

DRI-II Short Form: Study of Reliability and Validity

Donald D. Davignon, Ph.D.

10-11-02

Abstract

The reliability and validity of the Driver Risk Inventory-II Short Form (DRI-II Short Form) was studied in a sample of 8,145 DUI/DWI offenders. The DRI-II Short Form is a short version of the DRI-II. It has four scales for measuring DUI/DWI offender risk of aggressive driving and substance (alcohol and drugs) abuse. Reliability analyses showed that all DRI-II Short Form scales had reliability alpha coefficients between .85 and .91. DRI-II Short Form scales successfully discriminated between two offender groups. Offenders with 2 or more DUI/DWI arrests scored significantly higher than offenders who had 1 or no such arrests. The Driver Risk Scale identified 100% of the offenders who admitted being aggressive drivers. The Alcohol and Drugs scales identified offenders who had been treated for alcohol and drug problems, 99% and 100%, respectively. DRI-II Short Form classification of offender risk was shown to be within 2.7% of predicted risk range percentile scores for all DRI-II Short Form scales. DRI-II Short Form scale scores were significantly correlated with DRI-II scale scores. The results of this study support the reliability and validity of the DRI-II Short Form.

DRI-II Short Form: Study of Reliability and Validity

Introduction

In many DUI/DWI offender assessment settings, because of their heavy workload, practitioners want reliable, valid and accurate tests that can be completed in as little time as possible. The DRI-II Short Form was designed for this purpose. It is a shortened version of the Driver Risk Inventory-II. It was designed to be much shorter, yet retain very high statistical reliability, validity and accuracy. The Driver Risk Inventory-II (DRI-II) is a DUI/DWI offender risk and needs test that has been shown to be reliable, valid and accurate. The DRI-II and DRI-II Short Form evaluate aggressive and problem prone drivers and substance (alcohol and other drugs) abusers while concurrently classifying offenders as substance abusers or substance

dependent in accordance with DSM-IV criteria. The tests can be used to measure the severity of DUI/DWI offender problems in judicial, correctional and community service provider programs.

The DRI-II Short Form is a multidimensional test that was developed to meet the needs of DUI/DWI offender screening and assessment. DRI-II Short Form scales measure alcohol and drug abuse severity (Alcohol & Drugs Scales) and aggressive driver problems (Driver Risk Scale). The Substance Abuse/Dependency Classification Scale is comprised of reformatted DSM-IV criteria for classifying offenders as substance dependent or substance abuser. In addition, the Truthfulness Scale measures offender truthfulness while completing the test. Offenders who deny or minimize their problems are detected with the Truthfulness Scale. Truthfulness Scale scores are used to truth-correct other measurement scales scores. The present study investigated the reliability, validity and accuracy of the DRI-II Short Form. The correlation between DRI-II Short Form scale scores and DRI-II scale scores also was studied.

Test validity is commonly measured by administering a second criterion test that purports to measure the same thing. This was done in the DRI-II normative standardization study, which is reported in the document DRI-II: An Inventory of Scientific Findings. However, it is not practical to administer criterion tests during ongoing operations because it is too time consuming. That is why unique database validity measures are utilized in this study. DRI-II and DRI-II Short Form validity has been studied in the past using criterion measures that are summarized in the DRI-II Scientific Findings document.

This study validates the DRI-II Short Form in a sample of DUI/DWI offenders who were processed as part of offender assessment procedures in court service programs by court referral officers. Two methods for validating the DRI-II Short Form were used in this study. The first method (discriminant validity) compared first and multiple offenders' scale scores. Multiple offenders were offenders with two or more DUI/DWI arrests and first offenders had one or no arrest. It was hypothesized that statistically significant differences between multiple and first offenders would exist and DRI-II Short Form scales would differentiate between first and multiple offenders. Multiple offenders would be expected to score higher on DRI-II Short Form scales because having a second arrest is indicative of serious problems.

The second validation method (predictive validity) examined the accuracy at which the DRI-II Short Form identified aggressive drivers, problem drinkers and problem drug abusers. In the DRI-II Short Form, alcohol, drug and aggressive driver problem information is obtained from the offenders' responses to test items. Offenders who admit problems would be expected to score in the corresponding scale's problem range. For problem information the following test items were used, "I have been treated (counseling, outpatient or inpatient) for an alcohol problem." "I have attended Narcotics Anonymous (NA) or Cocaine Anonymous (CA) for help with my drug problem." "Two or more of the following are true, careless or reckless driver, drive fast or take some chances, arguments or quick temper, three or more moving violations (tickets) in the last five years, two or more at-fault accidents in the last five years."

For the predictive validity analyses offenders were separated into two groups, those who admitted problems and those who did not admit to problems. Then, offender scores on the relevant DRI-II Short Form scales were compared. It was predicted that offenders who admit drinking problems would score in the problem risk range (70th percentile and above) on the Alcohol Scale. Similarly, offenders who admit drug and aggressive driver problems were predicted to score in the problem range on the Drugs and Driver Risk Scales. Non-problem is

defined in terms of low risk scores (39th percentile and below). The percentage of offenders who admit problems and also score in the 70th percentile range and above is a measure of how accurate DRI-II Short Form scales are. High percentages of offenders who admit problems and have problem risk scores indicate the scales are accurate.

For ease in interpreting offender risk, the DRI-II Short Form scoring methodology classifies offender scale scores into one of four risk ranges: low risk (zero to 39th percentile), medium risk (40 to 69th percentile), problem risk (70 to 89th percentile), and severe problem risk (90 to 100th percentile). By definition the expected percentages of offenders scoring in each risk range (for each scale) is: low risk (39%), medium risk (30%), problem risk (20%), and severe problem risk (11%). Offenders who score at or above the 70th percentile are identified as having problems. Offenders scale scores at or above the 90th percentile identify severe problems. The accuracy of the DRI-II Short Form in terms of risk range percentages was examined in this study.

Method

Subjects

There were 8,145 DUI/DWI offenders tested with the DRI-II Short Form. There were 6,788 males (83.3%) and 1,357 females (16.7%). The ages of the participants ranged from 20 through 50 as follows: 20 & Under (11.4%); 21-30 (28.9%); 31-40 (29.4%); 41-50 (20.3%); 51-60 (7.5%) and 61 & Over (2.4%). Demographic composition of the participants was as follows. Race/Ethnicity: Caucasian (74.9%); Black (21.0%), Hispanic (3.6%) and Other (0.5%). Education: Eleventh grade or less (35.4%); High school graduate/GED (41.4%); Some college (17.2%) and College graduate (5.9%). Marital Status: Single (44.3%); Married (28.8%); Divorced (16.6%); Separated (7.8%) and Widowed (2.5%).

Nearly two-thirds (62%) of the participants had one or no DUI/DWI arrest. Nearly one-fourth (21.7%) of the offenders had two DUI/DWI arrests and over 16 percent had three or more DUI/DWI arrests. That is, over one-third (38%) of the participants were multiple offenders (had two or more DUI/DWI arrests). The average BAC level at the time of arrest for the 5,124 offenders who provided their BAC was 0.138. The average BAC for males and females was identical at 0.138. The average BAC of multiple offenders was 0.152. Twenty percent of the participants had one or more alcohol arrest that was not for DUI/DWI and 11.4 percent had one or more non-DUI/DWI drug arrest.

Procedure

Participants completed the DRI-II Short Form as part of their court-referred screening and assessment. The DRI-II Short Form contains four measures or scales. These scales are briefly described as follows. The Truthfulness Scale measures the truthfulness of the respondent while taking the DRI-II Short Form. The Alcohol Scale measures severity of alcohol use or abuse. The Drugs Scale measures severity of drug use or abuse. The Driver Risk Scale measures risk of problem prone and aggressive driving. The Substance Abuse/Dependency Classification Scale contains reformatted DSM-IV criteria for classifying offenders as substance abuser or substance dependent.

Results and Discussion

The inter-item reliability coefficient alphas for the four DRI-II Short Form scales are presented in Table 1. All scales were highly reliable. Reliability coefficient alphas for all DRI-II Short Form scales were at or above 0.85. These results demonstrate that the DRI-II Short Form is a very reliable adult DUI/DWI offender assessment test.

Table 1. DRI-II Short Form Reliability Coefficient Alphas

DRI-II Short Form Scale	Coefficient Alpha	Significance Level
Truthfulness Scale	.85	p<.001
Alcohol Scale	.91	p<.001
Driver Risk Scale	.85	p<.001
Drugs Scale	.86	p<.001
<hr/>		
Substance Abuse/ Dependency Scale*	.85	p<.001

*The Substance Abuse/Dependency Classification Scale is a classification as opposed to a measurement scale derived from DSM-IV criteria. Dependency and abuse items do not measure the extent to which predicted criteria are met. However, the Substance Abuse/Dependency Scale's coefficient alpha is included here because it demonstrates that DSM-IV dependency and abuse items as incorporated in the DRI-II Short Form are also reliable.

Discriminant validity results are presented in Table 2. The results presented in Table 2 show that mean (average) scale scores of first offenders were significantly lower than scores for multiple offenders on all DRI-II Short Form scales with the exception of the Truthfulness Scale. With regards to the Truthfulness Scale, first offenders scored statistically higher than did multiple offenders. This result means that first offenders tried to minimize their problems more than did multiple offenders who may be more sensitized to the availability of their court records. Either multiple offenders were more candid about their DUI histories or first offenders were more naïve and attempted to minimize their DUI histories. The Truthfulness Scale was demonstrated to be reliable as shown above.

As expected, multiple offenders scored significantly higher on the Alcohol, Driver Risk and Drugs Scales than did first offenders. Higher scores for multiple offenders means they have higher risk or that their problems are more severe than first offenders. This analysis shows that the Alcohol, Driver Risk and Drugs Scales results support the discriminant validity of the DRI-II Short Form. The offenders who were thought to have more severe problems (multiple offenders) scored significantly higher on these scales than the first-time offenders. These results strongly support the discriminant validity of the Alcohol, Driver Risk and Drugs Scales.

Table 2. DRI-II Short Form Scale Score Comparisons between First Offenders (one or no DUI/DWI arrest) and Multiple Offenders (two or more DUI/DWI arrests)

DRI-II Short Form Scale	First Offenders Mean (N=5,084)	Multiple Offenders Mean (3,061)	T-value	Level of Significance
Truthfulness Scale	9.05	8.39	t = 6.74	p<.001
Alcohol Scale	4.50	10.20	t = 31.52	p<.001
Driver Risk Scale	3.83	4.09	t = 3.19	p<.001
Drugs Scale	4.21	5.19	t = 8.73	p<.001

Predictive validity results for the correct identification of problem behavior (aggressive driving tendencies, drinking and drug abuse problems) are presented in Table 3. Table 3 shows the percentages of offenders who had or admitted to having problems and who scored in the problem risk range. For the Alcohol and Drugs Scales criteria, problem behavior meant the offenders had treatment and admitted alcohol and drug problems. For the Driver Risk Scale criterion the offenders admitted having characteristics representative of aggressive driver problems. In these analyses scale scores in the Low risk range (zero to 39th percentile) represent “no problem,” whereas, scores in the Problem and Severe Problem risk ranges (70th percentile and higher) represent alcohol, drugs or aggressive driver problems.

The Alcohol Scale correctly identified 99 percent of the DUI/DWI offenders who had been treated for alcohol problems one or more times. There were 1,688 offenders who reported having been in alcohol treatment. These offenders are classified as problem drinkers. Of these 1,688 offenders, 1,671 individuals (99%) had Alcohol Scale scores at or above the 70th percentile. The Alcohol Scale correctly identified 99 percent of the offenders categorized as problem drinkers. This high rate of correct identification represents accurate assessment of offenders who have had alcohol treatment. This result supports the validity of the DRI-II Short Form Alcohol Scale.

The DRI-II Short Form Drugs Scale is also very accurate in identifying offenders who have drug problems. There were 569 offenders who reported having attended NA or CA for drug problems. All 569 offenders, or 100 percent, had Drugs Scale scores at or above the 70th percentile. This result supports the validity of the DRI-II Short Form Drugs Scale.

Table 3. DRI-II Short Form Predictive Validity

DRI-II Short Form Scale	Correct Identification of Problem Behavior
Alcohol Scale	99%
Drugs Scale	100%
Driver Risk Scale	100%

The Driver Risk Scale accurately identified offenders who admitted having aggressive driving problems. All (100%) of the 1,222 offenders who admitted aggressive driver problems scored in the problem risk range. The DRI-II Short Form Driver Risk Scale identified all offenders who have aggressive driver problems. This result validates the Driver Risk Scale.

Risk range percentile scores are derived from scoring equations based on offenders' pattern of responding to scale items and criminal history, when applicable. These results are presented in Table 4. There are four risk range categories: Low Risk (zero to 39th percentile), Medium Risk (40 to 69th percentile), Problem Risk (70 to 89th percentile) and Severe Problem or Maximum Risk (90 to 100th percentile). Risk range percentile scores represent degree of severity. The higher the percentile score is the higher the severity of the offender's problems.

Analysis of the accuracy of DRI-II Short Form risk range percentile scores involved comparing the offender's obtained risk range percentile scores to predicted risk range percentages as defined above. The percentages of offenders expected to fall into each risk range are: Low Risk (**39%**), Medium Risk (**30%**), Problem Risk (**20%**) and Severe Problem or Maximum Risk (**11%**). These percentages are shown in parentheses in the top row of Table 4. The actual percentage of offenders falling in each of the four risk ranges, based on their risk range percentile scores, was compared to these predicted percentages. The differences between predicted and obtained are shown in parentheses.

As shown in Table 4, DRI-II Short Form scale scores are very accurate. The objectively obtained percentages of participants falling in each risk range are very close to the expected percentages for each risk category. All of the obtained risk range percentages were within 2.7 percentage points of the expected percentages. There were 14 of 16 comparisons between obtained and predicted percentages that were within two percentage points. These results demonstrate that the DRI-II Short Form is accurate for 98 percent of the offenders assessed. These results demonstrate that the DRI-II Short Form scale scores accurately identify offender risk.

Table 4. Accuracy of DRI-II Short Form Risk Range Percentile Scores

Scale	Low Risk (39%)	Medium Risk (30%)	Problem Risk (20%)	Severe Problem (11%)
Truthfulness	39.6 (0.6)	31.3 (1.3)	17.3 (2.7)	11.8 (0.8)
Alcohol	37.2 (1.8)	30.7 (0.7)	21.7 (1.7)	10.4 (0.4)
Driver Risk	38.6 (0.4)	29.0 (1.0)	20.1 (0.1)	12.3 (1.3)
Drugs	40.2 (1.2)	30.4 (0.4)	17.8 (2.2)	11.6 (0.6)

Note: The Substance Abuse/Dependency Scale is a classification, not a measurement scale and is not included in this analysis. The differences between obtained percentages and predicted percentages are given in parentheses.

The correlation coefficients between DRI-II Short Form scale scores and Driver Risk Inventory-II scale scores are presented in Table 5. As shown in Table 5, DRI-II Short Form scale scores were highly correlated with DRI-II scores. A high correlation coefficient between the short form and the standard form means that there is a high degree of relationship between the two forms. Correlation coefficients between DRI-II Short Form and DRI-II were very close to perfect correlation. In terms of risk range percentile scores, offender risk measured with the DRI-II Short Form is as accurate as risk measured with the Driver Risk Inventory-II.

Table 5. Pearson Product-Moment Correlation Coefficients between

DRI-II Short Form Scale Scores and Driver Risk Inventory-II Scale Scores
All coefficients are significant at the p<.001 level.

	Truthfulness	Alcohol	Drugs	Driver Risk
Correlation Coefficient	.96	.98	.97	.93

Conclusions

This study demonstrated that accurate DUI/DWI offender assessment is achieved with the DRI-II Short Form. Results corroborate and support the DRI-II Short Form as an accurate assessment or screening test for DUI/DWI offenders. The DRI-II Short Form accurately measures offender risk of aggressive driver problems and substance (alcohol and drugs) abuse. In short, the DRI-II Short Form provides useful information concerning offenders' adjustment and problems that contributes to understanding the DUI/DWI offenders.

Reliability analyses demonstrated that all four DRI-II Short Form scales are highly reliable. All coefficient alphas are at or above 0.85. Reliability is necessary in DUI/DWI offender assessment or screening tests for accurate measurement of offender risk. Tests cannot be valid or accurate without being reliable.

Validity analyses confirm that the DRI-II Short Form measures what it purports to measure, that is, DUI/DWI offender risk. Results demonstrate that repeat offenders exhibit more problem-prone behavior than first offenders. Multiple offenders (having 2 or more DUI/DWI arrests) scored significantly higher than first offenders (discriminant validity). Moreover, the Driver Risk Scale identified 100% of the offenders who admitted having aggressive driver problems. The Alcohol and Drugs Scales correctly identified offenders who have alcohol or drugs problems (predictive validity). And, obtained risk range percentages on all DRI-II Short Form scales very closely approximated predicted percentages. These results strongly support the validity of the DRI-II Short Form.

Problem-prone drivers exhibit many characteristics that are identified with the DRI-II Short Form. Identification of these problems and prompt intervention can reduce a DUI/DWI offender's risk of future arrests or recidivism. The DRI-II Short Form facilitates understanding of DUI/DWI offender aggressive driver tendencies and substance abuse problems. DRI-II Short Form results also provide an empirical basis for recommending appropriate supervision level, intervention and treatment programs.