NEUROPSYCHIATRIC DIMENSIONS OF CRIMINAL BEHAVIOR*

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INTRODUCTION

Recent analysis of criminality gives clues as to the multiple factors--that is genetic, social, psychiatric and neurologic--that contribute to criminal behavior. In view of this, an important research strategy becomes a careful phenomenological analysis of the antisocial behavior in an attempt to develop subtypes of that all too inclusive category "antisocial personality." Such a strategy seems valuable in the affective disorders and to some extent in schizophrenia, the two other equally broad diagnostic labels utilized in the Diagnostic and Statistical Manual. Identifying subtypes is important if such subtypes have specific prognostic and therapeutic implications, e.g., a group that might be significantly responsive to a pharmacologic regimen versus other groups more responsive to psychotherapeutic and/or sociologic intervention.

The current study is based on the hypothesis that limbic system dysfunction, reflecting either a focal epileptoid mechanism and/or a more generalized maturational lag of the central nervous system, contributes to a specific type of impulsive aggressiveness which leads to antisocial acts. Data reported in this chapter also suggest that neurologic insult and histories of minimal brain dysfunction and/or hyperactivity significantly contribute to the identification of this syndrome. The data presented here is a summary of a more detailed analysis of our findings on 93 recidivist aggressors hospitalized at the Patuxent Institution (4).

STUDY FINDINGS

In a previous study I proposed a new diagnostic classification--the "Episodic Behavioral Disorders," defined as any precipitously appearing maladaptive behavior that interrupts the life-style and

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life-flow of the individual, the behavior being both out of character for the individual and out of context for the situation. Pertinent for this discussion is one of the subcategories of episodic behavioral disorders, namely "Episodic Dyscontrol," defined as an interruption in life-style that is an abrupt act or short series of acts with a common intention carried through to completion and accompanied by either a relief of tension or gratification of a specific need (see Figure 1). These dyscontrol acts are motivated by intense feelings of fear and rage with either absent or distorted foresight; hence, result in destructive behavior towards self or others. In my original monograph, I indicated that these dyscontrol acts fell on a continuum between two polar extremes; at one pole the essential mechanism is a transitory limbic system seizure, while at the other pole the dyscontrol acts are determined by psychodynamic mechanisms, that is, the act represents an explosive rebellion against a severe superego in a person who is usually over-controlled or over-inhibited.

In an earlier study (3) I noted a sex reversal in the prevalence of the episodic behavioral disorders in that among children, males were more likely to demonstrate such behavior than females, while serial admissions of adults to an acute psychiatric center indicated just the reverse, that is more females than males demonstrated such behavior (2). An evaluation of the clinical histories revealed that the behavior which precipitated admission to a psychiatric hospital for adult females with dyscontrol symptoms would probably have led to incarceration in adult males.

The study summarized here was a test of this hypothesis, namely to look at the prevalence of such a syndrome in the Patuxent Institution, a unique hospital-prison where recidivist aggressors were assigned by the courts on indeterminate sentences as "defective delinquents." A defective delinquent by statute is defined "as an individual who by the demonstration of persistent aggravated anti-social or criminal activity and is found to have either such intellectual deficiency or emotional unbalance or both as to clearly demonstrate an actual danger to society so as to require such confinement and treatment when appropriate as may make it reasonably safe for society to terminate the confinement and treatment."* It was felt that such a study might also clarify possible mechanisms behind Wolfgang's cohort of repeated offenders. He noted that in his total cohort of 9,946 boys reared in a ghetto area of Philadelphia, 35% had at least one contact with the police before age 18 (7). However, 6.3% of this group were chronic offenders, that is with 5 or more offenses, and this small percentage

*The Maryland Defective Delinquent Law was repealed July 1, 1977 but this was after the data collection on this study had been completed.

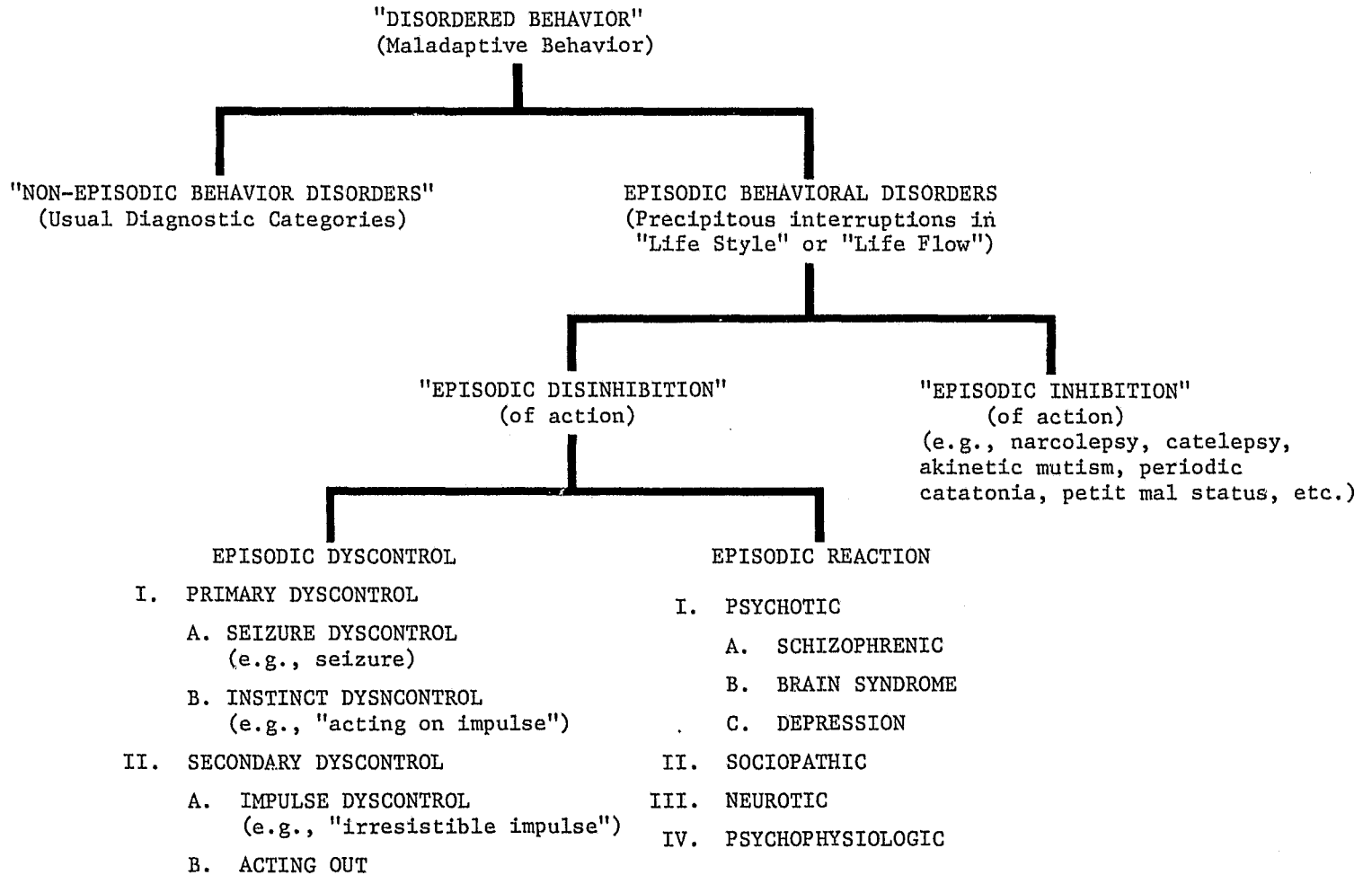


FIGURE 1
EPISODIC BEHAVIORAL DISORDERS

were responsible for 52% of the total criminal acts commited by the entire birth cohort. I suspect that a significant number of these repeated offenders are typical of those referred to Patuxent Institution as defective delinquents, and that both within Wolfgang's chronic offenders and the inmates of Patuxent Institution there would be a large number of individuals demonstrating episodic dyscontrol. Subsequent analysis of the Patuxent data confirmed this suspicion, inasmuch as 53 of the 93 individuals studied (57%) met the criteria for diagnosis of episodic dyscontrol.

Drug activated alpha chloralose electroencephalograms were used as an objective measure of the epileptoid and/or maturational instability of the central nervous system. This procedure brings out latent EEF abnormalities, such as focal or generalized spikes or typical petit mal spike slow waves as well as generalized paroxysmal delta-theta activity. Such abnormalities are elicited in 90% of epileptics as well as individuals with neurologic evidence for focal central nervous system disorder. This technique also elicits abnormal patterns in a high percentage of psychiatric patients who give a history of dyscontrol behavior. It induces abnormal EES' patterns in only 15% of individuals who have no history of epilepsy, neurologic disease, or behavioral abnormalities. Its value then is to decrease significantly the "false negative" EEGs while not increasing excessively the "false positives" (3).

A systematic scoring of dyscontrol behavior was devised by Plutchik (6) on the basis of the monograph on the episodic behavioral disorders (3). This dyscontrol scale showed mean scores higher than 20 in epileptics, violent self-referred patients, male and female prisoners. The 18 item self-rating scale was graded on the basis of never (0), rarely (1), sometimes (2), often (3), and included the following statements:

1. I have acted on a whim or impulse.

2. I have had sudden changes in my moods.

3. I have had the experience of feeling confused even in a familiar place.

4. I do not feel totally responsible for what I do.

5. I have lost control of myself even though I did not want to.

6. I have been surprised by my actions.

7. I have lost control of myself and hurt other people.

8. My speech has been slurred.

9. I have had "blackouts".

10. I have become wild and uncontrollable after one or two drinks.

11. I have become so angry that I smashed things.

12. I have frightened other people with my temper.

13. I have "come to" without knowing where I was or how I got there.

14. I have had indescribable frightening feelings.

15. I have been so tense I would like to scream.

16. I have had the impulse to kill myself.

17. I have been angry enough to kill somebody.

18. I have physically attacked and hurt another person.

Utilizing these two dimensions, that is the activated delta-theta activity on the electroencephalogram as a measure of central nervous system instability and the self-rating scales as a measure of dyscontrol behavior, we devised a 2 x 2 matrix for classifying the 93 recidivist aggressors. Figure 2 represents this matrix listing the distinguishing characteristics for epileptoid dyscontrol and hysteroid dyscontrol as presented in the original monograph on the episodic behavioral disorders (3). In an unselected sample, group 4 would represent the total range of non-episodic pathology and also include normal individuals. With regard to group 3 no prediction was made in the original monograph as to the behavioral characteristics of this group except that it could represent those group 4 subjects who showed "false-positive" electroencephalograms.

Table 1 lists the offenses for which the subjects were currently incarcerated. The mean number of incarcerations for this population was 4.2; 40% had spent more than 5 years in other correctional facilities before their current incarceration and the average current incarceration was 5.5 years. Table 2 lists other demographic characteristics of the sample and Table 3 gives the psychiatric diagnosis for this group. In this summary neither table needs comment except that it should be noted individuals with overt psychosis or serious

DELTA-THETA

DYSCONTROL SCALE	HIGH	LOW
HIGH	1. "EPILEPTOID" DYSCONTROL Confusion and partial amnesia Accepts responsibility Diffuse affects Undisguised goals Uncoordinated or indiscriminate action "Alloplastic readiness" No premeditation Tension release or direct gratification Projective tests do not indicate impulsivity	2. "HYSTEROID" DYSCONTROL Clear sensorium-complete amnesia Denies responsibility Discrete affects Disguised symbolic goals Sophisticated action Normally inhibited action Premeditation: Conscious or unconscious Indirect or symbolic gratification Projective tests indicate impulsivity
LOW	3. "False Positives" in non-episodic conditions or normals	4. Non-episodic conditions or normals

FIGURE 2

PREDICTED CHARACTERISTICS IN FOUR GROUPS OF EPISODIC DISORDERS

TABLE 1

CRIMINAL OFFENSES
N = 92

Murder, Assault to	6
Rape	10
Rape, Attempted	2
Rape, Assault to	1
Carnal Knowledge	1
Carnally Know, Assault to	2
Indecent Exposure	1
Perverted Practice	9
Assault on Child	1
Assault and Battery	4
Assault	3
Narcotics Law	1
Abduction	1
Robbery	5
Robbery with a deadly weapon	20
Robbery, Assault to	3
Explosives Violation	1
Arson	4
Burglary	7
Breaking and Entering	3
Housebreaking	2
Storehouse Breaking	2
Rogue and Vagabond	1
Larceny, Grand	1
Larceny, Auto (unauthorized use)	1

TABLE 2

DEMOGRAPHIC DATA

AGE:	N = 93
19-24	34.4%
25-34	45.2
35-44	16.3
45-54	4.4
SEX:	
Male	100.0%
MARITAL STATUS:	
Single	68.8%
Married	12.9
Separated	12.9
Divorced	5.4
RACE:	
White	62.4%
Black	36.6
Other	1.1
EDUCATION:	
College Grad.	1.1%
High School Grad.	3.2
10-11 yrs.	12.9
7-9 yrs.	45.2
Less than 7 yrs.	36.6
Uncoded	1.1
OCCUPATION:	
Minor Executive	2.2%
Clerk, Technician	3.3
Skilled Manual	6.5
Semi-skilled Employee	21.7
Unskilled Employee	55.4
Not Working	7.6
Uncoded	3.3
Missing	1.1

TABLE 3

DIAGNOSES OF SUBJECT POPULATION

	NO. OF SUBJECTS*
Mental Retardation	3
Epilepsy	1
Psychoses	1
Neuroses	3
Personality Disorders	
True Personality Disorders	
Paranoid Personality	1
Schizoid Personality	10
Explosive Personality	10
Antisocial Personality	44
Passive-Aggressive Personality	21
Sex Deviations	
Homosexuality	3
Pedophilia	9
Exhibitionism	1
Other Sex Deviation	4
Alcoholism	
Episodic Excessive Drinking	13
Habitual Excessive Drinking	5
Alcohol Addiction	1
Narcotic Drug Dependence	15

*-Some subjects had multiple diagnoses.

medical or neurologic disorders were not confined at the Patuxent Institution. Family, social, and economic data were collected on this population, but there was no significant difference between the subgroups with regard to these factors. The groups appeared relatively homogeneous--that is all our subjects came from extremely deprived social-economic groups with evidence for early childhood parental separation and a history of criminality, mental illness, and alcoholism in siblings and parents. Such a patient sample then would highlight psychiatric and neurologic, rather than socioeconomic variables. Figure 3 represents a scattergram of the 93 "defective delinquents" at the Patuxent Institution as they were placed in this four group matrix.

The data collected on these individuals included the following:

1. Psychiatrist--A psychiatric history and mental status examination as recorded on the current and past psychiatric scale (CAPPS) of Endicott and Spitzer (1); A CAPPS addenda which included a detailed analysis of the dyscontrol acts including prodromal symptoms, affect during the act, motor coordination, memory, and premeditation; a mood and affect scale (4).

2. Group therapist--A rating of treatment behavior by a member of the staff of Patuxent Institution (4).

3. Psychologist--A battery of psychological tests to measure CNS integration, cognitive control, and personality characteristics (4).

4. Neurologist--Neurologic history including birth data, head injury, and central nervous system insult; neurologic examination for congenital stigmata, hyperacusis, photophobia, apraxia, asymmetry of motor strength, gross coordination and proprioceptive sensation (4).

Also included in the data analysis was a global estimation by the neurologist based solely on neurologic data of a possible epileptic "suspect" and a global estimation by the psychiatrist of an epileptoid mechanism behind the dyscontrol behavior based on the phenomenological analysis of epileptoid versus hysteroid types of dyscontrol behavior as outlined in the monograph on episodic behavioral disorders (3). This phenonmenological analysis is summarized in Figure 1.

Figures 4, 5, 6 and 7 show the intergroup differences on this two-dimensional analysis utilizing a one-way analysis of variance with the least significant difference criterion employed for mean group differences. Those items designated by an asterisk represent intergroup

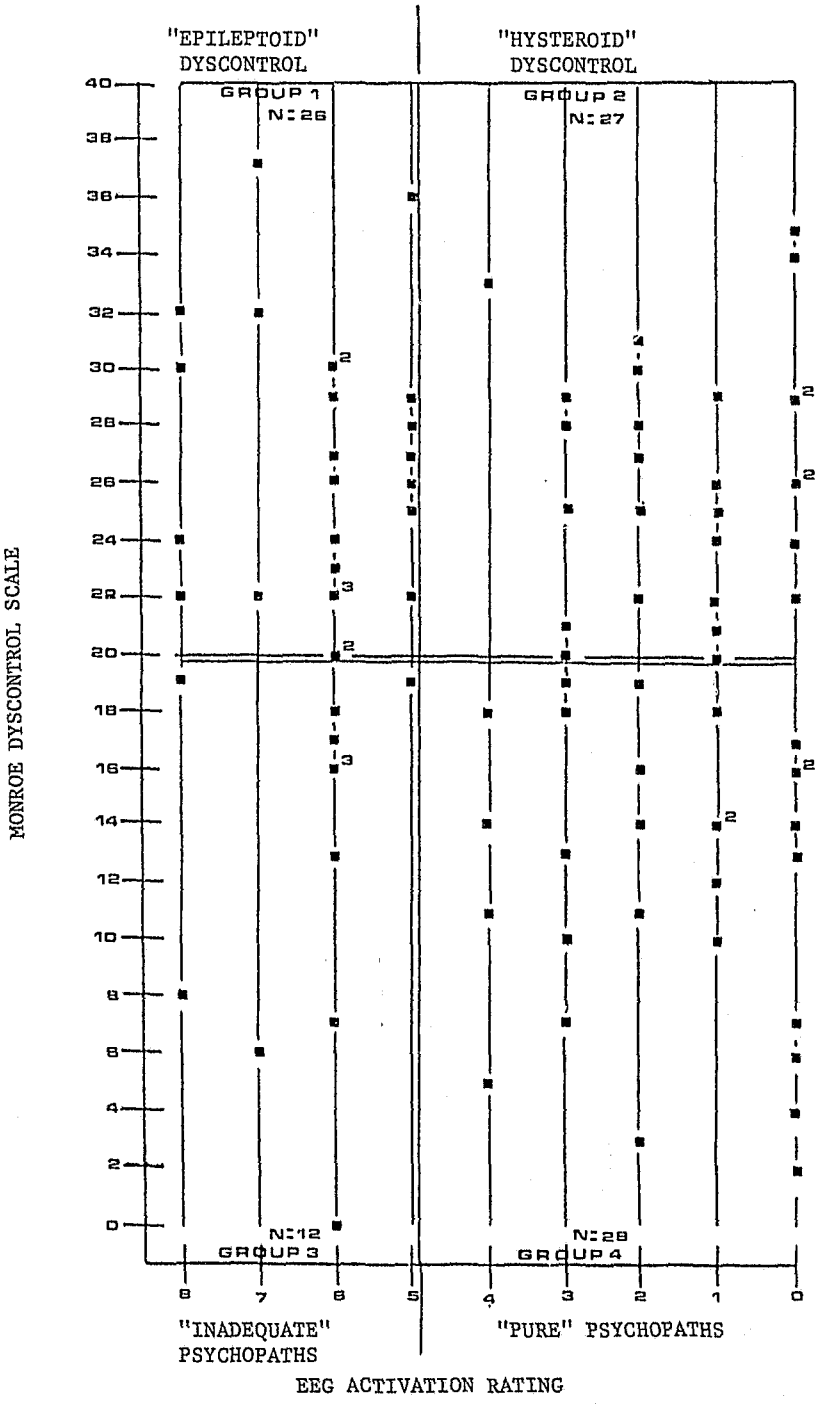
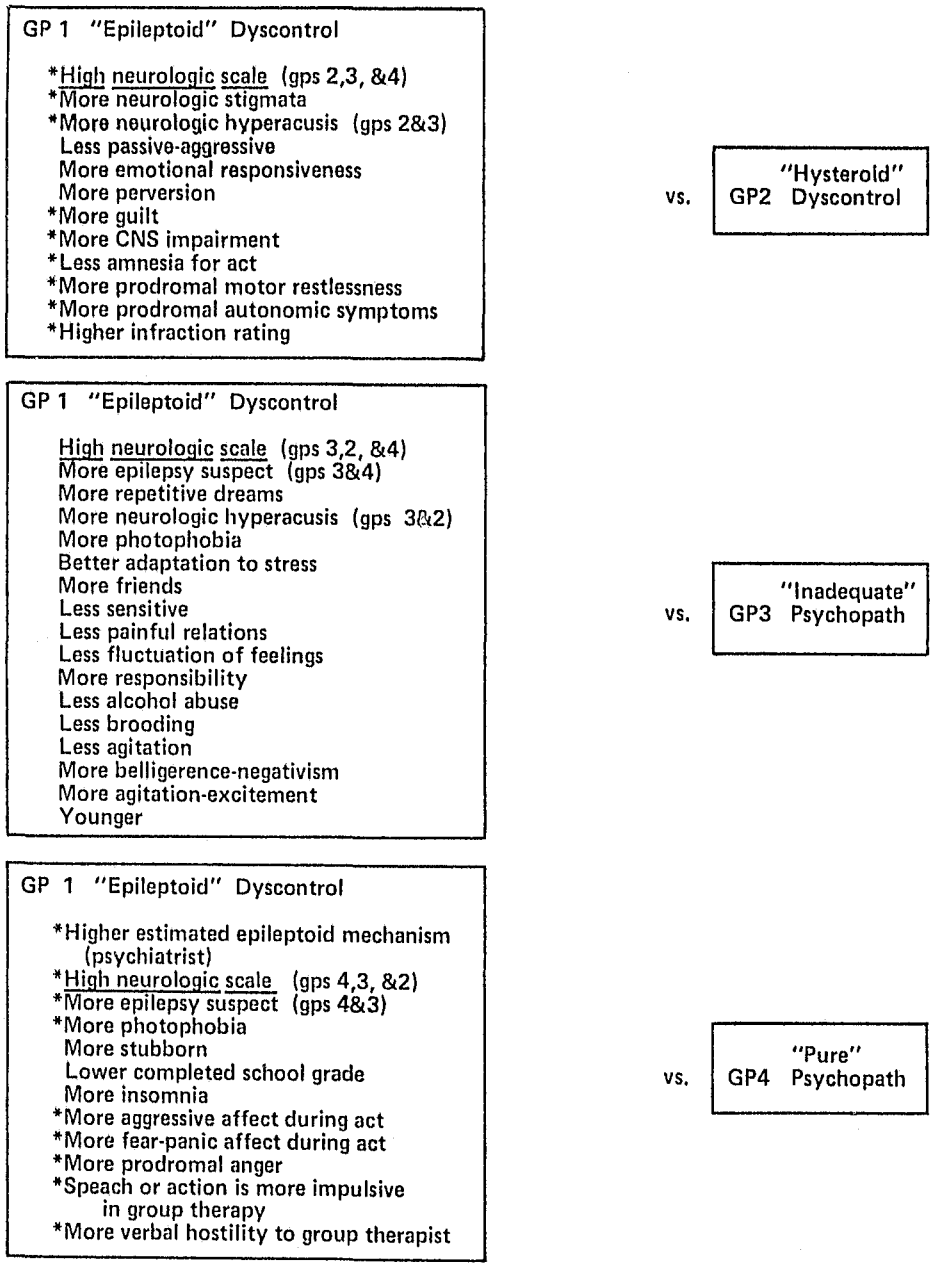
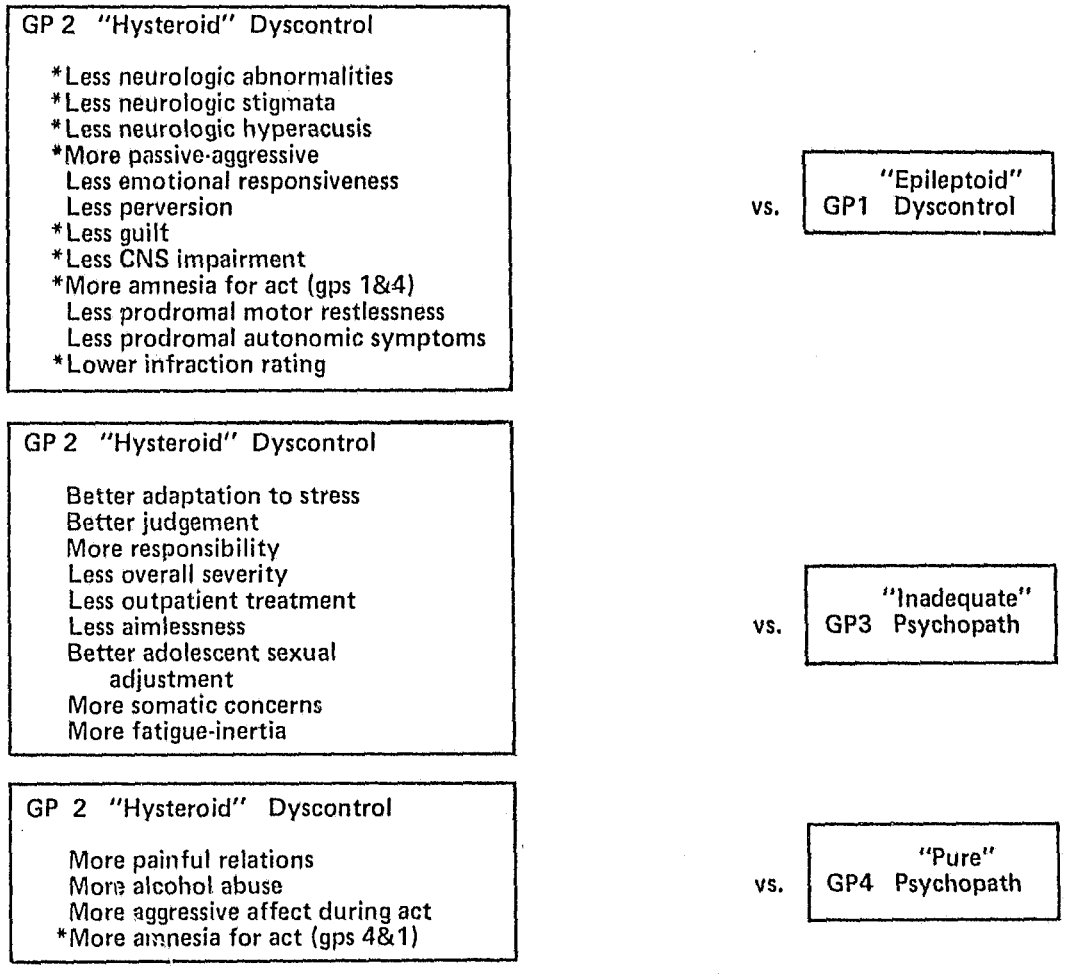


FIGURE 3
SCATTERGRAM OF THE FOUR GROUP SYSTEM



*Predicted in previous study (3). Underlined item differentiates from all other groups.

FIGURE 4
GROUP DIFFERENCES IN "EPILEPTOID" DYSCONTROL



*Predicted in previous study (3).

FIGURE 5
GROUP DIFFERENCES IN "HYSTEROID" DYSCONTROL

GP 3 "Inadequate" Psychopath

Less epilepsy suspect
Less repetitive dreams
Less hyperacusis
Less photophobia
Less neurologic abnormalities
Poorer adult friendship patterns
More sensitive
More painful relations (gps 1&4)
More fluctuation of feelings
More alcohol abuse (gps 1&4)
More brooding
More agitation
Less belligerence-negativism
Less agitation-excitement
Poorer adaptation to stress (gps 1,2, &4)
Greater lack of responsibility (gps 1,2, &4)
Older

vs. GP1 "Epileptoid" Dyscontrol

GP3 "Inadequate" Psychopath

Poorer judgement (gps 2&4)
More overall severity (gps 2&4)
More outpatient treatment (gps 2&4)
More aimless behavior (gps 2&4)
Poorer adolescent sexual adjustment
Less somatic concern
Less fatigue-inertia
More emotional responsiveness
Poorer adaptation to stress (gps 2,1, &4)
Greater lack of responsibility (gps 2,1, &4)

vs. GP2 "Hysteroid" Dyscontrol

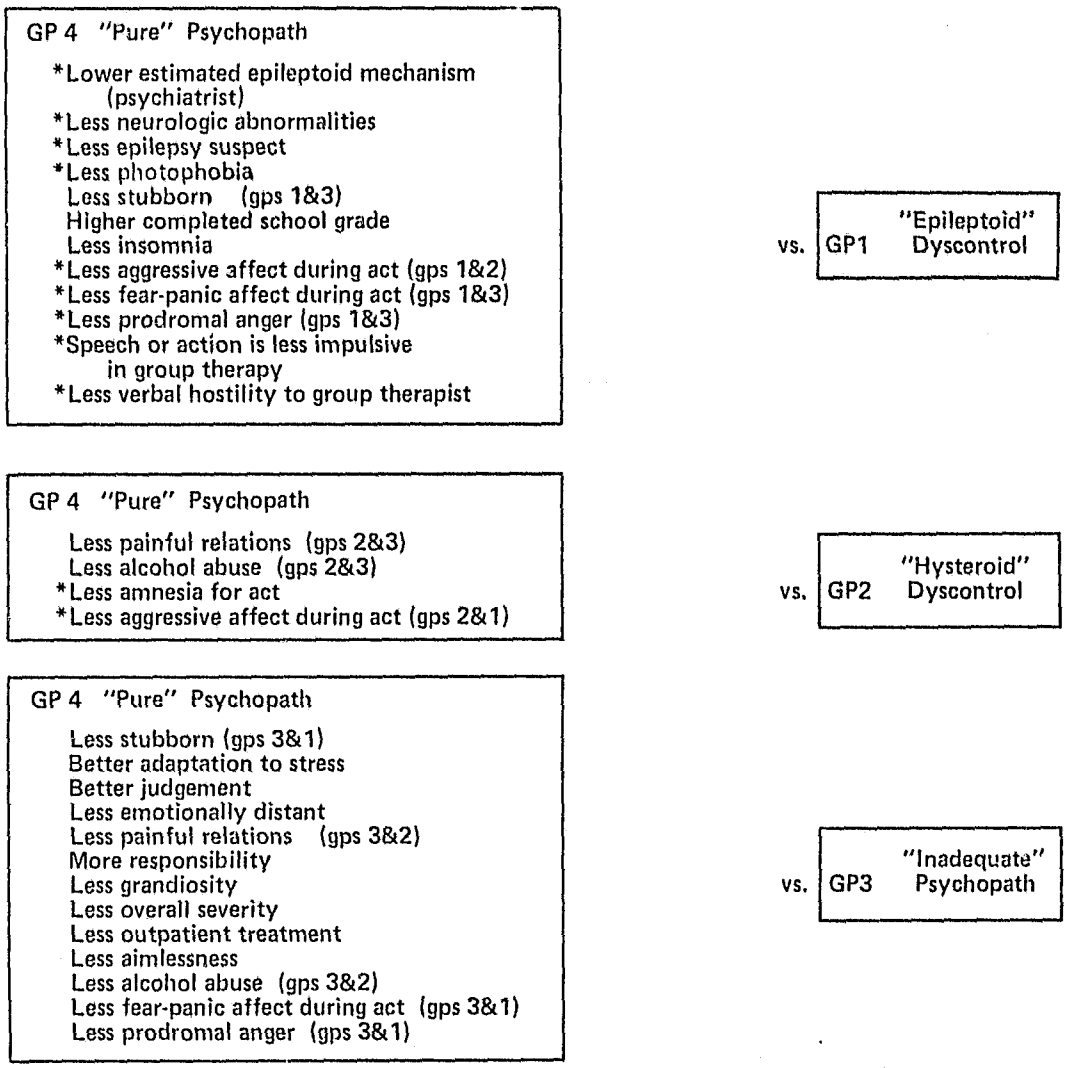
GP3 "Inadequate" Psychopath

More stubborn
Poorer judgement (gps 4&2)
More emotionally distant
More painful relations (gps 4&1)
More grandiosity
More overall severity (gps 4&2)
More outpatient treatment (gps 4&2)
More aimless (gps 4&2)
More alcohol abuse (gps 4&1)
More fear-panic affect during act
More prodromal anger
Poorer adaptation to stress (gps 4,2, &1)
Greater lack of responsibility (gps 4, 2, & 1)

vs. GP4 "Pure" Psychopath

Underlined item differentiates from all other groups.

FIGURE 6
GROUP DIFFERENCES IN "INADEQUATE" PSYCHOPATH



*Predicted in previous study (3).

FIGURE 7
GROUP DIFFERENCES IN "PURE" PSYCHOPATH

TABLE 4

SUMMARY OF 4 GROUP CHARACTERISTICS

	GROUP 1	GROUP 2	GROUP 3	GROUP 4
Suspicion of epilepsy	+			
Neurologic dysfunction	+			
Excessive motor activity	+			
Unrealistic thinking	+			
Sexual aggression	+			
Hostility	+			
Poor academic performance	+			
Passive-aggressive		+		
Amnesia		+		
Less overt guilt		+		
Socially inept			+	
Irresponsible			+	
Poor judgement			+	
Aimless			+	
Poor interpersonal relations			+	
Alcohol abuse			+	
Better abstract thinking				+

Figure 8 shows the mean MMPI Standard Scale Profiles illustrating the parallelism of group 1 and 2 and group 3 and 4 respectively with no differences between 1 versus 2 and 3 versus 4. Thus, the MMPI Profile does not differentiate between those who show activated delta-theta and those who do not, although as reported above the psychiatric data does differentiate between these high and low activated delta-theta groups. However, comparison of the MMPI Profiles for those who show high dyscontrol symptoms (group 1 and 2) versus those who show low dyscontrol symptoms (group 3 and 4) indicates that the tetrad of Pa, Pt, Sc, and Ma are significantly higher and at or in the interpretable range for the dyscontrol group, although both the dyscontrol and the non-dyscontrol groups have very high Pd scores.

Looking at these profiles in more detail, we see that in group 1 and 2 the validity scales reflect the veracity of the individual's self report and a candid admittance to socially unacceptable feelings or behavior. The clinical picture is one of severe problems with impulse control in individuals who, as a group, should be considered extremely dangerous. These individuals lack basic sensitivity to and the ability to empathize with others. Their thinking is quite deviant. As a group they are erratic and unpredictable; quick to explode into verbal rage and/or physical violence. They show the highest level of irritability, restlessness, tension, and negativism. In interpersonal relations, they are likely to be aggressive and provocative leaving others quite uneasy and intimidated. Such individuals are capable of bizarre and heinous crimes of violence.

On the other hand, the group lacking dysncontrol symptoms (group 3 and 4) are more defensive, rigid and less comfortable regarding their impulsive problems. They would be considered immature, irresponsible, childish, demanding and egocentric, as well as emotionally unstable. Their low frustration tolerance leads them to become tense, moody and depressed. Suicide attempts, assaultiveness, aggressive outbursts towards women, and heavy drinking would be prominant in the histories of these men. They would show a poor work adjustment and a lower financial status.*

Summary

The two dimensional classification of aggressive criminals utilizing a measure of central nervous system instability and a self-rating of dyscontrol symptoms seems to have clinical relevance.

*MMPI interpretations were made by Lawrence Donner, Ph.D., Associate Professor of Psychiatry (Psychology), University of Maryland School of Medicine, Baltimore, Maryland 21201.

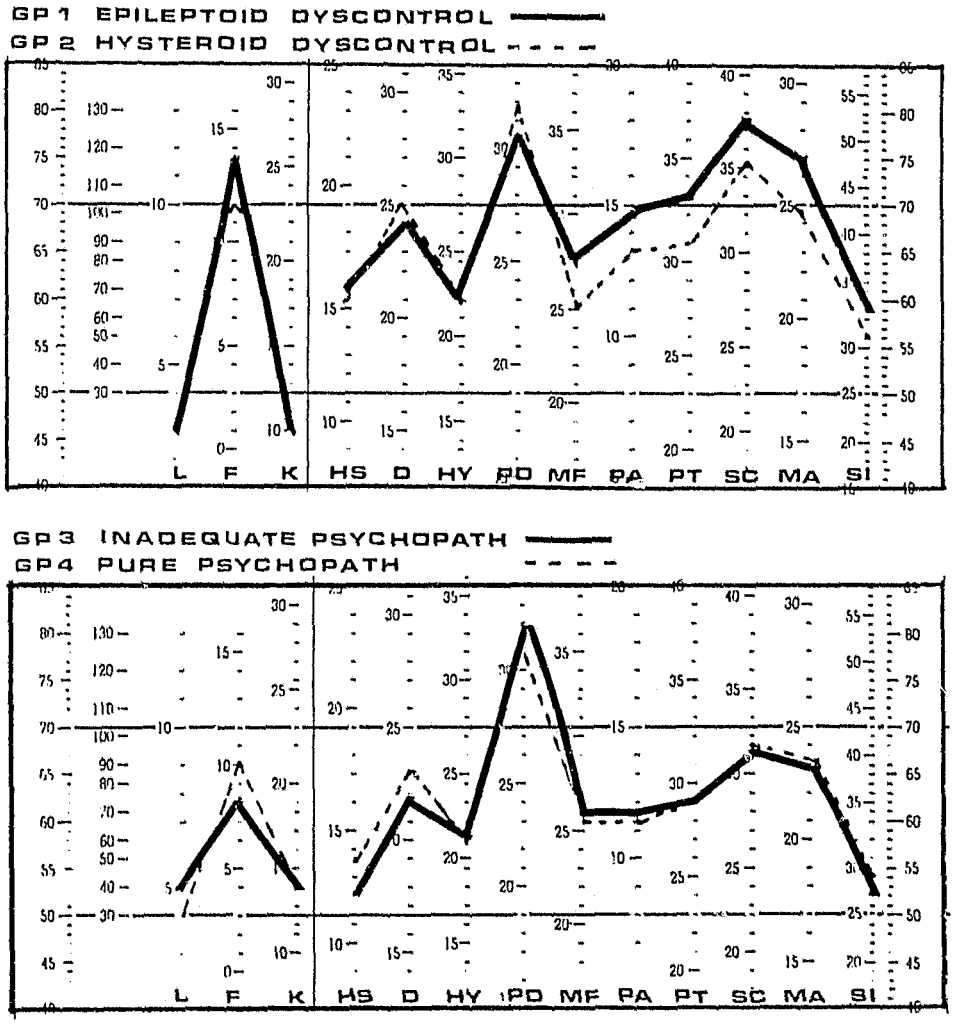


FIGURE 8
MEAN MMPI PROFILE SCALES FOR THE FOUR GROUP SYSTEM

The heuristic value of such a classification depends on the effectiveness of different therapeutic regimens for the four subgroups. For example, group 1 the "epileptoid" dyscontrol group would be expected to respond to anticonvulsant medication if the underlying mechanism is, as hypothesized, a focal limbic system seizure. Clinical anecdotal information supports this view. The results of a more sophisticated double-blind crossover study (4) are more complex and confounded by order effects as well as the fact that a prison environment with strict external controls in itself inhibits dyscontrol behavior. Nevertheless, there was some evidence that the anticonvulsant drug primidone (Mysoline) had positive clinical effects. Many prisoners reported that under the regimen they "thought more clearly." When asked to elaborate, they said that they could reason better by anticipating the future consequences of current behavior. In support of this subjective statement was the fact that the epileptoid group showed a significant improvement on the Porteus Maze Quality Score during the drug regimen when compared to their placebo performance. However, the final test of the validity of this classification in predicting drug response will depend upon studies of individuals who are on parole status.

Assignment to these four groups other than through use of the criterion variables depends upon multiple measures of behavioral performance, particularly: psychiatric history; neurologic history; neurologic examination for soft neurologic signs; behavior of the individuals in the treatment setting; and to a lesser extent psychometric examination. The last point is not surprising in view of the episodic quality of the dyscontrol syndrome. Tests for central nervous system integration and cognitive control can not be done during the dyscontrol act itself, and might well show abnormalities during these episodes that would not be apparent when measured during the inter-episode epoch. However, personality characteristics, particularly as assessed by the MMPI did reveal significant differences particularly when comparing recidivist criminals with dyscontrol symptoms and criminals without such symptoms.

Collaborators in this study included the following faculty of the Department of Psychiatry, University of Maryland School of Medicine: George U. Balis, M. D., J. David Barcik, Ph.D., Barbara Hulfish, M.D., John R. Lion, M.D., Duncan McCullock, E.E., Matthew McDonald, Ph.D., David A. Paskewitz, Ph.D. and Jeffrey S. Rubin, B.A.

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