each rating. Observers who scored higher on psychopathy were more accurate in perceiving vulnerability to victimization; however, psychopathy was not associated with mention of gait as a reason for vulnerability ratings. According to Wheeler *et al.* (2009), this discrepancy may reflect an inability among psychopathic individuals to articulate the specific cues used in making vulnerability judgments, at least among nonoffender samples.

Using the same walker videos and procedure as Wheeler *et al.* (2009), Book *et al.* (2013) sought to replicate these findings with a sample of maximum security male offenders. Consistent with previous findings, observers with higher psychopathy scores were more accurate in perceiving the walker's vulnerability to victimization (i.e. an assault with the intent to rob or steal). While higher scores on Factor 1 (i.e. interpersonal and affective traits) were significantly related to accuracy in vulnerability perceptions, Factor 2 (i.e. behavioral and antisocial traits) scores were unrelated. Book *et al.* (2013) speculated that Factor 1 traits (e.g. manipulation) might be used to facilitate the exploitation and victimization of others, while Factor 2 traits (e.g. impulsivity, sensation seeking) may inhibit the ability to accurately perceive vulnerability cues. Contrary to the findings of Wheeler *et al.* (2009), observers with higher Factor 1 scores were more likely to use the target's gait cues as a rationale for their vulnerability ratings. Book *et al.* (2013) postulated that offenders may be more cognizant of the cues used to determine vulnerability because they have more experience in selecting potential victims than students.

Gender differences in psychopathy

The extant literature examining the association between psychopathy and accuracy in perceiving vulnerability has focused exclusively on perceptions of male observers. As such, it is unclear whether this adept ability extends to females with higher psychopathy scores. With evidence of gender differences in both the rate and manifestation of psychopathy, it is important to determine whether the ability to accurately perceive vulnerability can be generalized to females that exhibit psychopathic traits.

According to a systematic review conducted by Beryl *et al.* (2014), rates of psychopathy differ among male and female offenders. That is, psychopathy appears to be less prevalent among female offenders compared to male offenders. A similar pattern of prevalence has been identified among noninstitutionalized samples (e.g. Borroni *et al.*, 2014). Thus, it is not surprising that the distribution of psychopathy scores tends to be higher among males than females (e.g. Forth *et al.*, 1996).

Gender differences have also been noted in the manifestation of psychopathic traits, specifically, in the ability to accurately perceive nonverbal cues signaling emotional vulnerability. In a recent study, Demetriooff *et al.* (2017) examined whether perceptions of micro-expressions differed as a function of psychopathy and gender. Interestingly, gender differences were noted in emotion judgement accuracy. That is, females scoring higher on a measure of psychopathy were more accurate in identifying micro-expressions of sadness than their male counterparts, whereas males scoring higher on a measure of psychopathy were more accurate in identifying micro-expressions of disgust than their female counterparts. To our knowledge, this is the only study to examine gender differences in perceptions of nonverbal micro-expressions signalling emotional vulnerability among psychopathic individuals. In general, Demetriooff *et al.* (2017) demonstrate the importance of differentiating between males and females when examining psychopathy, as effects may not generalize from one sex to the other.

Current study

Previous research examining the association between psychopathy and accuracy in perceiving vulnerability to victimization has utilized a very limited definition of victimization, focusing specifically on vulnerability to an assault with the intent to rob or steal (Book *et al.*, 2013; Wheeler *et al.*, 2009). To determine whether accuracy extends beyond this instrumental form of violence, the current study sought to replicate the association between psychopathy and accuracy while expanding the definition of victimization to capture various forms of violent crime (i.e. robbery, threats, physical abuse, sexual assault/abuse, stalking). The previous research has also been limited in that it has focused exclusively on the perceptions of male observers. As such, gender differences in perceptions of victimization, or a psychopathy by gender interaction may have been overlooked. Highlighting the potential for gender differences, evidence suggests that psychopathy differs in males and females (e.g. Beryl *et al.*, 2014), and, more recently, suggests that male and female observers scoring higher on psychopathy differ in the ability to detect nonverbal micro-expressions of sadness and disgust (Demetrio *et al.*, 2017). With support for potential gender differences, it is important to determine whether the association between psychopathy and accuracy identified among men (Book *et al.*, 2013; Wheeler *et al.*, 2009) extends to women who exhibit psychopathic traits. Finally, the current study sought to identify the facet(s) of psychopathy most salient to the prediction of accuracy, a component of psychopathy not yet examined in the extant literature. Exploring the associations at the facet level will allow for a better understanding of the traits comprising psychopathy that aid in forming more accurate perceptions of vulnerability.

Seeking to replicate previous research (i.e. Book *et al.*, 2013; Wheeler *et al.*, 2009), we hypothesized that psychopathy, specifically Factor 1, would be positively associated with more accurate perceptions of vulnerability to violent victimization. The current study also sought to examine the association between the facets of psychopathy and accuracy; however, no specific hypotheses were made as these analyses were exploratory. In terms of gender, it was first hypothesized that men would score higher on psychopathy compared to women, in keeping with the extensive literature demonstrating this gender difference (e.g. Borroni *et al.*, 2014). Given the limited research examining gender differences in the relationships between psychopathy and the detection of nonverbal cues, no specific hypotheses were made in terms of the gender differences in accuracy in perceiving vulnerability. These analyses were, therefore, exploratory. Finally, with evidence that psychopathy is not associated with the mention of using gait cues to make vulnerability judgements among student samples (i.e. Wheeler *et al.*, 2009); it was hypothesized that the same would be true in the current study. No hypotheses were made regarding the association between psychopathy and the mention of the remaining vulnerability cues, as these analyses were intended to explore and identify other cues that may have influenced vulnerability judgements in the current sample.

Method

Participants

A sample of 586 undergraduate students was originally recruited online via an electronic research bulletin board. To ensure a range of psychopathy scores, students scoring in the top and bottom 20 percent of a pre-screened psychopathy measure (i.e. Self-Report Psychopathy Scale Short Form (SRP-SF); Paulhus *et al.*, 2016) completed as a part of a mass testing protocol were sent a personal invitation to participate in the study, although all students with access to the research bulletin board were eligible to participate. Of the original 586 participants, only 320 completed the walker vulnerability ratings. Of these 320 participants, 9 did not provide consent and 19 others were missing more than 10 percent of the items on the measure of psychopathy. These 28 participants were removed from subsequent analyses. Given that the remaining participants had a small percentage of missing data (< 5 percent) on the measure of psychopathy (Tabachnick and Fidell, 2007), expectation maximization (EM) was applied to the raw psychopathy scores.

After conducting EM, the final sample size ($n = 291$) consisted of 69 men and 221 women (1 participant did not disclose their gender), and age ranged from 17 to 39 ($M = 19.84$; $SD = 3.05$). For the purpose of analyses, males and females were coded as 1 and 0, respectively.

The majority of the sample was Caucasian (65 percent; $n = 192$), followed by Asian (10 percent; $n = 29$), Middle Eastern (9 percent; $n = 26$), other ethnicities (8 percent; $n = 24$), African Canadian (3 percent; $n = 10$), Hispanic (2 percent; $n = 6$), East Indian (1 percent; $n = 4$), and Aboriginal Canadian (1 percent; $n = 4$).

Procedure

Students with access to the online research bulletin board were first shown a recruitment notice that briefly described the study. Those who chose to participate clicked a link that redirected them to a consent form. After providing consent, participants were asked to complete a brief demographic questionnaire and a series of measures included as part of a larger study. For the purposes of the current study, participants completed the SRP-III scale (SRP-III; Paulhus *et al.*, 2016) prior to viewing a series of target videos. Following each video (approximately 10 seconds in length), participants rated the target's vulnerability by indicating whether they believed the target was vulnerable to violent crime (i.e. robbery, threats, physical abuse, sexual assault/abuse, stalking). They were also asked to justify this decision with an open-ended question. The entire session took approximately one hour.

Materials

Walker videos. Consistent with Wheeler *et al.* (2009) and Book *et al.* (2013), potential walkers were unknowingly filmed from behind as they walked down a hallway to capture their natural gait. For the purpose of the current study, consenting walkers indicated whether or not they had experienced violent victimization or an attempted violent victimization (e.g. mugging, stalking, sexual abuse, or assault) at any point in their life. Note that only female walkers were included in order to control for the confounding effect of target gender. Additionally, research has shown that women are more likely the target of sexual violence than men (Elliott *et al.*, 2004) and that women are more likely to fear victimization than men (Schafer *et al.*, 2006).

While a total of 36 videos were originally recorded, walkers were excluded from analyses if anything obstructed the ability to view their gait in the video (e.g. adjusted their clothing; $n = 6$). Videos were also excluded if another person could be seen in the frame or if they were carrying an object (e.g. phone, wallet; $n = 10$). The gait cues of each walker were coded in congruence with the criteria established by Grayson and Stein (1981), where nonvictims exhibit organized body movements and victims exhibit less synchronous movements. Interrater reliabilities were good to excellent across the gait characteristics of each target ($\kappa = 0.63-1.00$). For the purposes of the current study, we were only interested in the female targets that had experienced violent victimization ($n = 16$) and those that had never experienced any type of victimization ($n = 4$). To control for base rate, 4 walkers were randomly selected from the 16 that had prior experiences of violent victimization. Thus, observers were shown eight randomly ordered videos, four of which depicted a violent victim and four of which depicted a nonvictim. Among these walkers, gait was significantly related to experiences of violent victimization ($\rho = 0.92$, $p < 0.05$).

Measures

*SRP-III scale (Paulhus *et al.*, 2016).* Psychopathy was assessed using the SRP-III, which is a 64-item self-report scale, with responses made on a five-point Likert-type scale. Items load on four facet scores – interpersonal manipulation (IPM), callous affect (CA), erratic lifestyle (ELS), and ASB – which can be combined to reflect the two-factor model of psychopathy (i.e. where IPM and CA combine to reflect Factor 1 and ELS and ASB combine to represent Factor 2). Studies have shown the SRP-III to be both reliable and valid across student and community samples (Mahmut *et al.*, 2011; Neal and Sellbom, 2012; Williams *et al.*, 2007). Cronbach's α coefficients were acceptable in the current sample across total, Factor, and facet scores (range: 0.81-0.93). Once the sample was divided by gender, however, the CA facet fell just below acceptable levels of internal consistency for both males (0.54) and females (0.57).

Accuracy scores and vulnerability cues. Participants viewed the walker videos, indicating whether each walker was vulnerable (yes or no) to violent victimization. Accuracy scores were calculated

by categorizing observer ratings of walker vulnerability into correct and incorrect judgments based on each walker's self-reported history of violent victimization. For example, if a walker had been violently victimized and the observer correctly identified the walker as a victim of past violence, that observer would receive a score of 1 for correctly rating the walker's vulnerability. This procedure was repeated for all eight target videos (four victims and four nonvictims). Total accuracy scores were then calculated by summing the number of correct responses among the eight videos. As such, total accuracy scores ranged from 0 to 8, where higher scores indicated greater accuracy in perceiving vulnerability to violent victimization. For the entire sample, mean accuracy was 3.95 (SD = 0.96).

In an open-ended format, observers were also asked to provide a justification for each vulnerability rating. Of the 295 participants, 191 provided an answer to the open-ended questions. By examining the judgment cues presented by the first ten participants, the first and second author identified seven common themes in which the subsequent responses were coded: appearance (e.g. body type); clothing; gender (e.g. mentioned target was female); intuition (e.g. gut feeling); movement (e.g. the way the person walked/carried themselves); environment (e.g. dark hallway); and other (e.g. target was alone). Using these cue categories, the first and second author identified how often each participant mentioned each cue by summing the number of times each cue was reported across all eight videos. These counts were then converted into proportions, as some observers had missing responses (e.g. if an observer provided justifications for six out of eight targets, the number of times they reported using each cue would be calculated out of six). Thus, each of the 191 participants had a proportion calculated for each of the seven cue categories that they mentioned at least once.

Interrater reliability statistics were computed between the first and second author for 20 percent of the cases with available cue information (i.e. all cue categories provided by 38 of the 191 participants was coded for interrater reliability). Reliability was assessed using a two-way random effects model intraclass correlation coefficient (ICC; absolute agreement). The proportion of each cue identified by both authors showed acceptable reliability with ICC values ranging from 0.87 to 0.99 (median = 0.92). The only exception was the intuition cue; as only two of the 38 participant responses selected for interrater analyses mentioned this cue, the ICC value could not be calculated. Across all 191 participants, the intuition cue was mentioned 17 times. Both authors reviewed these cases and a consensus code was reached.

Results

Gender

Independent samples *t*-tests were conducted to examine gender differences between men and women on the SRP-III (see Table I). Results indicated that men scored significantly higher than women on total scores, Factor 1, Factor 2, and on all four facets (range of Cohen's *d* = 0.47-0.93). An independent sample *t*-test was also conducted to examine gender differences in the ability to

Table I Mean differences between men and women on total, Factor, and facet scores

<i>Psychopathy</i>	<i>Men M (SD)</i>	<i>Women M (SD)</i>	<i>t</i>	<i>d [95% CI]</i>
SRP Total	162.14 (27.12)	140.98 (27.11)	5.69**	0.78 [0.50, 1.05]
Factor 1	88.70 (14.85)	76.32 (14.24)	6.28**	0.86 [0.58, 1.14]
Factor 2	73.44 (15.52)	64.66 (15.45)	4.15**	0.57 [0.29, 0.84]
IPM	44.38 (9.77)	37.65 (9.66)	5.07**	0.69 [0.42, 0.97]
CA	44.32 (6.53)	38.67 (5.97)	6.77**	0.93 [0.64, 1.20]
ELS	45.51 (8.77)	40.73 (9.66)	3.69**	0.51 [0.23, 0.78]
ASB	27.93 (9.55)	23.93 (8.11)	3.45**	0.47 [0.20, 0.74]

Notes: Degrees of freedom for all *t*-tests = 292. SRP Total, Self-Report Psychopathy Scale total score; IPM, interpersonal manipulation; CA, callous affect; ELS, erratic lifestyle; ASB, antisocial behavior; *d*, Cohen's *d*; CI, confidence interval. ***p* < 0.01

accurately perceive vulnerability to violent victimization. Interestingly, men's perceptions of vulnerability, $M=4.07$ ($SD=0.99$), were no more accurate than women's perceptions of vulnerability, $M=3.90$ ($SD=0.94$), $t(288)=1.31$, $p=0.19$; Cohen's $d=0.18$, 95 percent CI $[-0.09, 0.45]$. Both men and women scored at near chance levels of accuracy.

Psychopathy and victim selection

A series of bivariate correlations were conducted to examine the association between psychopathy and accuracy in perceiving vulnerability to violent victimization among the overall sample (see Table II). Consistent with previous research (e.g. Book *et al.*, 2013), Factor 1 scores were associated with greater accuracy in perceiving vulnerability to violent victimization. Total psychopathy scores, however, were not significantly associated with accuracy. Among the facets of psychopathy, IPM was the only facet associated with accuracy in perceiving vulnerability to violent victimization. Interestingly, when the data are separated by gender, total psychopathy scores, Factor 2 scores, and the ASB facet are significantly related to accuracy among men. No significant associations were noted among women.

Hierarchical linear regression

As previously stated, the current study was the first to examine whether accuracy in perceiving vulnerability to violent victimization could be predicted from gender, psychopathy (total, Factors, and facets), and the relevant interactions. All assumptions underlying linear regression were satisfied (e.g. linearity, multicollinearity; Tabachnick and Fidell, 2007). Notably, each interaction was entered into the model independently (see Table III).

The first hierarchical linear regression examined whether observer's gender (i.e. 1 = male, 0 = female), total psychopathy scores (centered), and the gender by psychopathy interaction were predictive of accuracy in perceiving vulnerability to violent victimization. The gender by psychopathy interaction was significant ($B=0.01$, $p<0.05$), where the effect of psychopathy on accuracy was dependant on the gender of the observer. That is, higher scores on psychopathy were predictive of greater accuracy among male observers compared to those scoring lower on psychopathy. When the observer was female, however, no association was identified between psychopathy and accuracy.

The second regression analysis examined whether accuracy in perceiving vulnerability to violent victimization could be predicted from the observer's gender, Factor 1 psychopathy scores (centered), and the interaction between gender and Factor 1. This analysis revealed no independent predictors or interactions, suggesting that the importance of psychopathy in the prediction of accuracy may not be due to Factor 1 among students. The third regression analysis examined whether accuracy could be predicted from Factor 2 (centered), gender, and the interaction between gender and Factor 2. Interestingly, a gender by Factor 2 interaction was

Table II Bivariate correlational analyses of the association between psychopathy and accuracy in perceiving vulnerability to violent victimization

Psychopathy	Overall ($n=291$)		Men ($n=69$)		Women ($n=221$)	
	r	95% CI	r	95% CI	r	95% CI
SRP Total	0.07 ^a	[-0.05, 0.18]	0.25 ^{a,*}	[0.01, 0.46]	-0.02 ^a	[-0.15, 0.11]
Factor 1	0.12 ^{a,*}	[0.01, 0.23]	0.18 ^a	[-0.06, 0.40]	0.07 ^a	[-0.06, 0.20]
Factor 2	0.01	[-0.11, 0.12]	0.25 [*]	[0.01, 0.46]	-0.09	[-0.22, 0.04]
IPM	0.12 [*]	[0.01, 0.23]	0.19	[-0.05, 0.41]	0.08	[-0.05, 0.21]
CA	0.09	[-0.03, 0.20]	0.15	[-0.09, 0.37]	0.04	[-0.09, 0.17]
ELS	-0.01	[-0.12, 0.11]	0.17	[-0.07, 0.37]	-0.09	[-0.22, 0.04]
ASB	0.04	[-0.08, 0.15]	0.25 [*]	[-0.06, 0.40]	-0.07	[-0.20, 0.06]

Notes: r , Pearson correlation coefficient; CI, confidence interval; SRP Total, Self-Report Psychopathy Scale total score; IPM, interpersonal manipulation; CA, callous affect; ELS, erratic lifestyle; ASB, antisocial behavior. ^aOne-tailed. * $p<0.05$

Table III Hierarchical linear regression predicting accuracy in perceiving vulnerability to violent victimization from gender, and total, Factor, and facet psychopathy scores

Predictor	B (SE)	Interactions t	95% CI
SRP × gender	0.01 (0.01)*	1.98	[0.00, 0.02]
F1 × gender	0.01 (0.01)	0.90	[-0.10, 0.03]
F2 × gender	0.02 (0.01)*	2.51	[0.01, 0.04]
IM × gender	0.01 (0.01)	0.82	[-0.02, 0.04]
CA × gender	0.02 (0.02)	0.83	[-0.02, 0.06]
ELS × gender	0.03 (0.02)	1.84	[-0.00, 0.06]
ASB × gender	0.03 (0.01)*	2.32	[0.01, 0.06]

Notes: SRP Total, Self-Report Psychopathy Scale total score; F1, Factor 1; F2, Factor 2; CA, callous affect; ELS, erratic lifestyle; ASB, antisocial behavior; CI, confidence interval. All interaction terms were run independently. * $p < 0.05$

identified, where higher scores on Factor 2 psychopathy were predictive of greater accuracy among male observers compared to those scoring lower on psychopathy. The same was not true among female observers.

The final analyses were exploratory and examined whether the facets of psychopathy and gender, as well as the corresponding interactions were predictive of accuracy in perceiving vulnerability to violent victimization. Interestingly, the gender by ASB facet interaction was the only significant interaction among the four facets. Specifically, higher scores on the ASB facet were predictive of greater accuracy among male observers compared to those who scored lower on the ASB facet. Comparatively, accuracy did not differ as a function of ASB scores among females.

Vulnerability cues

Bivariate correlational analyses were conducted to assess whether the proportion of times each of the seven vulnerability cues (i.e. appearance, clothing, gender, intuition, movement, environment, other) were mentioned was associated with psychopathy scores for the overall sample, and among male and female observers. Descriptive statistics and bivariate correlations are presented in Tables IV and V, respectively. Among the overall sample ($n = 81$), the mention of intuition was positively associated with the ASB facet. Moreover, total psychopathy, Factor 1, Factor 2, IPM, CA, and ELS were negatively associated with the mention of other cues. Among male observers ($n = 27$), the mention of intuition was positively associated with scores on Factor 2 psychopathy and the ASB facet. Among female observers ($n = 53$), the mention of other cues (e.g. mentioning that the walker was alone) was associated with total psychopathy scores, Factor 1, Factor 2, IPM, and the ELS facet. No other cues were associated with psychopathy among observers. Additionally, no significant associations were identified between the mention of cues and accuracy in perceiving vulnerability to violent victimization among the overall sample or across gender.

Table IV Descriptive statistics of the vulnerability cues

Vulnerability cue	Overall M (SD)	Male M (SD)	Female M (SD)
Appearance	0.38 (0.33)	0.35 (0.33)	0.45 (0.33)
Clothing	0.13 (0.24)	0.10 (0.19)	0.17 (0.28)
Gender	0.05 (0.18)	0.02 (0.07)	0.12 (0.31)
Intuition	0.13 (0.30)	0.13 (0.31)	0.13 (0.30)
Movement	0.46 (0.66)	0.46 (0.37)	0.47 (1.06)
Environment	0.05 (0.17)	0.04 (0.15)	0.05 (0.22)
Other	0.14 (0.30)	0.17 (0.33)	0.10 (0.24)

Note: M, average proportion of times a cue was mentioned

Table V Bivariate correlations between psychopathy and vulnerability cues

Vulnerability cue	Total	Factor 1	Factor 2	IM	CA	ELS	ASB
<i>Appearance</i>							
Overall	0.06	0.08	0.03	0.14	-0.01	0.03	0.03
Female	0.11	0.12	0.08	0.20	-0.02	0.02	0.14
Male	-0.21	-0.19	-0.21	-0.15	-0.21	-0.04	-0.35
<i>Clothing</i>							
Overall	-0.02	0.06	-0.10	0.04	0.10	-0.05	-0.14
Female	0.03	0.10	-0.04	0.10	0.08	0.01	-0.09
Male	-0.37	-0.19	-0.49*	-0.28	-0.03	-0.41	-0.46*
<i>Gender</i>							
Overall	0.09	0.15	0.02	0.11	0.21	0.00	0.04
Female	-0.12	-0.11	-0.12	-0.13	-0.07	-0.14	-0.07
Male	0.04	0.18	-0.09	0.09	0.28	-0.09	-0.08
<i>Intuition</i>							
Overall	0.16	0.09	0.21	0.07	0.11	0.15	0.23
Female	0.09	0.07	0.11	0.02	0.12	0.05	0.17
Male	0.34	0.16	0.47*	0.20	0.08	0.45*	0.38
<i>Movement</i>							
Overall	0.06	0.05	0.06	0.06	0.03	0.04	0.07
Female	-0.02	0.04	-0.06	0.03	0.06	0.07	-0.22
Male	0.15	0.08	0.19	0.12	0.01	0.04	0.31
<i>Environment</i>							
Overall	-0.14	-0.15	-0.11	-0.19	-0.08	-0.11	-0.09
Female	0.00	-0.04	0.05	-0.05	-0.02	0.05	0.03
Male	-0.44*	-0.42	-0.40	-0.50*	-0.23	-0.41	-0.30
<i>Other</i>							
Overall	-0.31**	-0.29*	-0.31*	-0.28*	-0.26*	-0.31**	-0.25*
Female	-0.28	-0.26	-0.28	-0.25	-0.24	-0.29*	-0.21
Male	-0.35	-0.32	-0.34	-0.32	-0.25	-0.31	-0.30

Notes: Overall, males and females combined; Total, total psychopathy score; IM, interpersonal manipulation facet; CA, callous affect facet; ELS, erratic lifestyle facet; ASB, antisocial behavior facet. * $p < 0.05$; ** $p < 0.01$

Discussion

The purpose of this study was to expand the current literature on psychopathy and perceptions of vulnerability to victimization by including an analysis of observer gender, including a more nuanced examination of psychopathy at the facet level, and focusing the analyses on a broader definition of violent victimization. Consistent with previous research (e.g. Beryl *et al.*, 2014), gender differences were identified among psychopathy scores, where men scored higher on psychopathy than women. Moreover, despite limited research examining gender differences in the detection of nonverbal cues (Demetrio *et al.*, 2017), the current study did find that accuracy in perceiving vulnerability to violent victimization did differ across gender. Among the overall sample, significant associations with accuracy were evident for Factor 1 and the IPM facet. Subsequent linear regression analyses, however, identified gender differences in the association between psychopathy and accuracy. Specifically, total, Factor 2, and the ASB facet of psychopathy were positively associated with accuracy among male observers, but not among females. In fact, psychopathy in general (total, Factors, and facets) was unrelated to accuracy among female observers. This suggests that the adept ability to accurately perceive nonverbal cues signalling vulnerability is specific to males exhibiting psychopathic traits.

Contrary to previous research identifying an association between Factor 1 psychopathy and accuracy (e.g. Book *et al.*, 2013), the current study suggests that Factor 2, more specifically the ASB facet, is most salient to the prediction of accuracy in perceiving vulnerability to violent victimization among male observers. This discrepancy may be due to the differences in the definition of violent crime across the studies. We defined violence with more specificity in order

to capture more serious forms of crime (i.e. robbery, threats, physical abuse, sexual assault/abuse, stalking), whereas Book *et al.*'s definition was much broader (i.e. anything equal to or greater than bullying). Specifically, scores on the ASB facet, of the SRP-III, which were predictive in the current study, are based on items such as "I have attacked someone with the idea of injuring them," "I was convicted of a serious crime," and "I have threatened people into giving me money, clothes, or makeup" (Paulhus *et al.*, 2016). Thus, those with more experience in victimizing others appear to be more accurate in identifying targets vulnerable to similar crimes based on nonverbal cues.

It is important to note that the lack of association between psychopathy and accuracy among females may be an artifact of the type of victimization behavior examined. For example, female psychiatric patients have been shown to engage more often in relational forms of violence toward family members in the home (Robbins *et al.*, 2003). While too little is known about female psychopathy to draw a valid conclusion about this finding, future research could examine gender differences in perceptions of other forms of victimization more common to females (e.g. familial violence). This gender discrepancy does, however, emphasize the importance of distinguishing male and female psychopathy in research and practice.

To identify the cues utilized by observers when making vulnerability judgments, a series of correlational analyses were conducted on the cues listed. Male observers higher on Factor 2 psychopathy and the ASB facet tended to report the use of intuition when making vulnerability judgments. Female observers higher on psychopathy (i.e. total, factor 1, IPM, and ELS) were less likely to report using other cues (e.g. mentioning that the walker was alone). Across both male and female observers, psychopathy was not associated with the use of movement cues when making vulnerability judgments, despite the association between victimization history and gait among the walkers. Identifying a similar result, Wheeler *et al.* (2009) postulated that the absence of an association between psychopathy and the mention of movement cues may reflect a lack of experience in selecting victims among undergraduate student samples. Since students are less likely to be experienced in selecting victims than offenders, it is possible that they are less able to articulate the cues used to identify a vulnerable walker. The current study supports this notion, as the males who were more accurate (i.e. higher on Factor 2 psychopathy and the ASB facet) were the same males to mention using intuition more often when making vulnerability judgements. In other words, they "just knew", but could not articulate why.

Limitations

Despite the interesting results observed, the limitations of the current study need to be considered. First, the current study may be limited by the use of a convenience sample of university students. This limitation is attenuated, however, by the fact that the current study, like other studies utilizing students (Wheeler *et al.*, 2009), did find significant associations between psychopathy and accuracy in perceiving victimization. Future studies should nonetheless replicate the current results with a sample of male and female offenders. Another limitation of the current study is the fact that accuracy scores had a somewhat limited range given that only eight videos were used. You would expect a random responder to correctly identify 50 percent of the victims or nonvictims, which would place their accuracy score at 4 out of 8. Someone correctly identifying five out of eight walkers as either victims or not would still only be performing slightly better than chance. Future studies could address this concern by making use of more videos in order to provide a larger range of possible scores.

Implications

In terms of practical implications, understanding factors related to victim selection and identifying the nonverbal cues that make people vulnerable to victimization allows for the development of intervention strategies that may help prevent future incidences of victimization. Johnston *et al.* (2004) provide evidence that it may be possible to lower individuals' vulnerability to attack by adapting their walking style. Specifically, women who participated in gait training were rated as significantly less vulnerable post-training than women who participated in a self-defense class. Moreover, vulnerability ratings for those who participated in a self-defense class were almost

identical pre- and post-course. Although these results do not address the importance of being able to physically defend oneself upon attack, they do support the potential for intervention strategies that may reduce perceptions of vulnerability.

While the current study presents factors that may place certain individuals at greater risk for violent victimization, these results should not be interpreted as a means of blaming individuals for their victimization. Without question, the fault for any form of victimization lies solely with the perpetrator. What can be taken from these findings, however, are the characteristics of observers (in this case, the antisocial/behavioral traits of psychopathy) associated with successful victim selection, and the importance of developing effective intervention strategies for those at risk of engaging in predatory behaviors and victimizing strangers. Although limited, research does suggest that those who offend against strangers are more violent and opportunistic in their crimes (e.g. Polaschek *et al.*, 1997), and are thought to be at a higher risk of reoffending than those who offend against acquaintances (e.g. Davis and Smith, 1981). Thus, if the goal of treatment is to reduce the occurrence of victimization, interventions must be developed to target the unique characteristics of offenders who are more likely to engage in violent victimization broadly and of strangers specifically.

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Further reading

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