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## **Domestic Violence Inventory Pre-Post: An Introduction**

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### **Abstract**

The domestic violence/intimate partner violence literature places a great deal of focus on treating offenders. In addition to risk classification, a key component of treatment is determining treatment outcome. The question becomes: what effect did treatment have on the offender? The present study introduces the DVI Pre-Post and examines test statistics in a sample of 2,792 domestic violence offenders that were administered the DVI Pre-Post at treatment intake; 262 offenders were administered the test again upon treatment completion. The present study examined test statistics and gender and offender (First and Multiple offenders) differences in scores. Multiple offenders attained significantly higher scores than First offenders on all DVI Pre-Post scales except for the Truthfulness Scale. DVI Pre-Post classification of risk at intake was within 3.7 percent of predicted percentile scores for its six scales and each scale's four risk ranges. All DVI Pre-Post scales attained reliability coefficients of .86 and above. Results support the DVI Pre-Post as an accurate and valid domestic violence treatment outcome assessment.

*Keywords:* DVI Pre-Post, domestic violence, intimate partner violence, offender, treatment, outcome

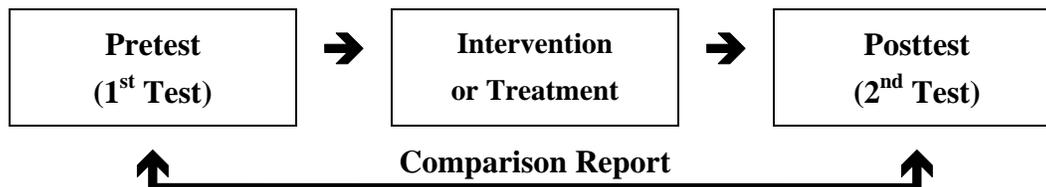
## **Domestic Violence Inventory Pre-Post DVI Pre-Post**

In the past, domestic violence perpetrators were assumed to have been rehabilitated, positively changed or cured by virtue of completing assigned or mandated treatment. Research has shown that this is not necessarily the case (Broome, Flynn, Knight & Simpson, 2007). Some domestic violence offenders do not benefit from treatment (Mechanic, Weaver, Resick, 2000).

This fact underscores the need for accurate domestic violence treatment effectiveness or treatment outcome measures (Knight, Simpson & Hiller, 2003). Expecting all domestic violence clients to want positive change may be unrealistic, especially when treatment is court ordered or mandated by a probation officer.

Baseline methodology and pretest-posttest research design was reviewed by Davidian, Tsiatia & Leon (2005). When reviewing treatment effects or outcome, it is important to remember that treatment outcome is influenced by the treatment that is provided as well as client or patient-related factors like attitude, motivation, goals, and treatment perceptions (Broome, Flynn, Knight & Simpson, 2007).

The DVI Pre-Post is administered twice: once at treatment intake (pretest) and again at treatment completion (posttest). Pretest scores serve as a baseline for posttest comparison. Pretest-posttest scale score differences demonstrate treatment effects or change. Pretest scores are compared to analogous posttest scores to determine if measureable change occurred. The DVI Pre-Post does not interpret, judge or state opinions about treatment program effectiveness or treatment outcome. It simply reports positive or negative changes in DVI Pre-Post scale scores. Indeed, the intent is to objectively report pretest – posttest **change**.



Two reports are generated: the pretest (intake) report and the posttest (treatment completion) report, which generates the comparison report. Both of these reports can be seen at [www.dvi-pre-post.com](http://www.dvi-pre-post.com). The DVI Pre-Post integrates this baseline methodology.

### **DVI Pre-Post Scale Description**

#### **Truthfulness Scale:**

Evaluators, treatment staff and mental health professionals are aware of domestic violence perpetrator denial. Yet, a common weakness of domestic violence recidivism research is that most assessment instruments do not control for offender’s truthfulness (Bishop, 2009). Observation of and research regarding domestic violence perpetrators has determined that these offenders commonly attempt to curtail the severity of their violent actions, often deny violent behavior and convincingly portray themselves as victims (Kinberg, 2008). Bell and Change-Hill

(1998) noted that a domestic violence perpetrator that provides accurate information on the nature and severity of his or her violent behavior is the best predictor of outcome.

The DVI Pre-Post uses a Truthfulness Scale to determine offender truthfulness while they are being tested. Using a procedure similar to the MMPI's truthfulness scale – correction (Meehl & Hathaway, 1946) the DVI Pre-Post “truth-corrects” its scale scores. The DVI Pre-Post Truthfulness Scale determines if the offender's answers are accurate and truthful.

On this note, the DVI Pre-Post Truthfulness Scale provides valuable domestic violence offender information in and of itself. Indeed, the Truthfulness Scale identifies self-protective offenders that attempt to conceal information, minimize their problems or portray themselves in an overly favorable light. Socially desirable responding can have a significant impact on assessment results (Blanchett, Robinson, Alksnis & Sarin, 1997). Extreme attempts to deceive (scores at the 90<sup>th</sup> percentile and higher) invalidate the DVI Pre-Post and all of its scale scores. This is because the denial and attempts to fake good are so extreme they distort the test data and thereby invalidate the tests results.

In a 2009 study involving parolees, Marlow and Chesla noted that non-judgmental, objective exploration of parolees' readiness to change and discussion of their behavior and problems (such as substance abuse) can increase disclosure and admission, which improves the odds of sincere clinical participation. The very nature of the DVI Pre-Post as an evidence-based, objective assessment means that offenders are more likely to be candid about their problems. Offender truthfulness at the time of their assessment is reflected in their Truthfulness Scale score.

As stated, offender truthfulness is associated with treatment outcome. Domestic violence offender denial and problem minimization has been shown to exacerbate lack of treatment progress (Murphy & Baxter, 1997) and increased probability of treatment dropout (Daly & Peloski, 1000), as well as increased probability of recidivism (Knopp, Hart, Webster & Eaves, 1995); Grann & Wedin, 2002). Reluctance or refusal to take responsibility for one's behavior can indicate a lack of motivation and a lack of an inclination to change (Scott & Wolfe, 2003).

### **Violence (Lethality) Scale:**

The DVI Pre-Post Violence (Lethality) Scale measures offenders' domestic violence potential, predisposition and proneness (Davignon, 2006). This DVI Pre-Post scale incorporates both nonspecific violence and domestic or intimate partner violence. Elevated (70<sup>th</sup> percentile and higher) Violence Scale scores identify offenders with a propensity for violent behavior. Research shows that the probability of re-occurring domestic violence increases when the offender is generically violent (Hilton & Harris, 2005; Johnson, Gilchrist & Beech, 2006).

A history of violent behavior is a predictor of re-abuse (Harrell & Smith, 1996; Quigley & Leonard, 1996) and is the most commonly-examined risk factor in the legal system (Roehl & Guertin, 1998). *Past violence toward non-family members and any verifiable criminal history have been found to be predictive of both domestic violence treatment program failure and domestic violence recidivism*, (Baba, Turk-Bicabci & Asquith, 1999; Jones & Gondolf, 2001). Other researchers recognize prior violence as a predictive factor, but also include other factors (criminogenic needs) like substance (alcohol and other drugs) abuse, control issues and mental health disorders in their violence-predicting models (Girard & Wormith, 2004; Hilton, Harris, Rice, Houghton & Eke, 2008).

One of the risk factors for a battered woman to be killed by her abuser is a history of domestic violence being perpetrated against the woman by the perpetrator (Campbell, Sharp & Glass, 2000). Prior violence can not only be a predictor of future violence in itself, but can also be a predictor of more serious or potentially violent events.

The DVI Pre-Post Violence Scale is the point of convergence of all other DVI Pre-Post scales (Truthfulness Scale, Alcohol Scale, Drug Scale, Control Scale and Stress Management Scale). An elevated Violence Scale score (70<sup>th</sup> percentile and higher) with other co-occurring elevated scale scores would indicate that other scales are exacerbating violence proneness and/or vice versa. The DVI Pre-Post Violence Scale score at pretest is used to determine violence treatment program intensity. The posttest Violence Scale score establishes violence proneness at treatment completion and, as warranted, identifies the need for continued or altered violence treatment.

### **Alcohol & Drug Scales:**

Research literature presents strong support of the association between substance (alcohol and other drug) abuse and domestic violence (Leonard & Roberts, 1996; Jacobs, 1999; Wilson, et al., 2000; Stuart, Moore, Kahler & Ramsey, 2003). The DVI Pre-Post Alcohol Scale and Drug Scale are independent of one another, which enables specific problem identification and measurement. This scale independence facilitates matching of problem (alcohol and/or drugs) severity with treatment intensity.

Research indicates an association between prior drug-related arrests and unsuccessful domestic violence treatment. Roberts (1998) found that 70 percent of domestic violence offenders were under the influence of alcohol and/or drugs at the time of their assault. Substance abuse has also been related to batterer recidivism (Hamberger & Hastings, 1990; Tollefson & Gross, 2006), and failure to complete batterer treatment (Dalton, 2001; Rooney & Hansen, 2001). When substance abuse is problematic, substance (alcohol and other drugs) abuse treatment is an important component of domestic violence offender therapy (Stuart, 2005). Indeed, the results of Jones & Gondolf's (2001) study indicated the probability of violent recidivism decreased following substance abuse treatment.

To enhance specificity and accuracy, the DVI Pre-Post has an independent Alcohol Scale and Drug Scale. These scales measure substance use, and when appropriate, substance abuse. Separate Alcohol and Drug scales make specific alcohol and/or drug problem identification, problem measurement and problem severity – treatment intensity matching possible.

### **Control Scale:**

Another important component of domestic violence is control. Attaining power and control over their victims is often the primary goal of domestic violence perpetrators (Hines & Douglas, 2010). *Domestic violence may occur when the offender feels that they are losing control and attempts to recapture it* (Gondolf, 1985; Umberson, Anderson, Glick & Shapiro, 1998). In a 2005 study, Dutton, Goodman and Schmidt reported a significant association between a measure of non-violent coercive control and intimate partner violence. Female offenders can also resort to domestic violence as a means of maintaining control (Follingstall, Wright, Lloyd & Sebastian, 1991; Graham-Karan & Archer, 2008).

The DVI Pre-Post Control Scale measures the severity of the offenders need to control. Within the scope of domestic violence, control usually refers to the process of regulating or

restraining others. Controlling behaviors include intimidating, threatening, disparaging, hitting and battering. The Control Scale measures the severity of the offenders need to control so that problem severity can be matched to treatment intensity.

Elevated (70<sup>th</sup> percentile and higher) DVI Pre-Post scales are problematic. Co-occurring scale elevations represent co-occurring problems or disorders. The higher the scale score the more severe the problem. There are several levels of DVI Pre-Post scale interpretation ranging from viewing DVI Pre-Post scales as self-reports to interpreting scale elevations and scale inter-relationships. The Control Scale is particularly sensitive to co-occurring problems and disorders. Elevated (70<sup>th</sup> percentile and higher) and severely elevated (90<sup>th</sup> percentile and higher) co-occurring scales (e.g., Violence Scale, Alcohol Scale, Drugs Scale, Stress Management Scale) invariably exacerbate offenders need for control.

### **Stress Management Scale:**

According to Dr. Hans Selye, an authority on stress, stress may be considered as the “nonspecific response of the body to any demand made upon it.” Stress not only affects your body, but your emotions, mind and spirit (Litvak, 1979). Everyone must deal with stress, anxiety and frustration.

High rates of domestic violence have been shown to occur among people experiencing stressful life events and chronic stress (Frye & Karney, 2006). Other research suggests that the frequency and perceived impact of stress contributes to domestic violence (Cano & Vivian, 2001; Langar, Lawrence & Bary, 2008). Flynn and Graham (2010) found that *both domestic violence perpetrators and their victims perceive stress as an explanation for why domestic or intimate partner violence occurs*. Individuals that do not possess effective stress management skills are at increased risk to a variety of health and adjustment problems, including violence (Umberson, Williams & Anderson, 2002) and substance (alcohol and other drugs) abuse (Cooper, Russell, Skinner, Frone & Mudar, 1992).

The Stress Management Scale includes items that encompass stressful events, positive coping skills and stress handling strategies. Consequently, the Stress Management Scale assesses both stressful events and positive coping skills which when combined results in a Stress Management Scale score.

### **DVI Pre-Post**

The DVI Pre-Post consists of 147 true-false and multiple choice items, written at a low 6<sup>th</sup> grade reading level. Administration time is 25 to 30 minutes. All DVI Pre-Post tests are computer-scored using a diskette or flash drive on the internet (Davignon 2004; Lindeman, 2009). The same test is administered twice. The DVI Pre-Post is administered before (pretest) and then again after treatment (posttest). Upon posttest, the DVI Pre-Post software automatically compares pretest and posttest results and prints a Comparison Report.

There are many self-report questionnaires or tests that assess violence (Tolman & Bennett, 1990), but few incorporate additional scales to assess co-existing or contributing problems. The DVI Pre-Post is rather unique in this respect.

In addition to evaluating domestic violence perpetrators' violence (or lethality) proneness per se, the DVI Pre-Post screens additional or auxiliary factors like offender truthfulness, substance (alcohol and other drugs) abuse, control issues and stress management abilities prior to (pretest) and after (posttest) treatment. These auxiliary factors or criminogenic needs are incorporated in the DVI Pre-Post as scales (measures).

When assessing treatment outcome, it is important to remember that treatment outcome is influenced by the treatment provided as well as client-related factors like attitude, motivation, client perceptions, compliance, goals, etc. (Broome, Flynn, Knight & Simpson, 2007).

DVI Pre-Post multi-scale configuration, scoring and risk classification procedures resemble Minnesota Multiphasic Personality Inventory (MMPI) methodology. The MMPI is the most widely used psychological test in the United States and possibly the world. Scale item answers are scored and totaled, relevant court and treatment history is included and truth-correction procedures are applied. DVI Pre-Post truth-correction methodology is similar to the MMPI's L, F and K scale adjustments. Raw scores reflect what the client wants you to know, whereas truth-corrected scores reveal what the client is trying to hide. Truth-corrected scores are more accurate than raw scores (Davignon, 2004).

### **The Present Study**

The present study involved 2,792 domestic violence perpetrators that were administered the DVI Pre-Post. Of these, 262 domestic violence offenders were administered the DVI Pre-Post twice. At pretest (treatment program intake), risk classification enabled staff to match problem severity with treatment intensity. Problem severity and treatment intensity matching enhances treatment effectiveness (Bach & McCracken, 2000; Bonta and Andrews, 2007). In the present study, DVI Pre-Post scales identified problems that were incorporated in the client's treatment plan. Slade (2002) noted that problems/disorders not included in treatment plans will likely not be treated.

The time interval between DVI Pre-Post test administrations varied in the present study. The mean interval between intake (pretest) and treatment completion (posttest) was 166 days or approximately 5.5 months. The median number of days elapsed between pretest and posttest was 171 days. The mode was 147 days. The interval ranged from 20 days to 471 days elapsing between intake and treatment completion. These treatment duration figures are based upon the 262 clients that completed both the DVI Pre-Post pretest and posttest.

The present study also investigated the reliability, validity and accuracy of the Domestic Violence Inventory Pre-Post or DVI Pre-Post in the larger sample (2,792) of domestic violence perpetrators. The DVI Pre-Post was administered as part of standard intake procedure in domestic violence treatment programs from January 2009 through May 2011. Participating agencies are representative of US-wide counseling and treatment programs, courts, probation and corrections departments, corrections department referrals and clinics both referring and treating domestic violence perpetrators.

Participants ranged in age from 18 to 73 years, with an average age of 33.6 years. Of the 2,792 participants, 2,343 (83.9%) were male and 449 (16.1%) were female. Ethnic composition was: Caucasian (69.9%; African American (11.5%); Hispanic (7.0%); Asian (0.8%); Native

American (3.8%) and other (7.0%). Education levels of participants were as follows: Less than a high school education (24.9%), GED or High School graduate (49.7%), Some college (18.7%), College graduate (5.6%), and Graduate school (1.1%). Marital status classification of participants consisted of: single (50.6%); married (30.4%); separated or divorced (18.4%) and widowed (0.6%).

## Results

To facilitate clarifying the relationship between offenders, their court records and their DVI Pre-Post scale scores, Pearson  $r$  correlation coefficients were calculated. Pretest scale scores were correlated with offender court-related history information. The resultant Pearson's  $r$  correlation coefficients are as follows: the *age at first conviction* correlated  $r = -.23$  with the Violence Scale and  $r = -.15$  with the Drugs Scale. *Total number of arrests* attained a correlation of  $r = .36$  with the Violence Scale,  $r = .26$  with the Alcohol Scale and  $r = .20$  with the Drugs Scale. *Number of domestic violence arrests* attained a correlation of  $r = .40$  with the Violence Scale and  $r = .15$  with the Alcohol Scale. *Number of assault arrests* attained a correlation of  $r = .23$  with the Violence Scale. *Number of alcohol-related arrests* attained a correlation of  $r = .40$  with the Alcohol Scale. The Drugs Scale and the *number of drug-related arrests* correlated at  $r = .31$ . All correlations were significant at  $p < .001$ . Ferguson (2009) recommends the following strength of association guidelines for interpreting Pearson's  $r$  correlations: practically significant effect: .20 to .49; moderate effect: .50 to .79; strong effect .80+. As Ferguson (2009) also noted, accepting any effect size as noteworthy without the use of magnitude guidelines "renders their usefulness as moot."

Correlations between DVI Pre-Post scale scores and court history establish that both pieces of information are functional in determining offender risk level. The inverse relationships between *age of first conviction* and the Violence Scale ( $r = .23$ ) as well as the *age at first conviction* and the Drugs Scale ( $r = -.15$ ) align with concepts established in the criminology literature – individuals that begin offending at a younger age are at greater risk of continuing to offend in the future (Ge, Donnellan & Wenk, 2001). A younger age at first conviction is associated with more severe Violence Scale and Drugs Scale scores. Violence proneness and drug involvement have been discussed as criminogenic needs that are associated with criminal behavior. With regard to the other court history items in this analysis, positive associations were found with DVI Pre-Post scale scores, demonstrating that as arrest frequencies increase, related DVI Pre-Post scale scores concurrently increase. For example, the *number of domestic violence arrests* and the number of *assault arrests* attained robust positive correlations with the Violence Scale.

### Gender Differences

Hines & Douglas (2010) note that there is much controversy regarding male perpetrator and female perpetrator similarities and differences. Other researchers (e.g., Simmons, Lehman, & Cobb, 2007) emphasize that domestic violence tests should be standardized on both sexes.

$T$ -test analyses were performed to examine possible scoring differences between male and female offenders' DVI Pre-Post scale scores. Cohen's  $d$  was calculated to determine effect size of the differences between male and female mean scores. A statistically significant  $t$ -value indicates that the differences in means did not occur by chance. The Cohen's  $d$  value was then calculated using means and standard deviations from  $t$ -test results. Effect size is calculated to

assess the magnitude of differences and is independent of sample size, unlike tests of significance (Becker, 2000). This means that a significant *t*-value will not always have a notable effect size (*d*).

Of the 2,792 domestic violence offenders represented in this research, 2,343 were male and 449 were female. Gender differences for male and female DVI Pre-Post respondents' gender differences are presented in Table 1. In Table 1, an asterisk represents significant effect and “†” stands for a Cohen’s *d* “noteworthy” effect.

Significant male–female differences were demonstrated on all DVI Pre-Post scales, except one. The Truthfulness Scale did not significantly differentiate between male and female domestic violence offenders. The Truthfulness Scale *t*-value and *d*-value were not significant. Cohen’s *d* effect size measure was negligible when applied to Truthfulness Scale gender differences. These findings show that male and female offenders’ Truthfulness Scale scores were essentially the same. In marked contrast, males and females attained significantly different mean scores on all other DVI Pre-Post scales (Violence, Control, Alcohol, Drugs and Stress Management).

DVI Pre-Post Scales	Males		Females		<i>T</i> -Test <i>t</i> -value	Effect Size (Cohen’s <i>d</i> )
	M	SD	M	SD		
Violence	21.13	11.83	17.67	11.23	5.71*	0.30†
Control	7.37	6.38	6.84	6.48	2.63*	0.08
Alcohol	8.31	8.86	6.42	8.32	4.17*	0.22†
Drugs	6.97	7.18	5.94	7.45	2.78*	0.14
Stress Management	114.16	44.45	108.39	43.83	2.53*	0.13
Truthfulness <sup>a</sup>	8.34	5.94	7.86	8.18	1.48	0.06

<sup>a</sup>All *t*-test values, except for the Truthfulness Scale, are significant at  $p < .001$ . Overall sample size was 2,792, but due to incomplete and invalid tests the corrected sample size was 2,535.

As presented in Table 1, male domestic violence offenders attained significantly higher DVI Pre-Post scale scores than female offenders on the Violence, Control, Alcohol, Drugs and Stress Management scales. The Truthfulness Scale did not significantly differentiate between male and female offenders. Cohen’s *d* effect values for the Violence and Alcohol Scales are greater than .20, which means these results are noteworthy (Cohen, 1988). In summary, important gender-related distinctions exist and will continue to be studied in future research.

DVI Pre-Post answer sheets gather information on domestic violence offenders’ criminal history. In the present study, staff members were asked to verify offender-provided information. Table 2 presents *t*-test and Cohen’s *d* statistics comparing male and female domestic violence offenders’ criminal history. Cohen’s *d* effect sizes above 0.20 constitute a “noteworthy” effect. In Table 2 an asterisk represents significant effect and “†” denotes a Cohen’s *d* “noteworthy” effect.

Criminal History Items	Male Offenders		Female Offenders		T-test t-value	Effect Size (Cohen's <i>d</i> )
	Mean	SD	Mean	SD		
Age at first conviction	23.47	10.11	27.84	9.90	-2.34*	0.14
Total arrests	6.00	8.80	2.86	6.14	7.10*	0.41†
Domestic violence arrests	1.32	1.43	0.86	0.86	6.55*	0.39†
Assault arrests	0.64	2.78	0.25	0.60	2.87*	0.24†
Alcohol-related arrests	1.41	3.80	0.63	2.60	4.11*	0.31†
Drug-related arrests	0.66	2.14	0.17	0.67	4.82*	0.19

Asterisks (\*) represent significant t-test at the  $p < .001$  level. Cohen's (1988) strength of association (of value) was maintained, however descriptive terms describing each effect range were changed to read: below .20 "not significant," above .20 to .49 "noteworthy," above .50 to .79 "significant" and above .80 "very significant."

The number of domestic violence arrests, total number of arrests, number of assault arrests, and the number of alcohol-related arrests significantly differentiated between male and female domestic violence offenders. In contrast, males' and females' mean age at first conviction and the mean number of drug-related arrests were significantly different, but did not produce a "noteworthy" Cohen's *d* effect size.

### Correlations

Correlation analysis was applied to DVI Pre-Post pretest (1<sup>st</sup> test) and posttest (2<sup>nd</sup> test) results. Traditionally this would have been designated a test-retest reliability analysis.

There were 262 offenders that completed both the DVI Pre-Post pretest and posttest. This studies pretest–posttest interval was, on average, 166 days or approximately 5.5 months. Correlation analysis between pretest and posttest scale scores demonstrated impressive (practically to moderately strong significance) correlations over approximately a 5½ month test-retest period. These correlation coefficients are presented in Table 3.

Truthfulness	Alcohol	Control	Drugs	Violence	Stress Mgmt
.31*	.72*	.54*	.43*	.33*	.45*

Asterisks (\*) represent significant t-test at the  $p < .001$  level. Strength of association guidelines for interpreting Pearson's *r* coefficients: practically significant effect: .20 to .49; moderate effect: .50 to .79; and strong effect .80+. (Ferguson, 2009).

These correlations indicate that DVI Pre-Post scales effectively measure the same constructs at pretest and posttest. In this study, domestic violence offenders' posttest scores were lower than analogous pretest scores, showing positive change or improvement. Interestingly, offenders that attained higher scores at pretest tended to maintain their higher score ranking at posttest.

Since the DVI Pre-Post pretest scale scores are often reflected in a domestic violence offender's treatment plan, it is important that they are valid. In other words, do DVI Pre-Post scales measure what they are purported to measure? The standard Domestic Violence Inventory (DVI) is a widely-accepted domestic violence offender screening test that is extensively used in the United States. It has demonstrated impressive reliability, validity and accuracy. The DVI

and DVI Pre-Post have analogous or comparable scales. Consequently, a strong association or correlation between DVI and DVI Pre-Post scales would strongly support DVI Pre-Post concurrent validity. Attained DVI and DVI Pre-Post Pearson's *r* correlation coefficients are presented in Table 4.

Truthfulness	Alcohol	Control	Drugs	Violence	Stress Mgmt
.68*	.85*	.77*	.82*	.66*	.56*

Asterisks (\*) represent significant t-test at the  $p < .001$  level. Strength of association guidelines for interpreting Pearson's *r* coefficients: practically significant effect: .20 to .49; moderate effect: .50 to .79; and strong effect .80+. (Ferguson, 2009).

All DVI and DVI Pre-Post scale correlations are moderate to very strong. These impressive correlation coefficients support using the DVI Pre-Post pretest scales as baseline measures for inclusion in domestic violence offender treatment plans. It is reasonable to conclude DVI Pre-Post pretest scores as representative of offender risk.

In sum, impressive test-retest reliability was demonstrated with DVI Pre-Post pretest and posttest scale correlations. In addition, impressive criterion validity was demonstrated with DVI and DVI Pre-Post scale correlations. These results support DVI Pre-Post validity.

### Reliability

Cronbach's alpha reliability coefficients are widely-accepted measures of test reliability (Cortina, 1993). Cronbach's alpha reliability coefficients for the six DVI Pre-Post scales are presented in Table 5.

Scales	(2008, n=623)	(2009, n=597)	(2010, n=1,764)	(2011, n=2,792)
Truthfulness	.88	.89	.89	<b>.90</b>
Alcohol	.94	.95	.94	<b>.92</b>
Drugs	.92	.92	.92	<b>.89</b>
Control	.86	.88	.87	<b>.88</b>
Violence	.88	.90	.90	<b>.89</b>
Stress Management	.93	.93	.93	<b>.92</b>

Cronbach alpha's of .75 and higher are professionally recognized as reliable (Nunnally, 1978) and according to Roberts & Rock (2002), are appropriate for risk assessment instruments.

DVI Pre-Post scale reliability coefficients are consistently robust (at or above .86) over the four year period from 2008 through 2011. The professionally accepted reliability standard is .75. All DVI Pre-Post scales exceed this standard. The most recent reliability coefficients (2011, n=2,792) are most representative of the DVI Pre-Post. DVI Pre-Post reliability coefficients for the year 2011 are as follows: Truthfulness Scale (.90,  $p < .001$ ), Alcohol Scale (.92,  $p < .001$ ), Drugs Scale (.89,  $p < .001$ ), Control Scale (.88,  $p < .001$ ), Violence Scale (.89,  $p < .001$ ), and Stress Management Scale (.92,  $p < .001$ ). These results strongly support the internal consistency of DVI Pre-Post scales. The DVI Pre-Post is a reliable domestic violence offender assessment instrument or test.

## Validity

DVI Pre-Post research extends over two decades. Using several validation methods, validity studies have been conducted on thousands of domestic violence offenders. Early studies used criterion measures and the DVI Pre-Post scales were validated with other tests, e.g., the MMPI L, F and K scales, polygraph examinations, Taylor-Manifest Anxiety Scale, Treatment Intervention Inventory, Domestic Violence Inventory, SAQ-Adult Probation III, etc. Much of this research is summarized in the document “DVI Pre-Post: Inventory of Scientific Findings” (Davignon, 2004 and recently updated by Rahnema Khandaker, 2011).

Since the DVI Pre-Post was validated with other tests, the present validity analysis examines differences between First offenders (2,025, 74.8%) that reported no more than one domestic violence arrest, and Multiple offenders (684, 25.2%) that reported two or more domestic violence arrests. There were 83 offenders that had not reported arrest-related information. They were excluded from this analysis.

It was hypothesized that Multiple offenders would attain higher (more severe) DVI Pre-Post scale scores than First offenders. Pretest scale scores were examined in this analysis. T-test and Cohen’s *d* values are presented in Table 6. In Table 6, an asterisk represents significant effect and “†” denotes a Cohen’s *d* “noteworthy” effect.

DVI PRE-POST Scales	First offenders		Multiple offenders		T-test	Effect Size
	M	SD	M	SD	<i>t</i> -value	(Cohen’s <i>d</i> )
Violence	18.24	10.308	28.11	12.653	-20.39*	0.86†
Control	7.03	6.16	7.74	6.56	-2.55*	0.11
Alcohol	5.67	6.45	15.23	10.83	-27.47*	1.07†
Drugs	6.01	6.52	13.26	9.01	-16.90*	0.92†
Stress Coping	114.64	44.59	108.99	43.98	2.87*	0.12
Truthfulness <sup>a</sup>	8.26	6.00	7.81	5.34	1.75	0.07

All *t*-test values, except for the Truthfulness Scale and Drugs Scale, were significant at  $p < .001$ . <sup>a</sup>overall sample size was 2,792, but due to invalid test deletion the Truthfulness Scale corrected sample size was 2,535.

As shown in Table 6, with the exception of the Truthfulness Scale, Multiple offenders’ mean scale scores are significantly higher than First offenders’ average scores. The difference between First and Multiple offenders mean Truthfulness Scale scores did not have a significant size effect. The non-significant difference between First offender and Multiple offender Truthfulness Scale scores suggests that truthfulness (or denial and problem minimization) is similar for First and Multiple offenders. This finding will continue to be explored in future DVI Pre-Post research.

The Violence Scale t-test comparing First and Multiple offenders is highly significant ( $t = -20.39$ ). Similarly, the attained Cohen’s *d* value was substantial ( $d = 0.86$ ), which establishes the strength of this effect. The finding that the Violence Scale was so effective in discriminating between First and Multiple offenders attests to the effectiveness of the DVI Pre-Post Violence Scale in identifying violent proneness. In addition, the differences between First and Multiple offenders’ mean scores for the Alcohol Scale ( $t = -27.47$ ,  $d = 1.07$ ) and Drugs Scale ( $t = -16.90$ ,

$d=0.92$ ) were also large in magnitude. This research supports the view that DVI Pre-Post scales are co-determinants of domestic violence and substance-related problems.

### Accuracy

DVI Pre-Post scale accuracy can be approximated by determining how closely actual or attained scores come to predicted scale scores. DVI Pre-Post risk ranges are the same as those used in the Domestic Violence Inventory (DVI) and other tests used in DVI Pre-Post validation. These risk range classification categories are: low risk (zero to 39<sup>th</sup> percentile), medium risk (40 to 69<sup>th</sup> percentile), problem risk (70 to 89<sup>th</sup> percentile) and severe problem (90 to 100<sup>th</sup> percentile). In other words, with a large sample of domestic violence offenders tested with the DVI Pre-Post, it is predicted that 39 percent will score in the low risk range, 30 percent will score in the medium risk range, 20 percent will score in the problem range and 11 percent will score in the severe problem range.

This classification system has proven to be fair and accurate. The problem threshold is the 70<sup>th</sup> percentile and higher, whereas the severe problem threshold is the 90<sup>th</sup> percentile and higher. Table 7 shows how attained or actual scale scores compare to predicted scale scores.

Scale	Low ( <b>39.0%</b> )	Medium ( <b>30.0%</b> )	Problem ( <b>20.0%</b> )	Severe Problem ( <b>11.0%</b> )
Truthfulness	39.3 <b>0.3</b>	30.0 <b>0.0</b>	19.4 <b>0.6</b>	11.3 <b>0.3</b>
Alcohol	38.7 <b>0.3</b>	31.3 <b>1.3</b>	20.0 <b>0.0</b>	10.0 <b>1.0</b>
Control	42.7 <b>3.7</b>	28.6 <b>1.4</b>	19.4 <b>0.6</b>	9.3 <b>1.7</b>
Drugs	37.2 <b>1.8</b>	30.8 <b>0.8</b>	20.7 <b>0.7</b>	11.3 <b>0.3</b>
Violence	37.3 <b>1.7</b>	30.0 <b>0.0</b>	20.7 <b>0.7</b>	12.0 <b>1.0</b>
Stress Coping	39.3 <b>0.3</b>	30.0 <b>0.0</b>	20.0 <b>0.0</b>	10.7 <b>0.7</b>

The Truthfulness Scale correction applies to all scales represented in this Table. Tests with missing information and invalid tests (N=257) were deleted.

To review Risk Range Classification (Table 7) or DVI Pre-Post scale accuracy, let us begin in the upper left corner with the term Scale, which is above the six DVI Pre-Post scales. Starting with the Control Scale and moving to the right, the next column is labeled *Low* for low risk scale classification. The bold (39.0%) in parentheses represents the percentage of clients predicted to score in the low risk range. Then going down three rows to the Control Scale, the 42.7 represents the percentage of offenders that scored in the low risk range. To the right of 42.7 is a bold 3.7, which represents the difference between predicted and actual attained scale scores. The predicted percentile is 39.0%, whereas the attained percentage was 42.7. This means the attained or actual percentage is 3.7 percent higher than predicted. As you continue moving to the right a similar procedure is applied to the Medium risk range (1.4% difference), to the Problem risk range (0.6 % difference), and Severe problem risk range (1.7% difference). This is accurate assessment. Out of 24 possible (6X4) comparisons, the largest predicted – attained difference is 3.7 percent.

As shown in Table 7, all attained risk range scale percentages were within 3.7 percentage points of that scales predicted risk range percentage. These results support the accuracy of the DVI Pre-Post.

### **Summary**

The present study introduced the DVI Pre-Post and investigated its statistical properties. Gender differences in attained scores and court history were explored. Participants included 2,792 domestic violence perpetrators; 2,343 were male and 449 were female. All DVI Pre-Post scale scores differentiated between male and female offenders, with the exception of the Truthfulness Scale. Mean Truthfulness Scale scores of male and female offenders were comparable. Criminal history was also reviewed in terms of gender differences. The differences between male and female offenders' age at 1<sup>st</sup> arrest; total number of arrests; domestic violence arrests; number of assault arrests; total number of arrests; number of alcohol-related arrests and number of drug-related arrests were all statistically significant. Male domestic violence offenders consistently attained higher scores than female offenders.

The test-retest (pretest-posttest) interval was reviewed for each DVI Pre-Post scale. All DVI Pre-Post scales demonstrated robust test-retest or pretest-posttest interval correlation coefficients.

Comparison of First and Multiple offenders' mean scale scores resulted in a highly significant Violence Scale difference. Multiple offenders' mean Violence Scale scores were significantly higher (more severe) than the mean scores of First offenders. Other DVI Pre-Post scales, with the exception of the Truthfulness Scale, also demonstrated significant differences in the mean score differences between First and Multiple offenders.

Accuracy analyses of Pretest percentile scores established that DVI Pre-Post risk ranges effectively classify offender risk. Out of 24 possible comparisons, the largest difference between predicted and attained percentile score classifications (low, medium, problem, severe) was 3.7 points.

Though methods for identifying domestic violence risk have become more effective over the last several decades, the area of domestic violence treatment outcome (or effectiveness) is a grayer one. The DVI Pre-Post fuses domestic violence risk identification with treatment outcome measurement. DVI Pre-Post configuration aligns with the widely-accepted baseline methodology that is often utilized in studies of change. Pretest results serve a dual purpose. First, they establish domestic violence offender problem severity at intake. Problem severity can then be matched to treatment program intensity. Information provided in the Pretest report can be integrated into the offender's treatment program, thereby increasing the likelihood of positive change. Matching offender risk level to treatment intensity is well-established as a best practice for increasing the odds of rehabilitation. The second function of the Pretest is that it serves as the baseline for after-treatment outcome comparison. Comparison of Pretest and Posttest scores establish whether change has occurred. Examining the strength and direction of change helps in understanding treatment effects. Posttest results also represent post-treatment problem change. Then, as warranted, posttest results can demonstrate the need for additional treatment or alternative treatment. These results can also help answer the questions: "Was treatment effective?" And, "Did the domestic violence offender positively change?"

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