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Development and Confirmatory Factor Analysis of the Non-Violent and Violent Offending Behavior Scale (NVOBS)

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The purpose of this research was to develop a psychometrically sound measure of violent and non-violent offending, suitable for both male and female participants in general (non-forensic) samples. Potential items were selected from existing measures. A sample of 653 British university students completed all items, and their responses were analyzed using exploratory factor analysis and validated with confirmatory factor analysis. There were five separate factors (general violence, drug-related offenses, partner violence, theft, and criminal damage), which were confirmed with acceptable fit indices. The five-factor model applied to both males and females. Each subscale demonstrated good internal consistency, with alphas for each factor ranging from moderate to good. This new measure is a potentially valuable research tool for investigating people's involvement in violent and non-violent offending. The importance of examining the psychometric properties of scales, and confirming the category groupings using CFA of the items is outlined. Aggr. Behav. 9999: XX–XX, 2013. © 2013 Wiley Periodicals, Inc.

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INTRODUCTION

General[Q2] violence and non-violent behavior are frequently examined together in the criminological literature. Intimate Partner Violence (IPV) is generally studied separately from other types of crime as it is perceived to be a unique and specialist type of crime warranting its own research, theories and interventions (Daly & Wilson, 1988; Dobash & Dobash, 1992; Hotaling, Straus, & Lincoln, 1990; Gelles & Straus, 1979; Giles-Sims, 1983). In contrast with this, Gottfredson and Hirschi (1990, 2007) concluded that offenders have a propensity to commit a wide variety of criminal acts, and specialism in one type or another is quite rare. Similarly, the longitudinal research by Farrington et al. (2006) found that self-reported offenders tended "to be deviant in many aspects of their lives." A review of criminal careers research (DeLisi & Piquero, 2011, p. 291) again found that "virtually all offenders are generalists." These sources all suggest that offenders are likely to be criminal generalists rather than specialists, and that the perpetration of violent and non-violent offending is likely to overlap. There is at present no comprehensive measure that combines both violent and non-violent offenses. It was the purpose of this study to design such a measure so as to facilitate research on the generality of offending.

Measuring IPV, Violent, and Non-Violent Crime

Although the three offense areas are usually studied separately, some research has examined them together. Moffitt, Kreuger, Caspi, and Fagan (2000) investigated partner violence and general crime in 21-year-old men and women. Partner violence was measured using 13 items which consisted of the nine physical assault items from the original Conflict Tactics Scale (Straus, 1979), plus four new items, involving twisting the partner's arm, forced sex, shaking the partner, and throwing you are the partner bodily (Moffitt et al., 1997). The Self-Report Delinquency interview was used to measure general crime. General violence was measured using five items. Non-violent offending was split into three categories; theft (12 items), fraud (9 items), and vice (23 items). The

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researchers found that many perpetrators of partner violence also engaged in physical aggression towards.

Straus and Ramirez (2004) investigated the violent and non-violent criminal history of male and female IPV perpetrators. They measured partner violence using the 12-item physical assault scale from the CTS2 (Straus, Hamby, Boney-McCoy, & Sugarman, 1996). These 12 items consisted of 5 minor assault items and 7 severe assault items. Criminal history was measured by four items, two involving violent crime (physical attack and carrying a hidden weapon), and two involving stealing. These four questions were asked for crime perpetrated before and after age 15, so that there were eight items in total. The research found that a prior criminal history predicted IPV perpetration, and the relationship was stronger for prior violent crime than for property crime.

Where previous research has involved the three offense types (violent, partner violent and non-violent crime) different measures, with different response formats have been used to assess each one, with some being very brief (e.g., Straus & Ramirez, 2004). The problem with using different measures with different response formats is that the results are not directly comparable as there will be different variance in the units of measurement for each variable, which introduces different elements of measurement error and bias. The problem with using scales with different numbers of items is that it is not possible to ascertain if the higher prevalence or frequency of offending is simply due to there being more items on that particular scale. It is also difficult to compare between different offenses if different measures have been used. Other potential problems include not separating general violence and non-violent offending (e.g., Moffitt et al., 2000), precluding the exploration of differences between general violence and non-violent crimes. The current study seeks to overcome these limitations by creating a scale that allows the three offense types to be measured and analyzed as three separate domains.

Although there are other comprehensive measures, such as the British Crime Survey (BCS) for the UK, the National Crime Victimization Survey (NCVS) for the US, and the Uniform Crime Reporting Survey (UCRS) for Canada, the questionnaire developed in this study is much shorter and more suitable for use in psychological research, where it can be administered alongside other measures. Problems associated with the existing measures include the national crime surveys only measuring crimes that have a direct victim, so that victimless crimes (such as drug taking) are excluded. These are included in the current measure, making it a more comprehensive assessment of self-reported offending behavior. Crime surveys measure only crime victimization,

whereas the current questionnaire also measures offense perpetration. It therefore provides a comprehensive measure for use in psychological research.

To overcome the limitations in existing measures, outlined above, a measure is required which has comparable questions for all three offense types, which uses the same response method throughout, and has a wide variety of criminal acts included, so that the profile of men's and women's offending can be adequately captured. The current research involves the development of such a scale.

The Overlap

This divide between research on IPV and other crime may be borne out of feminist conceptualizations, where IPV, unlike other violent and non-violent crime, is viewed as being uniquely the consequence of patriarchy, and is therefore solely (or largely) regarded in terms of men aggressing against women (e.g., Dobash & Dobash, 1980, 1998, 2004; Dobash, Dobash, Cavanagh, & Lewis, 1998; Dobash, Dobash, Wilson, & Daly, 1992; Henning, Jones, & Holdford, 2003). The evolutionary view parallels this, highlighting the uniqueness of intersexual aggression as the consequence of mate-guarding arising from paternity uncertainty (e.g., Wilson & Daly, 1992, 1996). From both the feminist and evolutionary perspectives, IPV is portrayed as a unique and specialized crime due to victim choice, in that victims are female and in an intimate relationship with a male perpetrator (but see Archer, 2012; Felson, 2002; Graham-Kevan & Archer, 2009).

In contrast, research from a more psychological or criminological perspective has recognized the heterogeneity of IPV perpetrators, with some being exclusively violent within their intimate relationship and others being violent in more than one context, that is, their violence is not limited to their partner but occurs out of the home as well. Research dating back to the 1980s (e.g., Cadsky & Crawford, 1988; Fagan, Stewart, & Hansen, 1983; Gondolf, 1988; Shields, McCall, & Hanneke, 1988) has identified this overlap in the perpetration of general violence and IPV. These classifications have more recently been confirmed for both male (Holtzworth-Munroe, Meehan, Herron, Rehman, & Stuart, 2000) and female (Babcock, Siard, & Miller, 2003) perpetrators. Babcock et al. (2003) concluded that the findings for women parallel those for men, with perpetrators of IPV being a heterogeneous group. Male typologies of violent behavior have been developed and extensively researched (e.g., Holtzworth-Munroe & Stuart, 1994), but consideration of female typologies and how they relate to the male research is sparse. Although an association between types of violent offending has long been identified, investigation into the overlap of

offending behavior in men and women has largely been neglected, particularly for women.

Risk Factors for IPV, Violent, and Non-violent Crime

Previous research has examined the criminal histories of men and women who perpetrate IPV, and has found that a substantial subgroup of these men and women have prior convictions for crimes unrelated to partner abuse (Babcock et al., 2003; Busch & Rosenberg, 2004; Buzawa, Hotaling, Klein, & Byrne, 1999; DeLucia, Owens, Will, & McCoin, 1999; Henning & Feder, 2004; Moffitt et al., 2000, 2001). This research provides evidence for the interrelatedness of the three different types of crimes, and provides a rationale for assessing them all in the same sample.

Additionally, research has shown that risk factors for aggressive and antisocial behavior tend to be shared by both boys and girls (Broidy[Q3] et al., 2003; Côté, Tremblay, Nagin, Zoccolillo, & Vitaro, 2002; Moffitt et al., 2001), and that the same influences predict both general and partner aggression in men and women (Moffitt et al., 2000; Tremblay et al., 2004). These shared risk factors include low self-control, negative emotionality, low intelligence and empathy deficits, and suggest that the different forms of aggression are developmentally similar and likely to co-occur.

Aggressive adults are highly likely to have a history of aggressive behavior beginning in childhood (Conradi, Geffner, Hamberger, & Lawson, 2009; Hay, 2005). Longitudinal research has found that men and women with a history of conduct problems are more likely to enter into a relationship with a violent partner, and are likely to perpetrate violence towards their partners, in excess of their own victimization (Moffitt et al., 2001), suggesting that IPV "is but another expression of an earlier emerging antisocial propensity" (Moffitt et al., 2001, p. 65). Longitudinal data have demonstrated that the overlap between IPV and general violence perpetration is similar for men and women, showing that partner-violent men and women at age 21 were more likely to aggress against non-family members than those who were non-violent to their partners (Moffitt et al., 2000). This research demonstrates that different types of aggressive and antisocial behaviors share similar risk factors and are likely to co-occur in both sexes.

Studying Violent and Non-Violent Offending of University Students

Although students are generally thought to be relatively law-abiding, especially with regards to violent crime, there is one violent crime which has been found to be prevalent in student populations, and that is IPV (e.g., Fiebert & Gonzalez, 1997; Foo & Margolin, 1995; Nabors, 2010; Riggs & O'Leary, 1996; Straus, 2008; Straus & Ramirez, 2004; White & Koss, 1991). Therefore, using this population allows us to examine the overlap of self-reported offending in a non-selected sample. Although violent and non-violent crime in university students may be low compared with other populations, research shows that these behaviors are present: they may just be less frequent in students. Therefore, other samples are likely to show similar patterns of offending, only at higher rates. Statistics show that students form quite a large part of the population in many countries, for example, in the UK there are approximately 2.5 million students (Higher Education Statistics Agency: HESA, 2011). Universities are employing strategies to widen participation to make university more accessible to underrepresented groups, and HESA collects and provides statistics on this. The university that this sample was taken from is above the UK average for widening participation to under-represented groups, including those from low participation neighborhoods (top 10), and those from lower socio-economic statuses (top 25) (HESA, 2011). Therefore, the population from which the current sample was derived has a reasonably wide demographic representation for a University sample.

In summary, the aim of this research is to create a psychometrically sound scale that allows the separate assessment of violent and non-violent offending in men and women. To achieve this, we conducted exploratory factor analysis, and then confirmatory factor analysis, on the Non-violent and Violent Offending Behavior Scale (NVOBS: Thornton, Graham-Kevan, & Archer, 2010) for men and women, together and then separately, to create a scale appropriate for use with both sexes. Additionally the scale was assessed for reliability.

METHOD

Item Selection

Potential items were selected by reviewing existing measures of delinquency (which included items relating to general violence and non-violent offending) and partner violence and, in order to include a broad range of both violent and non-violent criminal acts (e.g., Bendixen & Olweus, 1999; Borjesson, Aarons, & Dunn, 2003; Dahlberg, Toal & Behrens, 1998; Huizinga, Esbensen, & Weiher, 1991; Mak, 1993; Moffitt & Silva, 1988; Moffitt et al., 1997; Straus, 1979; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). Initially, 119 items were selected from the literature review and a pilot study was conducted to investigate the prevalence of the behaviors in women as violent and criminal scales tend to be developed on men. A number of items from the earlier measure used in the pilot study were eliminated due to

very low endorsement (endorsed by <1% of the sample; e.g., Used a weapon on someone, Choked partner, Sold cocaine, Arson, Stole over £100), suggesting that these behaviors may not be characteristic of university students. Therefore, a final pool of 70 items was generated and used in the current research. The general violence and IPV items were duplicates of each other in order that the same items were captured. Items were adapted for use in the current study so that they all had the same response options.

Data Collection

Data were collected from a total of 653 participants (300 [45.9%] men and 353 [54.1%] women). A subset of the present sample was published as a study investigating predictors of offending (Thornton, Graham-Kevan, & Archer, 2010). The present analysis does not overlap with what was reported there. The study was approved by the University of Central Lancashire Ethics Committee. Participants were either undergraduate or postgraduate students from a variety of courses, recruited on campus at a British university. Inclusion criteria comprised: being in a heterosexual relationships for at least one month in the past 12 months, and being over 18 years of age. Age ranged from 18 to 56 and the mean age was 22.14 years (men: 22.22; women: 22.08). It is important that men and women were matched for age as research has shown that violence (e.g., Archer, 2004) and offending (Gottfredson & Hirschi, 2007) decrease with age: therefore failure to match men and women on age could distort sex differences. There was no significant sex difference for age (t (651) = .17, P = .87). Participants who consented were administered questionnaires containing the 70 items, and were asked to report the extent to which they had been violent towards their partners, violent towards others, and engaged in non-violent offenses in the past 12 months (see Appendix 1 for instructions to participants). The 12-month time period is commonly used in both studies of IPV (e.g., Straus, 1979; Straus, Hamby, Boney-McCoy, & Sugarman, 1996), and in general aggression research (e.g., Richardson & Green, 1999, 2003). Items were answered on a 7-point scale of 0 (never happened) to 6 (happened more than 20 times). Straus et al. (1996) recommend recoding the responses to weight the data by creating midpoints for each of the items as follows: 4 (3–5 times), 8 (6–10 times), 15 (11–20 times), and 25 (more than 20 times: 25 is an assumed midpoint and is recommended by Straus et al., 1996, p. 305). Therefore, this procedure was adopted here.

RESULTS

For the purposes of factor analysis, the sample was randomly divided into two sub-samples, one used to conduct exploratory factor analysis (n = 337, men = 152, women = 185) and the other used to validate the structure using confirmatory factor analysis (n = 316, men = 148, women = 168). To examine potential sex differences, exploratory factor analyses were also conducted separately for men and women. The sexes were matched for age within each subsample.

The dataset was initially assessed for suitability for factor analysis. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy ranges from 0 to 1, and the result should be .6 or above to show appropriateness for factor analysis (Field, 2009; Kaiser, 1974; Tabachnick & Fidell, 2007). For this study KMO = .76, which is above the recommended minimum value. Bartlett's test of sphericity was statistically significant (χ^2 (903) = 6515.93, P < .001), indicating that the inter-item correlations were sufficiently large for principal component factor analysis. Therefore, the data are suitable for factor analysis.

A principal component analysis (PCA) with Varimax (orthogonal) rotation was conducted. Oblique rotation (Direct Oblimin) was also tested: however, the inter-factor correlations were all weak (.2 or below). Therefore, the decision to use an orthogonal rotation method was justified (Pedhazur & Schmelkin, 1991).

The number of factors to retain is often determined by a Scree test (Cattell, 1966; Klein, 1994). However, the Scree test can be subject to ambiguity where there is either no clear break in the curve or where there appears to be more than one definite break. Since the Scree plot was ambiguous in this case, Horn's Parallel Analysis was used (Horn, 1965). Parallel analysis (PA) calculates average eigenvalues from a random dataset that is based on the sample size and number of variables contained within the real dataset. The real eigenvalues are then compared with the random eigenvalues, and only those where the actual values are higher than the corresponding random values are retained (see Hayton, Allen, & Scarpello, 2004 for an outline of the PA procedure). Following parallel analysis, five factors were retained for the final solution. Together these five rotated factors explained 42.95% of the total variance. By studying the items that load on to each factor, the five factors were labeled, as (1) general violence, (2) drug-related offenses, (3) IPV, (4) criminal damage, and (5) theft. Only items which loaded >.4 on to at least one factor (Stevens, 1992) were retained, and no items loaded on more than one factor. Factor 1 (general violence) contained 12 items, factor 2 (drugs) contained 5 items, factor 3 (IPV) contained 8 items, factor 4 (criminal damage) contained 4 items, and factor 5 (theft) contained 4 items. Because each factor is measuring a different offense related dimension, the factors will now be referred to as subscales. The factor loadings for each item, along

with Eigenvalues and percentage variance explained by each subscale, are displayed in Table 1 for the final rotated solution.

Reliability analysis was used to measure the internal consistency of the subscales. Cronbach's alpha coefficient (α) is one of the most popular indicators of internal consistency (Field, 2009). Alphas for each subscale on the NVOBS ranged from acceptable to good, since all were above .7 (see Table 1). To examine potential sex differences, exploratory factor analyses were also conducted separately for men and women. Examination of the factor compositions and percentage variance explained suggested similarities between the sexes: therefore, data were combined for men and women.

Confirmatory Factor Analysis

The model fit of the five-factor solution was tested using confirmatory factor analysis, performed using AMOS version 18.0. Item parcels were used to reduce the number of individual items entered into confirmatory factor analysis, in order to increase the stability of parameter estimates (Holt, 2004). To create parcels, scale items were bundled by averaging items. Averaging keeps the means more interpretable and comparable regardless of the number of items in the bundle. One of the chief advantages of parceling is that it improves the subject to variable ratio. Table 1 shows the parcel placement for each item. Model fit was assessed using comparative fit index (CFI), root mean square error of approximation (RMSEA), and goodness of fit index (GFI). The current model was recursive and identified. Confirmatory factor analysis produced a model of good fit ($\chi^2 = (55)$ 147.90, $P < .001$, RMSEA $= .07$, GFI $= .94$, CFI $= .94$). For completeness, the model fit of the three factor (general violence, IPV, and non-violent offending) conceptual model suggested in the introduction was also tested. The results showed that the three factor model was not as good a fit to the data as the five-factor model ($\chi^2 = (62)$ 303.00, $P < .001$, RMSEA $= .08$, GFI $= .91$, CFI $= .91$). Therefore, the five-factor model was selected as the final model.

Further Analyses of the NVOBS Subscales

Subscales were derived from the factors by totalling the items for each of the five resulting offending behavior subscales. The subscale totals were screened for outliers and normality (Tabachnick & Fidell, 2007). Outliers were reduced so that extreme scores were one more than the next most extreme score. Descriptive statistics are provided for each subscale (i.e., general violence, drug-related behavior, IPV, criminal damage, and theft) in Table 2.

It is evident from Table 2 that the data are over-dispersed (standard deviations are higher than the

TABLE 1. Results of Principal Components Factor Analysis With Varimax Rotation ($n = 337$) of NVOBS for Men and Women Showing the Final Five-Factor Solution[a]

Item	Rotated Factor Loadings	Parcel
Factor 1. General Violence (GV: 12 items)		
1. Kicked someone	.85	GV1
2. Hit someone with a fist	.77	GV1
3. Pushed grabbed or shoved someone	.75	GV1
4. Beat someone up	.70	GV2
5. Scratched someone	.67	GV2
6. Slammed/held someone against a wall	.65	GV2
7. Hit or tried to hit someone with something hard besides a fist	.63	GV3
8. Bit someone	.61	GV3
9. Threw something at someone	.61	GV3
10. Slapped someone	.58	GV4
11. Twisted someone's arm or hair	.57	GV4
12. Bent someone's fingers	.54	GV4
Eigenvalue	6.32	
% Variance explained	14.71	
α	.89	
Factor 2. Drugs (5 items)		
13. Used ecstasy	.84	D1
14. Used cocaine/crack	.79	D1
15. Used speed	.77	D1
16. Used cannabis	.73	D2
17. Gang of 3 + fighting, causing damage/disturbance	.61	D2
Eigenvalue	3.48	
% Variance explained	8.09	
α	.79	
Factor 3. IPV (8 items)		
18. Kicked partner	.79	IPV1
19. Hit partner with fist	.76	IPV1
20. Slapped partner	.75	IPV1
21. Bent partners fingers	.68	IPV2
22. Threw something at partner	.63	IPV2
23. Pushed grabbed or shoved partner	.48	IPV2
24. Scratched partner	.45	IPV3
25. Twisted partners arm/hair	.43	IPV3
Eigenvalue	3.37	
% Variance explained	7.83	
α	.74	
Factor 4. Criminal Damage (CD: 4 items)		
26. Damaged something in a public place	.67	CD1
27. Graffiti	.62	CD1
28. Broke windows of empty building	.55	CD2
29. Damaged others property on purpose	.46	CD2
Eigenvalue	2.90	
% Variance explained	7.74	
α	.71	
Factor 5. Theft (T: 4 items)		
30. Stole 5–50	.67	T1
31. Stole <5	.66	T1
32. Possessed stolen property	.48	T2
33. Enter building to steal/damage	.44	T2
Eigenvalue	2.40	
% Variance explained	5.58	
Overall α	.70	

[a]Alphas were for scales based on the factors.

TABLE 2. Means and Standard Deviations of NVOBS Subscales Overall and by Sex ($n = 653$), and χ^2 and d for Sex Differences

Factor	Overall Mean (SD)	Overall Range (%0)	Men Mean (SD)	Men Range (%0)	Women Mean (SD)	Women Range (%0)	χ^2	d[a]
GV	7.85 (11.13)	0–39 (30.2%)	10.44 (12.26)	0–39 (23.7%)	5.65 (9.55)	0–23 (35.8%)	21.89 (1)*	.43
IPV	1.74 (3.01)	0–11 (57.8%)	0.84 (1.85)	0–9 (69.3%)	2.51 (3.55)	0–11 (48%)	51.32 (1)*	−.59
Drugs	2.40 (4.24)	0–16 (61.3%)	3.64 (5.52)	0–16 (56.3%)	1.99 (3.73)	0–12 (65.4%)	10.97 (1)*	.35
CD	0.79 (1.62)	0–5 (74%)	1.12 (1.86)	0–5 (64.7%)	0.50 (1.31)	0–5 (81.9%)	16.66 (1)*	.39
Theft	1.00 (1.82)	0–6 (69.7%)	1.37 (2.19)	0–6 (63%)	0.68 (1.35)	0–4 (75.4%)	15.34 (1)*	.38

[a]Minus sign indicates that women's values are higher than men's.
*$P < .001$.

corresponding means). This sort of distribution is typically found in studies of IPV using the Conflict Tactics Scale and similar measures (Straus, 1979; Straus et al., 1996). The preferred method for such datasets, which are truncated at zero, highly skewed in the positive direction, and overdispersed (standard deviations are higher than the corresponding means), is negative binomial regression (Gardner, Mulvey, & Shaw, 1995; Hilbe, 2007[Q4]; Hutchinson & Holtman, 2005). This has been used in recent studies of IPV (e.g., Archer, Fernández-Fuertes, & Thanzami, 2010; Finkel, DeWall, Slotter, Oaten, & Foshee, 2009), and was used in the present case to test for differences between the factor analysis and the confirmatory factor analysis subsamples on each of the five NVOBS subscales. The Goodness of Fit statistics were satisfactory as the Deviance value should be near 1 (general violence: Value/df = 1.11; drugs: Value/df = 0.79; IPV: Value/df = 0.84; criminal damage: Value/df = 0.61; theft: Value/df = 0.69). There were no significant differences between the factor analysis and confirmatory factor analysis subsamples on each of the five NVOBS subscales: general violence (Wald χ^2 (1) = 0.97, P = .33), drug offenses (Wald χ^2 (1) = 0.07, P = .79), IPV (Wald χ^2 (1) = 0.14, P = .71), criminal damage (Wald χ^2 (1) = .75, P = .39), and theft offenses (Wald χ^2 (1) = 0.13, P = .72). Therefore, the data from the two subsamples were combined, and means, standard deviations, and frequencies of scores were calculated for each subscale overall, and for men and women separately.

Negative Binomial Regressions (NBR) were used to test for sex differences on the five NVOBS subscales (see Table 2 for the NBR results). The Goodness of Fit statistics were again satisfactory as the Deviance values were near 1 (general violence: Value/df = 1.11; drugs: Value/df = 0.78; IPV: Value/df = 0.85; criminal damage: Value/df = 0.62; theft: Value/df = 0.69). Men perpetrated higher levels of general violence (Wald χ^2 (1) = 21.89, P < .001), drug offenses (Wald χ^2 (1) = 10.97, P < .001), criminal damage (Wald χ^2 (1) = 16.66, P < .001), and theft offenses (Wald χ^2 (1) = 15.34, P < .001) than women, but women perpetrated significantly more IPV (Wald χ^2 (1) = 51.32, P < .001) than men. According to Cohen's (1988) criteria, effect sizes (shown in Table 2) were small for drug offenses, theft and criminal damage, and medium for IPV and general violence.

Intercorrelations Between the Five Offending Behaviors

Table 3 shows the Pearson correlations between the five identified offense types separately for men and women to demonstrate the interrelatedness of offending for men and women. The results revealed small to moderate significant correlations between all offenses for women, and small to moderate significant correlations between most offenses for men. For men IPV was not correlated with drug offenses or criminal damage. Overall the correlational results suggest that men's and women's violent and nonviolent offending is interrelated,

TABLE 3. Pearson Correlations for All Five Categories of Offending Behavior for Men and Women

	Men GV	Men IPV	Men Drugs	Men CD	Men Theft	Women GV	Women IPV	Women Drugs	Women CD	Women Theft
GV	—	.20*	.18*	.35*	.33*	—	.28*	.20*	.31*	.26*
IPV		—	.03	.01	.20*		—	.23*	.21*	.23*
Drugs			—	.38*	.40*			—	.35*	.39*
CD				—	.47*				—	.43*

*$P < .001$.

1 and supports the theory that offenders are "cafeteria"
2 criminals rather than specialists and are likely to be
3 involved in a variety of criminal behavior where there is
4 opportunity (Gottfredson & Hirschi, 1990). There was no
5 evidence of multicollinearity as there were no correla-
6 tions above .70.

DISCUSSION

10 The aim of this study was to develop a self-report
11 measure of violent and non-violent offending behavior
12 which could be used by researchers to investigate the
13 range of self-reported offending behavior in men and
14 women in non-forensic populations. Five factors mea-
15 suring violent and non-violent offending behavior in men
16 and women were identified. These were: general
17 violence, IPV, drug-related behavior, criminal damage,
18 and theft. These categories are similar to the Home Office
19 crime categories, which cover violent crime, acquisitive
20 crime, vandalism/criminal damage, and drug offenses
21 (Home Office, 2010). The NVOBS was shown to be
22 psychometrically sound, with the resulting subscales
23 having moderate to good internal consistency. Therefore,
24 the NVOBS should be a useful instrument for measuring
25 offending behavior in non-selected samples such as the
26 ones used in the present study.

27 The new questionnaire distinguishes the components
28 of offending, and allows for comparisons to be made
29 between male and female offending. Examining sex
30 differences in the NVOBS factors has provided support
31 for previous research. We found that men self-reported
32 more general violence than women: this was an expected
33 finding, as a large body of research shows that, outside of
34 intimate relationships, men are more violent than women,
35 at every age and for various measures (Archer, 2004,
36 2009; Eme, 2007, 2009, 2010; Moffitt et al., 2001). The
37 finding that men are more generally violent than women
38 fits with the sexual selection theory where intrasexual
39 competition is motivated by status and resource acquisi-
40 tion, and so sex differences should be most evident
41 during young adulthood to correlate with the peak of
42 reproductive competition (Daly & Wilson, 1988; Wilson
43 & Daly, 1985). The current sample comprised predomi-
44 nantly young adults as the mean age of the current sample
45 was 22 years. Eme (2010) suggested that the sex
46 difference in violent behavior occurs because men are
47 more vulnerable than women to a "host of neuro-
48 developmental risk factors that in interaction with family
49 and environmental adversity exponentially increase the
50 probability of violent behavior" (p. 486).

51 We also found that women were more violent than men
52 within intimate relationships, which also supports a large
53 body of evidence. Research using unselected samples
54 (such as student samples) shows that women can be as

violent as men within intimate relationships, if not more
so (Archer, 2000, 2002, 2006, 2012; Graham-Kevan &
Archer, 2003; Thornton, Graham-Kevan, & Archer,
2010). This finding has been found for both "minor"
violence (e.g., pushing, slapping, hitting) as well as
"severe" types of violence (Ehrensaft et al., 2004; Lussier
et al., 2009; Straus, 2008), except for the items "beat up"
and "choke" where the majority of the perpetrators were
men (Archer, 2002), and women were the perpetrator in
only about a third of cases. Research has shown that
both men and women underreport their perpetration of
IPV compared to reports about their partners, but this bias
is more pronounced for men (Archer, 1999), leading
to sex differences being slightly more in the female
direction for perpetrators' reports than for victims'
reports (Archer, 2000).

Alternatively, the current findings may be related to
male students having more to lose in terms of reputation
by physically aggressing against their female partners: in
a student sample, people live within close proximity of
each other, so that any IPV is likely to be detected. Male
IPV is not socially sanctioned in such groups, this makes
it more likely female victims would seek helps and others
would intervene on their behalf (Felson, 2002). There-
fore, male students may have more to lose in a student
sample than males in a community sample, and so they
may inhibit their aggression towards their female
partners, as the costs of not doing so are particularly
high. Women's IPV is not viewed as negatively as men's
and evokes less disapproval (Gerber, 1991), and
therefore may attract less third party involvement.
Men's inhibition and the costs of IPV perpetration being
lower for women than men may instead facilitate
women's violence towards her partner (George, 1994),
which would result in less male perpetrators and more
female perpetrators in a sample such as this.

We found that men perpetrated more non-violent
offenses (drugs, criminal damage, and theft) than women,
which supports existing research findings, such as those
of Moffitt et al. (2001) and Steffensmeier and Allan
(1996), who reported that men are generally more
antisocial than women. The effect sizes were smallest for
drug-related offenses, theft and criminal damage, and
largest for IPV, and general violence, which is consistent
with previous research (e.g., Moffitt et al., 2001; Smith &
Visher, 1980[Q5]). Recent research by Vaughn, Fu, et al.
(2011) suggests that females are significantly more likely
than males to abstain from engaging in the use of
substances and from antisocial behavior, which is
consistent with the current finding that men engage in
significantly more non-violent and generally violent
offenses than women. The sexual selection theory may
also account for why men may be involved in more
nonviolent crimes than women. Men may steal or

damage resources in order to outcompete rivals and increase the likelihood of their own access to females (Kanazawa & Still, 2000; Walsh, 2000).

The correlations revealed the interrelatedness of offending for men and women and showed that each offense, whether violent or nonviolent, was related to the perpetration of other offenses. All the results are consistent with previous research and theories which say that offenders are likely to be versatile, and unlikely to specialize in one particular type of crime (DeLisi & Piquero, 2011; Farrington et al., 2006; Gottfredson & Hirschi, 1990), particularly those classed as "the severe 5%" of offenders who are versatile and are found to engage in high levels of the majority of antisocial and violent behavior (Vaughn, DeLisi, et al., 2011, p. 79). The results are also consistent with the conclusions of Payne^{Q6}, Higgins, and Blackwell (2010, p. 1015) that "partner abusers should be viewed and treated as general types of criminals rather than specific types of offenders" because those who are violent within relationships are also more likely to be violent towards others in other settings. Altogether, the current findings demonstrate the close association between violent and nonviolent offending in men and women, and show that violent and nonviolent offending tend not to occur in isolation and instead form an interrelated set of complex behaviors. The interrelatedness between the five types of crime for men and women builds the case for measuring them together to assess their comorbidity, which is essential for extending our knowledge regarding the onset, development, and underlying mechanisms related to the different aspects of offending behavior in men and women.

Howard and Dixon (2011) developed a classification of violent offenses to be used to predict violent reoffending as part of the Offender Assessment System (OASys). To create this violence predictor, they examined a number of the main violence risk assessment instruments and found that there were 22 separate approaches for classifying criminal acts as either violent or non-violent. None of these classifications included drug offences or theft, which were assessed in the current study. Howard and Dixon (2011) concluded that "this lack of consensus on the classification of violent criminal behavior is an important issue for developers of new violence risk measures." Therefore, their research has also identified a need for a comprehensive measure that classifies violent and non-violent offenses. The results from Howard and Dixon's study have confirmed that violent and non-violent offenses overlap, as a history of criminal damage was found to predict future violent offending.

Studies such as the present one are limited in a number of ways. First, factor analysis itself has limitations. Factor analysis is a highly subjective procedure at a number of stages. The judgments made throughout the analysis including deciding which analytic method to use, which rotation method to use, and how many factors or items to retain or omit at each stage. However, we countered these limitations by confirming the same results using an alternative rotation method which indicated a robust solution. We also used parallel analysis to identify the number of factors to retain. This has been shown to be a more accurate method than using either Kaiser's Criterion or Cattell's Scree plot alone (Hayton et al., 2004). Furthermore, there can be any number of solutions and the interpretation of the solution is left to the researcher. There are also no external criteria against which to assess the validity of the solution. However, our use of CFA to confirm the NVOBS factor structure addresses this limitation. Acknowledging the limitations, both factor analysis and CFA have been widely used in scale development and are deemed to be very useful evaluative methods.

A further potential limitation is that self-reports were used. Self-reports can be affected by socially desirable responding, and participants may deliberately distort their responses by underreporting violent and antisocial acts in order to minimize their involvement. This has been found to be the case in the area of partner violence, where both men and women underreport their perpetration of IPV (Archer, 1999).

All participants in the current study were university students. Therefore, a non-student sample could also be used to establish norms and generalizability of the factor structure. Therefore, researchers using the NVOBS should report the internal consistency of the factors from their research samples. However, the university sample used in the current study has a reasonably wide demographic range and there is a great deal of research in this area that has used student samples (e.g., Fiebert & Gonzalez, 1997; Foo & Margolin, 1995; Nabors, 2010; Riggs & O'Leary, 1996; Straus, 2008; Straus & Ramirez, 2004; White & Koss, 1991), and therefore this scale will be of use in similar future research.

Furthermore, future research could assess additional psychometric properties of the measure, for example, test–retest reliability. Anonymity regarding participant responses precluded test–retest data being obtained during the current research, therefore, the current research is limited in that it is not clear how stable responses to the various NVOBS subscales are over time. Also, the measure should be used in alternative populations, such as prison and community samples, to examine whether the norms identified in the student sample are generalizable to other samples.

It was beyond the scope of the current study to include association with other scales, but further studies will include measures of validity (e.g., convergent,

discriminant) that are standard in validation papers, to evaluate the generalizability of the scale. For example, it is important to assess how responses to the five subscales relate to responses on widely used measures of trait aggression (e.g., Buss–Perry Aggression Questionnaire, Attitudes toward Violence Against Women) and other measures of IPV.

In conclusion, the questionnaire developed in this study is an improvement and extension of pre-existing measures because it is a comprehensive one that contains comparable questions for all three offense types (general violence, IPV, and non-violent offending), and uses the same response format throughout. The NVOBS appears to be a useful self-report measure of violent and non-violent offending with good psychometric properties.

Appendix 1: Instructions to participants

IPV

Sometimes conflict gets out of hand and physical fights occur. Couples have many different ways of trying to settle their differences. This is a list of things that might happen when you have differences. Please use the following scale to answer the questions below. Please read each statement carefully, and then circle the number that corresponds to how many times you did each of these in the last year, and how many times your partner did them in the last year. If your relationship did not last for the whole of the past year, please indicate how many times you and your partner did each of these during your whole relationship.

How often did this happen in the past year?

0 = This has never happened, **1** = Once in the past year, **2** = Twice in the past year, **3** = 3–5 times in the past year, **4** = 6–10 times in the past year, **5** = 11–20 times in the past year, **6** = More than 20 times in the past year.

General violence

Sometimes conflict gets out of hand and physical fights occur. Please answer the following questions in relation to **your** behavior. Please **do not** include fights you have had with a romantic partner (such as a boyfriend/girlfriend **as you have already been asked about this in Introduction**[Q7] Section), only include fights with someone other than your partner, for example, friend, family member, stranger, etc.

Please use the following scale to answer the questions below. Please read each statement carefully, and then circle the number that corresponds to your reply.

How often did this happen in the past year?

0 = This has never happened, **1** = Once in the past year, **2** = Twice in the past year, **3** = 3–5 times in the past year, **4** = 6–10 times in the past year, **5** = 11–20 times in the past year, **6** = More than 20 times in the past year.

Non-violent offending

Please answer the following questions in relation to **your** behavior.

Please use the following scale to answer the questions below. Please read each statement carefully, and then circle the number that corresponds to your reply.

How often did this happen in the past year?

0 = This has never happened, **1** = Once in the past year, **2** = Twice in the past year, **3** = 3–5 times in the past year, **4** = 6–10 times in the past year, **5** = 11–20 times in the past year, **6** = More than 20 times in the past year.

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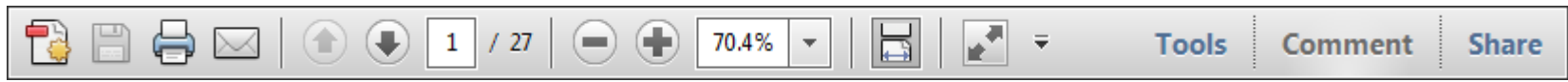
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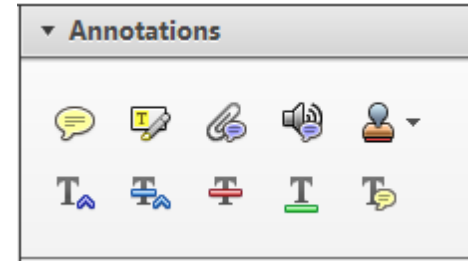
1. Replace (Ins) Tool – for replacing text.

Strikes a line through text and opens up a text box where replacement text can be entered.

How to use it

- Highlight a word or sentence.
- Click on the Replace (Ins) icon in the Annotations section.
- Type the replacement text into the blue box that appears.

---
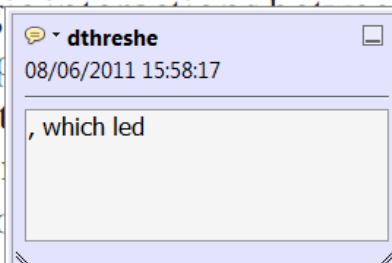
2. Strikethrough (Del) Tool – for deleting text.

Strikes a red line through text that is to be deleted.

How to use it

- Highlight a word or sentence.
- Click on the Strikethrough (Del) icon in the Annotations section.

---

3. Add note to text Tool – for highlighting a section to be changed to bold or italic.

Highlights text in yellow and opens up a text box where comments can be entered.

How to use it

- Highlight the relevant section of text.
- Click on the Add note to text icon in the Annotations section.
- Type instruction on what should be changed regarding the text into the yellow box that appears.

---

4. Add sticky note Tool – for making notes at specific points in the text.

Marks a point in the proof where a comment needs to be highlighted.

How to use it

- Click on the Add sticky note icon in the Annotations section.
- Click at the point in the proof where the comment should be inserted.
- Type the comment into the yellow box that appears.

# USING e-ANNOTATION TOOLS FOR ELECTRONIC PROOF CORRECTION

5. Attach File Tool – for inserting large amounts of text or replacement figures.

Inserts an icon linking to the attached file in the appropriate pace in the text.

How to use it

- Click on the Attach File icon in the Annotations section.
- Click on the proof to where you'd like the attached file to be linked.
- Select the file to be attached from your computer or network.
- Select the colour and type of icon that will appear in the proof. Click OK.
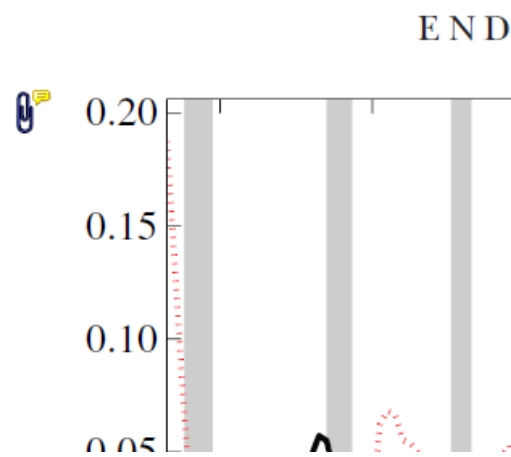
## 6. Add stamp Tool – for approving a proof if no corrections are required.

Inserts a selected stamp onto an appropriate place in the proof.

How to use it

- Click on the Add stamp icon in the Annotations section.
- Select the stamp you want to use. (The Approved stamp is usually available directly in the menu that appears).
- Click on the proof where you'd like the stamp to appear. (Where a proof is to be approved as it is, this would normally be on the first page).
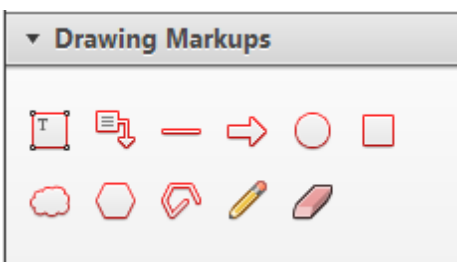
7. Drawing Markups Tools – for drawing shapes, lines and freeform annotations on proofs and commenting on these marks.

Allows shapes, lines and freeform annotations to be drawn on proofs and for comment to be made on these marks..

How to use it

- Click on one of the shapes in the Drawing Markups section.
- Click on the proof at the relevant point and draw the selected shape with the cursor.
- To add a comment to the drawn shape, move the cursor over the shape until an arrowhead appears.
- Double click on the shape and type any text in the red box that appears.
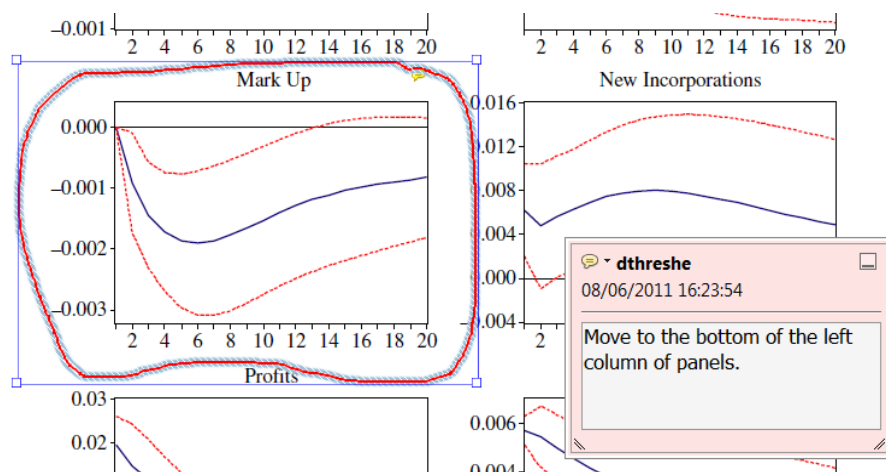
For further information on how to annotate proofs, click on the Help menu to reveal a list of further options:

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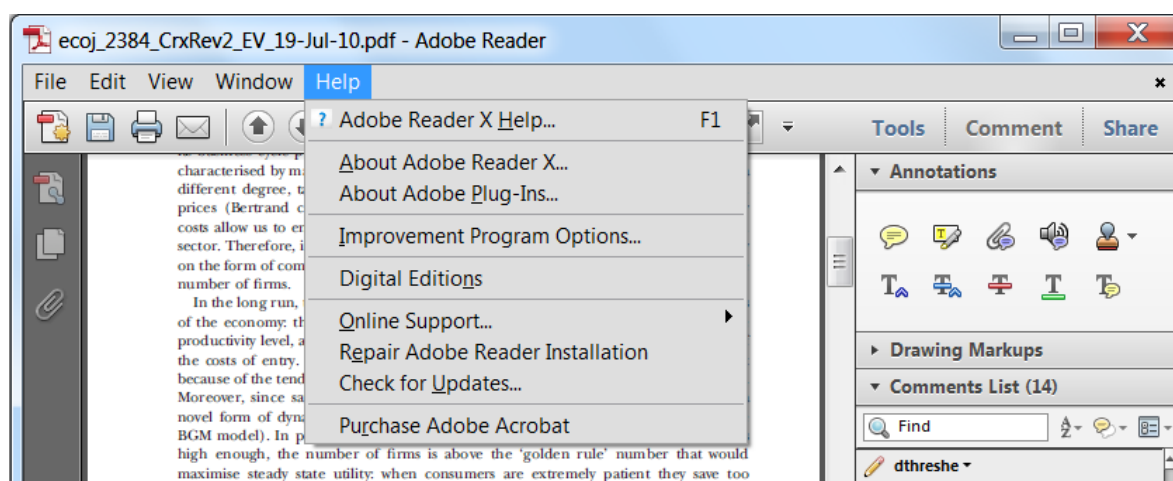
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