

# Predicting Future Reconviction in Offenders With Intellectual Disabilities: The Predictive Efficacy of VRAG, PCL–SV, and the HCR–20

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Accurate predictions of future reconviction, including those for violent crimes, have been shown to be greatly aided by the use of formal risk assessment instruments. However, it is unclear as to whether these instruments would also be predictive in a sample of offenders with intellectual disabilities. In this study, the authors have shown that the Violence Risk Appraisal Guide (V. L. Quinsey, G. T. Harris, M. E. Rice, & C. Cormier, 1998); the Psychopathy Checklist—Screening Version (S. D. Hart, D. N. Cox, & R. D. Hare, 1995); and the History, Clinical, Risk Management—20 (C. D. Webster, K. S. Douglas, D. Eaves, & S. D. Hart, 1997) were all significant predictors of violent and general reconviction in this sample, and in many cases, their efficacy was greater than in a control sample of mentally disordered offenders without an intellectual disability.

*Keywords:* risk assessment, violence, recidivism, intellectual disability

Offenders with an intellectual disability (ID)<sup>1</sup> represent a subgroup of mentally disordered offenders that have been largely ignored in the literature on formal methods of risk assessment of future dangerousness (Barron, Hassiotis, & Banes, 2004; Johnston, 2002). This is a serious omission as offenders with ID appear to represent a sizable minority of the offender population (Holland, Clare, & Mukhopadhyay, 2002; McBrien, 2003) and may offend at a greater rate. Hodgins (1992) found that men and women with ID were 4–5 times more likely to commit a violent offense. However, Lindsay, Taylor, and Sturmey (2004) have cautioned that strong evidence to support this notion is lacking.

It is now well established that unaided clinical judgment is poor at predicting future dangerousness in mentally disordered offenders (e.g., Fuller & Cowan, 1999; Monahan, 1981; Quinsey, Harris, Rice, & Cormier, 1998, 2006). Hence, a range of instruments based on personality traits (e.g., Psychopathy Checklist—Revised

[PCL–R; Hare, 1991] and Psychopathy Checklist—Screening Version [PCL–SV; Hart, Cox, & Hare, 1995]), actuarial models (e.g., Violence Risk Appraisal Guide [VRAG]; Quinsey et al., 1998, 2006), and structured clinical judgment (e.g., History, Clinical, Risk Management—20 [HCR–20]; Webster, Douglas, Eaves, & Hart, 1997) has been developed. There is now a lot of evidence for the efficacy of these tools for predicting violence in mentally disordered offenders (e.g., Douglas, Ogloff, Nicholls, & Grant, 1999; Gray et al., 2003, 2004; Hare, Clarke, Grann, & Thornton, 2000; Harris, Rice, & Camilleri, 2004; Snowden, Gray, Taylor, & MacCulloch, 2007). However, Lindsay, Elliott, and Anstell (2004) have stated that compared with the field of mainstream criminality, the literature on how to predict future offenses for those with ID is less clear (see also Johnston, 2002; Quinsey, Book, & Skilling, 2004).

Few studies have directly addressed the question of whether established risk assessment instruments are effective in an ID population. Morrissey et al. (2005) investigated the ability of a

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<sup>1</sup> Diagnostic classification systems, such as the International Classification of Diseases—10 (World Health Organization, 1992) and the *Diagnostic and Statistical Manual of Mental Disorders* (text rev.; DSM–IV–TR; American Psychiatric Association, 2000), outline the criteria required for a diagnosis of mental retardation to be as follows: significantly subaverage intellectual functioning with an IQ of less than 70 (confidence interval = 65–70), a concurrent deficit of adaptive functioning, and age of onset before 18 years. Various terms are used throughout the research literature to describe these criteria, such as mental retardation, learning disabilities, developmental disabilities, and intellectual disabilities (Holland et al., 2002). These terms all refer to the same cluster of criteria required to satisfy a diagnosis of mental retardation (Holland et al., 2002). In the present article, we decided to use the term *intellectual disabilities* (IDs) as it is the most widely used term in the research literature.

modified PCL-R to predict institutional violence and found only a weak relationship between PCL-R score and inpatient violence. Lindsay et al. (2007) also have shown that both the VRAG and the HCR-20 were able to predict institutional violence. Unfortunately, neither study contained data from non-ID controls for comparison.

Quinsey et al. (2004) found that the VRAG was predictive of violent and sexual incidents in an ID-offender group and that the level of prediction was similar to the construction sample of mainly non-ID offenders (Quinsey et al., 1998). For the ID group, Quinsey et al. (2004) replaced the PCL-R score item of the VRAG with the Childhood and Adolescent Taxon (Harris, Rice, & Quinsey, 1994; Quinsey et al., 1998), as it was felt that this was easier to score for offenders with ID. Consequently the VRAG total score may be different to that completed for the general offender population. This is particularly important as the PCL-R score attracts the highest weighting of all the variables in the VRAG and therefore can have a large impact on total score. We therefore examined the abilities of these (unmodified) instruments to predict future convictions (including both general and violent reconviction) in a group of mentally disordered offenders with ID in comparison to those without a diagnosis of ID.

## Method

### Design

The study was a pseudoprospective case-note analysis of patients discharged from four independent sector medium secure facilities in the United Kingdom (the scoring of risk assessments was completed at the point of discharge and was blind to outcome). The data pertain to patients who were discharged between 1990 and 2001 (see below), allowing each patient a minimum of 2 years for reconviction postdischarge. The predictor variables were the risk assessment instrument scores, and the outcome measures were future criminal convictions (general offending and violent offending).

### Participants

A total of 1,312 patients were discharged from four independent sector hospitals in the United Kingdom. Patients were excluded if any of the following applied: they resided in the hospital for less than 7 days ( $n = 8$ ), they died during their stay at the hospital ( $n = 11$ ), their files were incomplete or missing ( $n = 11$ ), their records of conviction from the United Kingdom Home Office were missing ( $n = 100$ ), or if the patient's responsible medical officer did not specify a psychiatric diagnosis in his or her case notes ( $n = 41$ ). The final sample consisted of 1,141 patients. Patients were admitted to the hospital on the basis of (a) having a serious mental illness, ID, or personality disorder; (b) having been convicted of a criminal offense ( $n = 881$ ); or (c) having exhibited behavior that might have led to a conviction in different circumstances ( $n = 260$ ).

The patients in the sample were discharged from the hospital between 1990 and 2001. All patients had a minimum of 2 years follow-up to ensure adequate time for reconviction. Not all risk instruments could be completed on all participants because of a lack of relevant file information, leading to different numbers for the instruments and their subscales.

### Diagnoses

A consultant psychiatrist made the diagnoses on admission using the International Classification of Diseases—10 (World Health Organization, 1992). The specific frequency and percentage of patients with different diagnoses are outlined in Table 1. The ID group ( $n = 145$ ) all had a diagnosis of mental retardation (MR; Codes F70–F79). These diagnoses are synonymous with that of MR as defined by the *Diagnostic and Statistical Manual of Mental Disorders* (text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000). This ID group consisted of 121 patients with mild MR, 18 with moderate MR, 5 with severe MR, and 1 with unspecified MR. In the ID group, 49 patients had a diagnosis of ID alone, and 96 patients had a comorbid diagnosis of another mental disorder (either mental illness or personality disorder). The non-ID group ( $n = 996$ ) consisted of all the other participants, all of whom had some form of psychiatric diagnosis but without ID.

### Demographics

In the ID group there were 118 (81.4%) men and 27 (18.6%) women, with a mean age at the time of discharge of 31.54 years ( $SD = 8.94$ , range = 18.84–65.78). In the non-ID group, there were 843 (85.6%) men and 153 (15.4%) women, with a mean age at the time of discharge of 31.95 years ( $SD = 9.28$ , range = 16.90–71.25). The two groups did not significantly differ on gender or age at discharge. The ID group had a lower number of previous convictions ( $M = 8.30$ ,  $SD = 13.05$ ) than the non-ID group ( $M = 11.80$ ,  $SD = 16.35$ ),  $t(1139) = -2.47$ ,  $p < .05$ .

All risk assessments were completed via case review notes as they were at the time of discharge. All raters were trained on the instruments by Nicola S. Gray, who is an approved trainer for the PCL-R course and who runs training courses on both the HCR-20 and VRAG. Reliability of the VRAG scores was high, with a VRAG total score intraclass correlation (ICC) of .95, which is in line with the reliability reported by the authors of the VRAG ( $r = .96$ ; Harris et al., 2003). The reliability of the PCL-SV ratings for the current study was uniformly high (PCL-SV total: ICCs be-

Table 1  
*Frequency of Diagnoses Across the Sample*

Diagnosis	<i>n</i> (%)
Organic, including symptomatic, mental disorders	28 (1.9)
Mental and behavioral disorders due to psychoactive substance use	142 (9.6)
Schizophrenia, schizotypal, and delusional disorders	708 (47.7)
Affective disorders	149 (10.0)
Neurotic, stress-related, and somatoform disorders	22 (1.5)
Behavioral syndromes associated with physiological disturbances and physical factors	2 (0.1)
Disorders of adult personality and behavior	274 (18.5)
Mental impairment	145 (9.8)
Disorders of psychological development	6 (0.4)
Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	8 (0.5)
Sexual and identity disorders	1 (0.1)

*Note.* Total number of diagnoses is greater than total number of patients because of comorbidity. Percentages are expressed relative to the total number of diagnoses.

tween .89 and .95), which is in line with previous studies (Douglas et al., 1999). The interrater reliability for the HCR-20 was also high (HCR-20 total: ICCs between .80 and .88) and was consistent with previous research (Douglas et al., 1999). The ratings were made in a set order of PCL-SV, HCR-20, and then VRAG. The PCL-SV was rated first, as it is a component of both the HCR-20 and the VRAG. The HCR-20 was rated before the VRAG so as to minimize the influence of the more objective VRAG on the more subjective HCR-20, though we note that as the instruments were all rated by the same rater, there may be some contamination of one assessment with that of another. However, in clinical practice this is also likely to be the case.

The outcome measure was recidivism, with postdischarge offenses being collated from the Home Office Offenders Index (2000). Violent offenses included all offenses classified as violence against the person by the Home Office, as well as kidnap, criminal damage endangering life, robbery, rape, and indecent assault.

### Procedure

Ethical committee approval was obtained from the Ethical Committee of the School of Psychology, Cardiff University.

## Results

### Comparison of Risk Assessment Scores

The descriptive statistics for offenders with ID (the ID group) and offenders without ID (the non-ID group) on the VRAG, PCL-SV, and HCR-20 are outlined in Table 2.

The ID group had higher VRAG total scores,  $t(533) = 3.25, p < .01$ . The ID group also had significantly greater PCL-SV total scores,  $t(905) = 4.50, p < .001$ ; Part 1 scores,  $t(786) = 4.07, p < .001$ ; and Part 2 scores,  $t(885) = 2.84, p < .01$ .

The ID group had higher HCR-20 total scores,  $t(1035) = 7.66, p < .001$ ; History subscale scores,  $t(1022) = 3.40, p < .01$ ; and Clinical subscale scores,  $t(1025) = 12.99, p < .001$ . However, the ID group did not differ significantly on the Risk Management subscale score,  $t(1025) = 1.39, p > .05$ .

### Base Rates of Offending Across the Diagnostic Groups

The ID group was reconvicted at a slower rate (approximately one half) than the rate of the non-ID group for both violent

offenses (e.g., after 2 years, 4.8% for the ID group and 11.2% for the non-ID group) and general offenses (e.g., after 2 years, 9.7% for the ID group and 18.7% for the non-ID group). Survival analysis showed these differences to be significant (violence: Log Rank [1] = 7.11,  $p < .01$ ; general Log Rank [1] = 8.19,  $p < .01$ ).

### Predictive Abilities of the VRAG, the PCL-SV, and the HCR-20 Across Diagnostic Groups

Our initial analysis has shown that the ID group offended at a slower rate than the non-ID group and thus had a different base rate for reconviction. Hence, to compare the efficacy of the instruments across the groups, we needed a statistical technique that was immune to changes in the base rate. The use of signal detection theory (D. M. Green & Swets, 1966) has been championed as a succinct and accurate way of expressing the performance of risk assessment instruments and is immune to base rates, thus allowing comparisons of efficacy across groups or contexts with different base rates (Mossman, 1994; Swets, 1988). The efficacy of the instrument can be given by the area under the curve (AUC) of the receiver operating characteristic. Using standard conventions, we considered AUCs  $> .56$  as small effects, AUCs  $> .64$  as medium effects, and AUCs  $> .71$  as large effects (Rice & Harris, 2005). AUCs derived from the same population were compared by the methods described by Hanley and McNeil (1992).

**VRAG.** The AUCs for the VRAG scores are displayed in Table 3. The AUC for predicting violent reconviction after a 5-year follow-up period in the ID group was .74 ( $SE = .09$ ), which was significantly above chance levels ( $p < .001$ ) and which constituted a large effect size (Rice & Harris, 2005). This AUC was nearly identical to that of the non-ID group, and this suggests that the VRAG was as good at predicting violent reconviction in the ID group as it was in the non-ID group.

Before this conclusion is accepted, we would like to note a limitation to this result. Because violent reconvictions are relatively rare, this necessarily means that the number of people actually receiving a violent reconviction in the ID group is quite small. Thus, the AUC of .74 for the ID group is based on only 11 individuals who received such a conviction (and of course the many others that did not receive a conviction). To support our conclusion of comparative efficacy, we therefore also examined the data for general reconviction. Snowden et al. (2007) have reported that risk assessment instruments designed to predict gen-

Table 2  
Descriptive Statistics of the VRAG, PCL-SV, and HCR-20 Scores for the ID and Non-ID Groups

Risk assessment instrument	ID group				Non-ID group			
	<i>n</i>	<i>M</i>	<i>SD</i>	Range	<i>n</i>	<i>M</i>	<i>SD</i>	Range
VRAG	115	6.95	8.60	-14, 29	420	3.00	10.45	-24, 36
PCL-SV total	132	8.96	4.79	0, 20	775	6.88	4.94	0, 22
PCL-SV Part 1	124	4.40	3.06	0, 11	667	3.22	2.97	0, 12
PCL-SV Part 2	129	4.59	2.56	0, 11	762	3.81	2.81	0, 12
HCR-20 total	139	22.32	5.98	10, 37	898	17.92	6.34	0, 36
History	139	12.43	3.17	6, 19	889	11.24	3.75	0, 20
Clinical	139	5.86	2.08	2, 10	893	2.96	2.35	0, 10
Risk Management	138	4.09	2.45	0, 10	894	3.71	2.58	0, 10

Note. VRAG = Violence Risk Appraisal Guide; PCL-SV = Psychopathy Checklist—Screening Version; HCR-20 = History, Clinical, Risk Management—20; ID = intellectual disability.

Table 3  
*The Area Under the Curve (AUC), Standard Error (SE), and Number (n) for the Risk Prediction Instruments for Violent Reconstructions After 5 Years (Upper Section) and for General Recidivism After 5 Years (Lower Section)*

Scale and offense	ID group			Non-ID group		
	AUC	SE	n	AUC	SE	n
Violence at 5-year follow-up						
VRAG	.73*	.09	84	.74*	.03	320
PCL–SV	.73*	.10	100	.69*	.03	566
PCL–SV Part 1	.66	.10	93	.62*	.03	488
PCL–SV Part 2	.63	.10	97	.71*	.03	554
HCR–20	.79*	.08	107	.68*	.03	671
HCR–20 History	.81*	.07	106	.69*	.03	667
HCR–20 Clinical	.71*	.08	106	.55	.03	666
HCR–20 Risk Management	.64	.10	106	.63*	.03	668
General at 5-year follow-up						
VRAG	.74*	.07	84	.73*	.03	320
PCL–SV	.76*	.07	100	.70*	.02	566
PCL–SV Part 1	.68*	.08	93	.61*	.03	488
PCL–SV Part 2	.68*	.07	97	.74*	.02	554
HCR–20 <sup>a</sup>	.81*	.05	107	.68*	.02	671
HCR–20 History	.80*	.06	106	.71*	.02	667
HCR–20 Clinical <sup>a</sup>	.69*	.07	106	.51	.02	666
HCR–20 Risk Management	.73*	.07	106	.63*	.02	668

Note. ID = intellectual disability; VRAG = Violence Risk Appraisal Guide; PCL–SV = Psychopathy Checklist—Screening Version; HCR–20 = History, Clinical, Risk Management—20.

<sup>a</sup> AUCs differ between ID and non-ID groups (Hanley & McNeil, 1992) at  $p < .01$ .

\*  $p < .05$  (which indicates that a value differs from chance [0.50]).

eral offending are also good at predicting violent offending (and vice versa), and they have argued that these instruments can be used somewhat interchangeably. It is methodologically easier to study general offending, as such events are more common (enabling greater statistical power), and therefore it is beneficial to be able to use general offending as a proxy for violent offending when testing the efficacy of risk assessment instruments. Of course, the ability to predict general offending may also be of interest in itself (Gendreau, Little, & Goggin, 1996). Table 3 also provides the AUCs for predicting general offending. We found that the VRAG was indeed an excellent predictor of general offending in the ID group, and its efficacy did not differ statistically from its ability to predict general offending in the non-ID group. Hence, all the evidence points to the ability of the VRAG to predict both general and violent reconviction in those with ID at a similar level of efficacy as in those without ID.

*PCL–SV.* The AUCs for all of the PCL–SV scores are displayed in Table 3. The PCL–SV was a good predictor of both violent and general reconstructions in the ID group, yielding large effect sizes. These AUCs for the ID group did not differ significantly from those in the non-ID group.

*HCR–20.* The AUCs for all of the HCR–20 scores are displayed in Table 3. The HCR–20 was a very good predictor of violent reconviction in the ID group, achieving an AUC of .79, which is a very large effect size. Indeed, it is notable that this figure is larger than the AUC for the non-ID group, though this difference did not reach statistical significance. As mentioned above, this difference may not have achieved significance because of the low base rate of violent offending. For general offending, the HCR–20 was again a greater predictor of convictions for the ID group than the non-ID group, and this difference was statistically significant ( $p < .05$ ).

The strong performance of the HCR–20 total score was also reflected in the History subscale for the ID group but somewhat less so for the Clinical subscale. The Risk Management subscale did not achieve statistical significance. However, it should be noted that this was due to a loss of statistical power, as the AUC for the Risk Management subscale was actually slightly greater than for the non-ID group (in which there were far greater numbers).

Thus, the HCR–20 appeared to be a very good predictor of future violent and general offending in the ID group and may have even had more efficacy in this group than in the non-ID group. The Clinical subscale of the HCR–20, however, showed disappointing results for the ID and non-ID groups.

*Which risk assessment instrument?* A secondary analysis was completed to ascertain whether any one of the risk assessment instruments was significantly better than the others at predicting violent and/or general reconstructions within the ID group. The aim of this analysis was to inform whether any of the risk assessment instruments could be best recommended for use with offenders with ID. However, a series of paired  $z$ -score comparisons revealed no significant differences in the predictive accuracy of the VRAG, PCL–SV, or HCR–20 within the ID group. For the sake of completeness, the same comparisons were completed for the non-ID group, and again no significant differences were found between the predictive accuracies of the risk assessment instruments in the non-ID group.

## Discussion

In our study, we aimed to test the efficacy of three risk assessment instruments (VRAG, PCL–SV, and HCR–20) to predict violent and general recidivism in mentally disordered offenders

with a diagnosis of ID. We found that all three of the instruments were able to predict violent recidivism over a 5-year period with large effect sizes. A similar pattern of results was also found for general offending. The efficacy of all the instruments was at least as good in the ID population as it was in a control sample of mentally disordered offenders without a diagnosis of ID (in which the efficacy of these instruments is well established).

Our results appear in broad agreement with the small number of studies that have examined risk prediction instruments in those with ID. Quinsey et al. (2004) found that the VRAG had an AUC of .69 for predicting violent incidents while in community housing. Morrissey et al. (2005) found a weak relationship (equivalent to an AUC of .60) between violence and a modified PCL-R score for predicting in-patient violence in a group of mentally disordered offenders with ID. This figure appears a little lower than the AUC we found (.73) for the PCL-SV. Finally, Lindsay et al. (2007) used both the VRAG and the HCR-20 in a sample of ID offenders. They found that both instruments had predictive validity (AUC = .71 and .72, respectively), with efficacy that again is in broad agreement with what we found in our study. Thus, despite differences in follow-up period, level of security for the patients, and outcome, these formal risk assessment instruments are effective predictors of violent behavior in those patients with a diagnosis of ID.

### Base Rate of Violence

A survival analysis revealed that the ID group had a different base rate of offending compared with the non-ID group. We also note that the average number of previous convictions (prior to the follow-up period) was less in the ID group. Despite being convicted at a lower rate before the time of our assessment, we found that the ID group had significantly higher scores on all our risk assessment instruments. How can this be explained?

The outcome measure we used was that of reconviction for a violent offense. Clearly, reconviction for a violent offense is not the same as whether the person has committed such a violent offense. To be convicted, the violent offender must be detected, prosecuted, and convicted by a jury. It seems very likely that a diagnosis of ID (or indeed behaviors consistent with this) may prompt differential treatment from professionals and nonprofessionals alike. Offenders with ID may commit just as many illegal acts but may not be treated in the same way, with more offenders with ID being diverted away from the criminal justice system. Turner (2000) has commented that offending behavior among people with ID is labeled as challenging behavior and does not involve the full legal process, which makes it very difficult to adequately compare groups in terms of the frequency of offending behavior. Johnston (2002) has noted that there is an underestimation of risk because of fitness to plead legislation, and G. Green, Gray, and Wilner (2002) have discussed how offenders with ID are most often diverted from the criminal justice system to mental health services or probation to avoid conviction and custody. The result of differential treatment is that ID offenders are less likely to get a reconviction for a given act compared with other mentally disordered offenders, and this may explain why the base rate for violent (and nonviolent) convictions was different across these groups in the present study. Further studies either looking at

rearrests or closely monitoring the behavior of these discharges would be most valuable.

### Conclusions

We found that the PCL-SV, VRAG, and HCR-20 were all significant predictors of future violence for those with a diagnosis of ID and that they could do this with similar accuracy (or in some cases even better accuracy) for a mentally disordered control population without a diagnosis of ID. We conclude that these instruments can be used in offenders with ID without the need for any modification of the items or scoring procedures to accommodate the diagnostic features of ID.

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