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Predicting violence risk and recidivism in female parolees: A state-wide sample

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ABSTRACT

Historically, research on violence risk assessments has primarily focused on male psychiatric patients and/or inmates, with minimal attention given to female patients and/or inmates—two populations likely to differ with regard to violence risk conceptualization. To date, there is no known measure of violence risk specifically tailored to predicting risk for this population that is accurate, brief, and cost-effective. As such, the current study exclusively focused on the predictive ability of the Iowa Violence and Victimization Instrument (IVVI) for female parolees over a 30-month follow-up period. Results indicated not only was the IVVI comparable across genders, its predictive power was comparable to more established measures (i.e., Violence Risk Appraisal Guide-Revised, HCR-20 V3). Results also found the IVVI may have greater usefulness with prediction of violent and felony property offenses, but limited usefulness for predicting misdemeanor property and drug offenses. Taken together, findings gathered from the current study suggest while women are reoffending at lower rates than men, yet there are fewer gender differences in risk factors for engaging in violence than expected.

1. Introduction

The evaluation of future risk for violence for individuals in either criminal or civil contexts, has become a critical component of practice for many mental health professionals. In situations where a clinician may be asked to evaluate risk for future violence, the individual at question may be facing civil commitment, release from prison, or the court may have a question about risk as it relates to sentencing. Having a thorough understanding of the variables associated with increased risk for violence is necessary. Decades of research on violence risk assessments have primarily focused on male psychiatric patients and/or inmates, with very little emphasis given to the ways in which women may differ with regard to violence risk conceptualization. This paper attempts to bridge the gap in the current literature by focusing on the predictive strength of violence and recidivism among female parolees.

2. Demographic and contextual variables related to violence in women

Regarding gender differences in engagement in violent crime, available research consistently indicates women engage in violence at lower rates than men (Federal Bureau of Investigation 2011; Logan and Blackburn 2009; Sorrentino et al. 2016), although the magnitude of this effect varies by type of violent crime (McKee and Dwyer 2015). Some researchers (Collins and Nichols 1999; Cooper and Smith 2011; McKee 2006) posit women offend at similar rates to men when the victim is within the family, underscoring that female perpetrated violence often has an interpersonal element. Similarly, Logan and Blackburn (2009) argue gender differences for violence risk are due to socialization differences and that women who become violent do so as a function of changes (i.e., chaotic, unstable, disturbed) in their social environment. This idea is supported by other findings which suggest women are more likely to engage in violence when there is a history of domestic violence (Campbell et al. 2007), familial abuse (Weizman-Henelius, Matti Gronroos, Putkonen, & Eronen, 2010), or a recent relationship change, like separation or divorce (Farooque et al. 2005; Paulozzi et al. 2001). Other researchers (Crimmins et al. 1997; Lewis and Stanley 2000; McKee and Shae 1998; Tardiff et al. 2004; Wilczynski 1997) have identified common mental health diagnoses associated with increased risk for violent behavior in women, including psychosis-spectrum disorders (e.g., Schizophrenia), major mood disorders (e.g., Major Depressive Disorder, Bipolar Disorder), and specific personality disorders

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(e.g., Borderline Personality Disorder). Post-Traumatic Stress and Substance Use Disorders are also linked to violent behavior in women, although the extent to which this differs from male rates of these diagnoses is uncertain (Logan and Blackburn 2009).

3. Existing violence risk assessments and their utility with women

Traditional guidance regarding prediction of violence focuses on utilization measures designed to consider structured professional judgment, as well as both static and dynamic risk factors (Melton et al. 2018). However, the use of such instruments with women is less clear. Research indicates some risk assessment measures may be used in generally the same manner for men and women, while others require adaptation or differences in interpretation (Logan and Blackburn 2009). For example, the Psychopathy Checklist-Revised (PCL-R; Hare 2003), a well-known measure of psychopathic personality frequently associated with violence risk prediction (Edens et al. 2001; Leistico, Salekin, DeCoster, & Rogers, 2008), has been validated extensively with male offenders and psychiatric patients in the United States, Canada, Great Britain, Sweden, and several other locations across the world. The PCL-R has also been validated for use with female offenders, with initial findings suggesting many features of psychopathy are similar between men and women (Hare 2003). In support of this idea, several researchers have found the PCL-R and its variants (e.g., PCL:SV [Psychopathy Checklist: Screening Version; Hart et al. 1995]) are equally as predictive of violence for men and women in secure/forensic psychiatric units and correctional samples (Gray and Snowden 2016; Nicholls et al. 2004). However, some researchers suggest the underlying factor structure proposed by Hare (2003) may be "substantially different for women" (Salekin et al. 1997, p. 576)—which impacts the utility of the PCL-R with respect to violence prediction. Other concerns about the utility of the PCL-R for predicting violence in women is that the interpersonal/affective factors may be more closely related to violent recidivism than lifestyle/antisocial ones (Coid et al. 2009; Salekin et al. 1998; but see Eisenbarth et al. 2012, for differential findings in a German sample). Therefore, PCL-R results should be interpreted with caution when exploring violence risk with women (Falkenbach 2008).

Similarly, many other violence risk assessments have shown mixed results for use with women. The HCR-20 V3: Assessing Risk for Violence (HCR-20, Version III; Douglas et al. 2013) and its earlier versions (HCR-20 V2; Webster et al. 1997; and HCR-20 V1; Webster et al. 1995) are examples. Although the HCR-20[1] has evidenced good reliability and predictive validity in samples comprised of both men and women, few studies have focused on gender comparisons (e.g., Coid et al. 2009; de Vogel and de Ruiter 2005; Nicholls et al. 2004; Schaap et al. 2009; Warren et al., 2005). Of those studies that have evaluated gender differences, there is support that certain risk factors may have greater relevance for women. Specifically, Coid et al. (2009) found HCR-20 total score, Historical, and Clinical scores predicted violent and non-violent reconvictions in female inmates, but unlike male inmates, their Risk Management subscale was not predictive of violent reconvictions. In a sample of forensic patients, Straud and Belfrage (2001) found no gender differences in HCR-20 subscale scores, but noted female patients had lower ratings than men for previous violence, young age at first violent incident, substance use problems, and negative attitudes, yet exhibited higher personality disorder, impulsivity, and stress ratings.

The importance of clinical factors for female forensic patients was highlighted by Nicholls (2001), who found only the Clinical subscale predicted recidivism in women, and by Grimbos et al. (2016), who showed men and women have differences in the types of Clinical items endorsed (i.e., high-risk women diagnosed with Borderline Personality Disorder, whereas high-risk men were more frequently diagnosed with Antisocial Personality Disorder or substance abuse concerns). In contrast, Garcia-Mansilla et al. (2011) explored salient historical scores from the HCR-20 among men and women and found subtle (not statistically significant) difference in predicting future violence. Specifically, their findings showed women had lower ratings than men for previous violence, substance abuse problems and negative attitudes; however, women were rated higher on historical items focused on relationship instability, employment problems, major mental illness, and early maladjustment.

Taken together, violence risk assessment measures have demonstrated questionable utility when used for predicting violence in women. Factors which influence future risk for violence in men (e.g., antisocial personality, psychopathy, substance use) do not always predict violence in women. Clinical and interpersonal factors (e.g., relationship instability, major mental illness, early maladjustment) appear more salient for women regarding violence risk. Although researchers have not consistently found that existing violence risk assessments are unable to adequately predict violence risk for women (as described above), there appears to be a consensus that interpretation of these measures must be undertaken with caution. For clinicians and administrators working within a correctional system, a secondary concern may be the bulk of research on the use of violence risk assessments with women has focused on individuals within a forensic or civil inpatient setting, and relatively little is known about how these measures may be used to predict violence for women preparing for parole. This limitation is particularly important given that women, like men, are often discharged on probation or parole with unfettered community access.

4. Violence prediction for female parolees

Compared to the literature focusing on men and risk for violence after release from prison, research on women and risk factors for violence upon release is scarce. Much of the extant literature focuses on risk for re-victimization due to domestic violence or sexual violence (e.g., Cross 2016), or on the importance of interpersonal factors for both adults and juvenile offenders. For example, the importance of a warm, supportive relationship with family members and/or a probation or parole officer has found to be particularly important for both adult and juvenile female offenders, to the extent that both are protective against violent recidivism (Vidal et al. 2015). Other researchers have found the following are also associated with violent recidivism after release from prison: substance abuse, personality disorder diagnosis, younger age at arrest, history of conduct problems, and previous violent convictions (Putkonen et al. 2003; Robertson et al. 1987; Sorrentino et al. 2016)—but the extent to which other variables are salient for women after they are released from prison is unknown.

5. The Iowa violence and victimization instrument

As described by Prell et al. (2016), the need for a valid, streamlined violence risk assessment for parolees led to the creation of a rapid screening instrument for assessment risk for future violence in the Iowa Department of Corrections (DOC)—the Iowa Violence and Victimization Instrument (IVVI). The Iowa DOC's underlying rationale for using this measure was to provide supervising parole and probation agents' insight into the individual's risk with the plan of developing appropriate interventions to minimize recidivism, while avoiding the logistical constraints of other violence assessments mentioned above. Prell et al. (2016) evaluated the efficacy of this measure with regard to predicting risk for future violence for 1961 male parolees in the Iowa DOC, who were followed for a 30-month period of probation or parole after their

[1] As described in Strub et al. 2016, given it was only recently published, the HCR-20 V3 is still in a period of transition, where many community agencies have not switched over to the new version from the HCR-20 V2. Thus, much of the research focusing on gender studies/comparisons focuses only on V2. Fortunately, data indicate strong associations between Versions 2 and 3. Thus, in this paper, we discuss the findings of studies using both V2 and V3.

release from incarceration. Utilizing the IVVI, their results reflected relatively good area under the curve (AUC) values for violence and victimization offenses, but not for drug offenses. Additionally, both Violence and Victimization scales, as well as individual items on the IVVI, performed equally well at 30-month follow-up.

6. Purpose and aims of the current study

The current study sought to expand on Prell's study by examining whether the IVVI had similar predictive utility for female parolees; and whether different items on the IVVI would demonstrate greater or less utility for women relative to men. Specifically, we hypothesized IVVI would show similar predictive validity for future violence and recidivism for female parolees as it previously did for male parolees. We also hypothesized some of the individual items (e.g., confirmed gang membership, previous violent convictions) would show limited predictive validity for women in comparison to men, given their comparatively lower base rate for violence and differences in violent reoffending.

7. Method

7.1. Participants

Participants in the current study included 2006 women who left prisons across the state of Iowa either currently on parole (n = 211) or were placed on probation (n = 1707). The age of the sample ranged from 18 to 73; however, the average woman was relatively young (M age = 33.43, SD = 10.50). The sample was comprised of European Americans (n = 1579, 78.7%), African Americans (n = 280, 14.0%), Hispanic Americans (n = 82, 4.1%), Native Americans (n = 40, 2.0%), and Asian Americans (n = 19, 1.0%). The ethnicity of six women were not clearly identified. Per the United States Census Bureau (2018), our sample is comparable to the most recent Iowa census, with the exception of African Americans, who currently represent 3.8% of the overall population in the state of Iowa. Women in the sample were on probation or parole for diverse offenses, which were divided into five major categories: public order (e.g., public intoxication, disorderly conduct) (n = 501, 25.0%), drug (n = 492, 24.5%), property (n = 685, 34.1%), violent (n = 302, 15.1%), and other offenses (n = 26, 1.3%). Within the five specific types of offenses, offenders committed several subtypes of criminal behavior.

A full list of all index offenses for the current study can be viewed in Table 1.

Table 1
Primary index offenses for the current sample.

Crimes	Number	Percent of sample
Alcohol-related	13	0.6
Arson	5	0.2
Assault	223	11.1
Burglary	69	3.4
Drug possession	175	8.7
Flight/Escape	2	0.1
Forgery/Fraud	217	10.8
Kidnap	3	0.1
Murder/Manslaughter	4	0.2
Other criminal offenses	23	1.1
Other drug offenses	95	4.7
Other public order offenses	21	1.0
Other violent offenses	59	2.9
OWI	383	19.1
Prostitution/Pimping	18	0.9
Robbery	3	0.1
Sex crimes	4	0.2
Stolen property	5	0.2
Tax laws	1	0.0
Theft	357	17.8
Theft of person	8	0.4
Traffic violation	63	3.1
Trafficking	222	11.1
Vandalism	32	1.6
Weapons total	2006	100

7.2. Procedure

Prior to data collection and analyses, approval for this study was provided by the Iowa DOC Institutional Review Board. All women paroled from Iowa prisons or placed on probation during the first six months of calendar year 2008 and under the supervision of Department of Corrections in the state of Iowa were scored on the IVVI, utilizing extensive records. In total, 2006 women admitted to probation or parole supervision were scored on the instrument. There were no missing data points for recidivism or the risk assessment scores. Each individual was followed for recidivism and/or administrative violations for 30-month post release.

7.3. Measurement

7.3.1. Independent variables

As described above, the current study utilized the classification system designed by the Iowa DOC to classify and understand the risk of offenders placed in the community using the IVVI. This instrument contains nine items reflecting current and prior offenses, criminal gang membership, and current age and focuses entirely on static items reflecting criminogenic variables associated with violent and nonviolent recidivism (e.g., prior lifetime convictions, whether convictions involved violence or weapon use, confirmed gang membership, current age). The measure yields two scale scores: Violence score, defined as the likelihood of a conviction for a violent offense within 30 months of measure administration; and Victimization score, or likelihood of a conviction for any violent or property offense (including misdemeanors and felonies) within 30 months of administration of the instrument at the onset of supervision. The risk instrument, including factors and scoring of the separate Violence and Victimization scales, and cut-points for risk categories, is found in the Appendix A (see also Prell et al. 2016).

7.3.2. Dependent variables

Female individuals scored on the risk assessment instrument were followed for two and a half years and tracked for recidivism. For the current study, prediction included conviction or parole revocation for any new violent or victimization offenses. Official court records were used to determine which women were convicted of new crimes or had their parole revoked following supervision. As such, the following outcome variables were used: drug offenses, property offenses (both felony and misdemeanor), victimization offenses, and any violent offenses. The follow-up period for the current study was 30 months. For each criminal outcome, scores were dummy coded as “0” if the woman was not arrested for that class of crime, or “1” of the individual did have an official arrest for that class of crime.

8. Results

8.1. Exploratory analyses

Two separate but related indices were computed: A Violence score and a Victimization score. As expected, the two scores were highly

Table 2
Predictive strength of individual risk items (prisoner study).

Risk factor	Recidivism: Violent crime	Recidivism: Victimization crime	Recidivism: New offense or return to prison
Current offense:			
Violence score	0.321	0.083	0.076
Victimization score	0.491	0.396	0.181
Current property offense:			
Victimization score	−0.054	0.279	0.098
Prior lifetime conviction: Murder, manslaughter, robbery, theft from a person	0.429	0.565	0.651
Prior convictions for violent crime(10 years):	0.554	0.600	0.373
Prior conviction for violent crimes(5 years):	0.518	0.612	0.392
Prior prison term release within last 5 years:			
Violent crime	0.290	0.729	0.754
Property crime	–	–	–
Confirmed gang membership	0.740	0.853	1.0
Current age:			
Violence scale	0.276	0.164	0.127
Victimization scale	0.351	0.196	0.187

correlated ($r = 0.73$, $p = 0.01$). Scores on the Violence scale ranged from −1 to 14 ($M = 1.66$, $SD = 2.00$) and scores on the Victimization scale ranged from-1 to 16 ($M = 1.48$, $SD = 1.62$). Notably, as expected, age was negatively correlated with both Violence ($r = -0.55$, $p < 0.01$) and Victimization ($r = -0.29$, $p < 0.01$) scales. Race (Caucasian and African-American) was also explored in the current study. A commonly used benchmark interpretation of effect sizes suggested by Cohen (1988) is small ($d = 0.02$), moderate ($d = 0.5$), and large ($d = 0.8$). However, research following Cohen suggest these values should not be interpreted so rigidly (Thompson 2007), which is seen in the present study. For the Violence score, Caucasian women ($M = 1.55$, $SD = 1.50$) had lower scores than African-American women ($M = 2.17$, $SD = 2.02$), F (2, 1859) = 17.8, $p < 0.001$, with a small to moderate effect size (*Cohen's d* = 0.34). Similar results were found for Victimization scores with Caucasian women ($M = 1.34$, $SD = 1.50$) having lower scores compared to African-American women ($M = 2.23$, $SD = 2.13$), F (2, 1859) = 37.30, $p < 0.001$, with a moderate effect size (*Cohen's d* = 0.48). Based on these results, race was controlled (i.e., used as a covariate variable) in subsequent univariate analyses.

With regard to overall percentage of recidivism, categories and offense rates were as follows: 114 (5.7%) women recidivated with a drug offense, 163 (8.1%) women recidivated with a property offense, and 316 (15.8%) women violently recidivated. 235 women (11.7%) recidivated with a crime of victimization (operationally defined as property and violent recidivism). Overall, 429 (22.4%) female parolees committed a new crime within a 30-month timeframe.

8.2. Univariate analyses

The first set of univariate analyses focused on the relationship between individual items on the IVVI and predicting violent reoffending. Goodman and Kruskal's gamma statistics was used to explore associations between individual risk items from the IVVI and recidivism while controlling for race, which can be seen in Table 2. For the current study, recidivism was classified as either: (1) Committing a new violent offense (2) Committing a new victimization offense or (3) Convicted or parole revocation due to committing a violent or victimization offense. Overall, most individual items demonstrated moderate to strong associations with recidivism. Specifically, prior convictions in the past 10 years was the strongest predictor of violent reoffending ($G = 0.55$, $p < 0.001$), followed by prior convictions in the past 5 years ($G = 5.14$, $p < 0.05$). Similarly, prior convictions in the past 10 and 5 years were the strongest predictors of committing a victimization crime ($G = 0.612$, $p < 0.001$; $G = 0.600$, $p < 0.001$, respectively). Regarding women who had their parole revoked or convicted due to committing a violent or victimization offense, gang affiliation and prior prison term in the last 5 years were both the strongest the strongest predictors ($G = 1.0$, $p < 0.05$; $G = 0.754$, $p < 0.01$, respectively).

Table 3
Univariate comparisons for risk assessment scores as a function of recidivism.

Recidivism type	No recidivism	Recidivism		
	M (SD)	*M (SD)*	*F*	*Cohen's d*
Drug offenses				
Violence score	1.64(1.59)	2.00(1.70)	5.35*	0.22
Victimization score	1.45(1.58)	1.85(2.16)	6.54*	0.21
Property offenses				
Violence score	1.61(1.53)	2.23(2.14)	21.96***	0.33
Victimization score	1.35(1.49)	2.88(2.27)	141.68***	0.80
Felony property offenses				
Violence score	1.59(1.50)	2.63(2.30)	61.05***	0.54
Victimization score	1.36(1.50)	2.87(2.32)	127.17***	0.77
Victimization offenses				
Violence score	1.59(1.51)	2.63(2.30)	61.05***	0.53
Victimization score	1.31(1.45)	2.74(2.22)	127.17***	0.78
Violent offenses				
Violence score	1.61(1.56)	2.82(2.00)	54.40***	0.67
Victimization score	1.42(1.60)	2.61(2.11)	51.32***	0.64
Any offense				
Violence score	1.55(1.50)	2.10(1.87)	39.24***	0.32
Victimization score	1.30(1.41)	2.13(2.11)**	92.90***	0.46

* $p < 0.05$.
** $p < 0.02$.
*** $p < 0.001$.

Next, univariate analyses for both Violence and Victimization scores and recidivism for any criminal offense were explored after controlling for race. Overall, property offenses yielded the largest effect size in comparison to the other recidivism types presented in Table 3. Within property offenses, felonies had a larger effect size than misdemeanor offenses. Victimization offenses had moderate felony property offenses

yielded the largest effect size in comparison to the other risk items presented in Table 3. Victimization and violent offenses effect sizes ranged from moderate to large, while drug and any offenses yielded a small effect size.

8.3. Group comparisons for risk assessment categories

The current study also explored the effectiveness of group risk classification. If risk categories were valid, then female parolees categorized as High risk would be more likely to recidivate than parolees categorized as Low risk. For these analyses, we focused on two primary categories of recidivism the instrument was designed to capture: Violence and victimization offenses. Concerning violence risk classification among women, 1589 female parolees were Low risk, 380 female parolees were Moderate risk, 36 female parolees were High risk, and 1 parolee scored in the Very High risk category. Overall, 96 women recidivated with a violent offense, which is lower compared to 224 males examined in Prell et al. (2016). Despite this significant difference, like males, as violence risk categories increased, female parolees were more likely to violently recidivate, $X(3) = 68.21$, $p < 0.001$. Out of 36 female parolees categorized as High risk, 9 (25%) violently reoffended (i.e., committed a new violent offense). In contrast, 48 out of 1589 (0.03%) female parolees categorized as Low risk violently reoffended. Regarding victimization risk classification, 1215 female parolees were Low risk, 594 were Low/Moderate risk, 185 were Moderate/High risk, and 12 were classified as High risk. Overall, 96 female parolees recidivated with a victimization offense. Similarly, female parolees categorized as High risk for victimization offenses were significantly more likely to recidivate compared to the other categories, $X(3) = 52.14$, $p < 0.001$. Out of the 12 female parolees classified as High risk, 3 (25%) reoffended with a new victimization offense. In addition, 25 out of 185 (13.5%) female parolees classified as Moderate/High risk committed a new victimization offense. In contrast, only 35 (0.02%) women from the Low risk group recidivated with a new victimization offense.

Finally, we placed female parolees into two risk classifications (high v. low) for both the Violence and Victimization scales to calculate the following utility estimates: Sensitivity, specificity, positive predictive power (PPP), and negative predictive power (NPP). Sensitivity measured the proportion of positives correctly classified as positives. Specificity was considered the proportion of negatives correctly classified as negative. PPP was the probability that an individual with a positive result on the test would engage in the measured behavior. NPP was the probability an individual with a negative result on the test would not engage in the measured behavior. The two lowest categories (Low and Low/Moderate) were grouped and classified as Low risk, and the two highest categories (Moderate/High and High) were grouped and classified as High risk group for both scales (violence and victimization). The Violence dichotomy scale (i.e., low and high groups) possessed a sensitivity of (0.98) and a negative predictive power of (0.96). When considering the sample's prevalence rate of 0.05, sensitivity (0.09) and PPP (0.24) both, as expected, significantly lower. Victimization categories were also dichotomized into Low vs. High risk groups. The Victimization dichotomy scale possessed a sensitivity of (0.92) and a NPP of (0.95). Again, when controlling for the prevalence rate of 0.07, both sensitivity (0.32) and NPP (0.25) were notably lower. Collectively, there was stronger sensitivity and NPP for victimization offenses for female than male parolees when controlling for prevalence rates.

8.4. Predicting recidivism

Receiver Operator Characteristic (ROC) analyses were used to examine the predictive strength in recidivism for the following offenses: Drugs, Property, Victimization, Violence, and Any Offense. If the area under the curve(AUC) is above chance (i.e., 0.5 or greater), the offense is statistically significant in predicting overall recidivism across a 30-month follow up period. (Zhou et al. 2002). The AUC analyses can be found in Table 4. Overall, Violence and Victimization scores were strong predictors of all offense types, with a level of variability scattered across all five offenses. Specifically, Victimization scores for property and victimization offenses were the strongest predictors of recidivism. Violence scores for victimization, property, and any offenses were less effective but still significant in predicting recidivism. Both Violence and Victimization scores for drug offenses while significant, were the least effective in predicting recidivism, which is consistent with the univariate analyses discussed above.

Table 4
AUC analyses for criminal outcomes for the Iowa violence and victimization instrument (IVVI).

Offense	AUC	Significance	SE	95% CI
Drug offenses Violence score	0.56	0.027	0.03	0.51–0.61
Victimization score	0.53	0.298	0.03	0.47–0.60
All property offenses				
Violence score	0.58	< 0.001	0.03	0.53–0.63
Victimization score	0.72	< 0.001	0.02	0.68–0.76
Victimization offenses				
Violence score	0.64	< 0.001	0.03	0.60–0.70
Victimization score	0.70	< 0.001	0.03	0.64–0.73
Violent offenses				
Violence score	0.69	< 0.001	0.03	0.62–0.74
Victimization score	0.66	< 0.001	0.03	0.60–0.72
Any offense				
Violence score	0.58	< 0.001	0.02	0.55–0.61
Victimization score	0.62	< 0.001	0.02	0.58–0.65

9. Discussion

There continues to be a lack of cohesive research that focuses on risk assessment and classification with women. There is even less of a focus on risk evaluation with women placed on probation or parole. Of the few studies to focus on violence risk among female parolees, the emphasis tends to be on risk for re-victimization from violent crime more generally and from domestic violence within the home (Cross 2016) or on the importance of interpersonal factors for both adults and juvenile offenders (Vidal et al. 2015). Although research has identified some salient demographic and clinical variables when examining risk for future violence with females, there are no known measures of violence risk specifically tailored to predicting risk for female parolees that are accurate, brief, and cost-effective. In addition, the consensus among many researchers is that until standard violence risk measures consider gender differences into their methods of administration and conclusions, existing violence risk measures must be interpreted with caution. Given the goal of conditional release is to successfully integrate female parolees into the community, there is a strong need to focus on well-supported violence risk measures to facilitate successful transitions into the community. Additionally, the use of empirically validated and cost-effective measures can help increase the potential for a safer environment for not only the parolee, but also those in her immediate environment. Considering these concerns, the current study exclusively focused on female parolees and the predictive ability of the Iowa Violence and Victimization Instrument (IVVI) over a 30-month follow-up period.

The primary evaluation of the IVVI showed positive predictive

utility for future violent offenses for female parolees. That is, female parolees categorized as High risk by the IVVI were more likely to engage in violent behavior than others categorized as Low risk. Results demonstrate not only is the IVVI comparable across genders, its predictive power is also comparable to more established measures such as the Violence Risk Appraisal Guide-Revised (VRAG-R; Harris et al. 2016) and HCR-20 V3: Assessing Risk for Violence (HCR-20, Version III; Douglas et al. 2013). Thus, by being a valid, brief, and cost-effective the IVVI may prove profitable for researchers and clinicians employed in correctional settings. The IVVI Violence scale showed significant predictive power for later violent offenses, while the Victimization scale showed significant predictive power for victimization offenses (property and drug offenses, both felony and misdemeanors). This suggests the IVVI may be used to predict not only violent recidivism, but potentially also to understand which female parolees may show increased risk for generalized criminal offending upon release.

In reviewing overall recidivism across all five offense types, Property offenses demonstrated the largest effect size. Among property offenses, the IVVI demonstrated greater predictive power for felony offenses (i.e., theft or damage to property worth more than $1,000) in comparison to misdemeanor offenses (i.e., theft or damage to property worth less than $1,000). These results make sense considering the latent variable of interest for most violence risk assessments is violence itself. More specifically, one can assume violent and property offenses with greater monetary value involve a greater likelihood of volatile, impulsive, and/or aggressive behavior.

Regarding statistical evaluation of individual risk items on the IVVI's and predictive power, results were largely consistent with male parolees examined in Prell et al. (2016), but somewhat contrary to our initial predictions. Specifically, gang membership and recent prison terms (e.g. released from prison within the last 5 years) were the strongest predictors of recidivism among female parolees. We predicted gang membership would be salient for future violence risk for women, but to a lesser degree than men, given its relatively lower base rate (i.e., women participate in gang violence at a much lesser frequency than men). This finding is particularly interesting given current literature (Campbell et al. 2007; Farooque et al. 2005; Logan and Blackburn 2009; Paulozzi et al. 2001; Weizman-Henelius et al., 2010) suggests men and women engage in violent behavior in different ways and have different environmental and psychological triggers for violence. For example, while research suggests interpersonal factors are associated with violent acts among women, women who seek out gang membership also have a history of victimization at home and gang affiliation is often used for protection and/or providing a sense of belonging (Moore and Hagedorn 2001).

While the IVVI demonstrated strong predictive power for most of the offense types, the IVVI's ability to predict later drug offender was only slightly above chance. This finding was in line with our predictions and corresponds with the findings of Prell et al. (2016) with male parolees. In addition, property offenses of lesser value (less than $1000 in Iowa) were less effective but still significant in predicting future violence. This is expected given misdemeanor property and drug offenses presumably entail less violent behavior, and thus may not be as clearly assessed by the IVVI. An additional factor worthy of consideration is the vastly different motives underlying perpetration of a violent offense, versus ones inherent in perpetration of drug-related offenses. It is reasonable to suggest women engage in violence for vastly different reasons than they engage in drug use. For example, women are more likely to engage in violence when there is a disruption to their current environment, especially when the disruption is related to interpersonal factors (Campbell et al. 2007; Farooque et al. 2005; Logan and Blackburn 2009; Paulozzi et al. 2001; Weizman-Henelius et al., 2010). Taken together, findings gathered from the current study suggest while women are reoffending at lower rates than men, there are fewer gender differences in risk factors for engaging in violence than expected. In addition, if taken together, these findings suggest the IVVI may have greater usefulness with prediction of violent and felony property offenses, but limited usefulness for predicting misdemeanor property and drug offenses.

The current study is notable for several strengths. First, this study is one of few to address violence risk in women, and one of even fewer which assess the utility of a violence risk assessment for incarcerated women who are pending release. Second, the large sample of female parolees is rare in research of violent recidivism for women, and potentially increases generalization of the current study's findings. Third, the expansion of Prell et al. (2016) findings with a female sample buffers the strength and utility of the IVVI, in that it demonstrates its usefulness for both men and women. Lastly, the current study yielded a complete lack of missing data, thereby eliminating the need for imputation or casewise deletion which might compromise the sample's integrity or affect the results. In addition, the current study utilized a sample including women facing both parole and probation. The inclusion of a sample of women facing different types of supervised release potentially leads to more effective data for correctional clinicians and parole/probation officers, or those involved in release planning.

Despite these strengths, the current study also possesses notable limitations. First, data was utilized from Iowa. This may potentially impact the generalizability of our results to other female parolee groups. Additionally, although the sample was comprised of women from several different racial/ethnic categories, the overall representation of women from minority groups was low. Although demographics in this sample were not significantly different from the general population in Iowa, it stands to reason that the racial distribution observed in Iowa is almost certainly different from that of women from other regions.

Future studies may consider investigating female parolee ethnic groups from other states to improve the overall confidence and predictive strength found in the current study. Additionally, it would be beneficial to conduct a longitudinal study following female offenders released on parole or probation to ascertain whether the predictive strength observed after two and a half years in the current study can be replicated in a lengthier period of observation (e.g., five to ten years). Finally, future researchers may consider further adapting the IVVI to include more specific items focusing on interpersonal factors related to violence (e.g., history of abuse, poor familial support) to increase predictive strength above and beyond that demonstrated in the current study.

Appendix A. Items and scoring for the Iowa violence and victimization instrument (IVVI)

Items	Violence Score	Victimization Score
1. Active offense includes:		
a. Assault, attempted murder, burglary, theft from a person, vandalism, or voluntary manslaughter	2	2
b. Most serious offense is forgery, fraud	−1	0
c. None of the above	0	0
2. Number of counts of current property		
a. None	0	0
b. One	0	1
c. Two or more	0	2
3. Ever convicted or murder/manslaughter, robbery, or theft from a person (priors only)		
a. Yes	1	1
b. No	0	0
4. Number of prior counts for violent crimes within last 10 years (any offense level)		
a. Property crime	0	1
b. Burglary (include violent and property types)	1	1
c. Weapons	1	1
d. Fight	1	1
e. None of the above	0	0
5. Prior convictions within the last 10 years (check all that apply)		
a. Property crime	0	1
b. Burglary	1	1
c. Weapons	1	1
d. Flight/escape (any offense level)	1	1
e. None of the above	0	0
6. Prior conviction for violent crime in the last 5 years (any offense level)		
a. Yes	1	1
b. No	0	0
7. Released from prison or juvenile commitment in the last five years		
a. Violent crime	2	2
b. Property crime	0	1
c. None of the above	0	0
8. Security threat group membership		
a. Confirmed	3	3
b. Suspected or none	0	0
9. Current age		
a. 24 or younger	2	1
b. Age 25-29	2	0
c. Age 30-37	1	0
d. Age 38-54	0	0
e. Age 55 or older	0	−1

Violence score categories	Victimization score categories
Low: −1 to 2	Low: −1 to 1
Moderate:3 to 5	Low/moderate:2 to 3
High:6 to 9	Moderate/high:4 to 7
Very High:10+	High:8+

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