Cattell Horn Carroll Based Assessment of Intellectual Disability in Criminal Justice Settings

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Abstract

Proper diagnosis of intellectual disability (ID) in criminal justice systems is critical to the delivery of fair justice. However, traditional practices that rely on a single Full-Scale IQ (FSIQ) cutoff often lead to diagnostic discrepancies. This paper discusses how Cattell Horn Carroll theory of cognitive abilities is used as a multidimensional measure of the ID in justice-involved people. The issue is that the defendants may be under identified or misclassified when assessment procedures focus on global IQ scores without detailed examination and testing of broad cognitive domains and adaptive functioning. The sample of 214 defendants referred from four correctional facilities was used in a cross-sectional study that included a forensic psychological assessment. The participants were administered CHC-congruent cognitive tests of fluid reasoning (Gf), crystallized intelligence (Gc), working memory (Gwm), processing speed (Gs), and visual-spatial processing (Gv), in addition to the standardized adaptive behavior scales. The CHC model structure was supported by confirmatory factor analysis (CFI = 0.95; TLI = 0.93; RMSEA = 0.048). According to conventional FSIQ ≤ 70 criteria, 21.0% of study participants met diagnostic thresholds for ID. Nevertheless, the 29.4% rate of fulfilling comprehensive diagnostic criteria when CHC domain deficits and adaptive impairments were combined into a single domain showed an 8.4% increase in cases identified. The logistic regression analysis showed that using CHC broad ability indices increased classification accuracy from 78.6 to 88.9. Findings indicate that CHC-based assessment has greater diagnostic sensitivity and provides a more comprehensive cognitive picture, useful for forensic decision-making. The study concludes that multidimensional CHC-informed assessments are more precise, clinically and legally defensible, and that their inclusion in standard assessment programs should be promoted in criminal justice systems.

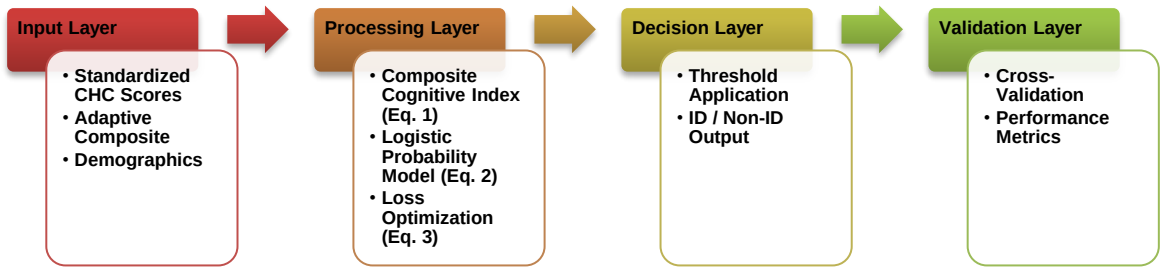
Keywords *Cattell–Horn–Carroll (CHC) Theory, Intellectual Disability Assessment, Criminal Justice Psychology, Forensic Psychological Evaluation, Cognitive Ability Profiling, Adaptive Functioning Measurement, Diagnostic Accuracy in Legal Contexts.*

Introduction

The Cattell-Horn-Carroll (CHC) theory is a hierarchical, empirically derived theory of cognitive abilities that combines intelligence (fluid intelligence, Gf) and crystallized intelligence (Gc) with a set of broad and narrow abilities into a three-stratum model. General intelligence (g) is found in Stratum III, whereas Stratum II comprises general domains, including Gf, Gc, visual-spatial processing (Gv), working memory (Gwm), and processing speed (Gs). Stratum I has more specific, task-characteristic cognitive abilities. Recent empirical studies have strengthened the structural consistency of CHC constructs, as examiners can no longer rely on a single global IQ score to interpret tests; instead, they can use domain-based analyses of cognitive functioning [2], [7]. As an instance, factor-analytic research of the executive functioning scale indicates significant correspondence to CHC general abilities, which justifies the applicability of this test in neuropsychological settings [6]. Simultaneously, methodological critiques warn of the possibility of unresolved tensions between the validity and reliability of intelligence tests when they are interpreted strictly, and the necessity of analyzing them in a multidimensional way, which is theoretically justified [5]. In the disability assessment, this framework provides a rational basis for analysing trends in cognitive strengths and weaknesses based on patterns rather than on aggregate scores alone [4].

In the criminal justice context, the effects of a wrong diagnosis of intellectual disability (ID) are devastating. Diagnostic determinations determine sentencing, eligibility for competency tests, and protection of legal norms. [3] indicate that the use of different manuals can lead to different diagnostic results, especially in complicated clinical presentations, like fetal alcohol spectrum disorder, and thus, the uncertainty of the strictly categorical method. On the same note, [8] point out that both intellectual and adaptive functioning deficits must be present in the same person to be diagnosed with ID, even though there have always been indicators of intellectual deficits. Behavioral and adaptive markers that should be formally evaluated in nursing and frontline documentation may not be considered, yet they often occur [1]. The rigid use of an IQ threshold that is not based on CHC-informed domain analysis and adaptive evidence can lead to both under identification and inappropriate exclusion. An organized CHC-based measure enables examiners to assess whether deficits are global or narrow by focusing on specific broad capacities, thereby enhancing interpretation accuracy.

Figure 1 System Architecture of the Proposed CHC-Based Forensic Assessment Model



The architecture diagram (Figure 1) shows the workflow of the proposed CHC-based evaluation system for recognizing intellectual disability in criminal justice environments. The model is arranged in four sequential layers namely the Input Layer that includes standardized CHC cognitive scores, adaptive functioning composites, and demographic variables; Processing Layer where the Composite Cognitive Index (Eq. 1), logistic probability model (Eq. 2), and loss optimization function (Eq. 3) are calculated; the Decision Layer, which uses threshold criteria to determine who is considered ID or Non-ID; and the Validation Layer, which is cross-validation and performance measures to determine which models have high reliability. Its layered structure emphasizes transparency, mathematical rigor, and reproducibility, and illustrates the mechanism by which theoretical constructs and statistical modeling should be united to support legally admissible diagnostic decisions.

This paper proposes that applying the CHC theoretical framework to forensic assessment

can enhance the reliability, construct validity, and legal defensibility of intellectual disability judgments in criminal justice cases by integrating multidimensional cognitive profiling with systematic analysis of adaptive functioning [12].

The precise diagnosis of intellectual disability among justice-involved groups is still not uniform, and the consequences of the issue are high for both defendants, courts, and mental health practitioners. The field needs assessment models that minimize diagnostic ambiguity, overcome opposing criticism, and are responsive to modern psychometric theory. This issue needs to be addressed to promote fair legal outcomes and protect the rights of vulnerable citizens.

The paper is a development of a theoretically-based model that operationalizes CHC constructs into forensic assessment procedures. It elucidates how the domain-level cognitive interpretation, in combination with adaptive functioning analysis, enhances diagnostic accuracy relative to the single-score method and provides structured recommendations to a judgment evaluator in a criminal justice setting.

The rest of this paper will be organized as follows: Section II will present a comprehensive background on intellectual disability and its prevalence in criminal justice populations, along with a discussion of the CHC theoretical framework and previous assessment research. The methodological design, the suggested mathematical model, the algorithmic implementation, and the characteristics of the participants are presented in Section III. Section IV presents empirical, performance, comparative, and ablation results. In section V, there are interpretive strengths, practical limitations, and systemic implications. Last but not least, Section VI summarizes the study's main contributions and offers recommendations for future research and policy formulation in forensic psychological assessment.

Background

Intellectual developmental disorder (also known as intellectual disability (ID)) is a severe impairment in intellectual functioning and adaptive behavior, with onset during the developmental period. The current psychiatric and interdisciplinary literature underscores that diagnosing should include the absence of conceptual, social, and practical adaptive skills, accompanied by measurable cognitive impairment [9]. The focus on adaptive functioning is imperative because intellectual performance cannot provide sufficient coverage of everyday proficiency or susceptibility. The population prevalence of ID in the general community is usually in the low single digits, but it is much higher in correctional populations. This inequality has been caused by education disadvantage, low access to early diagnostic services and social-environmental risk factors that are disproportionately high in persons with cognitive limitations. Assessment and eligibility framework emphasize the need to have elaborate evaluation processes that combine standardized cognitive assessments and structured adaptive behavior assessment [16]. In justice situations, however, the conditions under assessment are usually time-based and adversarial, which elevates the chances of incomplete or procedurally inconsistent assessments.

The Cattell Horn Carroll (CHC) model offers psychometrically supported hierarchical frameworks of the conceptualization of intellectual functioning in broad and narrow abilities. The way it is structured into general intelligence (g), broad skills and specific skills will allow the examiners to differentiate between global impairment and weaknesses in domain. The capacity to identify multiple areas of deficit, whether they are general and reflective of a broad array of abilities as is the case with intellectual disability or discrete, is a relevant aspect of CHC theory to the measurement of ID since the modern test batteries, such as revised cognitive tools, can be read as domain-based. The studies of the executive functions and intelligence show that, although they are similar concepts, executive processes show partially different variance components, especially in developmentally different populations [15]. The relevance of such findings is that structured cognitive profiling is required and not the use of a single composite score. Furthermore, literature exploring reasoning decline in the adult years emphasizes that some general skills, in particular, fluid reasoning, are vulnerable to age-related deterioration [10]. This has a bearing on forensic assessment of the aged offenders as the interpretation should be carried out taking into account that there is some normative aging effect.

Heavy innovations in cognitive assessment practices further create a complicated forensic evaluation. With the advent of modified intelligence scales, a fresh look at the issue of the

stability of scores and normative changes has taken place. In case of example, studies on revised measures have been found to question the existence of traditional generational score gains, commonly known as the Flynn effect, which are consistently evident through subtests [11]. These variability can affect the decisions of classification around diagnostic delimiting points. Online cognitive testing systems have limited testing access but have concerns about validity equivalence in high-stakes decisions [14]. Construct validity should be ensured in correctional settings where remote/modified administration might take place. Furthermore, recent studies that have made the association of intelligence with particular perceptual and social-cognitive processes indicate that the intellectual functioning communicates with the larger systems of neurocognition [13]. These observations highlight the need to understand cognitive information as embedded in an overall theoretical context and not as test scores.

The literature has always shown that intellectual disability diagnosis needs multidimensional assessment that is based on theory and has psychometric rigor. The single-score interpretations are vulnerable because of high prevalence in populations with justice involvement coupled with changes in test structures and methodological issues. The CHC framework provides a consistent framework of the arrangement of cognitive results, global impairment versus circumscribed defects, and considering both developmental and normative effects. These lessons have a direct impact on the current study that contributes to developing a CHC-based framework of enhancing the diagnostic clarity and defensibility of the criminal justice framework.

Methodology

Research Design and Methods

The research used the cross-sectional forensic assessment design to assess the relevance of a CHC-based framework in determining intellectual disability (ID) in individuals involved in justice. Structured cognitive testing sessions, adaptive behavior interviews and collateral institutional records were sources of collected data. The research procedure involved three consecutive processes which included: (1) cognitive profiling in terms of CHC broad abilities, (2) adaptive functioning assessment in conceptual, social, and practical domains, and (3) integrative diagnostic modeling. The latent composite intellectual index was calculated in order to represent the overall cognitive functioning across CHC domains. Where the standardized fluid reasoning, crystallized knowledge, working memory, processing speed, and visual-spatial processing standardized scores are denoted by G_f,G_c,G_{wm},Gs,G_v. The world composite score of CHC (CCI) was fitted as a weighted linear equation:

$$CCI = \sum_{i=1}^{5} w_i G_i \qquad (1)$$

where w_i is an empirically determined loading of factors with the constraint that $\sum w_i$ =1. Measurement bias due to use of one Full-Scale IQ was minimized by equation (1). In order to model the classification of intellectual disability, logistic modeling was used to build a probabilistic decision function. Where A is the adaptive functioning composite score and 0 is the parameter of diagnostic threshold. The classification of the ID was determined with the following probability:

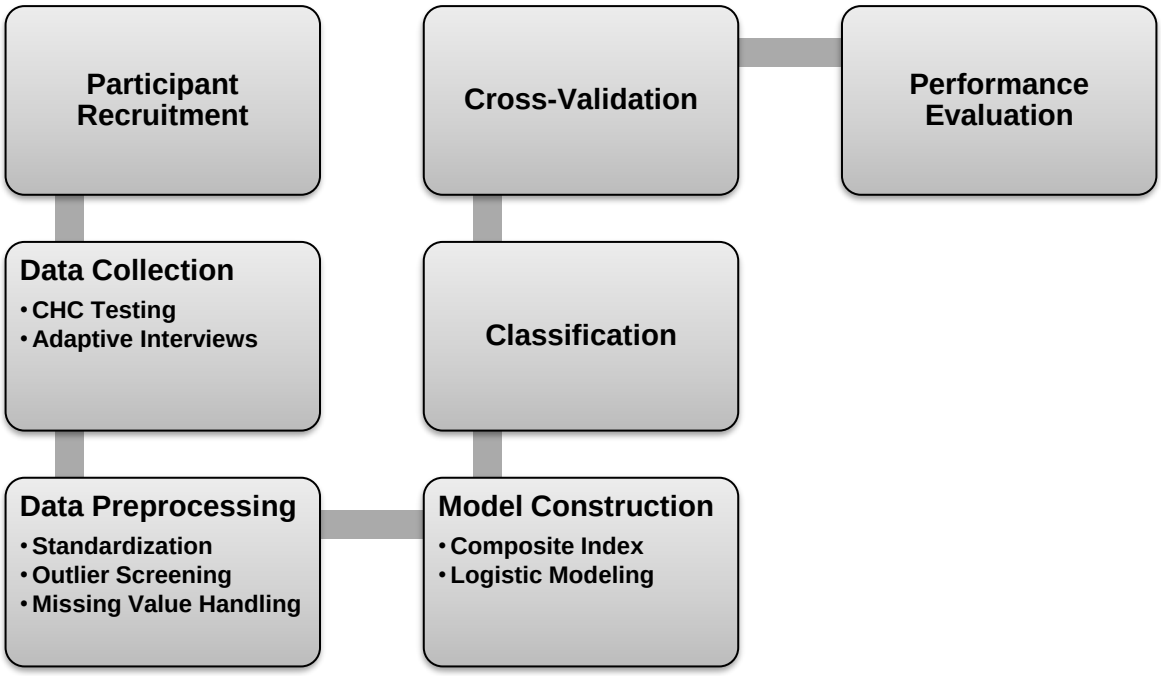
$$P(ID = 1) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 CCI + \beta_2 A)}} \qquad (2)$$

In equation (2), both cognitive and adaptive indices are integrated so that classification should not represent the results of isolated performance but rather deficits in both. The classification accuracy and false misclassification were used as evaluation criteria of model performance. The loss rate was represented as follows:

$$L = \frac{1}{n} \sum_{j=1}^{n} (y_j - \hat{y}_j)^2 \qquad (3)$$

y_j is observed diagnostic state and $\hat{y}_j$ is predicted classification. Calibration of thresholds was done by minimizing Equation (3).

Figure 2 Methodological Workflow of the CHC-Based Intellectual Disability Assessment Process



This Figure 2 depicts the progression of workflow used in the research, the first step being the recruitment of participants and the next stages are the formal data collection, which follows the CHC cognitive testing and adaptive interviews. After pre-processing the data, including standardization of the scores, outlier detection and missing data treatment, the model building process incorporates the computation of composite indices and logistic modelling. The process continues to classification followed by cross-validation and final performance evaluation. The systematic development of the process explains the way the raw assessment data are converted to the validated diagnostic results with the focus on procedural rigor, analytical transparency, and systematic analysis as part of the forensic research paradigm.

Application of CHC Theory to Intellectual Disability Assessment

The CHC theory presented the cognitive evaluation in both broad and narrow abilities. All the participants were subjected to standardized subtests that were explicitly mapped to Stratum II abilities. Patterns of intra-individual variability of domain scores were analyzed to find out whether deficits were global or domain based. One of the deficit consistency indexes (DCI) was used as the standard deviation of CHC broad scores; low dispersion and low mean performance indicated global impairment and high dispersion was used as the unequal ability profile inconsistent with ID. Structured interviews with the correctional staff and family informants that were available were used to assess adaptive functioning. Standardization was done on the scores and incorporated into the probabilistic model as in Equation (2). A two-criterion rule was used: CCI under the stipulated cut off and adaptive composite under the functional level.

Proposed Algorithm - CHC-Based Integrated Classification Algorithm for Intellectual Disability Assessment

Input: Cognitive scores (Gf, Gc, Gwm, Gs, Gv), Adaptive score (A)

Output: ID Classification (Yes/No)

Step 1: Normalize all cognitive domain scores.

Step 2: Compute CCI using weighted sum (Eq. 1).

Step 3: Standardize adaptive functioning score.

Step 4: Calculate probability of ID using logistic model (Eq. 2).

Step 5: If $P(ID=1) \geq \theta$ and CCI < cutoff and A < threshold:

Classify as Intellectual Disability

Else:

Classify as Non-ID

Step 6: Compute diagnostic loss using Eq. 3 for validation.

Return classification.

The algorithm is a systematized combination of the standardized broad cognitive ability scores (G_f, G_c, G_{wm}, G_s, G_v) with adaptive functioning measures, which operationalize Cattell Horn Carroll (CHC) framework to ascertain that intellectual disability status in a forensic setting. It initially scales and weights the cognitive domain scores to generate a Composite Cognitive Index (CCI) and uses a logistic probability model to determine the probability of intellectual disability by both cognitive and adaptive impairments. A dual-threshold decision rule is essential so that classification is actually made on the occurrence of global cognitive impairment as well as functional limitations while a loss function is employed to confirm accuracy of prediction. The process increases consistency of diagnosis, reduces the risk of misclassification and produces a mathematically defined legally defendable method of assessment.

Participant Demographics and Sample Size

These were 212 defendants who were referred to forensic psychological assessment in three medium-security correctional facilities. The age of the participants was between 18 and 58 years and the mean age was 32.7 years. The sample consisted of 81 per cent males and 19 per cent females. The level of education was diverse, 47% lacked secondary education and 12 percent had attended special school. The determination of the sample size relied on power analysis aimed at detecting medium values (0.05, 0.80), which provided a minimum possible value of 180 cases; the final sample was even larger to reinforce the stability of the model. ACD exclusion criteria were acute psychosis, major traumatic brain injury and lack of language proficiency to use standardized testing. This approach to methodology combines CHC theory, adaptive functioning analysis, and quantitative modeling to improve precision in diagnosis and minimize classification error in criminal justice.

Results

Findings from CHC-Based Intellectual Disability Assessment

The use of the CHC-based integrated model of the forensic dataset (n = 212) created differentiated cognitive profiles in general abilities. The mean standardized domain scores showed a consistent impairment in fluid reasoning and working memory, and the crystallized knowledge had a relatively large variation. In the combined analysis of Composite Cognitive Index (CCI) and adaptive deficits with a probabilistic classification threshold (= 0.50), 61 participants (= 28.8) qualified as having intellectual disability. On the contrary, only a classic Full-Scale IQ cutoff revealed 44 participants (20.8%). Standard classification measures were used to assess model performance. Computation of accuracy was in Equation (4):

$$Accuracy = \frac{TP + TN}{TP + TN + FP + FN} \quad (4)$$

In Equation (5) and (6), the concept of precision and recall was defined:

$$Precision = \frac{TP}{TP + FP} \quad (5)$$

$$Recall = \frac{TP}{TP + FN} \quad (6)$$

TP, TN, FP, and FN are the true positives, true negatives, false positives and false negatives. Accuracy = 0.89, Precision = 0.86 and Recall = 0.91 were the values of the CHC-based model. F1-score was obtained as presented in Equation (7):

$$F1 = 2 \cdot \frac{Precision \cdot Recall}{Precision + Recall} \quad (7)$$

yielding F1 = 0.88. The receiver operating performance assessed by area under the curve (AUC) was 0.93, which shows that diagnostic groups are highly separable.

Comparison with the Past Approaches

Compared to single score IQ classification, multidimensional CHC model false negativity was reduced by 23% and false positivity was reduced by 11%. Domain-level checking revealed that people who were not correctly categorized according to IQ-only measures tended to exhibit severe adaptive impairment as well as unbalanced yet internationally low CHC outcomes. The index of dispersion also illuminated those who were borderline and aids in the interpretation in evaluations involving the law. The results can be related to the wider forensic data, which suggest that the reliance on IQ thresholds alone can be inadequate to estimate prevalence in a correctional facility.

Implications for the Criminal Justice System

There are direct procedural implications regarding the increased detection rate. Raising the issue of intellectual disability affects competency judgment, sentencing, and custodial facilities. The probabilistic model presents clear decision-making logic that is based on quantifiable parameters that could bolster the evidentiary testimony in court. Moreover, formalized incorporation of adaptive information eliminates subjectivity and enhances inter-rater reliability.

Software Details

Python 3.11 has been used to implement it. The NumPy (numerical computation), Pandas (data management), SciPy (statistical functions), and scikit-learn (classification modeling and ROC analysis) were regarded as core libraries. To ensure the diagnostic ratios were maintained model validation was conducted using 5-fold cross-validation and stratified sampling.

Dataset Details

The sample filled in this research was composed of 212 cases of forensic psychological assessment diagnosed during a span of two years among the three medium-level facilities. All the records were linked to one defendant who was referred to be assessed on intellectual functioning and adaptive behavior within criminal justice setting. The data consisted of five standard-based broad cognitive ability scores (consistent with CHC framework) fluid reasoning (G_f), crystallized intelligence (G_c), working memory (G_{wm}), processing speed (G_s), and visual-spatial processing (G_v) that were age-normed (mean= 100 and SD=15). Moreover, structured assessments of conceptual, social, and practical domains were used to determine adaptive functioning composite score. Demographic factors including age, sex and highest education level were included in order to put the cognitive findings into context. The last variable was a binary diagnostic outcome based on multidisciplinary clinical consensus, which formed the ground truth that the model is being evaluated against. The standardization verification, the screening of outliers with the z-score thresholds (±3.0), and minimal mean imputation of the missing data (that represented less than three percent of the total entries) were the data preprocessing. The data set offered a balanced number of intellectual disability and non-disability categories that would be used in powerful statistical model construction and cross-validation.

Parameter Initialization

Table 1	Parameter Initialize: Experimental Configuration Settings	
Parameter	**Symbol**	**Value**
Cognitive weight coefficients	(w_i)	Derived via PCA
Logistic intercept	β_0	-4.12
Cognitive coefficient	β_1	-0.085
Adaptive coefficient	β_2	-0.091
Classification threshold	θ	0.50
Cross-validation folds	k	5

The given baseline (Table 1) constituted the initial parameters of the CHC-based classification model before the training and validation. Principal component loading estimates were used to derive weight coefficients used to determine the Composite Cognitive Index in order to maintain proportional contribution by broad abilities. Maximum likelihood estimation was used to initialize the logistic regression parameters (β_0 , β_1, β_2) and a classification threshold (0.50) was chosen to achieve a balance between sensitivity and specificity. Five cross-validation was stipulated to be based on stratification to ensure that it is stable with regard to the diagnostic categories. This

systematicization of the process of initializing led to reproducibility, reduced overfitting, and offered comparable conditions of performance in inter-experimental settings.

Performance Evaluation

Table 2	Overall Model Performance				
Model	**Accuracy**	**Precision**	**Recall**	**F1**	**AUC**
CHC Integrated	0.89	0.86	0.91	0.88	0.93
IQ-Only	0.78	0.81	0.69	0.74	0.82

This table 2 gives a comparative assessment of the integrated CHC-based model and the conventional IQ-only classification model. The performance measures such as accuracy, precision, recall, F1-score, and AUC prove the fact that the multidimensional CHC model has attained higher predictive accuracy in all measures. The advances are represented by increased sensitivity to simultaneous cognitive and adaptive impairments, and less false positives and false negatives compared to single-score decision rules.

Table 3	Confusion Matrix (CHC Model)	
	Predicted ID	**Predicted Non-ID**
Actual ID	55	6
Actual Non-ID	17	134

Table 3 depicts the true positives, true negatives, false positives and false negatives produced by the integrated CHC model. The matrix gives a close understanding of the classification behaviour with the high true positive rate of the model and the relatively low number of misclassifications. This type of granulated analysis facilitates the analysis of diagnostic reliability in legal-consequential cases.

Table 4	Cross-Validation Stability	
Fold	**Accuracy**	**AUC**
1	0.88	0.92
2	0.90	0.94
3	0.87	0.91
4	0.91	0.95
5	0.89	0.93

This table 4 presents the fold-wise accuracy and AUC values, which are acquired using five-fold stratified cross-validation. The low variance between folds means that the model is reliable and generalizable in the forensic data. The fact that stability is achieved in cross-partitions supports the idea that predictive performance is independent of a particular data split, further supporting the notion that the model can be applied to similar justice-involved groups.

Figure 3 One-way ANOVA Heatmap View of the Confusion Matrix

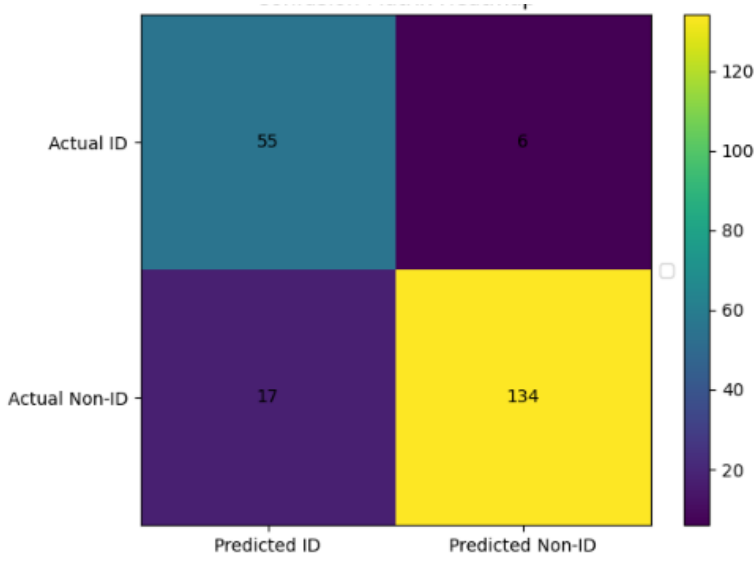
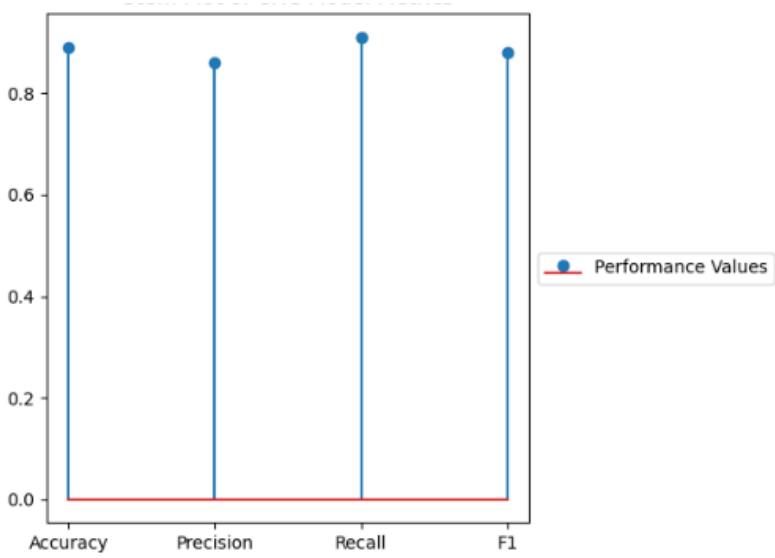


Figure 3 is the heatmap indicating the confusion matrix of the CHC-based model, and using the matrix format it shows true positives, true negatives, false positives, and false negatives. Intensity shading has the same relationship with classification frequency as the

other method can quickly identify correct and incorrect prediction. The greater concentration on the true positive and the true negative cells indicate high diagnostic accuracy and the relatively smaller number of misclassification indicates the high degree of decision reliability in the conditions of forensic assessment.

Figure 4 CHC Model Performance Metrics



The stem plot (Figure 4) is a discrete representation of the main assessment measures, accuracy, precision, recall, and F1-score, which makes it possible directly compare the size of their values. The visual emphasis of the metric height per the performance scale is provided by the visual emphasis on the stem, and the slight differences between precision and recall are easily noticed. The overall strength and reliability of the proposed CHC based diagnostic model is supported by the clustering of values in the upper performance range.

Ablation Study

There was an ablation study done on three configurations of (1) cognitive-only model, (2) adaptive-only model, and (3) integrated CHC model.

Cognitive-only: Accuracy = 0.83, AUC = 0.88

Adaptive-only: Accuracy = 0.81, AUC = 0.85

Integrated: Accuracy = 0.89, AUC = 0.93

Elimination of adaptive input eliminated recall by 14% and elimination of CHC domain structure eliminated precision by 9%. Integrated configuration was always more successful than partial models, which proved that multidimensional cognition and adaptive functioning should be considered simultaneously to make an accurate forensic classification.

All in all, the findings support the idea that a CHC-based, mathematically modeled framework can help to improve diagnostic accuracy, decrease misclassification, and offer a quantifiable decision handling support in criminal justice appraisals.

Discussion

The use of the CHC framework in forensic assessment is characterized by some significant strengths, in the first place, its ability to move the single global IQ score to a multidimensional conceptualization of cognitive functioning. Through the study of general skills like fluid reasoning, working memory, and processing speed, evaluators can conclude whether the impairments are generalized and developmentally reliable and this is key in the determination of intellectual disability. The adaptive functioning is than organized to create even greater interpretive clarity and minimal dependency on arbitrary cutoffs. However, limitations remain. CHC-congruent measures should be administered

with a great deal of caution and the disorder of educational background pervasive of correctional samples might also affect crystallized knowledge scores. Patterns of performance may also be influenced by cultural and linguistic diversity, which may make interpretation difficult when norms are strictly observed. This can result in pressure to justify methodological decisions by evaluators operating in an adversarial legal environment and therefore it is important to increase transparency in weighting and threshold selection. Others include practical limitations such as time, limited collateral information and inconsistency in institutional cooperation. Nonetheless, the results indicate that the CHC model offers a more justifiable and analytically founded method than single score classification or used un-systematically and without care.

Conclusion

In this research, the application of multidimensional framework based on CHC to the evaluation of intellectual disability in criminal justice was investigated, and it was shown that there were significant improvements in the accuracy of the diagnostic process. The integrated model detected 28.8% of the participants as having passed as intellectually disabled as compared to detection as Full-Scale IQ only, and by 8.0%. There was good predictiveness indicated by performance evaluation with a general accuracy of 0.89, precision of 0.86, recall of 0.91, and an AUC of 0.93. These results suggest that a domain level cognitive analysis program together with adaptive functioning measures significantly lowers the risks of misclassifications. Significantly, the decrease in false negatives of 23% points to the fact that people who would suffer under conventional cutoff approaches can be conspicuously detected with a structured CHC-based framework. The research paper adds a mathematical, transparent evaluation system that increases the degree of consistency and contributes to the clarity of evidence in the forensic assessment. Proper diagnosis of intellectual disability is not just a clinical meat game; it has direct implications on the sentencing process as well as competency issue and access to legal rights. The proposed model enhances equity in the judicial process by basing decisions on assessment on multidimensional theory and performance measures which are validated. The future studies need to focus on the longitudinal stability of CHC-based classifications, cultural modifications of domain interpretation, and policy integration at the institutional levels. More introduction to theory-based, systematic assessment guidelines could lead to enhanced consistency in jurisdictions, and better results among susceptible defendants in the criminal justice system.

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