

DELINQUENCY AND MINIMAL BRAIN DYSFUNCTION: A REPLICATION  
STUDY WITH IMPLICATIONS FOR CRIMINAL JUSTICE

by

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## ABSTRACT

DELINQUENCY AND MINIMAL BRAIN DYSFUNCTION: A REPLICATION  
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The relationship between delinquency and minimal brain dysfunction (MBD) is investigated herein from a criminal justice perspective. Twenty-five male delinquents from Mahoning County, Ohio, are described by their probation officers on a number of behavioral items indicative of MBD. The behavioral items make up the instrument employed--the Behavior Check List--formulated by Robert Lee Johnson, whose methodology is replicated and analyzed. The number of behavioral items applying to each delinquent is then compared with each delinquent's respective number of referrals to juvenile court. In this fashion, the relationship between the degree of the construct of MBD present and the magnitude of delinquent involvement is able to be tested. The Kendall tau statistical test of association revealed a positive and significant correlation between the two variables. It is estimated that 56% of the delinquent sample possess MBD, by virtue of the behavioral signs examined. However, the more blatant forms appear to be almost totally absent from the sample. These results, coupled with the literature, suggest that many delinquents repeatedly go unrecognized as possessing MBD, which may make an individual more prone to being defined as delinquent. This ignorance of MBD is not viewed as intentional, but owed to the status quo. However, such is a sad state of affairs, since

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recognition of the dysfunction is the key to treating those with this malady. Recognition, understanding, and awareness of the dysfunction in its role in delinquent character formation are the focus of this study.

I would like to express my appreciation to Dr. Don Palmer, D.D., Assistant Professor of Criminal Justice, who served as my major advisor throughout the undertaking of this project. I am indebted to him for his guidance and assistance. Also, I would like to thank Dr. John F. Savino, Associate Professor of Criminal Justice, and Dr. Edward J. Roberts, Professor of History, for serving on my thesis committee. Many invaluable suggestions and criticisms were gained by their membership.

Further, I would also like to thank the juvenile justice staff of Hamilton County, Ohio, for their cooperation, especially Mr. Larry F. Elson, Jr. Lastly, I am grateful to my wife, Fel, who typed the many drafts of this manuscript.

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The following tables are included in this report. Table 1 shows the results of the analysis of variance for the stability of scores on the BCL. Table 2 shows the results of the analysis of variance for the stability of scores on the BCL as a function of the number of items. Table 3 shows the correlation of scores on the BCL and the number of referrals.

The correlation between the BCL and the number of referrals was .71. This indicates that the BCL is a valid measure of the number of referrals. The results of the analysis of variance for the stability of scores on the BCL are shown in Table 1. The results of the analysis of variance for the stability of scores on the BCL as a function of the number of items are shown in Table 2.

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<sup>1</sup>James Lee Johnson, "An Investigation of Physical Brain Lesions and Delinquency with Emphasis on the Amygdala," *Psychological Monographs*, Vol. 21, No. 1, 1947, pp. 1-100.

<sup>2</sup>For the reader requiring a definition of the term "analysis of variance" in this report, it is recommended that the reader refer to the *Handbook of Psychology*, Vol. 2, 1951, pp. 1-100.

## CHAPTER 1

## INTRODUCTION

Statement of the Problem

The literature notes that often juvenile delinquency may be owed to a minimal brain dysfunction (MBD). Dr. Sam D. Clements describes the term "minimal brain dysfunction syndrome" as referring

. . . to children of near-average, average, or above average general intelligence with certain learning or behavioral disabilities ranging from mild to severe, which are associated with deviations of function of the central nervous system. Those deviations may manifest themselves by various combinations of impairment in perception, conceptualization, language, memory, and control of attention, impulse, or motor function.<sup>1</sup>

This association between delinquency and MBD can be inferred from the similarities between organic behavior disorders and delinquency, prevalence of MBD among the frequently-arrested socio-economic groups, similar sex ratios in brain-damaged and delinquent groups, and from studies specifically linking the two variables. The latter literature is scant compared to the voluminous literature owing delinquency to environmental factors.

The limited studies that have been done linking minimal brain dysfunction and juvenile delinquency involve the administration of complex testing and the complicated interrelationships among the testing indices.<sup>2</sup> However, the validity and reliability of these complex instru-

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<sup>1</sup>Robert Lee Johnson, "An Investigation of Minimal Brain Damage and Delinquency with Implications for Counseling" (Unpublished Ph.D dissertation, University of Oregon, 1972), p. 2, quoting Sam D. Clements, Minimal Brain Dysfunction in Children (Washington, D. C.: Department of Health, Education, and Welfare, 1966).

<sup>2</sup>For the reader requiring a definition of the term juvenile delinquency in this paper, it is synonymous with that used in Sections 2151.01 to 2151.54, inclusive, of the Ohio Revised Code.

ments can be questionable. For example, S. Dale Loomis said the following in questioning the validity of the well-known psychological tests used as indices for assessing MBD, such as the Bender Gestalt Test: "If the tests in general are unsuccessful in detecting the grosser forms of brain damage, it is probably not realistic to expect them to be sensitive to the more esoteric forms of brain dysfunction."<sup>3</sup>

Moreover, several such instruments used in the studies cannot be administered by the probation officer. This is unfortunate, since the probation officer knows more about the delinquent, whom he sees on a regular basis, than the medical or psychological practitioners, who has probably never seen the child before test administration. Moreover, the expense involved in many diagnostic procedures for MBD is exorbitant for the majority of existing juvenile justice systems.

Many of the studies are poorly structured, and thus, lack methodological expertise. Other studies, which are seemingly methodologically sound, are never replicated or critically analyzed to further prove their value. Too, a comprehensive review of recent literature on the relationship between MBD and delinquency is needed in this area of investigation.

The studies reviewed involve the disciplines of medicine, psychology, and education. Thus, a criminal justice perspective is lacking in the investigation of the relationship between MBD and delinquency.

Most important, however, is that the present literature, with one significant exception, fails to address the magnitude of delinquency with minimal brain damage. The studies do not make the distinction between first offenders and recidivists. Both categories are lumped into the

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<sup>3</sup>S. Dale Loomis, et al, "Prediction of Abnormalities in Adolescent Male Delinquents," Archives of General Psychiatry, XVIII (1967), 496-497.



same grouping of "delinquency." It can hardly be contended that the first offender and the recidivist pose the same requirements upon the criminal justice system or that they constitute the same anti-social type. In short, MBD should be assessed in light of the magnitude of a delinquent's career.

### The Present Study

In an effort to fill in these voids in the literature, the present paper was undertaken. To accomplish this task, I have chosen to replicate, in part, a methodological design. I feel that addressing an extant relevant methodology, especially in terms of the validity and reliability of the instrument used, is making a greater contribution to the field than initiating a methodology, given my limited resources and time.

The methodological design of Robert Lee Johnson was considered relevant and practical for replication for a number of reasons. Firstly, his instrument to assess MBD, based on behavioral patterns, can be practically utilized by the probation officer. Secondly, he proved his instrument to be valid and reliable for assessing MBD with the employment of control groups. Lastly, he specifically recognized and addressed the relationship between the magnitude of delinquency and minimal brain damage.

However, the methodological design, as well as the entire original work, was critically analyzed, for reasons stated in the next section. Further, a comprehensive updating of existing literature was conducted.

In accord with replication, Johnson's secondary hypothesis is retested herein. Essentially, the hypothesis postulates an association between the magnitude of delinquent involvement and the sheer frequency of behavioral signs of minimal brain damage. The former is measured by the number of referrals to juvenile court, whereas the latter is measured by the total score on the instrument employed--the Behavior Check List, which is an indice of MBD. Specifically, his hypothesis reads: "The magnitude of delinquent involvement is positively correlated with the number of behavioral signs of MBD manifested."<sup>4</sup>

#### Importance of the Study

Replication has largely been ignored and often looked down upon in many of the major disciplines. I am in disagreement with this status of replication and agree with Bauernfeind who called replication "the cornerstone of scientific validity."<sup>5</sup> Perhaps, if replication had been conducted more often in the past, MBD might today be recognized as a possible contributing factor in delinquency formation.

However, replication alone is not sufficient. A critical analysis of the original work is mandated to discover possible sources of error. If analysis were omitted from the replication, errors would go undiscovered. At the least, an analysis can present errors, if practical concerns prevent their correction. Therefore, replication with a critical analysis will aid future investigators looking at the same area of study.

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<sup>4</sup>Johnson, p. 40.

<sup>5</sup>Walter R. Borg and Meredith D. Gall, Educational Research - An Introduction (New York: David McKay Company, Inc., 1974), p. 290, quoting Robert H. Bauernfeind, "The Need for Replication in Educational Research," Phi Delta Kappan, L (1968), 126-128.

Secondly, this thesis hopes to augment the scant literature available from a criminal justice perspective. To date, a criminal justice perspective is lacking in the area of study that will ultimately affect the criminal justice system.

Lastly, the reassessment herein is a stringent test of the theoretical association between MBD and delinquency. If delinquency represents an "acting out" behavior as a result of the presence of MBD, it is, I believe, plausible to assume, as Johnson did, that the greater degree of minimal brain dysfunction, the greater number of delinquent acts will result. However, research cannot be based solely on plausible assumptions, since statistically significant findings are mandated. To the latter base, this research is focused.

## CHAPTER 2

## REVIEW OF THE LITERATURE

The possible relationship between MBD and delinquency is not a familiar relationship to the average reader. Therefore, before reviewing the studies which directly support and which directly deny such a relationship, relevant background information is presented. This investigator believes that this introductory material will give the reader a better insight into the possible relationship and, therefore, into the research conducted herein.

Delinquency and Environment

Delinquency has been associated with a number of factors. These factors, notably, include: social status, poverty, self-concept, mother's employment outside the home, broken home, etc.<sup>6</sup> However, what all these associations have failed to take into account is that some delinquency may be owed to minimal brain dysfunction.

This is not to say that environmental factors do not influence a child in becoming delinquent. Admittedly, the environmental response to the dysfunction contributes to the delinquent behavior formation. However, it can be postulated that without the dysfunction, social control agents would not react to the individual's unusual behavior, as being defiant, deviant, incorrigible, no good, etc., and no delinquent behavior would result. Several investigators postulate that MBD might make an individual more prone to be defined as delinquent (See literature review below). In

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<sup>6</sup>Travis Hirschi and Hanan C. Selvin, Principles of Survey Analysis (New York: The Free Press, 1973), p. 24.

short, the delinquency may be owed to MBD. Societal reactions to behavior can apply to any legally or socially defined behavior. Suffice it to say here that the present investigator is aware of such relationships and questions the fundamental assumptions upon which definitions of criminal and delinquent behavior are based. However, no matter how one views delinquent behavior, (positivists v. relativists), it remains that these delinquents possessing MBD must be recognized.

In other words, it matters little if we view the delinquent behavior of the MBD child as a result of a societal reaction or as a result of an "inborn criminality" or both. However, we must recognize that these delinquents possess the dysfunction. For recognition will lead, hopefully, to a different societal reaction; that is, the medical model will replace the incorrigibility label. As a result, those possessing the dysfunction will no longer be among the delinquent ranks.

#### A Theoretical Relationship

Many theories have been postulated linking brain involvement with behavior. The majority of these theories link specific areas of the brain with specific behaviors. For example, the temporal lobe has been implicated in aggressive behavior. Further, the preponderance of these theories are highly technical in nature and would mean little to the non-medical practitioner. Such discussions would add little to this review, and are, therefore, not included.

However, the postulates formulated by Serafetindes, noted in the work of Kohen-Raz and Assael, are non-technical in nature and advance how such a relationship between MBD and delinquency may exist. Serafetindes points out that the

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. . . brain pathology seems to be prone to determine antisocial and delinquent behavior as follows: (a) The emotional tension, generated by the brain dysfunction, leads to outbursts of rage and aggression. (b) As the function of language, memory, and learning are located in this area of the brain, they are likely to be impaired, and they seriously handicap the social and intellectual adaptation. (c) Social agents tend to react in a hostile way to the above mentioned negative manifestations of behavior and drive the child into marginal positions, opening the way to delinquent character formation.<sup>7</sup>

### Minimal Brain Dysfunction

Minimal brain dysfunction (MBD) refers to a latent form of brain dysfunction. By definition, it excludes the grosser forms of brain damage, resulting in intellectual deterioration or mental retardation, hence the prefix "minimal." In short, individuals with MBD are representative of the complete range of intelligence quotients, although usually normal, and their malady is not readily apparent to the average person.<sup>8</sup>

MBD may be owed to a number of factors. It may result from various forms of brain injury and brain damage owed to chromosomal disorders, inborn errors of metabolism, and vitamin and nutrition deficiencies. However, actual damage to the brain does not have to occur. According to Pontius, "Maturational lag of the frontal lobe functioning might be the basis of some type of minimal brain dysfunction in children."<sup>9</sup>

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<sup>7</sup>R. Kohen-Raz and M. Assael, "EEG and Rorschach Findings in a Group of Juvenile Delinquents Suspect of Organic Brain Disorder," ACTA Paedopsychiatry, XXXIII (1966), 256-257, quoting E. A. Serafetindes, "Aggressiveness in temporal lobe epileptics and its relation to cerebral dysfunction and environmental factors," Epilepsia, VI (1965), 33-42.

<sup>8</sup>Lester Tarnopol, "Delinquency and Minimal Brain Dysfunction," Journal of Learning Disabilities, III (1970), 22.

<sup>9</sup>Anneliese A. Pontius, "Neurological Aspects in Some Types of Delinquency especially among Juveniles: Toward a Neurological Model of Ethical Action," Adolescence, VII (1972), 292.

Minimal brain dysfunction is often used, more or less, interchangeably with a number of terms. Among the more prominent include such terms as: organic brain damage, minimal brain damage, minimal brain disorder, organic brain syndrome, brain damage, organic brain dysfunction, neurological impairment, post-encephalitic disorder, and cerebral dysrhythmia. Since each author has his own terminology preference, and, in the interest of variety, several of these terms will be used in this review. However, technically, MBD encompasses all of these terms, since, according to Lester Tarnopol, it refers to: "damage as well as genetic, developmental, or other deviations of function."<sup>10</sup>

#### Evidence for an Association

A relationship between minimal brain dysfunction and delinquency is suggested by a number of facts found in the literature. Although these facts cannot be considered as conclusive evidence, they lend credence to a possible relationship between MBD and delinquency.

It is well known that often behavior disorders are owed to a minimal brain dysfunction. Such a relationship is documented fully elsewhere and need not be repeated here.<sup>11</sup> However, the similarity of symptoms between many behavior disorders and juvenile delinquency suggests that the same contributing factor may be involved--namely, minimal brain dysfunction. As Sol Levy so succinctly states:

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<sup>10</sup>Tarnopol, p. 201.

<sup>11</sup>Johnson, pp. 7-23.



in these days with behavior disorders and juvenile delinquency on the rampage, it seems a great tragedy to adhere too stubbornly to a unilateral attitude regarding the concept of these conditions. It is felt that a great many cases labeled as behavior disorders and juvenile delinquency are caused by an unrecognized brain disorder, . . . .<sup>12</sup>

Recent studies, notably Lester Tarnopol's, have shown that individuals of lower socio-economic groups have a greater proportion of disturbances of perception, information processing, and other psychophysiological disorders than comparison groups in the middle and upper socio-economic groups.<sup>13</sup> Many of these disturbances can be owed to minimal brain dysfunction. The statistics from these studies are in agreement with statistics indicating that high percentages of adult and juvenile delinquents come from the lower socio-economic groups.<sup>14</sup>

In addition, the sex-ratio statistics further support such an association. Clements reported ratios of six to one and ten to one in the incidence of brain damage among males as compared to females. Similarly, there is a preponderance of males in the juvenile delinquent population.<sup>15</sup>

Lastly, selected case histories support the association between minimal brain dysfunction and delinquency. Upon identification and treatment of the minimal brain dysfunction, the delinquent terminates

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<sup>12</sup>S. Levy, "Juvenile Delinquency - Are we Ignoring Important Causative Factors in our Present-day Etiological Approach? Lex et Scientia, IV (1967), 85-86.

<sup>13</sup>Tarnopol, pp. 200-207.

<sup>14</sup>Allan Berman, "Neurological Dysfunction in Juvenile Delinquents," Child Care Quarterly, I (Summer, 1972), 265.

<sup>15</sup>Robert E. Keldgord, "Brain Damage and Delinquency: A Question and a Challenge," CPPCA Journal, VI (1969), 8.

the delinquent activities.<sup>16</sup> Typically, however, the delinquent with MBD goes unrecognized.

### Delinquency and Minimal Brain Dysfunction

The minimally brain-dysfunctioned child, who ends up being defined as delinquent, experiences a set of events similar to all MBD delinquent children. The following few paragraphs describe how the typically unrecognized MBD child may end up being defined as delinquent.

Because of their disability, they possess: poor perceptual-motor functioning; poor ability for abstraction and memorization; reading difficulties; language difficulties, especially in self-expression; short attention span; and poor impulse control. These disabilities usually become apparent to the child upon entering school, where the child's abilities are tested. Inability to perform like other children leads to frustration and failure, which in turn, leads to behavior which represents an acting out of this frustration and failure, such as disruptive and aggressive acts, depression, and truancy. Such acting out behavior is a defense mechanism of the individual. As noted in the work of R. Kohen-Raz and Marcel Assael: ". . . discreet and subclinical organic lesions in the CNS central nervous system might be among the antecedents of certain types of delinquent acting out, which is triggered off and reinforced by adverse environmental circumstances."<sup>17</sup>

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<sup>16</sup>Sol Levy, "Post-Encephalitic Behavior Disorder - A Forgotten Entity: A Report of 100 Cases," American Journal of Psychiatry, CXV (1959), 86-99. An excellent case history from Levy's work is quoted, in part, in the last chapter of this thesis. Note, also, that the statement preceding this note assumes that the treatment scheme is effective.

<sup>17</sup>Kohen-Raz and Assael, p. 252.

Ultimately, the child enters the juvenile justice system, and depending on the degree of "not wanting to change" labeled on the child, he is either placed on probation or is sent to an institution. Regardless of the disposition, further demands are put on the child to regulate his own behavior, over which he has little control. Such demands lead to emotional disorders, in addition to the unrecognized neurological and perceptual roots. Thus, the delinquent, showing the combined symptomatology, is usually referred to as "incurable."<sup>18</sup>

In short, ". . . failure to recognize significant disabilities of the MBD child early in a child's school career," Berman notes, "sets into motion a devastating series of events that, for a large number of unfortunates, ends up in a reformatory or a juvenile court."<sup>19</sup>

The MBD delinquents constitute a fairly recognizable group. It is ironic that large numbers ultimately go unrecognized as incurable. However, two authors of delinquent typologies, notably Dr. P. Katz and K. R. H. Wardrop, have acknowledged that MBD does indeed set this type of delinquency apart. In describing the organic group, Wardrop wrote:

The organic group is not confined to any one socio-economic level, and the pattern may be observed in all classes of the population. The offense behavior tends to be aggressive rather than acquisitive, sometimes involving deviant sex behavior. The interactional setting depends on the social class background, but there is generally no persistent interaction with a delinquent subculture, nor is there a self-image of criminality. Their poor capacity for abstract thinking tends in any case to make the self-

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<sup>18</sup>Berman, Neurological Dysfunction, p. 262.

<sup>19</sup>Allan Berman, "Delinquents are Disabled," in Youth in Trouble, ed. Betty Lou Kratoville (San Rafael: Academic Therapy Publications, 1974), p. 41.

image a rather vague one. Some cases, however, particularly where there is much family tension, tend increasingly to become identified with a delinquent culture.<sup>20</sup>

Interestingly enough, Wardrop sought to include the organic group among his other types: the grossly deprived delinquent, emotionally disturbed delinquent, family-problem delinquent, and the situational delinquent--all "environmental" groupings.<sup>21</sup>

Katz owed delinquency to environmental factors, psychiatric syndromes, conscience structures, and "factors concerning the brain and the way it functions."<sup>22</sup> Although less specific than Wardrop, his typology addressed the fact that much delinquency is owed to MBD, unlike the hundreds of other delinquent typologies extant, which ignore such a relationship.

#### Indices of MBD

In very few cases can a diagnosis of MBD be easily established. In most cases MBD can only be inferred from one or more measuring indices. In the literature reviewed below, the commonly-used measuring indices are physical examinations, medical histories, social histories (noting behavior patterns), discrepancies between verbal and performance intelligence quotients, psychological testing, neurological examinations, electroencephalogram (EEG) patterns, and psychiatric examinations with assessments of mental status. Usually, a diagnosis is made from a combined use of several selected indices. There is no agreement as to what is the

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<sup>20</sup>K. R. Wardrop, "Delinquent Teenage Type," British Journal of Criminology, VII (1967), p. 374.

<sup>21</sup>Ibid., pp. 373-380.

<sup>22</sup>P. Katz, "Patterns in the Development of Juvenile Delinquency," Corrective Psychiatry and Journal of Social Therapy, XVIII (1972), 10-18.

best indice of MBD. Thus, each investigator looking for a relationship between MBD and delinquency usually employs the indices within his own expertise.

### Literature Reviewed

#### Delinquents compared to a Standardized Population

Allan Berman's project, funded under LEAA, administered the Halstead-Reitan (H-R) neuro-psychological assessment to a random selection of thirty boys destined for the Rhode Island Training School for Boys. The findings revealed that 57% of the young delinquents had disturbances in their functioning that were associated with various types of neurological disorders.<sup>23</sup>

"This finding, in itself," declares Berman, "supports the work of other researchers such as Mark and Ervin (1970), who have evidence that 'hidden' neurological disorders may be responsible for aggressive and violent behavior outbursts."<sup>24</sup> Further, D. H. Stott notes that signs of neurological impairment, not taken into account in the matching of the well-known Cambridge Summerville Youth Study sample, (McCord and McCord, 1959), were significantly more frequent among the delinquents.<sup>25</sup>

Berman notes that the specific deficits these juvenile delinquents were suffering from are similar to those of the learning disabled. He postulates that these two groups are not basically different. However, those getting the learning disability label are exposed to less frustra-

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<sup>23</sup> Berman, A Neurological, p. 266.

<sup>24</sup> Ibid., p. 267.

<sup>25</sup> D. H. Stott, "Congenital Indicators in Delinquency," Proceedings of the Royal Society of Medicine, LVIII (1965), 703.



tion and failure in school. The fact that truancy is in the history of most delinquents lends further support to such a premise.<sup>26</sup>

In evaluating a control group of youngsters, matched with the delinquents for similar backgrounds, Berman's initial findings on about half the control group indicate that the percentage of disabilities will run about 20%. This compares with a 70% figure for the delinquent population, when randomness is not controlled for. The percentage distribution of delinquent disabilities was listed as follows: visual-perceptual or visual-motor disability (55%), perceptual-motor disability other than visual (31%), impaired non-verbal concept formation (31%), auditory discrimination or memory disability (30%), and impaired kinesthetic feedback (28%).<sup>27</sup>

In connection with the noteworthy Delinquency Control Project, Tarnopol investigated the relationship between MBD and delinquency. He hypothesized that ". . . the delinquent school dropout population from minority group ghettos should contain a greater percentage of children with MBD than the total population."<sup>28</sup>

Evidence for such a hypothesis comes from studies which have found the minority population to have a greater incidence of complications in pregnancy, little if any prenatal care, and premature births. Undoubtedly, a certain fraction of these children will be suffering from MBD, as a result of brain damage occurring in the early stages of life.<sup>29</sup>

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<sup>26</sup> Berman, A Neurological, p. 267.

<sup>27</sup> Note, quite obviously, that overlapping occurs among the percentages. See Berman, Delinquents, p. 41.

<sup>28</sup> Tarnopol, p. 201.

<sup>29</sup> Ibid.

However, Sheldon Litt found that ". . . perinatal complications considered in isolation are not a major etiological factor in general criminal behavior."<sup>30</sup>

The population of Tarnopol's study was composed of 102 male, non-white delinquents, ages ranging between 16 and 23. Subjects were administered the Weschsler Adult Intelligence Scale (WAIS), the Bender Visual Motor Gestalt Test, Oseretsky Test of Motor Proficiency (all psychologicals suggestive of MBD) and the Gates Test of Reading for General Significance, in addition to a comprehensive physical examination.<sup>31</sup>

In one-third of the subjects, neurological impairment was inferred on the basis of untreated chronic medical conditions and dietary deficiencies.<sup>32</sup> This finding is in agreement with a study by Stott, who found that 47% of his delinquent population had been unhealthy during the first 12 months of life as opposed to 37.6% of his control population.<sup>33</sup>

Of the 85 subjects who took the Bender Gestalt Test, only one-third had normal Benders, compared with 85% in the total population. The Oseretsky Test correlated with the Bender, indicating that the functioning problem was one of a visual motor integration or motor coordination.<sup>34</sup>

IQ score findings further supported Tarnopol's contention. Of the 84 subjects tested with the WAIS, 30 had large discrepancies between

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<sup>30</sup>Sheldon Litt, "A Study of Perinatal Complications As a Factor in Criminal Behavior," Criminology, XII (1974), 126.

<sup>31</sup>Tarnopol, pp. 201-205.

<sup>32</sup>Ibid., pp. 204-205.

<sup>33</sup>Stott, p. 703.

<sup>34</sup>Tarnopol, pp. 204-205.



verbal and performance IQ scores, highly suggestive of the presence of MBD.<sup>35</sup> This is in agreement with Camp, who carried out a study at the Colorado Children's Diagnostic Center. There, she found that performance IQ scores were greater than verbal IQ scores in the delinquent population more than in the standardized population.<sup>36</sup>

Reading scores followed the trend of support. It was found that 58% of the total group would be considered functionally illiterate by a sixth grade reading level, yet the mean grade attained equalled 10.5.<sup>37</sup> It cannot be contested that there is a high association between reading difficulties and MBD.

R. Sessions Hodge and his associates, early investigators of the relationship between MBD and delinquency, using the EEG and a psycho-social appraisal as indices of MBD, studied one hundred successive admissions to the Kingswood Classifying School. Subjects included only male delinquents, whose ages ranged from 10 to 17 years ( $\bar{X} = 14.3$ ,  $s = 2.6$ ), the majority of whom were not first offenders. The EEG studies were done "blind" and then compared with EEG patterns of the standardized population. The psycho-social appraisal was based on an estimate of 19 characters, each on a 3-point scale.<sup>38</sup>

Of the 100 EEG records taken, only 16 were found in the "normal" category. On a 1 to 3 scale of abnormality, with 3 representing gross

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<sup>35</sup>Ibid., pp. 203-206.

<sup>36</sup>Bonnie Webb Camp, "WISC Performance in Acting-out and Delinquent Children with and without EEG abnormality," Journal of Consulting Psychology, XXX (1966), 353.

<sup>37</sup>Tarnopol, p. 205.

<sup>38</sup>R. Sessions Hodge, et al, "Juvenile Delinquency: An Electrophysiological, Psychological and Social Study," British Journal of Delinquency, III (1953), 156-158.

abnormality, 40 were in Grade 1, 39 in Grade 2, and 5 delinquents were found in Grade 3. Using similar criteria, less than 5% of the EEG records from a standardized juvenile population were classified as abnormal.<sup>39</sup>

On the psycho-social appraisal, all 19 of those judged immature psychologically were also immature by EEG standards, although 10 of the 23 considered psychologically mature were assessed as immature on the EEG's. Further, there was no significant positive association between the psycho-social measures and any particular wave pattern on the EEG.<sup>40</sup>

By contrast, S. Dale Loomis and his colleagues found that abnormal EEG patterns were not more common in the delinquent population and suggested that ". . . undue emphasis has been placed on the role of such pathology in this behavior."<sup>41</sup>

Loomis and his colleagues studied 150 male subjects from a juvenile institution, ages ranging from 11 to 19 years. One hundred of these subjects were chosen at random, while fifty subjects suspected of abnormal EEG's were referred by the staff. Both sleep and awake EEG's were taken on the two groups. Thirty percent of the total subjects demonstrated abnormal EEG tracings, 44% and 23% from the referral and random group, respectively. Fourteen and six per second positive spikes were by far the most frequent abnormal EEG patterns.<sup>42</sup> Such patterns, which

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<sup>39</sup>Ibid., p. 163.

<sup>40</sup>Ibid., pp. 161-162.

<sup>41</sup>S. Dale Loomis, et al, "EEG Abnormalities as a Correlate of Behavior in Adolescent Male Delinquents," American Journal of Psychiatry, CXXI (1965), p. 1005.

<sup>42</sup>Ibid., pp. 1003-1006.

also can be described as "convulsive," are associated with minimal brain dysfunction.

Thus, an increased incidence of EEG abnormality was not encountered. However, the increased evidence of EEG abnormality, among a group specifically referred for EEG, indicated that it is apparently possible to select such cases on the basis of abhorrent clinical behavior or unusual history.<sup>43</sup>

Paul N. Graffagnino's investigation, which focused around the study of clinical indicators, is in support of this finding by Loomis. Clinical indicators is a term often used to describe the behavior patterns actually observed by a practitioner, as distinguished from facts derived from social history data or an experimental design. In comparing clinical indicators of MBD and EEG abnormalities, on a group of child psychiatric patients, Graffagnino and his associates found a significant association to exist. The greater number of EEG abnormalities a subject possessed, the greater number of clinical indicators he exhibited. The clinical signs of organicity included a pattern of self-injury, hyperactivity, distractibility, etc., and interestingly enough, "involvement with police or juvenile courts."<sup>44</sup>

Addressing the scarcity of literature on the subject, Loomis, after his initial work, undertook an indepth investigation of EEG abnormalities in delinquent girls. In this study, on the basis of psychological tests and psychiatric evaluation, Loomis attempted to predict EEG

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<sup>43</sup> Ibid.

<sup>44</sup> Paul N. Graffagnino, et al, "An Organic Factor in Patients of a Child Psychiatric Clinic," Journal of the American Academy of Child Psychiatry, VII (1968), 618-638.

abnormalities. One hundred institutionalized delinquent and dependent girls, who constituted over 95% of the institution's population, ages ranging from 13 years, 9 months, to 19 years, 3 months, made up the investigated population. Seventy-two percent of the subjects were referred to the private institution by family court. The majority of the girls were committed to the institution for running away from home, sexual misbehavior and dependency. In addition to running away from home and sexual misbehavior, incorrigibility, truancy, curfew violations and disorderly conduct topped the offense listing. Although 30% of the subjects had had no previous recorded delinquency offenses, 14% had as many as three earlier contacts.<sup>45</sup>

Only 28 abnormal EEG's were found among the 100 dependent and delinquent girls. The two psychologicals, Raven's Progressive Matrices and the Bender Gestalt, predicted an abnormal EEG finding correctly in 44% (7 out of 16) of the cases studied. The psychiatric evaluation (noting behavior patterns) had a 30% (14 out of 46) accuracy figure. However, both instruments overpredicted the occurrence of EEG abnormalities and failed to predict 7 cases in which abnormalities were present.<sup>46</sup>

Again, Loomis concludes:

There is no observable increase in the general incidence of EEG disturbances suggestive of MBD in this delinquent group, again suggesting that the role of such abnormalities in the etiology of continuing delinquent behavior is probably less than has been ultimately suspected. In particular, the 14 and 6 per second positive spike pattern is present to no significant greater extent than has been reported for the unselected normal school population.<sup>47</sup>

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<sup>45</sup>Loomis, Prediction, pp. 494-495.

<sup>46</sup>Ibid., p. 496.

<sup>47</sup>Ibid.

However, the representativeness of the sample population of delinquent girls he studied is doubtful. Since the private institution was sponsored by a religious faith, its population was largely comprised of that one faith. To draw inferences from this group to the total population of delinquents violates primary assumptions about the representativeness of a sample, since a sample must be "normally distributed" to be representative of the total population. Therefore, the extrapolation to the larger realm of delinquent behavior should be considered with a grain of reservation.

#### Delinquents with and without MBD

Further, the conclusions reached by Kohen-Raz and Assael are in agreement with Loomis that EEG abnormalities, as an indice of MBD, can be predicted on the basis of clinical behavior, which is suggestive of MBD. In their investigation, which went methodologically further than Loomis's, out of 19 juvenile delinquents suspected of organic brain disorder, based on psychologicals and behavior, 10 showed EEG abnormalities. Six of the abnormal patterns were of the convulsive type (14 and 6 per second positive spikes), while four cases presented a maturational deficit.<sup>48</sup>

In comparing the six convulsive delinquents with eight delinquents showing a normal EEG pattern, a highly significant correlation between Rorschach variables (a combined index of seven Rorschach variables dichotomized at the median cut-off point) and convulsive EEG's was found. However, no discrepancies between verbal and performance IQ scores were exhibited between the two groups on the Weschsler Intelli-

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<sup>48</sup>Kohen-Raz and Assael, pp. 252-254.



gence Scale for Children (WISC).<sup>49</sup>

The behavior traits, characteristic of MBD, of aggression, loitering and hanging around, absconding, sensitive and easily offended, daydreaming, and hallucinations were rated independently by two social workers. Probation officer reports and the observation report of the institution served as the bases for the ratings, which were done on a high-low incidence scale of 1 to 5. Among the two groups, only a significantly higher incidence of daydreaming was found in the group of convulsives. However, it was noted: ". . . these findings must be interpreted with caution, as they are based on ratings obtained from reading observation reports, the reliability of which could not be established."<sup>50</sup>

Joyce G. Small, similar in methodology to Kohen-Raz and Assael, compared those prisoners she found with EEG abnormalities and those without such an indice of MBD, and matched them for age and race. Study subjects were composed of one hundred felons, referred for psychiatric evaluation by the courts and law-enforcement agencies of St. Louis, Missouri, fifteen of which were under twenty years of age.<sup>51</sup>

One-third of the prisoners exhibited EEG abnormalities. However, no difference was found between EEG and non-EEG prisoners "in terms of the nature of the offense, psychiatric diagnosis, criminal recidivism, habitual aggressive behavior, data from the psychiatric, medical, and social histories, alcoholism, and drug addiction, psychological test

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<sup>49</sup> Ibid., p. 254. Note that this result is in agreement with the findings of Camp and Tarnopol, discussed earlier, although the latter researchers employed the adult version of the test.

<sup>50</sup> Ibid., pp. 254-255.

<sup>51</sup> Joyce G. Small, "The Organic Dimension of Crime," Archives of General Psychiatry, XV (1966), 82-83.

results or other items."<sup>52</sup>

However, the combined criteria for MBD she employed (EEG studies and five other indices of MBD) revealed that 77% of the prisoners displayed at least some indication of minimal brain dysfunction. Further, the combined criteria demonstrated that prisoners who had evidence of "brain damage at early onset with equivocal indications of brain dysfunction were significantly more often accused of theft than of any other offense."<sup>53</sup> This result is in apparent contrast with the conclusions of L. Lidberg. Although he found no correlation between concussion and all kinds of criminality in Sweden, frequency of concussion and crimes of violence he found to be significantly statistically correlated.<sup>54</sup>

#### Delinquents and Controls

Jimmy A. Beshai, too, divided a delinquent group into those with EEG abnormalities (N = 23) and those without (N = 20). However, Beshai matched these two groups for age, race, sex, IQ, and educational level with a normal population (N = 23). All three groups were given a battery of tests measuring: extroversion-neuroticism, high-risk taking, psychomotor inhibition, and future-past discrepancy ratings. Notably, the first variable is an integral part of H. J. Eysenck's theory, which predicts a high frequency of extroverted neurotics among delinquents.<sup>55</sup>

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<sup>52</sup>Ibid., p. 83.

<sup>53</sup>Ibid., pp. 87-88.

<sup>54</sup>L. Lidberg, "Frequency of Concussion and Type of Criminality - A Preliminary Report," Acta Psychiatry of Scandnavia, XLVII (1971), 453.

<sup>55</sup>Beshai, pp. 141-144.



Two hypotheses formed the basis for his investigation. He first hypothesized that the dysrhythmic group of delinquents would differ from the non-dysrhythmic group of delinquents on all the above four behavioral measures. Second, he hypothesized that the combined delinquent groups would differ from normals on the behavioral measures. Results were not definitive for the first hypothesis, but were for the second. However, the groups of delinquents did differ on measures 1 and 2, thus conflicting with Eysenck's theory of personality and crime.<sup>56</sup>

Walter J. Friedlander, studying twenty male prisoners, (ages 16 to 20 years), matched for age with patients at the Albany Medical Center, who constituted the control group, found that none of the prisoners exhibited a 14 and 6 per second positive spike pattern. Moreover, eight of the Medical Center patients exhibited such a pattern. Friedlander suggests that such an unexpected finding was owed to the facts that 80% of the prisoners were receiving anti-convulsive drugs and that the Medical Center patients exhibited other abnormal EEG patterns, in addition to the 14 and 6 per second positive spike pattern.<sup>57</sup> Graffagnino and his colleagues, cited earlier, postulated that this EEG pattern is of more clinical importance when it is combined with one or especially two slow wave abnormalities than when it is found alone.<sup>58</sup>

J. M. Wiener and his associates reviewed the EEG's of 80 delinquents and 70 non-delinquent males matched for age. Control subjects were volunteers, living in the same community as the delinquents, between

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<sup>56</sup>Ibid., pp. 142-144.

<sup>57</sup>Walter J. Friedlander, "Sleep EEG's in a Late Teen-age Prison Population," Diseases of the Nervous System, XXV (1964), 370-372.

<sup>58</sup>Graffagnino, et al, p. 634.

the ages of 13 and 18, who had exhibited no signs, symptoms, or history of organic brain damage or mental retardation. Results revealed that slow EEG activity was not more frequent in recordings from the delinquent subjects. Further, no relationship could be established between the 14 and 6 per second positive spike pattern and juvenile delinquency.<sup>59</sup> However, since the study employed volunteers, the representativeness of the sample can be seriously questioned. As Walter R. Borg and Meredith D.

Gall note:

Volunteers can rarely be used as a research sample because the very fact that they volunteer makes them different from persons in the population who did not volunteer. Therefore, samples of volunteers can be assumed to be biased, and the results of studies employing volunteers must usually be discounted or applied only to other volunteers drawn from the same population.<sup>60</sup>

#### Summary of Literature Reviewed

As can be seen by the foregoing, the studies investigating the relationship between MBD and delinquency differ in their methodological quality. Some compare their delinquent groups with figures of MBD from a standardized population, while others divide their delinquents into those with and without MBD. Yet, still others employ the highest methodological quality (generally speaking)--the control group.

However, even within the arbitrary classification of methodological quality that I have made, the studies are methodologically dissimilar. Several studies employ random sampling techniques, while others choose to work with referred groups suspect of MBD or successive admissions or simply availability samples.

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<sup>59</sup> J. M. Wiener, et al, "An EEG study of Delinquents and Non-delinquent Adolescents," Archives of General Psychiatry, XV (1966), 144-149.

<sup>60</sup> Borg and Gall, p. 127.

By far, however, the delinquent population addressed has been only males, with the exception of Loomis's study. Further, the majority of delinquents studied were institutionalized or destined for training schools.

Where control groups were employed, matching was done for a number of variables. However, age and sex were consistently controlled for in all the "control" studies reviewed. Thus, it would appear that these variables are important to control, in order to prevent, in Johnson's words, "alternative competing hypotheses" from being accepted.<sup>62</sup>

Substantively, none of the studies claimed MBD to be unequivocally present or absent in a delinquent population. They merely reported the percentage distribution or frequency of an indice(s) used for assessing MBD.

The ranges for some indices are vast. For example, Hodge reports 84% of his delinquent population to exhibit abnormal EEG's, whereas Friedlander reports his delinquents to be completely free from such abnormalities.<sup>63</sup> However, such comparisons must be qualified for each investigator employs his own standards on what constitutes "abnormal."

While the ranges for some indices are vast, ranges for other indices are in concert. To again reiterate figures already quoted, Tarnopol found 33% of his subjects to be neurologically impaired on the basis of untreated chronic medical conditions.<sup>64</sup> A slightly higher percentage

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<sup>61</sup>Loomis, Prediction, pp. 1003-1006.

<sup>62</sup>Johnson, p. 44.

<sup>63</sup>Hodge, pp. 155-172 and Friedlander, pp. 370-373.

<sup>64</sup>Tarnopol, pp. 200-207.

of 47% was reported by Stott.<sup>65</sup>

Generally speaking, there is a little more agreement than disagreement as to the relative frequencies of MBD indices in delinquent populations. However, this area of study is not one of consensus.

The EEG seems to be a favorite indice to employ. Ironically enough, the EEG has not been demonstrated to be any more valid than other indices used to assess MBD.

None of the studies reviewed were replications. Each investigator chose to start from the beginning. Such a lack of replication has given us many dissimilar, nearly-uncomparable studies. As stated in the introduction, perhaps this lack of replication is responsible for MBD not being acknowledged as a possible causative factor in delinquent behavior formation.

All of the studies reviewed usually employed several indices of MBD. Patterns of behavior indicative of MBD were often correlated with other more complex diagnostic indices. This suggests that this easily administered indice (patterns of behavior) is equal to the more complex indice. However, seldom was its validity tested directly. It is unfortunate that such an indice, amenable to practical administration by probation officers, was given such little attention.

The magnitude of delinquent involvement was only taken into consideration in one study--the study by Johnson--which is replicated, in part, herein. Again, this investigator is aware of no other study which made a distinction of the magnitude of delinquency.

The present work is devoted to the reasons cited in the last three paragraphs. In short, to fill the voids in the literature, a

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<sup>65</sup>Stott, pp. 703-704.

replication of an investigation using the behavior indice in evaluation of the magnitude of delinquency and MBD is undertaken.

A CRITICAL ANALYSIS OF THE PSYCHOLOGICAL INVESTIGATION

A Short Summary<sup>46</sup>

Type 2 CONDUCTING INVESTIGATION, JOURNAL DESCRIBES THE RELATIONSHIP AND BETWEEN MENTAL STATE DAMAGE AND BEHAVIOR. He indicated his work is fulfillment of his dissertation, requirements of the University of Oregon in 1974, 1975.

OF THE ABOVE, HE ESTABLISHES THAT THE CONCEPT OF MENTAL BRAIN DAMAGE IS GIVEN LITTLE CREDIT, AS REPORTED BY THE GROUPS FORM OF MENTAL PATHOLOGY, SUCH AS BEHAVIOR AND SYMPTOMS. WITHIN THE LABORATORY STUDY, THE DIFFERENCE IS VIEWED AS BEING CONTINUOUS IN THE PHYSIOLOGY OF THE MIND. He views all systems of functioning and source of the dysfunction; JOURNAL STATES THERE IS NO QUESTION TO BELIEVE "that people are either capable or not."<sup>47</sup>

The literature review points that there is a dearth of material directly addressing the relationship. In his review, "Literature on the subject of mental brain damage is not abundant, and experimental studies are particularly rare."<sup>48</sup> As a result, the review is composed of suggestive material. Mental brain damage is related to behavior-problem groups, maladjusted individuals, psychopaths, and psychiatric groups.

<sup>46</sup> These are following summary is based directly on Johnson's work, references have been eliminated, WITH THE EXCEPTION OF INCLUDING DIRECT QUOTATIONS AND SUBSTANTIAL REFERENCES. THE WORK MATERIAL IS TAKEN DIRECTLY FROM THE ABSTRACT OF HIS WORK, AS FOUND IN DISSERTATION OF 1974.

<sup>47</sup> Johnson, p. 7.

<sup>48</sup> Ibid., p. 11.



## CHAPTER 3

## A CRITICAL ANALYSIS OF THE DISSERTATION REPLICATION

A Short Summary<sup>66</sup>

From a counseling perspective, Johnson addressed the relationship between minimal brain damage and delinquency. He submitted his work in fulfillment of the dissertation requirement at the University of Oregon in June, 1972.

At the outset, he acknowledges that the construct of minimal brain damage is given little attention, as opposed to the grosser forms of brain pathology, such as epilepsy and aphasia. Within the introductory chapter, the dysfunction is viewed as being continuous in the physiology of the mind. He views all persons as possessing some degree of the dysfunction. Johnson states there is no reason to believe "that people are either organic or not."<sup>67</sup>

The literature review reveals that there is a dearth of material directly addressing the relationship. In his words, "Literature on the subject of minimal brain damage is not abundant, and experimental studies are particularly rare."<sup>68</sup> As a result, the review is composed of supportive material. Minimal brain damage is related to behavior-problemated groups, maladjusted individuals, psychopaths, and psychiatric groups.

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<sup>66</sup>Since the following summary is based directly on Johnson's work, footnotes have been eliminated, with the exception of footnoting direct quotations and contextual remarks. Too, some material is taken directly from the abstract of his work, as found in Dissertation Abstracts.

<sup>67</sup>Johnson, p. 7.

<sup>68</sup>Ibid., p. 11.

Only two studies are reported which directly address the relationship between MBD and delinquency, both of which were conducted in the early nineteen-forties.

The indices of minimal brain dysfunction are presented, with excerpts from those studies employing the respective indices. EEG and psychometric devices received little support, whereas perinatal difficulties, patterns of behavior (hyperactivity, short attention span, etc.) and IQ discrepancies were viewed as good indicators of MBD. However, it was stated that the use of the latter indice (IQ), although reliable, is restricted, since this information is not always available to teachers and counselors.

The behavioral indice appears in the majority of the studies. A tally taken of the behavioral signs of MBD listed in the literature revealed substantial agreement among the various authors. The behavioral indice is often highly correlated with other more complex indices. Yet, the correlations among the more complex indices are many times low and not significant. Further, it is noted that many times the "hard" indices of neurological impairment, such as the EEG, are mere supplements, in terms of diagnosis, to the "soft" behavioral indices.

On the basis of the review, it is concluded that MBD does in fact exist. Further, the literature suggests that higher incidences of MBD occur in behavior-problemed and delinquent groups. Lastly, the review revealed that diagnosis of MBD is often made on behavioral grounds.

Methodologically, Johnson compared three study groups on their incidence of minimal brain damage. The groups consisted of 17-year-old delinquent males (N = 23), male high school seniors (N = 23), and a group of minimally brain-damaged male children (N = 25), whose mean

age was lower than the other two groups. The delinquent group and the non-delinquent high-school group were also matched for socio-economic status, based on father's occupation.

Johnson's study attempted to answer two questions. "First, are behavioral signs associated with minimal brain damage displayed more often in delinquent groups than in comparable non-delinquent groups? Second, is there a relationship between the amount of delinquency and the number of behavioral signs displayed by individuals?"<sup>69</sup>

In order to ascertain the answers to these questions, he formulated, from the tally of the literature made, an instrument on which to rate behavioral signs of MBD, which he called the Behavior Check List (BCL). The County juvenile department counselors, the high school English teachers, and the teachers of the MBD children served as raters for their respective groups.

Results revealed that the MBD children scored the highest on the BCL ( $\bar{X} = 13.4$ ), while the high school seniors scored the lowest ( $\bar{X} = 4.2$ ). The delinquents fell between the two control groups as Johnson predicted ( $\bar{X} = 8.3$ ). A significant positive correlation (+.376 at .05) was found between scores on the BCL and the magnitude of delinquent involvement, the latter of which was measured by the number of referrals to juvenile court.

The results are postulated to support Johnson's "continuum of organicity."<sup>70</sup> By viewing the dysfunction on a continuum, ". . . rather than being either minimally brain damaged or not," Johnson notes, "atten-

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<sup>69</sup>Robert Lee Johnson, "An Investigation of Minimal Brain Damage and Delinquency with Implications for Counseling, DA, XXXIII: 2106A.

<sup>70</sup>The continuum of organicity should not be confused with the continuum of abstraction, which is discussed below.

tion becomes more properly directed to the configuration of difficulties instead of a label."<sup>71</sup>

Further, the Behavior Check List was found to be a valid and reliable instrument for assessing minimal brain damage. Construct validity was attained, and the instrument achieved a positive .84 reliability coefficient.

Moreover, Johnson endeavors to place MBD within a large theoretical framework. He does so since he believes that ". . . insights at each level of analysis are necessary for the grand Gestalt of complete understanding."<sup>72</sup>

MBD can be viewed on several levels which make up such a theoretical framework. The levels of MBD extend from the concrete to the abstract. The former can be represented by verified organic lesions or damage, whereas the latter can be represented, in his words, "in terms of the person's assessment of himself, with the deficits associated with the condition forming an input for his apperception."<sup>73</sup> In other words, the psycho-social response to the dysfunction. The behavioral level is viewed as falling somewhere between the concrete and the abstract end of the abstract continuum.

Delinquency is placed at the abstract end of the continuum, for delinquency involves constructs such as values, norms, perceptions, etc. Therefore, a causal relationship is not believed to exist; but merely an association is viewed between MBD and delinquency.

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<sup>71</sup>Johnson, p. 63.

<sup>72</sup>Ibid., p. 76.

<sup>73</sup>Ibid., p. 77.

Treatment of the minimally brain-damaged child is given attention in a latter chapter. It is recommended that the physician treat the neurological disorder, whereas the psychologist-counselor should treat the disorder of apperception. However, the knowledge of the signs, behavioral as well as medical, of MBD by the counselor and teacher can aid a physician in the diagnosis and referral.

Lastly, an indepth discussion of the literature on counseling the MBD child is given. Since a summary of this aspect of the work is not considered to be relevant herein, no further discussion will be made. The interested reader is referred to the original work.

#### A Critique

As stated before, replication without analysis is meaningless. Therefore, what follows is a critical analysis of Johnson's work and his measuring instrument--the Behavior Check List. Since the BCL forms an integral part of the present research, it will be discussed separately from the discussion of his entire work.

The purpose of this analysis is not to belittle the instrument or its author. Every work has shortcomings; the present research is no exception. What is intended is to present to the reader an awareness of the shortcomings, as well as the aspects deserving of praise. It is suggested that the present use of the instrument and the present results be viewed in light of this critique. Since this thesis is a replication, the criticisms to follow apply to both the original and present study, with the exception of the revamped portions. However, note that for practical reasons, the instrument and its application have remained, for the most part, unchanged herein. (See also the section on limitations in the concluding chapter.)



### Critique of Overall Work

Johnson's work, "An Investigation of Minimal Brain Damage and Delinquency with Implications for Counseling," is worthy of replication for reasons stated above. However, I am not in full agreement with all aspects of his work.

The literature review is made up largely of supportive type of material. The literature he presents supports a relationship between MBD and delinquency, but does not address it directly. As a result, Johnson gives the reader the impression that his study will augment the one or two works that make up the literature on MBD and delinquency.

As my literature review illustrates, this impression is far from the truth. Prior to 1971 (the year before his dissertation is dated), more than twenty studies directly dealing with MBD and delinquency were conducted. Yet, he neither mentions them or lists them in his bibliography. This "oversight" of existing literature is owed to one of the following facts, possibly both:

- (1) he did not conduct a thorough literature review and/or,
- (2) he was aware of such studies, but sought to exclude them from his review.

Moreover, his review only deals with those studies purporting a relationship between MBD and delinquency. No studies which infer that such a relationship is spurious are mentioned.

By contrast, this investigator has reviewed and reported the more than twenty studies which have directly dealt, both supporting and denying the relationship between MBD and delinquency, contained in the literature, from approximately 1964 on. If I chose to report this type of study prior to 1964, the number could have been increased at least twofold. Yet,

Johnson, dealing with studies prior to 1964, still "overlooked" such studies.

To correlate the scores on the BCL and the number of referrals to juvenile court, Johnson employed a Spearman rho statistical measure of association. Such a test is the non-parametric counterpart of the noteworthy Pearson r. However, it is recommended by Champion that if a large number of ties exist among either variable, the Spearman should not be used.<sup>74</sup> Instead, the Kendall tau statistical measure of association, which takes into consideration a large number of ties, should be the alternative test. The data obtained by Johnson reveals 6 and 7 ties among the BCL scores and referrals, respectively. This violation of one of the basic assumptions of the Spearman rho test results in an extremely conservative value of association. In keeping with the assumptions of statistical testing, Johnson should have used the Kendall tau test, which the present investigator employed.

The utility of the measure used to represent the magnitude of delinquency is questionable. The number of referrals to juvenile court can only be said to represent just that and no more. Under this measure, a delinquent referred to juvenile court four times might be postulated to be "twice as delinquent" as a delinquent only referred to court two times, at least in terms of magnitude. However, if the latter delinquent committed two assaults, his magnitude of delinquency is hardly equal to the former delinquent, if he committed four truant acts. The reader may say that this investigator is confusing magnitude with seriousness of an offense. On the contrary, what is meant here is that seriousness of

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<sup>74</sup>Dean J. Champion, Basic Statistics for Social Research (Scranton: Chandler Publishing Company, 1970), p. 216.

offenses should be taken into consideration when measuring magnitude. A number of offense seriousness scales are available to aid an investigator in assigning degree of seriousness to each offense.<sup>75</sup>

If seriousness of offenses were considered, this would have been a more accurate description of the magnitude of delinquency. Therefore, at best, Johnson's "magnitude" can refer to the number of referrals to juvenile court. He contended no more than that. Possibly practical considerations prevented him from obtaining offense information. Too, such practicalities restricted this investigator from employing offense information.

However, the correlation referred to above did take into account the magnitude of delinquency despite the limited meaning of magnitude. This investigator is aware of no other study which takes into account the magnitude of delinquent involvement. Therefore, this investigator believes that the methodological errors and shortcomings, in terms of the value and worth of the study, are surpassed by the addressing and recognition of the magnitude of delinquency.

As noted in the summary, Johnson prefers to consider a continuum of organicity, as opposed to discreet categories, to avoid labeling. Such a reason considers the negative manifestations of labeling on the delinquent child, but ignores the implications for treatment. If all delinquents possess some degree of MBD, who should be treated and who shouldn't be treated for the dysfunction? Quite obviously, a BCL score that separates organics from non-organics is needed. This point is further discussed in

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<sup>75</sup>See, especially, June M. Andrew, "Violent Crime Indices Among Community-Retained Delinquents," Criminal Justice and Behavior, I (June, 1974), 123-130 and J. F. Hooke, "Rating Delinquent Behavior," Psychological Reports, XXVII (1970), 155-158.

the results chapter of this present research. As footnoted above, the continuum of organicity is not to be confused with the continuum of abstractions. A discussion of the latter follows.

Johnson's theoretical framework places delinquency at the abstract end of the continuum of abstraction. The relativist theorists, notably, Richard Quinney, would probably agree with this placement of delinquency.<sup>76</sup> However, it should be noted that the positivist theorists would probably deny the existence of the abstract end of the continuum. Constructs, values, norms, and perceptions are not among the vocabulary of the latter theorists. Nevertheless, further discussion is deemed to be beyond the scope of this present research. Again, it doesn't matter if we view delinquency, for purposes of this paper, as relativistic or deterministic. Recognition of the dysfunction is the key.

#### Limitations of the Instrument and its Application

Firstly, the very instructions at the top of the BCL question the reliability of the information the ratings are based on. According to the instructions, it is perfectly permissible to rate an individual "according to your observations and your inferences from reports of others."<sup>77</sup> (See Appendix A.) The latter source of information is not permitted in our courts of law and is questionable for use in the present manner. However, in light of the purpose of identifying possible individuals with MBD, it seems reasonable. For diagnostic and screening

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<sup>76</sup>As Quinney notes, crime is a man-made construct. Crime exists because man creates criminal definitions which involve abstractions of right and wrong. For a full explanation of his theory of crime see: Richard Quinney, The Social Reality of Crime (Boston: Little, Brown, and Company, 1970), especially, pp. 15-25.

<sup>77</sup>Ibid., pp. 101-102.

purposes, it is better to have more false positives, as opposed to false negatives. The former will be realized after subsequent testing. However, the latter would be lost forever.

The instructions go on to say: "Check 'like him' if any or all of the characteristics seem to apply to the individual to a greater degree than to most other persons his age."<sup>78</sup> The age restriction is to be applauded, for it puts the rater into perspective.

If the rater believes that the individual does not conform to the behavioral item, he may select the "not like him" category. Further, if he does not possess the relevant information to form the basis of the rating, he may check "unknown." These three discreet categories reduce the possible variation in perspectives of the behavioral traits among raters, as opposed to continuous categories. For example, if a bipolar scale of 7 were offered with 4 representing a neutral (unknown) response, the rater would then be offered 3 positive and negative replies. Quite obviously, such a continuous category would raise the variation in perspectives.

Despite the discreet categories, it can be contended that the probation officers in fact do have different perspectives on what constitutes a behavioral item. To illustrate, probation officer #1 may share a different perspective on what constitutes, say, for example, "impulsive" (item #4), as compared to probation officer #4. Although Johnson recognized this criticism of dissimilar perspectives between his three groups of raters, he did not address such dissimilarity within his groups of raters.<sup>79</sup>

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<sup>78</sup>Ibid.

<sup>79</sup>Ibid., p. 69.



This criticism of dissimilar perspectives could have been avoided if Johnson: (1) was able to calculate inter-rater and intra-rater reliability, or (2) presented the raters with fixed definitions of the behavioral items. However, from the reading of his report, it seems that both alternatives could not be carried out because of practical concerns.

More confusion is introduced into the dissimilar perspective issue by the very fact that some of the behavioral items consist of more than one characteristic. Furthermore, some of these characteristics, within one item, can be considered to be in disharmony. For example, do "moody" and "unpredictable" (item #7) constitute the same behavioral trait? Clearly, it is a matter of opinion. One wonders which characteristic the rater looks at over others in making his rating.

One further wonders if any personal feelings and emotions make up a part of the rating. For example, if a delinquent and his probation officer have a good relationship, the rating is likely to be more favorable than if they had a bad relationship. The "error of measurement," introduced by subjective feelings, could have been minimized by the employment of several raters. A mean of their ratings would then serve as the indice of MBD for each individual.

Although the BCL is subjective in its completion, it is highly objective in its scoring. Furthermore, administration time is short and it can be administered for a relatively low cost. Essentially, the short time needed for completion is the only concern.

Because of the ease of scoring and administration, the BCL is a practical instrument to employ within existing juvenile intake procedures and, I might add, within existing budgets. Its amenable administration insures that a person knowing the whole child will be making the rating. In using

such an indice, Johnson filled a void in the literature. In discussing the lack of practical diagnostic procedures, Berman states:

Yet despite the funds being expended in the area of rehabilitation of adult and juvenile delinquents there is virtually no attention being devoted to the problem of effective study of appropriate, practical diagnostic procedures that can be used within the existing framework of child care institutions. It would seem that a vital step has been generally overlooked in the total plan of study of delinquency.<sup>80</sup>

Johnson's instrument--the Behavior Check List--is the exception to the general practice that Berman discusses.

The BCL, as an MBD indice, based on behavioral signs only, has support from the literature review. In Chapter Two, it was noted that behavioral signs correlated significantly with more elaborate indices such as the EEG, neurological exams, etc. As Johnson notes, in the diagnosis of MBD, the other more complex indices are often mere supplements to behavioral signs.

Moreover, the check list concept is not new. For example, the Adjective check List has been used successfully for a number of years in assessing self-concept. The check list concept, again, is amenable to practical administration.

However, all instruments can be said to be products of their author and the time period of their creation. The Behavior Check List is no exception. Johnson, an individual probably of the upper-middle class, used terms, possibly inadvertantly, which are middle-class centered, in the compiling of the behavior traits. For example, item 11 reads: "Poor ability to delay gratification or to pursue long-range goals." Although this trait may be considered to be "abnormal" among the middle class, certain lower-class members of society do not consider this

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<sup>80</sup> Berman, Neurological Dysfunction, p. 266.

in the same light. Further, in some groups, the trait may be overly encouraged. Therefore, the BCL cannot be considered to be, in Borg and Gall's terms, "culture fair." They note that: "By 'culture fair' is meant that words and facts that are culturally linked have been eliminated from the text."<sup>81</sup>

Again quoting the above authors, Borg and Gall recognize four types of validity: content, concurrent, predictive, and construct.<sup>82</sup> Johnson approached construct validity indirectly by directly establishing content and concurrent validity. In essence, since the BCL looks reasonable and since high scores on the BCL represent those with verified MBD (content and concurrent, respectively), construct validity was established.

Borg and Gall define construct validity, the highest validity attainable, as "the extent to which a particular test can be shown to measure hypothetical constructs."<sup>83</sup> Thus, since the BCL differentiated between the MBD (a construct) group and the controls, construct validity can be said to be attained.

Because of the concern of practical administration, the Behavior Check List was used in this present research. Nevertheless, be it noted, before further discussion, that this concern, in the opinion of the present investigator, is believed to outweigh any methodological shortcomings.

Johnson established the reliability of this instrument by employing a split-half reliability coefficient. He found the BCL to be reliable, as measured by a positive .84 coefficient. Such a high coefficient reveals that the 26 behavioral traits are measuring essentially the same

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<sup>81</sup>Borg and Gall, p. 172.

<sup>82</sup>Ibid., p. 136.

<sup>83</sup>Ibid., p. 141.

characteristic. In the words of Claire Sellitz, et al.:

In order for split-half equivalence to be high, all items of the test must be highly correlated; that is, they must all provide a measure of essentially the same characteristic or of characteristics that vary together. To use the technical term, they must be homogeneous.<sup>84</sup>

However, although the high coefficient insures a reliable test instrument, it does nothing to insure the consistency and trustworthiness of the behavioral items checked on each BCL. In short, there is no "built in" measure of determining the consistency of answers on the Behavior Check List. The researcher is at the mercy of the raters to provide consistent and stable information. Such a situation is not unusual in experimental research focused at the real world. However, this investigator has devised a rough measure of establishing the stability of the responses derived. A discussion of this is presented in the methodology section which follows.

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<sup>84</sup>Claire Sellitz, et al, Research Methods in Social Relations, (New York: Holt, Rinehart, and Winston, Inc., 1959), p. 178.

## CHAPTER 4

## METHODOLOGY

Overview of the Methodology

Essentially, the methodology employs a correlational design. On the delinquent sample selected, it was determined if there is a significant positive association between the magnitude of delinquent involvement and the degree of minimal brain dysfunction. The former is measured by the number of referrals to the juvenile court and the latter by the scores obtained on the instrument employed--the Behavior Check List. This information was obtained from the probation officers of the delinquent sample.

The Behavior Check List is a list of 26 behaviors indicative of the presence of MBD. (See Appendix A.) The probation officers were simply asked to describe or "rate" each delinquent, meeting the subject criteria, on each of the 26 behaviors, according to the categories of "like him," "not like him," or "unknown." The score derived on each BCL is the number of behaviors (out of 26) checked "like him."

A detailed description of the methodology follows. Again, headings have been used to guide the reader.

Assumptions

In the physical sciences of chemistry, physics, etc., assumptions are scarce. For example, matter is either solid, liquid, or gas, and is defined as such. However, in the social sciences, including criminal justice, human elements, ethical considerations, though appropriately so, and practicalities interfere with some experimentation. Assumptions in



the social sciences must replace the hard facts of the physical sciences. Because of these concerns, the following assumptions have been made:

Assumption #1: Any and all delinquent behavior of the MBD child can be deemed to be an "acting out" behavior attributable to the minimal brain dysfunction. Admittedly, an MBD delinquent may commit an act, on a particular occasion, for reasons over and above the minimal brain dysfunction. However, it is impossible, at least for purposes of this present research, to separate the functional or environmental acts from those owed to MBD. Therefore, every delinquent act of the MBD child is assumed to be owed to the dysfunction. This assumption is not that far-reaching, since, by definition, organic factors take the lead role over functional factors. Too, "acting out" behavior may vary from child to child. This is to say that arson, for example, may be one child's way of "acting out," whereas another "acts out" by being truant.

Assumption #2: Johnson's instrument for assessing MBD--the Behavior Check List--is a valid and reliable instrument. Although this study indirectly tests the validity of the BCL, by virtue of the findings derived, it does not address validity directly. To do so is considered to be beyond the scope of this paper. Since validity is assumed, there is little point in testing for reliability, since reliability is contingent upon the proving of validity. Therefore, both the validity and reliability of the measuring instrument are assumed, on the basis of the original work.

Assumption #3: The probation officer raters employed in this study have the same perspectives regarding the behaviors which make up the BCL. In other words, probation officer #1 has the same perspective on what constitutes a delinquent being "impulsive" (item #4) and being

"emotionally immature" (item #9) etc., as probation officers #2, 3, and 4. (See Appendix A.) This assumption is believed to be a safe assumption, since by virtue of their common work settings, it can be argued that they share the same perspectives. Note that this investigator attempted to have all 4 probation officers rate the same individual, in order to calculate "intra-rater reliability." However, due to practical considerations, this was not possible. None of the probation officers felt that they knew any one delinquent well enough to rate him.

Assumption #4: The probation officer raters were truthful and consistent in the completion of each and every Behavior Check List. Such an assumption is necessary, since the measuring of internal consistency was not "built into" the instrument. It is, therefore, assumed that none of the raters went down the BCL and checked the choices whimsically on any particular individual(s). However, to augment this assumption, this investigator has formulated a rough estimate of internal consistency which is discussed below.

### Subjects

Subjects are comprised of all 17-year-old delinquent males active on the Mahoning County caseload during the past five months. Discussions with probation officers revealed that this length of time had to be selected in order to insure that a sufficiently large N would be obtained.<sup>85</sup> Apparent in this definition are the age and sex restrictions. The age restriction is chosen, since it "was an attempt to assure that the delinquent careers for most subjects would have climaxed." Only

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<sup>85</sup> Interview with John S. Goodwin and Larry F. Zizzo, Jr., Juvenile Research Center, Youngstown, Ohio, 21 April 1975.

males were chosen for this study, since their delinquent patterns and activities are less diverse than comparable female delinquents, and are, therefore, more amenable for study.<sup>86</sup>

Further, in order for a delinquent on the caseload to be included in this study, he must have "lived in the County at least since commencing high school." Too, the probation officer must feel that he knows the delinquent well enough to rate him. These further criteria were added to assure that the probation officer raters would be cognizant of the magnitude of reported delinquent activity manifested by each delinquent. Moreover, if a delinquent exhibited obvious signs of MBD, he was omitted from study. All these restrictions or subject criteria are those formulated by Johnson.<sup>87</sup>

#### Instrumentation

The Behavior Check List (see Appendix A), formulated by Johnson, is the instrument used for assessing minimal brain dysfunction. It was chosen, since it was proven to be a valid and reliable instrument. Too, it was selected since it is most amenable to administration by probation officers. To reiterate, this investigator feels that the probation officer knows more about the delinquent, whom he sees on a regular basis, than a medical or psychological practitioner, who probably has never seen the child before test administration.<sup>88</sup> Yet, the validity of the BCL can be postulated to be equal to that of more complex, expensive indices of MBD,

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<sup>86</sup>Johnson, pp. 43 and 37.

<sup>87</sup>Ibid., p. 42.

<sup>88</sup>However, the interpretation and meaning of the individual MBD rating should be reserved for the medical or psychological practitioner.

which require extensive training in their administration.

Essentially, the BCL is a list of 26 behavioral traits, indicative of MBD. Some traits are composed of only one characteristic, whereas others are composed of as many as six characteristics. The score derived on the BCL is simply the number of behavioral traits that are deemed to apply to each delinquent, based on the probation officer ratings. In addition, this instrument also requests the residency and referral information of each delinquent.

#### Validity and Reliability

Johnson established the BCL to have construct validity, the highest form of validity attainable. Therefore, the establishment of validity is not specifically undertaken. To perform a further extensive validity test would be a major undertaking, and is beyond the scope of this paper. However, the results obtained from this study indirectly assess validity. For purposes of the present research, this is considered sufficient.

If validity can be assumed, it follows that reliability of the test instrument can also be based on an assumption. The following quote, taken from a text by Claire Sellitz, et al., bears this contention out:

If we knew that a measuring instrument had satisfactory validity for the purpose for which we intended using it, we would not need to worry about its reliability. If an instrument is valid, it is reflecting primarily the characteristic which it is supposed to measure, with a minimum of distortion by other factors either constant or transitory--that is, the extent to which it is influenced by transitory factors.

However, an investigator is seldom in the position of knowing in advance that his measure has satisfactory validity, unless this has been demonstrated in earlier studies concerned with the same characteristic.<sup>89</sup>

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<sup>89</sup>Sellitz, p. 166.

Therefore, since this investigator is in the position of knowing that the instrument utilized has satisfactory validity, reliability of the test instrument is not a concern.

#### Raters

There are five probation officers within Mahoning County who deal with delinquent males. However, since the subjects have to be 17 years of age, in accord with replication, one probation officer was omitted as a rater, since his caseload contained no 17-year-old youths. Therefore, four probation officers make up the "raters" of the delinquents studied.<sup>90</sup> In other words, the probation officers completed the instrument employed--the Behavior Check List--on each of their delinquents meeting the above subject criteria.

#### Instructions to Raters

The probation officers were simply asked to complete the BCL and to provide referral information about each delinquent meeting the subject criteria. Specifically, in completing the BCL, they were asked to rate each delinquent, on each behavior trait of the BCL, according to the categories of "like him," "not like him," or "unknown." (See Appendix A.) Their own observations, as well as inferences from reports of others, served as the basis for their ratings. They were instructed to: "Check 'like him' if any or all of the characteristics seem to apply to the delinquent to a greater degree than to most other persons his age."<sup>91</sup> The

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<sup>90</sup>The probation officer raters included Edward Hutchinson, George Jarbeck, Wade W. Smith, and Larry F. Zizzo, Jr. John S. Goodwin was omitted as a rater because his caseload contained no youths meeting the subject criteria.

<sup>91</sup>Johnson, p. 101-102.



score derived on the BCL is simply the number of items checked "like him."

In accord with Johnson's methodology, the probation officers were not told that the BCL is an instrument designed to assess MBD. However, they were told that this investigator was interested in comparing the behavior patterns of each delinquent with his respective number of referrals to the Juvenile Court.

#### Collection of Data

The BCL's were simply left with the four County probation officers for approximately a period of one week for completion.<sup>92</sup> After that time, they were picked up and analyzed.

On the data that I received (the BCL's), the delinquent subjects were identified only by their three initials. In this manner, anonymity was assured, and matters of confidentiality were avoided. Further, in this final report, initials were dropped, and the subjects are identified by number only. The use of initials is a minor modification of the original methodology.

Any BCL's lacking the residency or referral information or being incomplete, in reference to the 26 behavioral items, were omitted from analysis. In addition, any BCL which indicated that a delinquent has not lived in the County at least since commencing high school was deleted from the sample. Once again, the residency requirement assures that the probation officer rater is cognizant of all reported delinquent involvement of each of his delinquent cases.

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<sup>92</sup>The Behavior Lists were completed from 21 April 1975 thru 2 May 1975.

### Stability of Responses

As stated in the critique, users of the Behavior Check List are dependent upon the probation officer raters to provide consistent information. No measure of consistency and stability of responses was "built into" the instrument. In an effort to fill in this void, aggregate frequencies among similar behavioral items are compared. This comparison is thought to be a rough estimate and measure of consistency of the responses on the BCL. Similar frequencies represent consistency.

It was believed that the sets of behavioral items listed below in Table 1 would derived similar aggregate frequencies, by virtue of the similarity of the characteristics within the items. In other words, a rater, in selecting a behavioral item in the left column, as being descriptive of the delinquent being rated, is likely to select the similar behavioral item in the respective right column.

### Hypothesis to be Tested

As stated previously, most studies do not make a distinction between the magnitude of delinquency and MBD. To ignore the magnitude of delinquency ignores the fact that the first offender and the recidivist are different antisocial types. It cannot be contested that these two groupings of offenders pose different requirements upon the criminal justice system. Too, for juvenile intake procedures to "miss" an MBD delinquent, on his first visit to intake, has entirely different implications than the MBD delinquent, who has been passed through the intake procedures undiagnosed as minimally brain-damaged a number of times. The implications of the latter case, for the criminal justice system, are far-reaching. These implications are discussed in the last chapter.

TABLE 1  
SIMILAR ITEMS ON THE BCL AS A MEASURE OF RESPONSE STABILITY

Item Number	Behavioral Item	Item Number	Behavioral Item(s)
2.	Aggressive, domineering, rough, cruel, defiant, or destructive	5.	Irritable, frequently shows anger or hostility, frequent temper tantrums
4.	Impulsive	11.	Poor ability to delay gratification or to pursue long range goals
8.	Insecure, anxious in new situations, needs structure	9.	Generally emotionally immature
22.	Much variation in school performance from day to day, hour to hour, or minute to minute	23.	Generally poor school achievement or adjustment
24.	Short attention span, impaired concentration ability	25. and 26.	Distractible and Restless

Further, to test the relationship between the magnitude of delinquency and MBD is to more stringently test the theoretical relationship of MBD as a causal factor in delinquency formation. If a relationship does truly exist, it will withstand any statistical testing, including that herein. Such stringent testing is necessary for the relationship, if proved to be significant, herein, and with other investigators, will have implications for our present criminal justice system.

Therefore, Johnson's secondary hypothesis was retested herein. As he phrased it: "The magnitude of delinquent involvement is positively

correlated with the number of behavioral signs of MBD noted."<sup>93</sup>

### Statistical Procedures

I have correlated the amount of delinquent involvement with the number of behavioral signs of minimal brain dysfunction, for each delinquent of my sample. The former is measured by the number of referrals to Juvenile Court; whereas, the latter is measured by the score obtained on the BCL. In other words, I have determined whether or not there is a significant positive correlation between the two variables--magnitude of delinquent involvement (X) and the number of behavioral signs of MBD (Y).

In order to make such a determination, I first employed a statistical test of association. Johnson employed the Spearman rho ordinal test of association. However, discussions with probation officers indicated that among the referrals there would be a large number of ties.<sup>94</sup> For example, several individuals might have been referred to the Juvenile Court 3 times or 4 times, etc. As noted in the critique, one underlying assumption of the Spearman rho is that a large number of ties not be present. It is suggested by Champion that if a large number of ties does exist, the Kendall tau ordinal test of association, with its correlation for ties, would be a more accurate test.<sup>95</sup> Therefore, to correlate the number of referrals to Juvenile Court and the BCL scores, the Kendall tau test of association was used.

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<sup>93</sup>Ibid., p. 40.

<sup>94</sup>Interview with John S. Goodwin and Larry F. Zizzo, Jr., Juvenile Research Center, Youngstown, Ohio, 21 April 1975.

<sup>95</sup>Champion, p. 216. Note that if there had only been a few ties, the Spearman rho test would have been employed.

In order to compute tau, an underlying assumption of this test is that the data be at least of the ordinal level of measurement.<sup>96</sup> Since both number of referrals and BCL scores are scores amenable to ranking, the ordinal level of measurement is achieved.

Upon computing tau, I then determined if the value derived was significant at the .05 level of significance. To do so, I used Kendall's significance of tau test, as found in Champion, which, essentially, is a derivation of the well-known Z test of significance.<sup>97</sup>

Thus, I have made two statistical determinations:

1. the strength of the association as measured by the Kendall tau, and
2. the significance of the association, or correlation, as measured by Kendall's Z test of significance.

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<sup>96</sup> Ibid., p. 218.

<sup>97</sup> Ibid., pp. 218-219.



## CHAPTER 5

## RESULTS

The Sample

Twenty-eight delinquent males from Mahoning County, Ohio, were rated by their probation officers on the Behavior Check List. However, three of the Behavior Check Lists were omitted from analysis, since two did not provide referral information and the third represented a delinquent not meeting the residency requirement. Therefore, twenty-five delinquent males make up the sample studied.

Stability of Responses

A comparison of similar aggregate frequencies, among similar behavioral items, is the rough method of establishing stability of responses chosen herein. As illustrated in Table 2, the responses on the BCL, based on the 5 sets of items, overall, appear to be stable. However, set #4, dealing with school performance, might be said to represent an indication of partial instability. However, this investigator postulates that the dissimilar frequencies in this set are not a result of instability in completing the BCL. Item #22 refers to specific conduct in school, whereas item #23 deals with overall conduct. The former may not be known to the probation officers, since it requires knowledge of specific conduct. However, the latter is usually common knowledge to most probation officers. To reiterate, only "like him" responses are counted in the final analysis. Therefore, it is postulated that the low frequency in item #22 is a result of the probation officers not possessing that information, as opposed to representing a high frequency of "not

like him" responses. Thus, it may be concluded that the probation officer raters were consistent and stable in completing the Behavior Check List, on the basis of the behavioral sets examined.

TABLE 2

SIMILAR ITEM ANALYSIS ON THE BCL AS  
A MEASURE OF RESPONSE STABILITY

Item Number	Behavioral Item	Frequency	Item Number	Similar Behavioral Item(s)	Frequency
2.	Aggressive, domineering, rough, cruel, defiant, or destructive	5	5.	Irritable, frequently shows anger or hostility, frequent temper tantrums	6
4.	Impulsive	22	11.	Poor ability to delay gratification or to pursue long range goals	22
8.	Insecure, anxious in new situation, needs structure	18	9.	Generally emotionally immature	19
22.	Much variation in school performance from day to day, hour to hour, or minute to minute	7	23.	Generally poor school achievement or adjustment	17
24.	Short attention span, impaired concentration ability	14	25.	Distractible	16
			26.	Restless	17

Observations on a Few Item Tallies

It is interesting to note that the delinquent sample received such low percentages (8% or less) on the physical deficit traits, items 17 through 20, inclusive. A possible explanation for such an occurrence is that delinquents who exhibit such traits at intake, are referred to

mental health services or other community services, and as a result are not placed on probation. (See Appendix B.)

Item #2, on the BCL, representing aggressiveness, which is very often characteristic of MBD, received a total tally of 5, equalling 20% of the sample studied. Some investigators might postulate that the delinquent sample therefore does not possess MBD to any great degree. However, this investigator feels that the frequency of 5 is an attribute of the sample. In other words, the more aggressive males are not placed on probation, but are usually sent to an institution. Nevertheless, high total BCL scores among the sample (to be discussed) indicate that MBD is present, but that the aggressive trait is present to a lesser extent. (See Appendix C.)

Poor memory and wide discrepancies in specific abilities, items 14 and 21, respectively, revealed low percentages of 20 and 12 percent, respectively. Again, it is apparent that "gross" neurological impairment is acted upon at intake. Individuals exhibiting such behaviors were probably, and more appropriately, referred to mental health services.

#### Scores and Referrals

Total scores on the Behavior Check List ranged from 2 to 19 with a mean of 10.96 and a standard deviation of 4.84. (See Appendix C.) We may judge the meaning of these figures by borrowing Johnson's mean scores for his control groups. He found that the high school subjects and MBD children exhibited mean scores on the BCL of 4.2 and 13.4, respectively.<sup>98</sup> To achieve a needed rough estimate of MBD, in the present sample, we may say that those achieving a score of 4 or less are free of the dysfunction.

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<sup>98</sup>Johnson, p. 56.

(N = 4), and that those exhibiting a score of 13 or more possess the dysfunction to a high degree (N = 7). Individuals falling between these arbitrary scores could be said to belong to either group (N = 14). In line with the laws of chance, 50% could be assigned to both groups. Therefore, we may conclude, with reservations of course, that 11 delinquents are "non-organics" and 14 delinquents are "organics." On this basis, it appears that a score of 11 separates the two groups. Of course, for purposes of screening for identification of those with MBD, those "uncertain" 14 individuals would have to be further tested to determine which 50% belongs with which group.

Referrals to the Juvenile Court, representing the amount of delinquency manifested by each delinquent, ranged from 2 to 7 referrals. Quite obviously, with such a short span of referrals much overlapping was present. (See Appendix C.) This investigator recognizes that the official number of referrals might not represent the amount of true delinquency exhibited by a delinquent. However, for purposes of this research, this was the most reliable measure of delinquent involvement that was possible to attain.

By correlating the Behavior Check List scores, representing degree of MBD present, and the number of referrals, representing the magnitude of delinquent involvement, the hypothesis was able to be tested. Stated again, it reads: "The magnitude of delinquent involvement is positively correlated with the number of behavioral signs of MBD noted."<sup>99</sup>

The Kendall tau statistical test of association, with its correction for ties, was used to test the hypothesis. Its formula, as

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<sup>99</sup>Ibid., p. 40.

found in Champion, reads as follows:

$$r = \frac{S}{\sqrt{\frac{1}{2} N(N-1) - T_x} \sqrt{\frac{1}{2} N(N-1) - T_y}} \quad (100)$$

Upon inserting the sample data into the above formula, a positive correlation was found as shown below in Table 3. It was then determined whether or not this correlation was significant. Significance of tau was conducted using the following formula:

$$Z = \frac{S - 0}{\sqrt{\sigma_s^2}} \quad (101)$$

TABLE 3

CORRELATION OF SCORES AND REFERRALS

Statistic	Value
Tau	+.297
Z	1.82*

\*p ≤ .05.

A significant Z value was derived, as shown above in Table 3. In order to be significant at the .05 level of significance, a Z value of 1.65 or greater was needed. Therefore, it can be concluded that the association between the magnitude of delinquency and the degree of MBD noted, by the behavioral indice, is both positive and significant. The hypothesis can be accepted.

<sup>100</sup>Champion, pp. 216-219.

<sup>101</sup>Ibid.



### Significance of Results

The value of many investigations in delinquency research is questionable. I refer not to those that investigate the relationship herein, but all those that attempt to correlate different phenomenon with delinquency. One approach of these investigators has been to correlate everything and anything with delinquency. This type of "shot gun" approach, euphemistically called multi-variate analysis, more often than not lacks theoretical foundations for the variables correlated with delinquency, even though some correlations may be high. The present study takes exception with this lack of a theoretical base. Briefly, to reiterate, some delinquency can be deemed to be one form of "acting out" behavior owed to minimal brain dysfunction. To say that variables backed by theory have more significance than those that do not cannot be contested. The theoretical base suggests that the correlation is more than a mere association. A "causal" sequence of delinquency formation is suggested.

In turn, the positive and significant association derived between the variables lends further credence to the theoretical base. The "causal" sequence is given support. This is not to say that MBD causes delinquency. However, MBD "causes" delinquency, in that it may make MBD individuals more prone to being defined as delinquent.

### Summary

The present results suggest that 56% of the delinquent sample studied possess minimal brain dysfunction, by virtue of the behavioral signs of MBD exhibited. Further, a positive and significant correlation was found between the number of behavioral signs and the amount of delinquent involvement, the latter of which is measured by the number of

referrals to juvenile court. The findings, coupled together, suggest that these delinquents repeatedly go unrecognized as possessing the dysfunction. However, the more blatant forms of the dysfunction appear to be almost totally absent from the sample.

These findings have different implications. First, the present study suggests that the current system of identifying and treating delinquents may be inadequate, particularly for those who are not referred to the courts. Further, these findings suggest a need for a more comprehensive system of identifying and treating delinquents, one that includes the identification and treatment of those who are not referred to the courts. This suggests that the current system of identifying and treating delinquents may be inadequate, particularly for those who are not referred to the courts. This suggests that the current system of identifying and treating delinquents may be inadequate, particularly for those who are not referred to the courts.

Secondly, on the basis of general observations and very limited professional literature, it appears that

delinquents who are not referred to the courts may be more likely to have serious mental health problems than those who are referred to the courts. This suggests that the current system of identifying and treating delinquents may be inadequate, particularly for those who are not referred to the courts.

Thirdly, the findings suggest that the current system of identifying and treating delinquents may be inadequate, particularly for those who are not referred to the courts. This suggests that the current system of identifying and treating delinquents may be inadequate, particularly for those who are not referred to the courts.

<sup>107</sup> Kasper L. Finkelhor, "Child Abuse and Neglect: A Question of Challenge," *Child Welfare*, 71 (1992), 319, and Don Johnson, "Social Responsibility and Child Abuse," *Child Welfare*, 71 (1992), 321. Paper presented at a meeting of the American Professional Society on the Abuse of Children, New York, February, 1992. See also Johnson, 1992, pp. 30-31.

<sup>108</sup> Johnson, p. 3.

## CHAPTER 6

## DISCUSSIONS AND CONCLUSIONS

Recognition and Treatment

Since Johnson used different statistical tests, the present results cannot be directly compared with his. However, despite this difference, both studies found samples which exhibited high scores on the instrument used for assessing MBD. Further, both studies conclude a positive and significant correlation between the magnitude of delinquency and minimal brain damage. This suggests, if we may extrapolate to the larger delinquent population, that many delinquents with MBD go unrecognized. Such an extrapolation receives support from the literature, notably the works of Pollack and Keldgord.<sup>102</sup>

Keldgord, on the basis of personal observations and very limited professional literature, suggests that

. . . our juvenile institutions today confine many youngsters who should not be so detained but who, unhappily, have been processed through the assembly line of juvenile jurisprudence without ever being seen by the competent person who could diagnose, or even suggest evidence of minimal brain damage.<sup>103</sup>

More methodologically orientated than Keldgord, Pollack reported on a large sample of behavior-problemed children, including delinquency, who went unrecognized as suffering from an organic disturbance. Further, this sample was initially incorrectly diagnosed as suffering from "child-

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<sup>102</sup>Robert E. Keldgord, "Brain Damage and Delinquency: A Question and a Challenge," CPPCA Journal, VI (1969), 3-9, and Max Pollack, "Mental Subnormality and 'Childhood Schizophrenia,'" Paper presented at a meeting of the American Psychopathological Association, New York, February, 1966 quoted in Levy, Juvenile, pp. 80-81.

<sup>103</sup>Keldgord, p. 5.

hood schizophrenia" and "infantile autism," which were said to be due entirely to psychological factors.<sup>104</sup>

Moreover, the number of delinquents with MBD who go unrecognized appears to be quite substantial. Keldgord, in considering the numbers of MBD delinquents arrested, referred to court, detained and institutionalized in California, estimated their number to be as large as 55,550.<sup>105</sup> Admittedly, much overlapping is present in the above categories of arrested, referred, etc. Yet, even when overlapping is accounted for, the number is shocking. However, what is really shocking is the fact that overlapping occurs. These delinquents repeatedly go unrecognized through the steps of the juvenile justice system.

Recognition of the ". . . behavioral signs of neurological dysfunction becomes critical," states Berman, "in appropriately identifying the affected children before they get into the viciously escalating cycle of school failure and peer ridicule."<sup>106</sup> Such an initial rating, by the probation officer, is crucial for the child's welfare. His rating of behaviors indicative of MBD is superior to the "one-shot" rating of the medical or psychological practitioner, as stated above. This is not to say that complex testing should not be a part of a diagnosis of MBD. However, the initial rating should be the responsibility of the probation officer, who knows the whole child or the child's 'Gestalt.'<sup>107</sup>

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<sup>104</sup>Pollack quoted in Levy, Juvenile, pp. 80-81.

<sup>105</sup>Keldgord, p. 8.

<sup>106</sup>Berman, Neurological Dysfunction, p. 267.

<sup>107</sup>Although it is recommended that the initial rating of MBD be the responsibility of the probation officers, interpretation of individual ratings, as well as future testing, by necessity, must be left to the medical and psychological practitioners.

For the most part, this lack of perception on the part of probation officers, juvenile hall counselors, juvenile court judges, and training school staff members is unintentional.<sup>108</sup> These individuals cannot be blamed, but their training can. Few jurisdictions provide training for their juvenile justice staff in the recognition of the behavioral signs of minimal brain damage.

However, such a lack of training is consistent with current social sentiment and official policy. Both assume, for the most part, that apart from a few "hard core" delinquents, most delinquency is owed to unfortunate circumstances.<sup>109</sup> This assumption completely ignores the individual as a psychobiological organism. Poor parental mishandling, poor rearing patterns and poor intrapersonal relationships attempt to explain all delinquency formation.<sup>110</sup> Therefore, training juvenile justice workers in the recognition of the behavioral signs of MBD is difficult to implement, in light of the status quo.

Some practitioners, who have vested interests in rehabilitation techniques which are environmentally based, dismiss organic factors as being "too expensive to look for." They state that it is not practical to screen for organic factors in thousands, when only a few might possess such factors. There is some truth in this statement. Admittedly, it is not practical to give half a dozen tests for MBD to every delinquent being referred to the court. However, it is practical to give the total delinquent population an inexpensive, diagnostic indice of MBD, such as the instrument used herein--the Behavior Check List. If high scores on

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<sup>108</sup>Keldgord, p. 5.

<sup>109</sup>Hodge, p. 168.

<sup>110</sup>Levy, Juvenile, p. 96.



the BCL resulted, other more complex diagnostic procedures could follow. However, the statement that only a few delinquents possess minimal brain dysfunction is an underestimate, as the present study and the literature suggest. Yet, the status quo reduces the possible training that probation officers might receive in administering such an indice.

However, some juvenile justice systems are more progressive than the majority and recognize the relationship between MBD and delinquency. Among the few jurisdictions which provide training for their staff in recognizing MBD and specialized treatment for their MBD delinquents include: Norfolk Juvenile and Domestic Relations District Court; the juvenile justice systems of Sonoma, Merced, and Alameda Counties, California; and Colorado's Division of Youth Services.<sup>111</sup> This recognition is the first of a two-step correction process, the second being treatment. For example, in the Norfolk Court, probation officers are instructed to watch for discrepancies between previous school achievement and achievement test results. If such a discrepancy is uncovered, a psychological, psychoeducational evaluation is initiated.<sup>112</sup> Depending on the diagnosis, referrals are made to competent professionals. In addition, the delinquent is usually placed in a community-based facility.<sup>113</sup>

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<sup>111</sup>See Richard E. Compton, "Diagnostic Evaluation of Committed Delinquents" in Youth in Trouble, ed. Betty Lou Kratoville (San Rafael: Academic Therapy Publications, 1974), pp. 44-56; Keldgord, pp. 3-9; and Chris W. Love and Gary H. Bachara, "A Diagnostic Team Approach for Juvenile Delinquents with Learning Disabilities," Juvenile Justice, XXVI (February, 1975), 27-30. Note that the list of jurisdictions reflects only the literature reviewed. However, this small number of jurisdictions discovered in the published literature suggests that the actual number is not much larger.

<sup>112</sup>The Court's orientation is toward recognizing the learning disabled. However, since MBD is a major causative factor of learning disabilities, the treatment scheme is relevant to be discussed herein.

<sup>113</sup>Love and Bachara, p. 28.

Berman states that treatment of the MBD delinquent "must be organized around each child's personal pattern of deficits, so that rehabilitation helps the child to overcome those specific problems that have caused his maladaptive behavior."<sup>114</sup> For example, treatment of an individual possessing an immature frontal lobe might consist of acquiring the ability to switch between principles of action, by presenting the individual with alternating verbal and written commands. Too, chemotherapy in recent years has been successfully applied to the minimally brain-damaged child. However, one of the goals of any treatment program is to teach the delinquent to attain self-regulating behaviors, in spite of his neurological impairment.<sup>115</sup>

Treatment of the MBD delinquent, where recognized, has shown promising effects. The following excerpt from a case history in Sol Levy's work shows that recognition and treatment does lead to law-abiding behavior:

When examined, the boy was extremely restless, hyperactive with short attention span, showing markedly unpredictable behavior. He also showed evidence of marked feelings of insecurity and inferiority for which he tried to overcompensate by aggressive behavior. Physical and neurological examinations were essentially negative. On the Stanford-Binet he scored an IQ of 111 but the examiner noted that his reading was markedly below average and that his concentration and attention spans were poor. EEG was also done which was reported as "mildly diffusely abnormal with activity below the full range of frequency." On the basis of the history and the characteristic behavior, a diagnosis of post-encephalitic behavior disorder was made and the boy was placed on 15 mg. benzedrine daily. Immediately after institution of therapy, his behavior improved markedly, restlessness and hyperactivity subsided, concentration span improved and although he had been on probation at school, he was immediately taken off since the teacher reported very satisfactory adjustment at school with marked improvement in his grades and better socialization with other children. He showed no further evidence of antisocial activity, had assumed responsibility in that he worked after school and during vacation time, and at that time

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<sup>114</sup>Berman, Neurological Dysfunction, p. 266.

<sup>115</sup>Ibid., p. 268.

all reports from the school and employers indicated that he was reliable and trustworthy. In the meantime, he did graduate from high school and has had steady employment.<sup>116</sup>

However, with the exception of a few good programs that recognize the relationship between MBD and delinquency, as Berman states: ". . . there is little organized, action-oriented effort toward understanding neuropsychological or perceptual impairment as it relates to delinquency."<sup>117</sup>

Some investigators, notably Love and Bachara, believe that the schools should play a key role in identifying minimal brain dysfunction, thereby reaching the "future delinquents" before they embark upon their criminal career.<sup>118</sup> The schools, for the most part, have applied special programming for the more obvious cases of MBD. For example, many schools have special classrooms for these children and/or possibly special study carrels, that help MBD children concentrate by reducing their stimulus field.<sup>119</sup> Yet, the more subtle forms of MBD seem to go overlooked. This fact is supported by the results obtained herein. To reiterate, in the present study, 56% of the delinquent sample had BCL scores suggestive of minimal brain dysfunction.

Therefore, this investigator recommends that the schools and the juvenile courts should undertake cooperative programs aimed at identifying and treating the minimally brain-damaged child. Today, the label "delinquent" often separates the child from the facilities of the school

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<sup>116</sup>Levy, Juvenile, pp. 98-99.

<sup>117</sup>Berman, Neurological Dysfunction, p. 265.

<sup>118</sup>Love and Bachara, p. 29.

<sup>119</sup>Berman, Neurological Dysfunction, p. 268.

system and casts him into the hands of the juvenile justice system. The mere label of delinquent, attached to the MBD delinquent, should not commence a tossing back and forth of a child. Cooperation is the key to identification and treatment. The latter two are a solution to the waste of human potential that currently occurs. As Sol Levy, again so succinctly states:

Assuming that in only 15 to 25 per cent of all juvenile delinquents these organic conditions, which are treatable and reversible can be diagnosed and recognized, . . . and thus, because of treatment, can restore the delinquent to a normal law abiding and socially well adjusted citizen (and I feel that this is an underestimation rather than an exaggeration of the incidence of these conditions responsible for juvenile delinquent), the problem could be greatly reduced with, as anyone will easily recognize its subsequent tremendous effect not only on the social but also on the economic status of the nation as a whole.<sup>120</sup>

#### Limitations of the Present Research

Every investigator is limited in what he or she would like to implement in his or her research. This investigator is no exception. Practical concerns and time limitations have forced restrictions on this research study.

Firstly and most importantly among these limitations is the fact that the instrument used had to be employed unchanged. Validity and reliability were assumed. I recognized errors within the instrument as the critique points out. However, if one change was made of any scope, replication would have been voided. If this investigator sought to change the instrument to any significant degree, the end result would have, had to be considered an entirely different instrument. Therefore, tests of validity and reliability would have, had to be re-undertaken.

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<sup>120</sup> Levy, Juvenile, pp. 99-100.



Such an endeavor alone would take months of research and study.

Admittedly, the present study took a large amount of information on faith alone. Perspectives of the probation officers on the behavioral items were assumed to be similar. In the same light, it was assumed that these raters were consistent in their completion of each and every BCL. These assumptions are not that far-reaching. However, it cannot be contended that statistically trustworthy information would have lent more value to the present study.

Some critics might argue that the sample size was too small to adequately test the hypothesis. On this point I can firmly argue that the sample size is acceptable. The statistical testing employed took the small sample size into account in testing the hypothesis. I contend that the results would have been the same if a larger sample size, say of 100 individuals, would have been employed.

However, the extrapolation made to the larger delinquent population must be considered with a grain of reservation, in light of the rules of statistical inference. The sample studied was not randomly selected, since it took into account all individuals within the study period, meeting the subject criteria. It may be contended that the sample therefore is not representative of the larger delinquent population.

However, I question anything short of a nationally selected sample as being truly representative of the "larger delinquent population." All that is required herein is that the reader considers the possible unrepresentativeness of the sample, as one moves further from the County sample studied to the larger sample in consideration. Lastly, however, it should be noted, again, that the present results are consistent with the literature, giving credence to extrapolation.



### Recommendations for Future Research

To any future investigators looking at the relationship between minimal brain damage and delinquency, I refer them to the previous section on limitations. These limitations should be given foremost attention. In addition, I recommend further aspects of study to be focused on in future research. I know of no better way to present them than to simply list them as follows:

1. The Behavior Check List, the instrument employed for assessing minimal brain dysfunction, should be revamped in accord with the above critique.
2. Delinquents exhibiting high scores on the BCL should be administered further indices of MBD. In short, the Behavior Check List should be cross-validated on other indices of MBD.
3. The sample selected in future research should give consideration to the inclusion of female delinquents.
4. In addition to residency and referral information, offense data should be sought for each study subject. As discussed above, offense data, taking seriousness into consideration, could then be correlated with the number of behavioral traits indicative of MBD. This would result in a more accurate description of the magnitude of delinquency.
5. A longitudinal study looking at the relationship investigated herein would be the most far reaching and valuable contribution to the field made yet. Data should be sought from individuals from at least two time periods, preferably five years apart, and then compared. Conceivably it could address the question: Did the increase or decrease in MBD correlate with the respective direction of delinquent involvement?

Contribution Made to Criminal Justice

Historically, criminal justice practitioners have, for the most part, ignored medical and psychological studies which have had implications for the field. This no doubt is somewhat due to the technical jargon abundant in the medical and psychological journals.

Herein, I have hoped to reduce this jargon to meaning for the criminal justice practitioner, decision maker, and student. The presenting of the awareness, understanding and recognition of the dysfunction in its role in delinquency formation has been one of my purposes in undertaking this research. For awareness, understanding, and recognition are the first steps in changing the current perspectives on treatment or "rehabilitation." In closing, as I stated at the outset, delinquency may be owed to a minimal brain dysfunction.

## BEHAVIOR CHECK LIST

Subject's 3 initials: \_\_\_\_\_ APPENDIX A \_\_\_\_\_

Please describe the above referred-to person in terms of the following characteristics, according to your information from reports of others.

## The Behavior Check List

Check the appropriate column for each item. Check "like him" if any or all of the characteristics seem to apply to the individual to a greater degree than to most other persons his age.

	like him	not like him	unknown
1. Generally poor socialization, withdrawn, poor social judgment, lack of affective bonds with others, exclusive			
2. Aggressive, dominating, rough, cruel, defiant, or destructive			
3. Frequently a discipline problem			
4. Impulsive			
5. Irritable, frequently shows anger or hostility, frequent temper tantrums			
6. Low frustration tolerance			
7. Moody, unpredictable, often refuses to obey orders			
8. Ineptness, actions in new situations, needs structure			
9. Generally emotionally immature			
10. Poor ability to show appropriate reactions (e.g., pity, fear, sympathy, amusement, affection)			

## BEHAVIOR CHECK LIST

Subject's 3 initials: \_\_\_\_\_ Rater's 3 initials: \_\_\_\_\_

Please describe the above referred-to person in terms of the following characteristics, according to your observations and your inferences from reports of others.

Check the appropriate column for each item. Check "like him" if any or all of the characteristics seem to apply to the individual to a greater degree than to most other persons his age.

	like him	not like him	unknown
1. Generally poor socialization, withdrawn, poor social judgement, lack of affective bonds with others, seclusive			
2. Aggressive, domineering, rough, cruel, defiant, or destructive			
3. Frequently a discipline problem			
4. Impulsive			
5. Irritable, frequently shows anger or hostility, frequent temper tantrums			
6. Low frustration tolerance			
7. Moody, unpredictable, wide swings to mood extremes			
8. Insecure, anxious in new situations, needs structure			
9. Generally emotionally immature			
10. Poor ability to show appropriate emotions. (e.g., pity, remorse, sympathy, amusement, affection)			

	like him	not like him	unknown
11. Poor ability to delay gratification or to pursue long range goals			
12. Concrete or stereotyped thinking, poor abilities for abstract reasoning, or difficulties in concept formation			
13. Perseverates in thought or behavior			
14. Poor memory			
15. Thinking frequently disorganized and confused			
16. Poor insight into difficulties			
17. Hyperactive or hypoactive			
18. Poor visual-motor coordination, perceptual defects			
19. Clumsy or awkward			
20. Difficulty or abnormality in speech, poor ability to communicate			
21. Wide discrepancies in specific abilities			
22. Much variation in school performance from day to day, hour to hour, or minute to minute			
23. Generally poor school achievement or adjustment			
24. Short attention span, impaired concentration ability			
25. Distractible			
26. Restless			

After completing the above, please supply the following information about the person you have just described:

Number of referrals to the Juvenile Court  
 Yes  No  Has subject lived in County at least since commencing high school?



## ITEM ANALYSIS OF THE BEHAVIOR CHECK LIST

Below, the aggregate number and percentage of each of the behavioral items checked "like him" on the Behavior Check List are indicated.

Item Analysis of the Behavior Check List

Behavioral Item	Count	Percentage
1. Generally poor socialization, withdrawn, poor social judgment, lack of affective bonds with others, exclusive	12	48
2. Aggressive, dominating, rough, cruel, defiant, or destructive	5	20
3. Frequently a discipline problem	13	52
4. Inactive	23	92
5. Irritable, frequently shows anger or hostility, frequent temper tantrums	8	32
6. Low frustration tolerance	14	56
7. Moody, unpredictable, wide swings to mood extremes	8	32
8. Insecure, anxious in new situations, needs structure	18	72
9. Generally emotionally immature	17	68
10. Poor ability to show appropriate emotions (e.g., pity, remorse, sympathy, amusement, attraction)	6	24
11. Poor ability to delay gratification or to persist long range goals	22	88
12. Concrete or stereotyped thinking, poor abilities for abstract reasoning, or difficulties in concept formation	10	40
13. Impulsive in thought or behavior	4	16
14. Poor memory	5	20
15. Thinking frequently disorganized and confused	8	32

## ITEM ANALYSIS OF THE BEHAVIOR CHECK LIST

Below, the aggregate number and percentage of each of the behavioral items checked "like him" on the Behavior Check List are indicated.

Behavioral Item	Number	Percentage
1. Generally poor socialization, withdrawn, poor social judgment, lack of affective bonds with others, seclusive	12	48
2. Aggressive, domineering, rough, cruel, defiant, or destructive	5	20
3. Frequently a discipline problem	13	52
4. Impulsive	22	88
5. Irritable, frequently shows anger or hostility, frequent temper tantrums	6	24
6. Low frustration tolerance	16	64
7. Moody, unpredictable, wide swings to mood extremes	6	24
8. Insecure, anxious in new situations, needs structure	18	72
9. Generally emotionally immature	19	76
10. Poor ability to show appropriate emotions (e.g., pity, remorse, sympathy, amusement, affection)	6	24
11. Poor ability to delay gratification or to pursue long range goals	22	88
12. Concrete or stereotyped thinking, poor abilities for abstract reasoning, or difficulties in concept formation	10	40
13. Perservates in thought or behavior	6	24
14. Poor memory	5	20
15. Thinking frequently disorganized and confused	8	32

Behavioral Item	Number	Percentage
16. Poor insight into difficulties	20	80
17. Hyperactive or hypoactive	2	8
18. Poor visual-motor coordination, perceptual defects	1	4
19. Clumsy or awkward	2	8
20. Difficulty or abnormality in speech, poor ability to communicate	1	4
21. Wide discrepancies in specific abilities	3	12
22. Much variation in school performance from day to day, hour to hour, or minute to minute	7	28
23. Generally poor school achievement or adjustment	17	68
24. Short attention span, impaired concentration ability	14	56
25. Distractible	16	64
26. Restless	17	68

APPENDIX C

RAW DATA

Raw Data

Inventory Check List Scores and Number of Referrals

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Within Sample Subject Number	Score (X)	Referrals (Y)
1	19	1
2	18	1
3	17	1
4	17	1
5	16	1
6	15	1
7	14	1
8	13	1
9	13	1
10	17	1
11	11	1
12	11	1
13	11	1
14	18	1
15	16	1
16	10	1
17	10	1

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## RAW DATA

## Behavior Check List Scores and Number of Referrals

Within Sample Subject Number	Score (X)	Referrals (Y)
1	19	6
2	18	4
3	17	3
4	17	2
5	16	4
6	15	4
7	14	5
8	13	5
9	13	3
10	12	4
11	12	3
12	11	5
13	11	4
14	11	3
15	11	2
16	10	5
17	10	5
18	10	4
19	10	2
20	9	2
21	6	7
22	3	3
23	2	2
24	2	2
25	2	2



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