HM Prison &
Probation Service

The development of a screen to identify individuals who may need support with their learning

Helen C Wakeling

The identification of individuals serving prison and community sentences who may have a mild learning disability (LD) or may find learning and day to day activities challenging, and therefore require particular help and support in their everyday living, is critical to ensure they are able to get the most out of their sentence. Her Majesty's Prison and Probation Service (HMPPS) are committed to supporting people with challenges to learning as much as for those without. On a population level, identifying the number of people in prison and serving community sentences who may struggle and need support would be helpful to improve the targeting of resources and to ensure the commissioning of appropriate services. On an individual level, referring those who may be more likely to have learning disabilities and difficulties coping with prison life for further assessment of their difficulties, or flagging them for additional support, has the potential to be helpful to those individuals and to the staff responsible for their care. This study reports on the development of a screen using the Offender Assessment System (OASys; Home Office, 2006).

For the purpose of this research, we are aiming to identify individuals who may struggle with prison or community sentences because of learning disabilities or learning challenges, and thus may need additional support. Some of these will likely have a mild LD (as defined by the World Health Organisation) with an intelligence quotient (IQ) of less than 70, whereas others will have an IQ of between 70 and 80, and therefore would not meet the diagnostic criteria for a mild LD, but who nonetheless may still have challenges with learning and managing day to day.

Key findings

- A sample of 2,232 adult males who had been convicted of a sexual offence and who were serving a custodial sentence was used. All had IQ information available using the Wechsler Adult Intelligence Scale (WAIS IV). In the present study we suggest that WAIS IQ data can be used as a marker for the identification of those who may require support with learning and everyday living while serving their sentence.

- Twenty-nine OASys items, which were found to be associated with IQ, were entered into a logistic regression with IQ (higher >=80 / lower <=79) as the outcome variable. Eight variables significantly predicted lower IQ (<= 79): no fixed abode, (lack of) work skills, problems with reading, writing and numeracy, reading problems, numeracy problems, learning difficulties, (no) qualifications, and easily influenced.

- A stepwise logistic regression was performed entering in these 8 variables. The final model contained 7 of the 8 variables (easily influenced did not add to the model): (no) qualifications, learning difficulties, problems with reading, writing and numeracy, reading problems, numeracy problems, no fixed abode, and (lack of) work skills.

- A seven-item tool was developed, which had good predictive validity.

- Possible uses of the tool are discussed. These include using the tool as a means of approximating the proportion of those in our care who may require support with learning and everyday living while serving their sentences. The tool could also be used as a way of helping to refer individuals for further assessment of their needs.

The views expressed in this Analytical Summary are those of the author, not necessarily those of the Ministry of Justice (nor do they reflect government policy).

Preventing victims by changing lives

Context

The World Health Organisation (WHO, 1992) defines an intellectual or learning disability (LD) as a significant reduced ability to understand new or complex information and to learn and apply new skills, which results in a reduced ability to cope independently (impaired social functioning), and begins before adulthood. IQ levels are used as a guide and the range of 50-69 is usually indicative of mild learning disability (although IQ levels alone are not sufficient to diagnose LD). The DSM-V (American Psychiatric Association, 2013) definition of 'Intellectual Disability' refers to limited functioning in 3 areas: social skills (e.g. communicating with others), conceptual skills (e.g. reading and writing ability) and practical ability (e.g. clothing/bathing one's self). LD is distinct to 'specific learning disabilities' or 'learning difficulties' which refer to a variety of disorders that affect the acquisition, retention, understanding, organisation or use of verbal and/or non-verbal information, such as dyslexia and dyscalculia (Davey, 2008). Although there is discrepancy on the prevalence of individuals with LD within the Criminal Justice System (CJS) due to the lack of established tools, it is estimated that between 20% and 30% of the prison population have some form of LD or difficulties that interfere with their ability to cope with the CJS (Loucks, 2007). It is estimated that around 7% of prisoners have an IQ of less than 70, whereas a further 25% have an IQ of between 70 and 79 (Mottram, 2007). It is also estimated that individuals with LD are overrepresented in the CJS (e.g. Holland, 2004), which includes both those in prison and on probation.

However, estimations of the extent of the problem are difficult without established and validated means of measurement. The HM Inspectorate of Prisons highlighted the failure within the CJS to identify individuals with LD (HMIP, 2015). Without a means of identifying individuals it is likely that an individual with LD or difficulties coping with the CJS will not be identified and, in turn, that their support needs will not be met (Talbot, 2009). This may cause problems for the individual and for the staff who work with them, who are not able to appropriately identify the individuals who need further support. If not identified and supported in their specific needs, people may experience difficulty in a prison context. Prisoners with LD have, for example, been found to be more likely than other prisoners to have broken a prison rule, been subject to control and restraint procedures, and to have spent time in segregation (Talbot, 2008). If people with LD and people with milder difficulties that interfere with their ability to cope are better identified and understood, these individuals may have a better chance of rehabilitative success.

The aim of the current research was to develop a screening tool to: 1) help identify the approximate extent of individuals with an IQ of less than 80, including those who may have an LD, who may struggle to cope in the prison population; and 2) facilitate the identification of individuals within prison or serving community sentences, who require further assessment of their difficulties, as well as further support.

Method

Sample

A sample of 2,232 adult males who had been convicted of a sexual offence and who were serving a custodial sentence was used. All had taken part in a cognitive behavioural treatment programme, collectively known as the Sex Offender Treatment Programmes (SOTPs; Mann & Fernandez, 2006) targeted at individuals who had committed a sexual crime between 2006 and 2011. This sample was used as all had IQ information available from the Wechsler Adult Intelligence Scale (WAIS IV; Lichtenberger & Kaufman, 2009). At the time, WAIS IV was routinely used on all individuals participating in these programmes. The average age of the sample was 38.8 and their average IQ was 94.2. Four hundred and fifty-two individuals (20%) had an IQ score of 79 or less, and 1,780 (80%) had an IQ score of 80 or more. One hundred and fifty-nine individuals had an IQ score of 69 or less (7.2%) and 2,218 had an IQ score of 70 or more (92.8%).

Measures

WAIS IV

The WAIS IV (Lichtenberger & Kaufman, 2009) was completed on all individuals prior to their participation in an SOTP. Assessments were conducted at the establishment at which the individuals started a programme.

IQ classification is primarily used by health professionals to assess the presence of LD and/or difficulties coping. However, the use of IQ as a marker of difficulties is not without its issues; impairments of social functioning and communication skills should be present in addition to a low IQ for a diagnosis of a LD. The World Health Organisation diagnoses LD according to 3 elements: IQ, social functioning and age at onset before adulthood (WHO, 1992). It is therefore acknowledged that IQ is just one aspect of LD and difficulties coping. However, it was the best marker available on a large sample from which to test the validity of a screening tool.

The IQ cut-off selected for this research was below 80. Mild disability is often identified as being below 70.

However, it is acknowledged that individuals with an IQ of between 70 and 80 may indeed have difficulty with aspects of life in general (Vankatesen, 2017), and with prison life, that would benefit from support. In fact, it is widely recognised that individuals with IQs of 80 or below may experience problems if they encounter the CJS (Talbot, 2008). As such, we decided to proceed with development of a tool to identify individuals with an IQ of less than 80. The current research therefore aims to identify individuals who may struggle with prison or community sentences, and thus may need additional support. Some of these will likely have a mild LD (as defined by the World Health Organisation) with an IQ of less than 70, whereas others will have an IQ of between 70 and 80, and therefore would not meet the criteria for a mild LD, but who may still have difficulties requiring support.

The Offender Assessment System (OASys: Home Office, 2006)

OASys is a structured assessment of static and dynamic reoffending risk factors used to aid the management of individuals convicted of crime. OASys is used throughout HMPPS with individuals aged 18 and over, who are convicted and awaiting sentence, serving custodial sentences of at least 12 months or serving probation sentences involving supervision. The main part of the assessment is an examination of offending-related factors which includes 13 sections covering criminal history, analysis of (current) offences, assessment of 10 dynamic risk factors and suitability to undertake sentence-related activities (e.g. unpaid work, offending behaviour programmes). Each of the dynamic risk factors is assessed using between 4 and 10 questions. Questions are scored as 0/1 (no problem/problem), 0/2 (no problems/problems), or 0/1/2 (no problem/some problem/significant problems). These factors assist the assessor in developing and reviewing an individual's sentence plan, which sets targets relevant to reducing risk of reoffending. Data from completed assessments are copied to a central research and statistics office, where data completeness and integrity checks are conducted.

Procedure

OASys items were first scrutinised, and those that theoretically might be expected to relate or indirectly relate to LD (including links to social functioning) or difficulties that may interfere with an ability to cope with the CJS were selected. Initial exploration of these items involved conducting a logistic regression to examine which factors could predict membership to higher or lower IQ groups. An Area under the Curve statistic (AUC) was then calculated to determine the predictive validity of the tool. Sensitivity and specificity of the final tool were also examined.

Results

Initial Exploration of OASys Items

OASys items were scrutinised and 29 items were selected as being potentially relevant. Table 1 lists these items, as well as the results of a logistic regression analysis. The sample was divided into two according to IQ: a higher IQ group (IQ >= 80) and a lower IQ group (IQ <=79) (see Method section for reasoning behind the IQ 80 split). All 29 factors were predictor variables, and IQ level was the outcome variable (lower or higher as defined previously). There were 8 significant variables in the model, as shown below.

Table 1: OASys items and Logistic Regression Output Predicting High/Low IQ

OASys Item	Scale format (3: 0 = no problems, 1 = some problems, 2 = significant problems)	Wald	Exp (B)
No fixed abode	0/2	4.20*	1.15
Unemployed	0/1/2	0.18	1.04
Employment History	0/1/2	0.01	0.99
Work skills	0/1/2	5.07*	1.31
Problems with reading, writing and numeracy	0/1/2	15.92***	1.74
Reading problems	0/1	4.08*	1.70
Writing problems	0/1	0.01	1.03
Numeracy problems	0/1	6.73**	1.67
Learning difficulties	0/1/2	29.21***	1.80
Qualifications	0/2	37.67***	1.54
Attitude to education	0/1/2	0.01	0.99
Financial management	0/1/2	1.75	0.85
Over reliance on friends	0/1/2	1.69	0.86
Budgeting impediment	0/1/2	1.09	1.14
Easily influenced	0/1/2	4.13*	1.24
Reckless behaviour	0/1/2	0.19	1.04
Difficulties coping	0/1/2	0.16	0.96
Psychological problems	0/1/2	2.24	0.83
Psychiatric problems	0/1/2	1.89	1.20
Childhood problems	0/1	0.02	0.98
Head injuries	0/1	0.04	0.95
Interpersonal skills	0/1/2	1.22	1.13
Impulsivity	0/1/2	0.42	0.94
Temper control	0/1/2	1.25	1.11
Problem solving skills	0/1/2	1.63	0.86
Consequences awareness	0/1/2	0.59	1.10
Understands others' views	0/1/2	0.31	1.07
Concrete thinking	0/1/2	0.09	0.97
General health	0/1	1.12	1.16

Note: * $p < .05$. ** $p < .01$. *** $p < .001$

For all of the significant results, the differences were in the expected direction, with those in the lower IQ group having a greater proportion of problems than the higher IQ group. The probability of belonging to the lower IQ group is increased by having no fixed abode, by having problems with work skills, by having problems with reading, writing and numeracy, by having specific reading problems, by having specific numeracy

problems, by having learning difficulties, by having problems with qualifications, and by being easily influenced. The odds of belonging to the lower IQ group was increased by 1.74 if an individual has problems with reading, writing and numeracy, by 1.80 if an individual has reported learning difficulties, and odds were increased by 1.52 if an individual lacks qualifications.

It should be noted that there are some items here that appear on the surface to duplicate each other; specifically problems with reading, writing and numeracy, and then problems with each of these 3 areas separately. These variables are 4 separate entries in OASys, in order to determine where the problems lie (i.e. in reading, writing or numeracy) and all 4 variables were therefore included separately.

A further logistic regression using a stepwise method was conducted entering in the 8 significant variables one by one (starting with the most predictive as defined from the previous analyses) until there was no longer a significant increase in the prediction of the binary IQ variable. Table 2 shows the results of the final model. The 'easily influenced' variable was excluded from the final model, as entering it in did not significantly increase the predictive power of the model, and it was not significantly predictive in the model. The final model therefore has 7 variables.

Table 2: Final Model of the Stepwise Logistic Regression

	B	SE	Wald	P	Exp (B)
Final Model					
Qualifications	.41	.07	37.10	.000	1.50
Learning difficulties	.61	.10	35.61	.000	1.84
Problems with reading, writing and numeracy	.53	.13	17.16	.000	1.69
Numeracy problems	.51	.19	7.23	.007	1.66
Work skills	.30	.09	11.47	.001	1.34
No fixed abode	.16	.06	6.13	.013	1.17
Reading problems	.56	.20	8.04	.005	1.75
Constant	-2.96	.13	520.20	.000	0.52

Exploring the Predictive Ability of Tool

A seven-item version of the tool was produced based on summing the raw scores of the 7 items in the final model produced from the logistic regression analyses presented above.[1] Scores could range from 0 to 11, with higher scores indicative of greater problems.

Figure 1: AUC Plot for seven-item LD Tool

An AUC of 0.83 was produced with the seven-item tool, which represented good predictive validity.[2] Figure 1 shows the AUC plot.

A confusion table, which outlines the sensitivity against the specificity of the tool by detailing the true positive (number of individuals correctly identified as having a low IQ), false positive (number of individuals with an IQ > 80 who are screened in), true negative (number of individuals correctly identified as not having a low IQ) and false negative (number of individuals with an IQ lower than 80 not screened in) rates for all possible scores of the tool, was produced to explore various cut-offs for the tool (see Table 3). A cut-off of 3 provided the best balance between false positives and true positives, and could therefore potentially be used as a cut-off score to indicate a low IQ. Sixty-five percent of the higher IQ group scored less than 3, and 85% of the lower IQ group scored 3 or more.

Table 3: Confusion Table showing sensitivity and specificity of the seven-item Tool

Score	Actual (according to IQ)	Predicted Lower IQ	Higher IQ	Total
>=1	IQ < 80	432 (96%)	16 (4%)	448
	IQ >= 80	1326 (75%)	444 (25%)	1770
>=2	IQ < 80	403 (90%)	45 (10%)	448
	IQ >= 80	901 (51%)	869 (49%)	1770
>=3	IQ < 80	383 (85%)	66 (15%)	448
	IQ >= 80	617 (35%)	1153 (65%)	1770
>=4	IQ < 80	333 (74%)	115 (26%)	448
	IQ >= 80	426 (24%)	1344 (76%)	1770
>=5	IQ < 80	283 (63%)	165 (37%)	448
	IQ >= 80	267 (15%)	1503 (85%)	1770

---

[1]   Because the no fixed abode item was the least predictive of the seven items, and had less (predictive power) than both numeracy and reading, which both score 0 and 1, if this item was present it was given a score of 1, rather than a score of 2 (which is the OASys raw score)
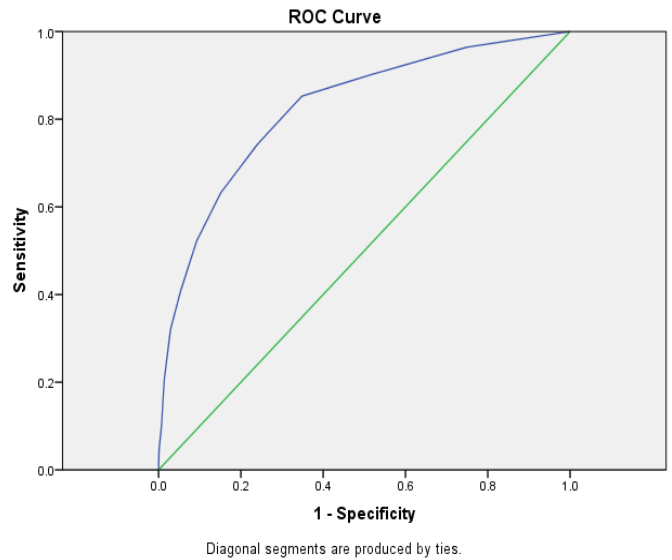
[2]   Predictive validity measures the extent to which results on a test is related to later performance or outcome that the test was designed to predict or should be able to predict.

Score	Actual (according to IQ)	Predicted Lower IQ	Higher IQ	Total
>=6	IQ < 80	234 (52%)	214 (48%)	448
	IQ >= 80	164 (9%)	1606 (91%)	1770
>=7	IQ < 80	183 (41%)	265 (59%)	448
	IQ >= 80	95 (5%)	1675 (95%)	1770
>=8	IQ < 80	143 (32%)	305 (68%)	448
	IQ >= 80	51 (3%)	1719 (97%)	1770
>=9	IQ < 80	91 (20%)	357 (80%)	448
	IQ >= 80	24 (1%)	1746 (99%)	1770
>=10	IQ < 80	46 (10%)	402 (90%)	448
	IQ >= 80	13 (1%)	1757 (99%)	1770
Score of 11	IQ < 80	21 (5%)	427 (95%)	448
	IQ >= 80	2 (0%)	1768 (100%)	1770

Exploring other potential cut-offs

As the criteria for mild learning disability is usually defined (along with other criteria as cited earlier) by an IQ of between 50 and 69, we further explored a potential cut-off of the tool for an IQ of below 70. An AUC of 0.85 was produced which represents good predictive validity. On examination of the sensitivity and specificity of the tool to predict membership to the below 70 IQ group or the 70 and above IQ group, a cut-off score of 5 was deemed most appropriate. A score of 5 on the tool, therefore, could potentially be used as a further cut-off score to indicate an IQ of lower than 70. At a cut-off score of 5, 79% of those who had an IQ of 70 or more would not be screened in, and 76% of those with an IQ of less than 70 would be screened in. This cut-off score needs further investigation with a bigger sample (of individuals with an IQ of lower than 70).

Conclusions

A seven-item tool was developed from OASys items, which had good predictive ability. The items were: learning difficulties, having no fixed abode, (lack of) work skills, (no) qualifications, problems with reading, writing and numeracy, specific problems with reading, and specific problems with numeracy. The tool was able to predict membership to a lower IQ group (<80), as measured by WAIS IV, with good accuracy. A cut-off score of 3 on the tool to identify whether individuals had a lower IQ score (<=79) or not produced the best balance between true positives and false positives. Further exploration found preliminary evidence that a cut-off score of 5 on the tool could identify whether individuals had an IQ of less than 70 (typically used as a proxy for mild learning disability).

It is proposed that this tool could usefully be implemented to identify people who need further support with accessing learning and engaging with their sentence, as they may experience difficulty coping within the CJS due to challenges with learning. Individuals who score 3 or more may require additional support. Those scoring 5 or more may be more likely to fall into a group who have a mild LD, and this cut-off could be used as a means of referring individuals on for further assessment of their difficulties, or formal assessment for a LD.

This tool could usefully be implemented at a population level to determine an *estimation* of the number of individuals who have an IQ of lower than 80 and potentially have difficulties that interfere with an ability to cope within the CJS. It would be useful, for example, for commissioners to understand the potential number of individuals who may face difficulty when serving their sentences, in order to ensure that the appropriate services are available. Equally, the tool could be implemented at an individual level to identify people who may need further support or access to additional services. The tool will be useful to prison staff (Governors, Senior Managers and Officers) to both target reasonable adjustments for individuals and ensure an accessible regime more generally. It should be noted that this has been designed as a *screening tool*, and not a comprehensive assessment. Using the cut-offs presented, there will be individuals who do not show symptoms of a lower IQ being screened in (false positives), and conversely individuals who do show symptoms of a lower IQ not being screened in (false negatives). As such, when using a screening tool like this at an individual level, it would be important to make further enquiries or assessments in order to make any final decisions regarding appropriate services or provision for that individual.

Limitations

Firstly, the study used a group of individuals who had committed sexual crime. Although there is no specific reason to suppose that the variables identified would not predict lower IQ in a wider sample, future research should attempt to validate the tool on a wider population, including those serving community sentences. The current research has also not validated the tool with females or specifically with individuals from ethnic minorities. These limitations should be addressed in future research. The tool should also be further validated against other available LD tools, such as those provided by Health and Social care and Education within prisons. Secondly, the present study used IQ as a marker for LD and difficulties with coping. As acknowledged earlier, IQ is just one aspect of assessing LD and difficulties with coping. Although this was the best available marker to use for the present study, this should be borne in mind when interpreting the findings and using the tool. The inter-rater reliability of OASys has also not been fully

established. Finally, it should be noted that further validation and cross-validation is required, which was not possible in the present study due to the relatively low numbers in the lower IQ group.

The present research attempted to explore cut-offs for the tool for predicting an IQ of lower than 80 and an IQ of lower than 70. We wanted to be able to identify individuals who might not meet the clinical diagnosis of a mild learning disability (IQ of between 70 and 79) as well as those who might (IQ of between 50 and 69). The reason for doing this is that there is a large number of individuals within the CJS who would fall within the group who have an IQ between 70 and 80, and we wanted a tool to identify and support these individuals, *in addition* to those who may be identified as possibly having an LD.

The screening tool uses OASys items to generate a score. As such, the use of the tool requires OASys data to have been gathered. Alternatives for individuals who do not have OASys data need to be explored. It is possible that the Basic Custody Screening Tool (BCST) could be used as an alternative, as it gathers information on 5 of the 7 items within the screening tool. Further research is required to examine this further.

References

American Psychiatric Association. (2013). Cautionary statement for forensic use of *DSM-5.* In *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC

Davey, G. (2008). Learning, Intellectual and Developmental Disabilities. In G. Davey (Ed.), *Psychopathology: Research, Assessment in Clinical Psychology* (570-714). Chichester: John Wiley and Sons

Criminal Justice Joint Inspection. (2015). A joint inspection of the treatment of offenders with learning disabilities within the CJS – phase two in custody and the community. London: HM Inspectorate of Prisons

Holland, A.J. (2004). Criminal behaviour and developmental disability: an epidemiological perspective. In W. L. Lindsay, J.L. Taylor and P. Sturmey (Eds.), *Offenders with developmental disabilities* (pp. 23-34). Chichester, UK: Wiley

Home Office (2006). *Offender Assessment System Manual version 2*. London: Home Office

Lichtenberger, E. O., and Kaufman, A. A. (2009). *Essentials of WAIS-IV Assessment.* New Jersey: John Wiley and Sons

Loucks, N. (2007). No One Knows: Offenders with Learning Difficulties and Learning Disabilities. Review of prevalence and associated needs. London: Prison Reform Trust

Mann, R. E., and Fernandez, Y. M. (2006). Sex offender programmes: Concept, theory and practice. In C.R. Hollin and E.J. Palmer (Eds.), *Offending behaviour programmes: Development, application, and controversies* (pp. 155-177). New York: Wiley

Mottram, P. G. (2007). *HMP Liverpool, Styal and Hindley Study Report.* Liverpool: University of Liverpool

Talbot, J. (2008). Prisoners' Voices: Experiences of the criminal justice system by prisoners with learning disabilities and difficulties. London: Prison Reform Trust

Talbot, J. (2009). No One Knows: Offenders with learning disabilities and learning difficulties. *International Journal of Offender Health, 5,* 141-152

Vankatesen, S. (2017). Demographic, Cognitive and Psycho-Social Profile of Adults with Borderline Intellectual Functioning. *Journal of Contemporary Psychological Research, 1,* 1-12

World Health Organization. (1992). *The ICD-10 Classification of Mental and Behavioural Disorders*. Geneva, Switzerland: World Health Organization