Domestic Violence Inventory: Introduction and Standardization in a Large Sample of Domestic Violence Offenders

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Summary

The reliability, validity and accuracy of the Domestic Violence Inventory (DVI) were investigated in a sample of 18,770 domestic violence offenders. The DVI has six scales for measuring offender risk of violence (lethality), substance (alcohol and other drugs) abuse, controlling attitudes and behaviors, as well as stress coping abilities (emotional and mental health problems). The DVI has a Truthfulness Scale for measuring offender truthfulness while completing the DVI. Reliability analyses demonstrated that all six DVI scales had Cronbach Alpha reliability coefficients between .88 and .94. Since the DVI was originally validated with other tests (criterion validity), the present research studied First offenders (14,512) and Multiple offenders (3,903) DVI performance. Multiple offenders scored significantly higher than First offenders on all DVI scales except for the Truthfulness Scale. Possible reasons for these unexpected Truthfulness Scale findings were discussed. Alcohol Scale scores at or above the 70th percentile identified 99.0 percent of the offenders that admitted to alcohol problems, whereas Drugs Scale scores at or above the 70th percentile identified 98.4 percent of offenders that admitted to drug problems. Similarly, Control Scale scores at or above the 70th percentile identified 93.4 percent of offenders that admitted to having dominating and controlling personalities. DVI classification of domestic violence offender risk was within 3.1 percent of predicted DVI percentile scores for its 6 scales and 4 risk ranges. This DVI research study is part of the DVI's ongoing standardization and its publication is for peer review.

Domestic Violence Inventory

The Domestic Violence Inventory (DVI) is a multidimensional self-report test that assesses adults (male and female) accused or convicted of domestic violence. The DVI is used in courts, probation departments, counseling agencies and treatment programs. The DVI is a domestic violence offender risk assessment and treatment tool. In addition to evaluating an offender's predisposition for violence per se, the DVI screens adjunctive factors like offender truthfulness, substance (alcohol and other drugs) abuse, control issues and stress coping abilities. Contributing factors (criminogenic needs) are represented in the DVI as scales (measures). Elevated (high) scale scores represent intensified problem severity. Domestic violence recidivism is ascertained by the Violence Scale (violence severity) score, domestic violence correlates (other DVI scales) and the offenders criminal history.

After reviewing the research literature, DVI areas of inquiry (scales) were established. Scale items were selected on the basis of their psychometric properties. In contrast to interviews,

DVI test administration (30 minutes), computer scoring and report printing (2½ minutes) are time efficient. Offenders can be tested individually or in groups.

The DVI consists of 155 true-false and multiple choice items. It reads at a low 6th grade level. The DVI can be administered in paper-pencil test booklet format. It can be administered in paper test booklet format, on the computer monitor or over the internet. Regardless of how DVI's are administered all DVI tests are computer scored (Lindeman, 2005). The DVI is also available in "human voice audio" in English and Spanish. Most active vocabularies (what we speak) are more limited than passive vocabularies (what we understand). Human voice audio recordings help overcome reading impairments and cultural differences. The DVI is standardized on Whites, Blacks, and Hispanics in the United States. More recently the DVI was standardized in Canada, England and Russia. Online or internet testing has expanded DVI utilization internationally.

The DVI answer sheet contains demographic (age, sex, ethnicity, education and marital status) and criminal history items like age at first conviction, times on probation, domestic violence arrests, etc. Offender identity is protected and the DVI is in full compliance with HIPAA (federal regulation 45 C.F.R. 164.501) requirements.

In many ways, DVI scoring and risk classification procedures resemble those used in the Minnesota Multiphasic Personality Inventory (MMPI). Scale item responses are totaled (raw scores), then relevant court and treatment history is included and truth-correction is applied. DVI scale scores are matched to percentile scores which are derived from gender (male and female) and ethnic (white, black and Hispanic) score distributions. In summary, offender risk for each DVI scale is determined by a series of questions that culminate in that scores risk classification. Domestic violence information is summarized in the DVI Profile, a graphic representation of the six DVI scale scores. Computer generated DVI reports are three (3) pages in length. Each scale score measures problem severity, thereby enabling evaluators to match problem severity with treatment intensity. Matching problem severity with treatment intensity is important for treatment effectiveness and reducing recidivism (Bonta & Andrews, 2007).

Six DVI Scales (Measures)

1. Truthfulness Scale

Experienced domestic violence evaluators are aware of offender denial. Crowne & Marlowe (1964) discussed offenders' need for social approval. Many researchers (Dutton & Hemphill, 1992; Dutton & Starzomski 1994; Henning & Holdford, 2006) have studied offender's deceitful behavior and techniques for adjusting to this response bias.

The DVI utilizes a 20-item Truthfulness Scale to determine offender truthfulness while being tested. In a procedure comparable to the MMPI truthfulness scale correction procedure (Meehl & Hathaway, 1946) the DVI "truth-corrects" its scale scores. Truth-corrected scores are more accurate than raw scores.

And the DVI Truthfulness Scale provides valuable domestic violence offender information in and of itself. The Truthfulness Scale score identifies self-protective offenders that attempt to conceal information, minimize their problems or "fake good." Extreme attempts to deceive (scores at the 90th percentile or higher) invalidate the DVI and all of its scale scores.

Truthfulness Scale information has also been related to treatment outcome. Domestic violence offender denial and problem minimization has been associated with treatment dropout (Daly & Pelowski, 2000) and lack of treatment progress (Murphy & Baxter, 1997) as well as higher risk of reoffending (Kropp, Hart, Webster & Eaves, 1995; Grann & Wedin, 2002).

Refusal to take responsibility for one's behavior may signify a lack of motivation and readiness for change (Scott & Wolfe, 2003).

One of the first things to check when reviewing a DVI report is the offender's Truthfulness Scale score. The Truthfulness Scale score takes precedence over other DVI scales because it determines whether-or-not the offender was truthful while completing the DVI.

2. Violence (Lethality) Scale

The 32-item Violence (Lethality) Scale measures offender's domestic violence potential, predisposition and proneness. This scale incorporates both generic violence and domestic violence. Elevated (70th percentile and higher) Violence Scale scores identify offenders that are a danger to themselves and others. Research shows that domestic violence re-abuse is most likely to occur by offenders that are "generally violent" (Hilton & Harris, 2005; Johnson, Gilchrist & Beech, 2006).

Past violence is a good predictor of re-abuse (Harrell & Smith, 1996; Quigley & Leonard, 1996) and is the most commonly used risk factor in the courts (Roehl & Guertin, 1998). Cooper (1993) reviewed the "assessing repeated violence" literature on men arrested for wife assault. Other researchers acknowledge prior violence as a predictive factor, but also include other factors (criminogenic needs) like violence potential, substance abuse, control strategies and mental health factors in their violence predicting models (Girard & Wormith, 2004; Hilton, Harris, Rice, Houghton & Eke, 2008).

The DVI Violence Scale is a point of convergence for all other DVI scales (Alcohol Scale, Drugs Scale, Control Scale and Stress Coping Abilities Scale). When elevated (70th percentile and higher) any of these DVI scales can exacerbate the Violence Scale scores meaning and significance.

3 & 4. Alcohol Scale & Drugs Scale

One of the most consistently reported correlates of domestic violence is substance (alcohol and other drugs) abuse (Leonard & Roberts, 1996; Jacobs, 1999; Wilson, et al, 2000; Stuart, Moore, Kahler & Ramsey, 2003). Although Alcohol and Drugs are separate scales in the DVI they are discussed here under the caption "Substance Abuse."

Roberts (1998) found that 70% of domestic violence offenders were under the influence of alcohol and/or drugs at the time of their assault. Substance abuse has also been associated with batterer recidivism (Hamberger & Hastings, 1990; Tollefson & Gross, 2006) and failure to complete batterer treatment (Dalton, 2001; Rooney & Hanson, 2001). When substance abuse is present, substance abuse treatment is an important component of domestic violence offender therapy (Stuart, 2005). Indeed, the results of Jones & Gondolf's (2001) study indicated that the probability of violent recidivism following batterer intervention was reduced 30-40% when offenders received substance abuse treatment.

To enhance specificity and improve accuracy the DVI has a 24-item Alcohol Scale and a separate 24-item Drugs Scale. When substance abuse is present these scales independently measure the severity of alcohol and drug abuse. Independent Alcohol and Drugs Scales make specific alcohol and/or drug problem identification and measurement possible. This is a necessary prerequisite for accurate matching of problem severity with treatment intensity. Offenders with severe problems can then be placed in intensive treatment programs, whereas offenders with less severe problems can be appropriately placed in less intensive treatment programs.

5. Control Scale

Another important domestic violence issue involves control. Violent men are often intensely preoccupied with self-control and control over others. (Gondolf, 1985). Domestic violence may occur when the offender attempts to regain control by people (predominantly men) who feel they are losing it (Gondolf, 1985; Umberson, Anderson, Glick & Shapiro, 1998) or when men perceive some threat to their position (Umberson, Williams & Anderson, 2002). Some research supports the finding that female offenders also resort to domestic violence as a means of control (Follingstall, Wright, Lloyd & Sabastion, 1991; Graham-Kavan & Archer, 2008).

The DVI's 19-item Control Scale measures a persons need to control self and others. Control usually refers to the process of regulating or restraining others. Controlling behaviors include intimidation, swearing, threatening, hitting and battering. The Control Scale measures the severity of controlling needs so problem severity can be appropriately matched with treatment intensity.

6. Stress Coping Abilities

High rates of domestic violence have been shown to occur among people experiencing stressful life events (Barling & Rosebaum, 1986; Felson, 1992) and chronic stress (Frye & Karney, 2006). Other research suggests that the frequency and perceived impact of stress contributes to domestic violence (Cano & Vivian, 2001; Langer, Lawrence & Bary, 2008). People with impaired stress coping abilities are at increased risk for a variety of health and adjustment problems, including violence (Umberson, Williams & Anderson, 2002) and substance abuse (Cooper, Russell, Skinner, Frone & Mudar, 1992).

The 40-item Stress Coping Abilities Scale includes stress items and stress handling procedures. This scale goes beyond just measuring stress. It measures how well the individual handles, manages or copes with stress. DVI offenders that score in the severe (90th percentile and higher) range invariably have other serious (diagnosable) emotional or mental health problems.

Even mild domestic violence can lead to more serious forms of violence if left unchecked. There are many self-report questionnaires and tests to assess violence (Tolman & Bennet, 1990) but few incorporate additional scales to assess co-existing contributing problems.

Standardization

Women represent 15% of all domestic violence offenders arrested in the United States (Rennison, 2002). However, almost all of the domestic violence tests discussed in the literature that report validity data were developed exclusively with male offenders (Renaur & Henning, 2005). Yet Simmons, Lehman & Cobb (2007) found dissimilarities between male and female domestic violence offenders and emphasized that domestic violence offender tests need to be standardized on males and females. The DVI was standardized on male and female domestic violence offenders.

Table 1 presents T-tests and Cohen's d comparisons between male and female domestic violence offenders. Of the 18,770 domestic violence offenders 14,962 were males and 3,788 were females.

Domestic violence offender's criminal histories were obtained from DVI answer sheets. Offenders reported this information and staff were asked to verify the information provided. Some participating domestic violence offender programs had access to court and treatment records, whereas others verbally corroborated this information with offenders.

Table 1. Criminal History Comparisons by Sex (n=18,770, 2008)						
Criminal	Male Offenders		Female Offenders		T-test	Effect Size
History Items	M	SD	M	SD	t-value	(Cohen's d)
Age at first arrest	23.81	9.82	25.69	9.63	-9.46*	0.20*
Misdemeanor convictions[a]	2.96	4.26	1.61	2.91	22.79*	0.38*
Felony convictions	0.72	1.54	0.31	0.98	20.07*	0.32*
Times on probation	1.39	1.56	0.78	1.01	28.62*	0.46*
Probation revocations	0.36	1.04	0.18	0.70	12.25*	0.21*
Times on parole	0.20	0.64	0.06	0.29	19.92*	0.28*
Parole revocations	0.09	0.59	0.05	0.53	4.59*	0.07
Total arrests	4.46	5.53	2.46	3.43	27.49*	0.43*
Times sentenced to jail	1.82	3.37	0.82	1.84	24.27*	0.37*
Times sentenced to prison	0.26	0.77	0.07	0.35	21.66*	0.32*
Years in jail or prison	0.82	2.43	0.21	1.27	20.98*	0.32*
Domestic violence arrests	1.14	1.23	0.75	0.95	21.52*	0.32*
Assault arrests	0.43	1.06	0.29	0.79	9.02*	0.15
Alcohol-related arrests	1.22	2.85	0.53	1.64	19.46*	0.29*
Drug-related arrests	0.49	1.80	0.29	1.22	8.26*	0.13

All t-test scores were significant at the p<.001 level. Cohen's (1988) "d" value effect size classification was maintained, however the descriptive adjectives describing each effect range were changed to read: below .20 "negligible," above .20 "noteworthy*," above .50 "significant" and above .80 "very significant."

As shown in Table 1, all t-test comparisons between male and female criminal history items significantly (p<.001) differentiated between gender. Due to the large sample size (18,770 offenders) Cohen's "d" was calculated to provide an index of effect size or relationship strength. Effect size helps decide whether observed differences matter (Thompson, 2000). In general effect sizes above 0.20 constitute a "noteworthy" effect. In Table 1 effect sizes that have an asterisk by their "d" score have effect sizes above 0.20. Consequently, even though "parole revocations," "assault arrests" and "drug-related arrests" significantly differentiate between male and female offenders Cohen's "d" statistic indicates the "effect" of these relationships is negligible. Table 1 t-tests and "d" effects further support the need for gender (male-female) test standardization. The DVI was standardized on male and female domestic violence offenders.

METHOD

The present study investigated the reliability, validity and accuracy of the Domestic Violence Inventory (DVI). This study validates the DVI in a large (18,770) sample of domestic violence offenders who were evaluated as part of standard intake and screening procedures in courts, probation departments, treatment facilities and community supervision programs. The data for this study was obtained from agencies that use the DVI in their intake and screening procedures.

This study included DVI test data from January 2006 through January 2009. There were 18,770 domestic violence offenders included in this study. Domestic violence offenders ranged in age from 16 to 87 years of age. Their average age was 32.7 years. This sample consisted of

14,962 (79.7%) males and 3,788 (20.2%) females. The ethnic composition of this 18,770 sample was: Caucasian (60.6%); African American (14.3%); Hispanic (15.1%); Native American (4.4%); and Other (3.2%). Almost two thirds of the offenders (61.3%) had a G.E.D. or High School diploma. Marital Status consisted of single (43.4%); married (29.1%); separated or divorced (21.5%) and widowed (1.8%) offenders. Multiple offenders were significantly older (M=34.4, SD= 9.6) than First offenders (M=32.2, SD=10.2), t=12.43, p<.001.

Domestic violence offender's court history (as obtained on the DVI answer sheet) is presented in Table 2. Offenders reported this information on their DVI answer sheet and staff were asked to verify the information provided.

Table 2. Frequency of Court History of Participants by Gender or Sex (n=18,770, 2008)										
Court-History Items	Males (Occurrence)					Females (Occurrence)				
	0	**1**	**2**	**3**	**4+**	**0**	**1**	**2**	**3**	**4+**
Misdemeanor convictions [a]	19.4	23.9	16.9	11.8	24.6	35.5	30.0	14.3	7.1	10.4
Felony convictions	64.9	17.3	7.4	3.4	4.7	80.5	11.0	3.9	1.1	1.2
Times on probation	28.7	34.0	20.5	8.5	6.5	46.5	34.6	11.7	3.7	1.5
Probation revocations	77.9	12.6	3.9	1.4	1.7	87.0	7.1	1.9	0.8	0.8
Times on parole	84.8	9.6	2.5	0.7	0.4	93.3	3.8	0.4	0.1	0.2
Parole revocations	93.0	3.0	1.0	0.4	0.4	95.9	1.0	0.3	0.2	0.3
Total arrests	7.7	19.8	16.6	13.4	39.4	18.1	30.9	17.8	11.0	20.0
Times sentenced to jail	41.9	21.3	12.1	7.3	14.7	61.2	19.7	7.6	4.5	4.9
Times sentenced to prison	82.6	9.7	3.4	1.2	1.0	92.8	4.2	0.5	0.3	0.2
Years in jail or prison	76.4	6.9	3.7	2.6	7.6	89.9	3.7	2.2	0.7	1.2
Domestic violence arrests	25.6	49.6	14.9	4.7	3.3	43.5	42.6	8.4	2.2	1.3
Assault arrests [b]	71.8	17.8	4.7	1.6	1.7	78.2	15.0	2.7	0.9	1.0
Alcohol-related arrests	55.3	18.8	9.9	5.1	8.5	74.0	13.6	4.9	2.5	3.0
Drug-related arrests	73.7	15.0	5.1	1.7	2.2	81.7	11.4	3.0	0.7	1.2

Note: court history is summarized in terms of frequency of occurrence. [a] excluding moving violations.
[b] excluding domestic violence arrests.

Table 2 was included because many of the means in Table 1 were small and could be volatile and influenced by the composition of the offender sample. Table 1 demonstrated that all criminal history items significantly differentiated between male and female offenders. In comparison to Table 1's means, Table 2 presents the frequency of court history item occurrence. Comparison of means and frequencies gives a more complete understanding of gender and court history interaction.

Invalid Scores

Truthfulness Scale scores at or above the 90th percentile identify invalid DVI tests. In these cases, a valid Truthfulness Scale score is present, but all other DVI scale scores are invalid due to offender's denial, attempts to minimize problems, and attempt to "fake good," or lie. Of the 18,770 domestic violence offenders in this study 647 or 3.4% had invalid tests. Invalidated

tests were excluded from the analyses. Consequently, the sample size of statistically analyzed data was 18,123.

Correlation coefficients were calculated between offender's court history (court records) and DVI scales. These correlation coefficients follow: Number of misdemeanor convictions correlates .22 with the Alcohol Scale and .19 with the Drugs Scale. Number of felony convictions correlates .22 with the Drugs Scale. Times on probation correlates 0.22 with the Alcohol Scale and .20 with the Drugs Scale. Number of probation revocations correlates .21 with the Drugs Scale. Total number of arrests correlates .22 with the Alcohol Scale and .25 with the Drugs Scale. Number of times sentenced to jail correlates .21 with the Alcohol Scale and .22 with the Drugs Scale. Number of domestic violence arrests correlates .23 with the Violence Scale and .19 with the Control Scale. Number of assault arrests (not domestic violence) correlates .17 with the Violence Scale. Number of alcohol-related arrests correlates .39 with the Alcohol Scale. And drug-related arrests correlates .28 with the Drugs Scale. These correlations reveal the complex relationships that exist between criminal history and current or future violent behavior. These findings support the view that domestic violence offenders have more than just violence problems – they also manifest attitudinal, substance (alcohol and other drugs) abuse, control and stress handling (emotional) problems and concerns.

RESULTS

Reliability

The DVI contains six measures (scales): 1. Truthfulness Scale, 2. Violence Scale, 3. Alcohol Scale, 4. Drugs Scale, 5. Control Scale, and 6. Stress Coping Abilities Scale. Inter-item reliability (alpha) coefficients for the six DVI scales are presented in Table 3. All 2006, 2007 and 2008 DVI scales were highly reliable with Cronbach alpha reliability coefficients at or above 0.86.

Table 3. DVI Scales reliability coefficients by year (2006, 2007, 2008)				
Scales	# of Items	2006 (n=37,024)	2007 (n=1,155)	**2008 (n=18,770)**
Truthfulness	20	.88	.89	**.89**
Alcohol	22	.94	.95	**.94**
Drugs	22	.92	.92	**.92**
Control	28	.88	.88	**.88**
Violence	32	.86	.90	**.90**
Stress Coping	40	.93	.93	**.93**

Cronbach alpha's of .75 and higher are professionally recognized as "reliable" (Nunnaly, 1978), and according to Roberts & Rock (2002) are appropriate for risk assessment instruments. DVI reliability was essentially unaffected by sample size or geography. 2007 and 2008 reliability coefficients were at or above 0.88 with four of six 2008 coefficients at or above 0.90.

Reliability in testing refers to a tests consistency. Test reliability refers to the consistency of scores obtained by the same person when retested with the same or an equivalent test. In most testing environments a reliability coefficient of .75 or higher is professionally accepted. All DVI scale scores exceed this standard. The weakest 2008 reliability coefficient was the DVI Control Scale (0.88). These DVI scales include: Truthfulness (.89, p<.001), Alcohol (.94, p<.001),

Drugs (.92, p<.001), Control (.88, p<.001), Violence (.90, p<.001) and Stress coping Abilities (.93, p<.001). These results strongly support the internal consistency of DVI scales. It is reasonable to conclude that the DVI (and scales contained therein) is a reliable domestic violence offender assessment instrument or test.

Validity

DVI research extends over 16 years. Many validity and reliability studies have been conducted on thousands of domestic violence offenders using several validation methods. Early studies used criterion measures and the DVI was validated with other tests, e.g., Minnesota Multiphasic Personality Inventory (MMPI) L, F and K scales, polygraph examinations, domestic violence offender ratings, etc. Subsequent validation studies used other tests (e.g., MMPI, MacAndrews, Taylor-Manifest anxiety Scale, MMPI Depression Scale, Treatment Intervention Inventory, SAQ-Adult Probation , etc. Much of this research is summarized in the "DVI: Inventory of Scientific Findings" document (Lindeman, 2005).

Most, if not all domestic violence offender screening agencies and treatment facilities are reluctant to administer two tests for validation purposes unless they are compensated for staff time. Since the DVI was originally validated with other tests, attention in the present study was focused upon First offenders (14,512, 77.3%) that had "no or one" domestic violence arrest and Multiple offenders (3,903, 20.8%) having two or more domestic violence arrests. First offender's that reported "no" domestic violence arrests were referred primarily by marriage counselors and other professionals working in divorce, custody hearings and counseling settings.

It was hypothesized that DVI scales would differentiate between First offender and Multiple offender domestic violence perpetrators. It was predicted that Multiple offenders would score higher than First offenders on all DVI scales. T-tests and Cohen's d (1988) are presented in table 4.

Table 4. T-test and Cohen's d Comparison Between First and Multiple offenders (n=18,770[a], 2008)						
DVI	**First offenders**		**Multiple offenders**		**T-tests**	**Effect Size**
Scales	M	SD	M	SD	t-value	(Cohen's d)
Violence	12.88	9.98	18.16	10.81	27.23*	.51**
Control	5.87	6.45	8.48	7.42	19.81*	.37*
Alcohol	8.39	10.94	12.44	12.93	17.71*	.33*
Drugs	6.53	9.75	8.67	10.64	11.27*	.22*
Stress Coping	113.73	41.44	104.22	39.96	12.97*	.23*
Truthfulness[a]	8.61	6.06	7.41	5.33	12.10*	.21*

All t-test values were significant (p<.001)*. *Cohen's (1988) d-value effect size classification system was used with new descriptive adjectives: .20 "noteworthy effect*," and .51 "significant effect**" [a]overall sample size was 18,770, but due to invalid test deletion the Truthfulness Scale corrected sample size was 18,123.

As shown in Table 4 the results of t-test analyses supported expectations. Multiple offenders average scale scores were significantly higher than First offenders average scores, except for the Truthfulness Scale. **Contrary to our expectation, First offenders had significantly higher mean Truthfulness Scale scores than Multiple offenders.** Upon closer analysis, when the 647 offenders with invalid Truthfulness Scale scores were reviewed, 84.4

percent were domestic violence First offenders. This suggests that First offenders were more likely to attempt to "fake good" than were Multiple offenders. It may be that Multiple offenders have learned that their multiple domestic violence offenses cannot be denied nor will they be overlooked when their court history is reviewed. In contrast, First offenders appear to be more naïve and uninformed regarding how the criminal system works. Many First offenders may believe they can underreport and "fake good" without getting caught. Most Multiple offenders know their domestic violence offenses are a matter of record and cannot be denied. This interpretation emphasizes the importance of the Truthfulness Scale.

In Table 4 the Violence Scale t-test between First and Multiple offenders was highly significant (t=27.23). Similarly Cohen's d between First and Multiple offenders was substantial (d=0.51) and demonstrates the strength of this effect. All other scales t-test values were highly significant (p<.001) and all d values or effects were "noteworthy." Thus, Table 4's statistics support important differences between First and Multiple offenders DVI scale scores. The finding that the Violence Scale was much more effective in discriminating between First and Multiple offenders supports the view that violence incorporates the attitudes and behaviors represented in other DVI scales (Truthfulness, Alcohol, Drugs, Control and Stress Coping Abilities). In other words, DVI scales are co-determinants that can exacerbate violence or serve as domestic violence triggering mechanisms. DVI scales are correlates of domestic violence.

Predictive validity was further evaluated on the Alcohol, Drugs and Control Scales for offender "admissions." The 647 invalid DVI reports were not included. This analysis was based on 18,123 domestic violence offenders DVI answers. Alcohol Scale number "79. I have a drinking problem" was the alcohol admission item. Drugs Scale item number "39. I have a drug-related problem" was the drug admission item used. And Control Scale item number "43. I have a forceful personality and usually dominate or control others" was the control admission item. Alcohol, Drugs and Control (items #79, 39 and 43) Scale "problems" were defined in terms of offender admissions.

Alcohol Scale accuracy statistics: 2,882 offenders or 15.9 percent admitted to having a drinking problem. Of these offenders 2,853 or 99.0 percent were correctly identified with elevated (70th percentile and above) Alcohol Scale scores. Drugs Scale: 2,116 offenders or 11.7 percent admitted having a drug-related problem. Of these 2,116 offenders 2,083 or 98.4 percent were correctly identified with elevated (70th percentile and higher) Drugs Scale scores. With regard to the Control Scale: 1,799 or 9.9 percent admitted to have a forceful and controlling personality. Of these 1,799 offenders 1,681 or 93.4 percent were correctly identified by elevated (70th percentile and higher) Control Scale scores.

The correct identification of 99.0 percent of problem drinkers having elevated (70th percentile and higher) Alcohol Scale scores supports the Alcohol Scales predictive validity. Similarly, the correct identification of 98.4 percent of drug abusers with elevated (70th percentile and higher) scores supports the Drugs Scales predictive validity. The lower, yet tolerable 93.4 percent correct identification of self-admitting controlling offenders with elevated Control Scale scores supports the Control Scales predictive validity. However, the lower Control Scale's "correct identification percentage" may in part be due to item ambiguity. In other words, the criterion item may be confusing with terms such as "forceful personality," "dominate," and "control."

Other DVI scales were not included in this predictive validity analysis for a variety of reasons. For example, both the Truthfulness Scale and Stress Coping Abilities Scale do not have one item that would serve as an admission item. Official court, probation or corrections records

would have been preferred for Violence Scale comparison criteria. However, these records were unavailable.

Gender Differences

Gender differences between male and female DVI scale scores are presented in Table 5. Of these offenders 14,962 were male and 3,788 were female. In Table 5 the Violence Scale did not significantly differentiate between male and female domestic violence offenders. And Cohen's d effect size was negligible for the Violence Scale. The Violence Scales t-value and d-value were not significant. This means that male and female offenders scored essentially the same on the DVI Violence Scale. This finding is in marked contrast to other DVI scale findings. All other DVI scales (Truthfulness Scale, Control Scale, Alcohol Scale, Drugs Scale, and Stress Coping Abilities Scale) have significant male-female differences. Gender differences on all DVI scales, including the Violence Scale, will continue to be studies in future research.

Table 5. Comparisons Between Male and Female DVI Scores (n=18,123, 2008)						
DVI Scales	Males		Females		T-Test	Effect Size
	M	SD	M	SD	t-value	(Cohen's d)
Violence	14.0	10.35	14.12	10.59	0.62 n.s.	.01 n.s.
Control	6.35	6.73	6.76	6.92	3.33*	.06
Alcohol	9.77	11.67	7.21	10.57	12.79*	.23*
Drugs	6.79	9.59	7.75	11.30	4.76*	.10
Stress Coping	113.39	40.87	105.11	42.78	10.56*	.20*
Truthfulness[a]	8.48	6.06	8.18	6.97	2.69*	.05

The t-test asterisk denotes a p<.001 significance level. The Cohen's "d" asterisk denotes noteworthy effects. No asterisk denotes a negligible d effect. Overall sample size was 18,770, but due to invalid test deletions Truthfulness Scale corrected sample size was 18,123.

Table 5 shows the Violence Scale comparison between male (14,962) and female (3,788) offenders. Male offenders scored significantly higher than female offenders on the Control Scale, Alcohol Scale, Drugs Scale, Stress Coping Abilities Scale and the Truthfulness Scale. Cohen's d effect values greater than .20 were demonstrated on the Alcohol Scale and Stress Coping Abilities Scale, which means that these interactions were noteworthy. Consequently, important sex (male-female) differences exist and these male-female scoring differences may also apply to other domestic violence offender tests. Caution suggests that sex difference should be examined in all domestic violence tests. The DVI has been standardized on males and females.

Between Scale Correlations

To assess relationships among DVI scales, between scale correlation coefficients were calculated. The results of these correlational analyses are presented in Table 6.

Table 6. Correlation Coefficients among DVI Scales (n=18,123, 2008)				
DVI Scales	Drugs	Control	Stress Coping	Violence
Alcohol	.37	.26	.22	.31
Drugs	-	.27	.27	.30
Control	-	-	.45	.72
Stress Coping	-	-	-	.56

Lipsey & Wilson (2001) noted that correlations coefficients of 0.25 to 0.39 are considered moderate and coefficients of 0.40 and higher are "high."

Analysis of DVI scale correlation results demonstrates significant correlations among DVI scales. These between scale correlation coefficients show that offenders scoring high on one scale tend to score high on other DVI scales. The high correlation coefficient between the Violence and Control Scale (r=.72) is noteworthy as it demonstrates that controlling behaviors and violence are closely related in domestic violence. Either control begets violence (or vice versa) or they may co-occur. Regardless, violence should not be prioritized at the expense of control in domestic violence assessment and treatment. And the strong correlation between the Stress Coping Abilities Scale and the Violence Scale gives credibility to the role of emotional and mental health problems in domestic violence.

These results further support the view that domestic violence offenders have more problems than just violence. Between scale correlations demonstrate that DVI scales are also assessing related constructs, but not so strong as to negate the fact that these scales measure important constructs. These results further support research that shows excessive drinking, drug abuse, control issues and problems handling stress are contributing factors to domestic violence.

Accuracy

For ease of presentation and meaningful classification DVI scale scores are distributed into four risk ranges: low (zero to 39th percentile), medium (40 to 69th percentile), problem (70 to 89th percentile) and severe (90 to 100th percentile). Scale scores at or above the 70th percentile identify offenders with problems. This means that 39 percent of offenders are expected to score in the low range, 30 percent in the medium range, 20 percent in the problem range and 11 percent in the severe problem range.

Table 7 shows how closely the attained 18,123 Domestic Violence Inventory (DVI) scale scores approximated predicted percentages. Table 7 shows the comparison of predicted scale scores (percentages) with the attained scale score percentages for each risk range. In Table 7 the six DVI scales are represented in the first column on the tables left. Then the four risk ranges are presented with predicted percentages presented in bold parenthesis below each risk range designation or name (low, medium, problem, severe). It is these predicted percentages (39%, 30%, 20% and 11%) that domestic violence offenders attained scores are compared to. The closer the "predicted" score percentage with the "attained" score percentage in each risk range – the more accurate the assessment.

Table 7. DVI: Accuracy of Scale Score Risk Range Placement (n=18,123, 2008)							
Scale	Low (39%)		Medium (30%)		Problem (20%)		Severe Problem (11%)
Truthfulness	39.6	**(0.6)**	30.7	**(0.7)**	19.7	**(0.3)**	10.0	**(1.0)**
Alcohol	39.9	**(0.9)**	29.4	**(0.6)**	21.2	**(1.2)**	9.5	**(1.5)**
Control	42.1	**(3.1)**	27.1	**(2.9)**	21.2	**(1.2)**	9.7	**(1.3)**
Drugs	39.2	**(0.2)**	31.5	**(1.5)**	18.7	**(1.3)**	10.6	**(0.4)**
Violence	40.2	**(1.2)**	30.8	**(0.8)**	18.1	**(1.9)**	11.0	**(0.0)**
Stress Coping	41.6	**(2.6)**	29.3	**(1.8)**	20.8	**(0.8)**	9.3	**(1.7)**

The Truthfulness Scale correction (18,123) applies to all scales.

From left to right, scales are identified and the four risk ranges (low, medium, problem and severe problem) are presented. Referring to the Truthfulness Scale, 39 percent (in bold parenthesis) of the 18,123 offender's evaluated means that 39 percent are expected or predicted to be classified in the "low risk" range. It was noted that 39.6 percent of offenders actually scored in the low risk range. The difference between predicted and attained scores is presented in bold parenthesis. In this example there is a 0.6 percent difference between expected and attained low risk Truthfulness Scale scores. The same procedure applies to each scale (6 scales) and each risk range (4). Out of 24 possible comparison points the widest discrepancy between predicted and attained percentiles was 3.1 percent. Obtained percentages were very close to the prediction percentages for each DVI scale.

Conclusion

The Domestic Violence Inventory (DVI) is a 155 item self-report test that consists of six scales or measures: Truthfulness Scale, Violence Scale, Control Scale, Alcohol Scale, Drugs Scale, and Stress Coping Abilities Scale. As a domestic violence assessment instrument or test the DVI incorporates these co-determinants or criminogenic needs in its domestic violence offender profile. This DVI research study incorporated 18,770 domestic violence offenders, but 647 or 3.4 percent of the participants invalidated their DVI tests and these discredited tests were excluded, leaving 18,123 participants.

All six DVI scales manifest impressive reliability. These Cronbach alpha reliability coefficients were: Truthfulness Scale (.89), Violence Scale (.90), Control Scale (.88), Alcohol Scale (.94), Drugs Scale (.92), and Stress Coping Abilities Scale (.93). Nunnaly (1978) and Roberts & Rock (2002) note that reliability coefficients of .75 are professionally acceptable. All DVI reliability coefficients in the present study (2008) were at or above .88.

Augmenting earlier research (Lindeman, 2005), the present study examined First (14,512) and Multiple (3,903) domestic violence offenders DVI scores. It was predicted that Multiple offenders would score significantly higher than First offenders on all DVI scales. Unexpectedly, Truthfulness Scale scores were significantly higher for First offenders. These results were explained in terms of First offender naïveté regarding justice system records. Multiple offenders may have learned by experience that denial, problem minimization and

attempts to "fake good" are often detected. As predicted, Multiple domestic violence offenders scored significantly higher than First offenders on the following scales: Violence Scale, Control Scale, Alcohol Scale, Drugs Scale, and Stress Coping Abilities Scale.

Significant between DVI scale correlations showed that offenders scoring high on one DVI scale tend to score high on other scales. These findings are consistent with other research that includes honesty, guilelessness, violence potential, substance (alcohol and other drugs) abuse, control strategies and emotional factors in their violence predicting models (e.g., Girard & Wormith, 2004; Hilton et al, 2008). Domestic violence offenders often have several co-determinants, criminogenic needs or problems contributing to their domestic violence profile.

DVI scales are criminogenic needs that contribute to domestic violence. When present elevated (70th percentile and higher) scores are indicative of problematic attitudes and behaviors that should be incorporated into domestic violence offender treatment. And since DVI scales measure problem severity – problem severity should be matched with commensurate treatment intensity.

Significant gender differences were found in all DVI scales. All DVI scales have been standardized on male and female domestic violence offenders. It seems prudent that all domestic violence offender assessment procedures or tests should assess gender differences, particularly because there are both male and female domestic violence offenders.

To assess DVI accuracy DVI risk range classification was reexamined. DVI scores are distributed into four risk ranges: low (0 -30%), medium (40 – 69%), problem (70 – 89%) and severe problem (90 – 100%). Thus, 39% of domestic violence offenders are predicted to score in the low risk range, 30% in the medium range, 20 percent in the problem range and 11% in the severe problem range. These predictions apply to each of the six domestic violence scales. For the 18,123 domestic violence offenders studied, the widest discrepancy between the predicted percent and the attained percent was 3.1 percent. Said another way, out of 24 possible (4 risk ranges X 6 scale scores) "predicted – attained" comparisons the largest difference was 3.1. Attained percentages were very close to the predicted percentages for each DVI scale.

Self-admitted drinkers were identified 99.0 percent of the time by their having an elevated (70th percentile and higher) score. Similarly, elevated Drugs Scale scores (70th percentile and higher) correctly identified 98.4 percent of self-admitted drug abusers. The lower correct identification percentage of self-admitted "controlling" offenders (93.4) may in part have been due to criterion question ambiguity.

In sum, the present study supports the reliability, validity and accuracy of the Domestic Violence Inventory (DVI). The identification of factors contributing to domestic violence is just the beginning. Matching problem severity with appropriate treatment intensity needs to be further clarified. Further research on domestic violence offender recidivism is also needed. We would like the Domestic Violence Inventory (DVI) to be included in that research. Interested parties should contact the author.

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