Personality pathology in a forensic setting : prevalence, assessment, and prognostic value for treatment

Spaans, M.A.

4

Chapter Four

MMPI profiles of males accused of severe crimes, a cluster analysis

Abstract

In studies attempting to classify criminal offenders by cluster analysis of MMPI(-2) data, the number of clusters found varied between ten (the Megargee System) and two (one cluster indicating no psychopathology and one exhibiting serious psychopathology). The latter results raise doubts about the suitability of the MMPI-2 for classification in forensic settings. The present study aimed at deriving an empirical classification system using cluster analysis of 247 MMPI-2 profiles of pretrial criminal defendants in a forensic psychiatric observation clinic. Results indicated only a "non-disturbed" and a "disturbed" profile, differing on general elevation of MMPI-2 profiles but displaying no qualitatively distinct profiles. The clusters differed on age at admission and first conviction, indicating a late onset of criminal activity for disturbed offenders. Also, the clusters differed significantly on Axis I diagnosis and borderline significantly on Axis II diagnosis. The absence of distinct personality profiles between the clusters suggests restricted usefulness of the MMPI-2 in a forensic context of diverse and severe psychopathology and serious crimes. Either the investigated population is in fact extremely homogenous, truly comprising only two kinds of offenders, or the types of offenders in these populations are not effectively distinguished by the MMPI-2.[3]

Introduction

The Minnesota Multiphasic Personality Inventory-2 (MMPI-2) (Hathaway & McKinley, 1989) is one of the most widely used and researched personality assessment instruments in correctional and forensic psychiatric settings (Nieberding et al., 2003). One line of research in this area has been to attempt to classify criminal offenders into distinct groups according to their MMPI(-2) profiles. Such classification may provide useful information with regard to the motives for committing certain severe crimes, as well as to the treatment and management that is best suited for specific subtypes of offenders.

Among the most influential classification systems is the Megargee System, developed over the past three decades (Megargee et al., 2001). This system, empirically derived in the mid-1970s with the use of cluster analysis on MMPI data of 1,164 subjects, classifies criminal offenders into one of ten clinically informative patterns. Although the system and the classification rules have been tested in a wide variety of criminal justice settings (e.g. Megargee, 1997; Hutton, Miner & Langfeldt, 1993), only a few studies have attempted to replicate the initial cluster analysis leading to this classification system. In fact, whether the MMPI-2 is capable of producing a categorical classification of different types of offenders in other settings remains largely unknown.

Nieberding and colleagues (2003) did, however, replicate Megargee's findings to a certain extent in a population of 300 mentally disordered inmates preparing for their return to the community. They found seven different clusters, each with distinct personality profiles. Inmates in the first cluster were distinguished by the absence of MMPI-2 clinical scale elevations while the second cluster showed interpersonal and emotional deficits, conflicted relationships, a tendency toward isolation, and a general mistrust of others. The third cluster displayed the highest percentage of Axis II disorders including antisocial features. Inmates in the fourth cluster had the highest percentage of mood disorders such as depression, chronic somatic problems, unresolved anger, and interpersonal conflict. Clinical elevations in the fifth cluster indicated significant personal distress and interpersonal isolation. Nearly half of the inmates in this cluster were diagnosed with schizophrenia, paranoid type. The sixth cluster displayed depressive features such as lethargy, somatic complaints, and anxious features including rumination

[3] Spaans, M., Barendregt, M., Muller, E., De Beurs, E., Nijman, H., & Rinne, T. (2009). MMPI profiles of males accused of severe crimes: a cluster analysis. *Psychology, Crime & Law,* 15(5), 441-450.

and self-criticism. Individuals in cluster seven were likely to have a history of suicidal and other self-destructive behaviors, episodes of confusion, peculiar or bizarre thoughts, and actively psychotic processes. Consistent with these findings, 88% of inmates in cluster seven received a diagnosis of schizophrenia, which was the highest percentage of all seven clusters (Nieberding et al., 2003).
Other studies, however, have identified far less categories based on MMPI(-2) data. Hall and colleagues (1991) attempted to derive a classification system of sexual offenders in a cluster-analytic procedure using MMPI data and cluster analysis, but found only two clusters: one cluster indicating impulsive and antisocial personality types, and one cluster exhibiting significantly more psychiatric disturbance (Hall et al., 1991).
A similar study aimed at using cluster analysis to identify psychological profiles and related mental health symptoms among juvenile offenders also found just two MMPI clusters (Espelage et al., 2003). The first cluster showed no clinical elevations, indicating the absence of any specific psychological disturbance or distress. The other cluster exhibited profiles of serious psychopathology, with high scores on the scales Schizophrenia, Paranoia, Psychasthenia, and Psychopathic Deviate. Individuals in this cluster were often moody, hostile, and unpredictable, lacked basic social skills, and were prone to violent tempers (Espelage et al., 2003).
Studies indicating only two separate clusters raise doubt about the suitability of using the MMPI-2 for classifying offenders in these settings. Either the investigated populations are extremely homogenous, comprising only two kinds of offenders, or the remaining types of offenders in these populations are not effectively distinguished by the MMPI-2. In the latter case the question arises whether the MMPI-2 should be the primary instrument for differentiating personality types in a forensic population. In the present study, we attempt to derive an empirical classification system based on MMPI-2 profiles in a known heterogeneous population of pretrial criminal defendants in a forensic psychiatric observation clinic. In line with the studies of Megargee and Nieberding, it was hypothesized that in this heterogeneous population, a cluster analysis of MMPI-2 profiles would produce a multitude of distinct personality profiles.

Method

Assessment site

All subjects were admitted to the Pieter Baan Center (PBC) in Utrecht, the Netherlands, for a residential pre-trial criminal responsibility assessment. The PBC is the official forensic psychiatric observation clinic of the Dutch Ministry of Justice, and has the legal status of a house of detention. The PBC administers around 90% of all clinical forensic assessments in the Netherlands. These assessments cover roughly 5% of all forensic evaluations; the remaining 95% of forensic evaluations take place in a non-specialized forensic setting (usually in a regular house of detention). Possible reasons for the court to order a clinical assessment of defendants include the severity of the crime, the severity of the assumed psychopathology, the maximum security level within the PBC, and potential societal disturbance or media attention associated with the defendant's case. As a result, the population of the PBC covers the more severe criminological and psychiatric cases, and cannot be seen as representative for the entire forensic population whose mental status is assessed.

All defendants are evaluated during a seven-week period by a multidisciplinary team consisting of a psychiatrist, a psychologist, two social workers, and a lawyer who supervises the assessment process along with a second psychiatrist. One of the social workers investigates the life history and social background of the defendant, the other is a supervisor on the defendant's ward whose task is to observe and describe the activities and behavior of defendant during his or her stay in the institution. The psychologist and psychiatrist carry the final responsibility for the PBC's conclusion in the final report concerning DSM-IV diagnoses, if any, and criminal responsibility. The latter two experts also advise the court whether forensic treatment of the defendants is indicated.

Subjects

The sample consisted of 247 defendants, admitted to the PBC between January 1 2000 and December 31 2005 for a criminal responsibility assessment, and of whom an MMPI-2 profile was present. The sample did not include defendants that had refused to participate in the study, and therefore not completed an MMPI-2, and defendants who were unable to complete an MMPI-2 due to intellectual disabilities, a poor comprehension of the Dutch language, or the presence of psychotic symptoms. Because of the low number of female defendants admitted to the institution (less than 10%), it was decided to include only male subjects in the study.

Measures

The variables comprise three categories of information: individual characteristics, clinical characteristics, and MMPI-2 data.

Individual characteristics

Individual characteristics included demographic variables (e.g., age of defendant at time of assessment, number of earlier convictions, age at first conviction, whether the defendant was a first offender, and cultural background of the defendant), and crime related variables (e.g., type of index crime, relationship between the perpetrator and the victim [i.e., acquainted or not acquainted with the victim], type of weapon used, information from the crime scene, and whether the offence was committed with others or alone).

For first offenders, the age at the time of the assessment was taken as a proxy for age at first conviction. For all defendants charged with homicide, the variable "attempted murder" indicated whether the charge involved *attempted* homicide (i.e., not lethal to the victim) or actual homicide (i.e., lethal to the victim).

Clinical characteristics

Clinical characteristics included the presence or absence of DSM-IV Axis I psychiatric diagnosis and Axis II personality disorder. Axis I substance abuse was scored on the basis of the official diagnosis in the final report. In Dutch forensic practice, however, substance abuse is assessed only when judged clinically relevant for the index crime. As a result, there may be some underreporting compared to actual substance abuse (e.g., nicotine abuse).

Minnesota Multiphasic Personality Inventory-2

The MMPI-2 (Hathaway & McKinley, 1989), is a self-report questionnaire consisting of 567 True or False questions designed to detect psychopathologic symptoms in psychiatric patients. Included in this study were T-scores on three validity scales as well as the basic clinical scales. The Validity scales are: L (Lie, unsophisticated lying), F (Low Frequency, tendency to answer affirmative to items rarely endorsed by normal people, also indicating psychopathology), and K (Correction, sophisticated lying). Clinical scales include Hs (Hypochondrias), D (Depression), Hy (Hysteria), Pd (Psychopathic deviation), Mf (Masculinity-Femininity, measuring the subjects identification with traditional gender roles), Pa (Paranoia), Pt (Psychastenia, indicating inter alia compulsions, obsessions, abnormal fears and difficulties in concentration), Sc (Schizophrenia), Ma (Hypomania), and Si (Social Introversion).

Statistical analyses

An inter-rater reliability analysis was carried out on twenty files to determine the degree of consensus on the scoring of individual and clinical characteristics. Total agreement was found for Axis I substance abuse, cultural background of the defendant, whether the defendant was a first offender, degree of criminal responsibility, and presence of an Axis I and/or II disorder (Cohen's Kappa = 1.00). Other variables demonstrated satisfactory agreement; type of weapon used (K = .92), location of the crime (.63), presence of a personality disorder (.57), age of the victim (K = .77), presence of an Axis I disorder (K = .90), and type of crime (K = .83).

A hierarchical cluster analysis was performed using Ward's method (squared Euclidean distance). Hierarchical cluster analysis is a statistical method aimed at creating objective classifications within a dataset, grouping together subjects with similar patterns on clustering variables. As we were interested in clinically identifiable groups, the MMPI-2's clinical scales were chosen as clustering variables. Ward's method (Ward, 1963) of cluster analysis initially treats all subjects as separate clusters. In the second step, the two subjects that are most identical on the clustering variables are clustered. To determine the two most identical subjects, the within cluster error sum of squares (ESS) of every possible combination is calculated and the result with the least ESS is chosen. This procedure is repeated by either clustering two subjects into a new cluster, a subject into an already existing cluster, or clustering two already existing clusters into a new cluster, until in the last step all subjects are combined into one all-encompassing cluster.

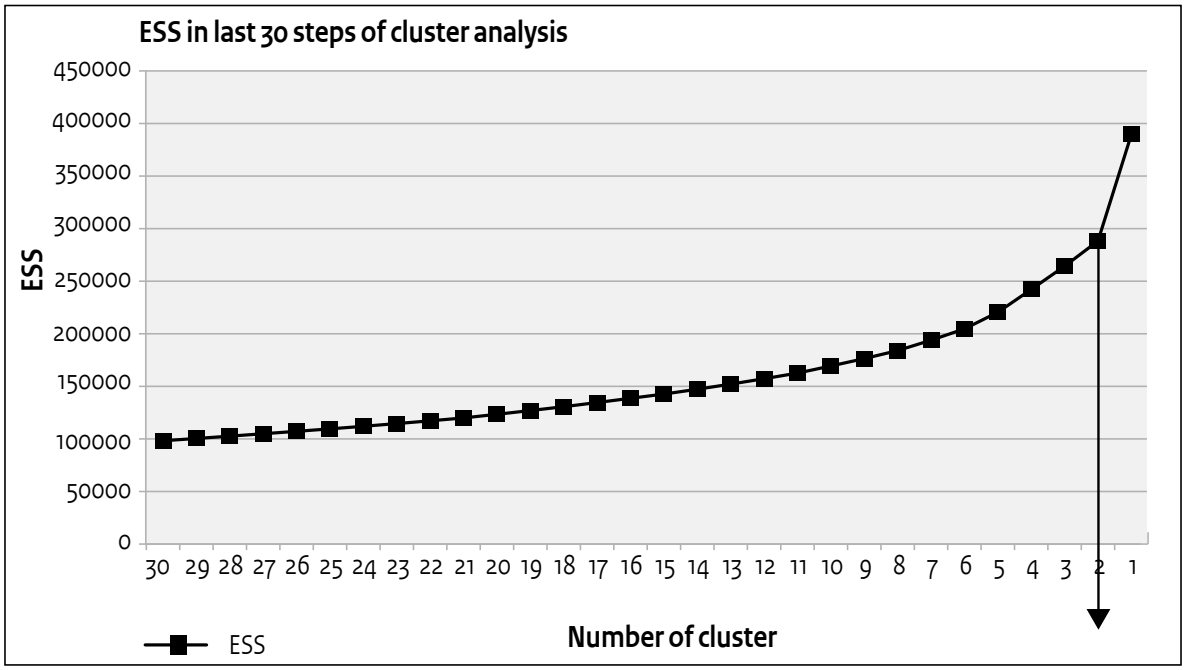
When clusters are merged, the within cluster variance will naturally become larger and the ESS will increase. When two clusters that are much alike are joined, the increase in ESS will be relatively small. When two clusters that are very different are joined, the increase will be relatively large. By carefully observing the way the ESS increases in each step of the cluster analysis, one can determine the appropriate number of clusters – the step before a sudden jump in ESS being the best point to terminate further clustering. As the criteria to determine the appropriate number of clusters are always based on professional judgment and therefore remain somewhat subjective, a number of alternative cluster solutions were also investigated to establish whether these resulted in clinically interpretable clusters.

Hierarchical clustering is useful in determining the best fitting number of clusters, but may perform wrongly when assigning individual cases to clusters due to the agglomerative nature of the process (Huberty, DiStefano, & Kamphaus, 1997). With every clustering, the centroid of the cluster changes, as a result of which cases that have been assigned to a certain cluster in the beginning of the process might better be assigned to another cluster at the end of the process. In order to assign cases to clusters, a k-means cluster analysis is used, which iteratively allocates all cases to a specified (*k*) number of clusters based on each cluster's nearest center points.
To investigate differences between clusters on clinical, demographic, and crime related characteristics, logistic regression and chi-square analyses were used.

Results

Figure 1 shows the agglomeration schedule of the hierarchical cluster analysis for the last 30 steps of the procedure. A sudden increase in ESS appeared at the final step, indicating that a two cluster solution would be the most appropriate. The first cluster showed considerably higher scores on all MMPI-2 subscales than the second cluster, but no distinguishable personality profiles were found.

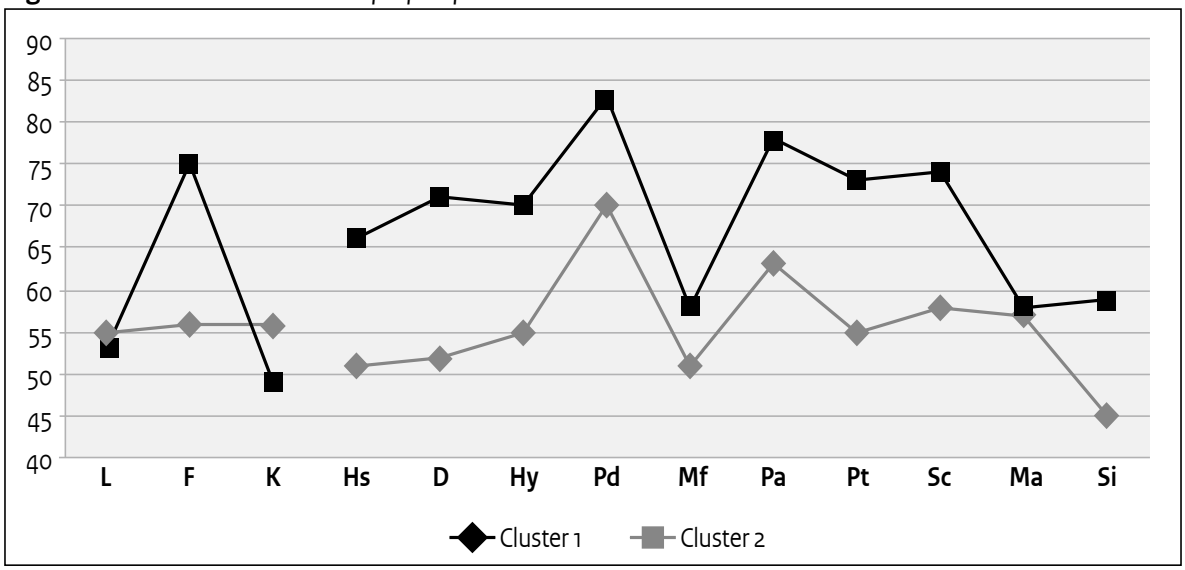
Figure 1. *Agglomeration schedule in last 30 steps of cluster analysis*



The total within clusters error sum of squares (ESS) of the last 30 steps of the hierarchical cluster analysis. The sudden increase in ESS in the last step suggests that the two cluster solution is the appropriate one.

As can be seen in Table 1, the two cluster solution comprises one cluster with only a clinical elevation on scale 4 (Cluster 1, "non-disturbed") and one cluster with elevations on all scales except scales 5, 9, and 0 (Cluster 2, "disturbed").

Figure 2. *Mean MMPI-2 cluster profiles for 2 cluster solution*



Furthermore, the clusters' profiles appear surprisingly similar with the three highest elevations on scales 4, 6, and 8 in both clusters (Figure 2).

Table 1. *Clusters' mean MMPI-2 profiles for four cluster solutions*

	n (%)	L	F	K	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si	Mean code
2 clusters															
Cluster 1	156	55	56	56	51	52	55	70	51	63	55	58	57	45	4-6
Cluster 2	91	53	75	49	66	71	70	83	58	78	73	74	58	59	4-6
3 clusters															
Cluster 1	86	56	51	57	48	50	52	64	50	61	53	54	53	44	4-6
Cluster 2	52	51	81	47	70	77	75	86	58	81	78	78	57	64	4-6
Cluster 3	109	54	63	54	57	58	60	79	55	69	61	65	61	48	4-6
4 clusters															
Cluster 1	77	54	69	55	61	66	66	81	58	75	69	70	57	56	4-6
Cluster 2	99	55	56	59	54	53	59	75	51	63	58	60	59	42	4-6
Cluster 3	50	55	54	51	45	48	47	59	49	63	50	54	53	48	4-6
Cluster 4	21	50	94	41	76	86	80	88	60	88	85	87	62	43	4-6
5 clusters															
Cluster 1	5	56	53	43	36	41	44	52	43	66	30	38	54	40	6-9
Cluster 2	53	51	62	52	51	48	51	74	53	63	56	62	72	41	4-6
Cluster 3	74	55	63	56	62	64	68	82	57	73	67	67	55	52	4-6
Cluster 4	85	57	54	58	51	54	56	67	49	62	56	57	49	47	4-6
Cluster 5	30	52	93	40	72	82	75	85	60	85	82	84	62	69	4-6

Validity scales: L (Lie), F (Low Frequency), and K (Correction). Clinical scales: Hs (Hypochondrias), D (Depression), Hy (Hysteria), Pd (Psychopathic deviation), Mf (Masculinity-Femininity), Pa (Paranoia), Pt (Psychastenia), Sc (Schizophrenia), Ma (Hypomania), and Si (Social Introversion). The clustering variables were the clinical scales 1 to 0. The validity scales L, F & K were not part of the clustering procedure, but are presented here as descriptive information. The cluster's mean code is presented as descriptive information only and is based on the rules for determining the high-point-code (McGrath, Rashid, Hayman, & Pogge, 2002): 1) the code was based on the two most elevated clinical scales, 2) scales 5 and 0 were ignored, 3) numeric precedence was used to resolve ties, and 4) the order of elevation was ignored.

Three alternative solutions were investigated in order to ascertain whether these would yield different profile structures, which they did not. For all alternative solutions, the main between-cluster difference seemed to be the general elevation of each profile, not a qualitative difference between the profiles themselves. Only in the five-cluster solution did one cluster emerge with a somewhat different profile, although it must be mentioned that this was a small cluster of only five subjects.

Results of the regression analysis are shown in Table 2. Initial tests for colinearity revealed a very high correlation between the variables defendant's age at first conviction and age of the defendant at time of assessment (r = .681). Because of this high correlation and the conceptual overlap between the two variables it was decided to include only the variable age at first conviction. The two clusters found in the initial cluster analysis did not differ on most clinical, offender and offence characteristics. Clinically, the two clusters only differed significantly on whether the subjects received an Axis I diagnosis and borderline significantly on receiving an Axis II diagnosis. Furthermore, age at first conviction was significantly higher in the disturbed cluster than in the non-disturbed cluster.

Table 2. *Logistic regression summary for diagnostic, offender, and offence characteristics*

Variable	β	SE	p	OR
Received Axis I diagnosis	.754	.335	.024	2.125
Received Axis II diagnosis	.614	.368	.095	1.849
Received Axis II diagnosis substance abuse	.242	.335	.471	1.273
First Offender	-.348	.431	.420	0.706
Number of prior convictions	.035	.032	.273	1.036
Age at first conviction	.058	.020	.003	1.060
Cultural minority	.398	.324	.220	1.489
Type of offence (1)				
Homicide	.093	.442	.834	1.097
Sexual offence	.522	.547	.340	1.686
Offence at offender's home	-.555	.378	.142	0.574
Offended with others	-.294	.443	.506	0.745
Victim known to offender	-.329	.361	.362	0.720
Victim's age < 16	-.386	.474	.415	0.680
Weapon choice (2)				
Knife	.092	.438	.834	1.096
Firearms	.176	.527	.739	1.192
Other	.483	.456	.290	1.620

(1) Reference category: other. (2) Reference category: none (only physical)

The two clusters did not differ significantly in level of criminal responsibility (see Table 3). However, the disturbed group did receive the advice of forensic treatment from the PBC's experts more often than the non-disturbed group.

Table 3. *Intercluster differences for expert's advice*

Expert's advice	Cluster 1	Cluster 2	c^2(df)	P
Criminal responsibility			5.68 (4)	.225
Responsible	19 (12%)	8 (9%)		
Slightly diminished responsible	39 (25%)	13 (14%)		
Diminished responsible	77 (49%)	56 (62%)		
Strongly diminished responsible	15 (10%)	9 (10%)		
Not responsible	6 (4%)	5 (6%)		
Measure advised	82 (53%)	66 (73%)	9.54 (1)	.002

Discussion

Based on MMPI-2 information, only two groups of distinct personality profiles were found: a "non-disturbed" and a "disturbed" profile. This conclusion supports the findings by Espelage et al. (2003) of one cluster indicating the absence of any psychological problems and the other exhibiting serious psychopathology. Even in a diverse population – containing not only severe and varied psychopathology but also individuals with no psychological disorders – different types of offenders are simply not effectively distinguished by the MMPI-2. Furthermore, the two resulting clusters did not reveal different types of offenders in the sense of different MMPI-2 profiles, but only varied in the degree of general psychopathology. These findings raise serious doubts about the usefulness of interpreting MMPI-2 profiles for differential diagnostic purposes. It may be concluded that the usefulness of the MMPI-2 in a forensic context is restricted to screening for the presence or absence of general psychopathological symptoms. Of particular interest, and reason for further caution in interpreting MMPI-2 profiles, is the fact that the two clusters only differed significantly on Axis I symptoms while the results for Axis II personality disorders were only borderline significant.

Two notable intercluster differences are worth mentioning, however. Firstly, the subjects in the disturbed cluster started their criminal careers later in life, indicated by the age at first conviction, than the non-disturbed cluster. This outcome concurs with findings of a study by Nijman, Cima and Merckelbach (2003) that the age at first conviction of psychotic offenders was significantly higher than that of non-psychotic offenders (i.e. psychotic offenders of severe crimes were first offenders more often than non-psychotic offenders), indicating that the psychotic offenders had a late onset of criminal activity. Furthermore, according to Nijman and colleagues (2003), a large portion of the psychotic or disturbed offenders had received psychiatric treatment prior to their first offense, indicating that they had a substantial psychiatric history, while the non-disturbed offenders typically came from a long criminal career and can be described as early starters. In line with these findings, it might also be the case that disturbed offenders are less exposed to opportunities to commit crimes at a young age because they are often under protective orders until at least the age of 18.

Secondly, the disturbed group received an advice for forensic treatment more often than the non-disturbed group. This finding itself is not surprising – the aim of such a measure is to treat the mental disorder that influenced the alleged crime, and more importantly, a mental disorder is one of the main criteria for advising forensic treatment. It confirms that the MMPI-2 is effective at measuring whether overall psychopathology was elevated in the present population. However, the fact that no profiles are retrievable empirically indicates that, in this particular population, the MMPI-2 is not able to distinguish more complex psychopathology.

A limitation of the study is the inclusion of only males in the study population. Also, not all willing observees are able to complete an MMPI-2 due to limitations such as intellectual disabilities or psychotic symptoms. Perhaps the inclusion of MMPI-2 profiles of these observees could have resulted in more than two clusters. However, these profiles were never realized as the MMPI-2 is not well-suited for individuals with the above-mentioned problems. Furthermore, as mentioned earlier, the clinical assessments performed in the PBC are only a small and probably highly specific proportion of all forensic assessments conducted in the Netherlands. Therefore, the results of this study can only be generalized to defendants of very severe crimes.

Despite the cluster analysis of 247 MMPI-2 scores not resulting in distinct personality type profiles, the MMPI-2 can certainly be used in individual cases to investigate the presence of psychopathology. Nonetheless, implications for future research in a similar population include a detailed investigation of individual MMPI-2 profile results and of the NEO-PI-R, a possible alternative instrument that can differentiate personality types in a forensic population.