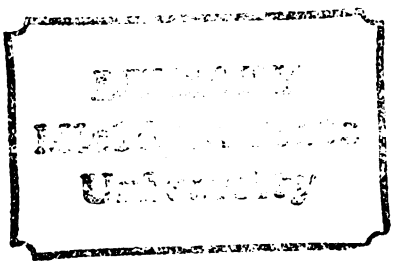

This is to certify that the

thesis entitled

SUGAR INTAKE AND THE
ASSAULTIVE CRIMINAL PERSONALITY

presented by

Jack Glen Jesse

has been accepted towards fulfillment
of the requirements for

M.S. degree in Criminal Justice

David B Kalinich

Major professor

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SUGAR INTAKE AND THE

ASSAULTIVE CRIMINAL PERSONALITY

By

Jack Glen Jesse

A THESIS

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ABSTRACT

SUGAR INTAKE AND THE
ASSAULTIVE CRIMINAL PERSONALITY

By

Jack Glen Jesse

Eighty-six inmates at the Ingham County Jail in Mason, Michigan were studied to determine what effects reported sugar and refined carbohydrate intake have upon both the physical and psychological, personality symptoms which can be identified as anti-social, criminal or maladaptive in nature. It was hypothesized that those inmates who reported high sugar and refined carbohydrate intake would produce significantly more of the biological and psychological symptoms as well as have a greater record of reported assaultive crimes. The personality traits of hostility, impulsivity, depression, and social deviency were measured by the Bi-Polar Psychological Inventory. A questionnaire designed to determine hypoglycemia was used to measure the physiological effects.

The results of this study pointed to several significant correlations corresponding to the stated hypothesis. Hostility, social deviency and impulsivity all showed positive significant correlations with the intake of sugar and refined carbohydrates. This study adds to the orthomolecular theory describing biological behavioral determinants, and points to practical applications in the criminal justice system.

TO MY WIFE PAM, AND CHILDREN,
JAMES, JAREMY AND HEIDI

who know that true knowledge comes

with faith and persistence, and that

we get to the top by helping others

get to the top.

ACKNOWLEDGEMENTS

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INTRODUCTION

Interest in orthomolecular theory which studies the effects of various molecular concentrations of certain substances in the brain upon mental and physiological functioning has been growing steadily during the last fifteen years. This search for alternative explanations, particularly to deviant, criminal activity, is in response to overcome some of the current personality, psychological and other physiological theories explaining criminal behavior. A second factor pressing expanded interest in this field is the overcrowding of correctional institutions, and the rise in not only absolute numbers of crimes, but in the crime rates. (Webster, 1978).

Biochemical research has discovered that the functioning of the brain is affected by molecular concentrations of many substances that are normally present in the brain. The optimum concentrations of these substances may differ greatly due to intake of various substances from the concentrations provided by its normal diet and genetic machinery. Abnormal deficits or excesses in these molecular brain concentrations, depending upon the specific and varying individual needs of each person, can lead to a variety of pathological thought and behavior patterns and, under some conditions, may be seen as antisocial or criminal in nature. This explanation of behavior, stemming from biological causes, was first given by Linus Pauling in 1968. (Meier, 1977). He called it the "orthomolecular theory" of behavior. Pauling won the Nobel Prize for his discoveries in bio-

chemistry. Although it is a general theory of optimal human functioning and dysfunctioning, the dysfunctions described are very similar to behaviors labeled as "delinquent" or "criminal".

The writer of this thesis is primarily interested in personality and behavioral dysfunctions related to chemical imbalances produced by a diet characterized by a high intake of sugars and refined carbohydrates which leads to a condition known as hypoglycemia or low blood sugar. Hypoglycemia occurs as a biological reaction when the adrenal gland becomes over stimulated by the almost immediate influx of refined carbohydrates and sugars into the bloodstream. The adrenal gland in turn stimulates the pancreas which produces insulin, which in turn enables the body to digest the sugars. It would appear that the human body, in many cases, just has not been able to adapt to this surge of predigested sugars which does not give the metabolic digestive processes the necessary time to complete normal functions to discharge reactors so that too much insulin is not produced. The over supply of insulin then, not only digests the sugars and refined carbohydrates just consumed, but also depletes the body of other natural sugars, resulting in a low blood sugar condition. (Fishbein, 1980; Thieme, 1976) offer a more detailed account of the metabolic process which results in reactive hypoglycemia. Hypoglycemia has been linked to delinquent behavior and other mental disorders and appears to show many of the symptoms which are commonly described as antisocial or criminal.

CHAPTER 1

LITERATURE REVIEW

Dr. Abram Hoffer, a leader in the orthomolecular medicine movement, described four major groups of symptoms which may accompany biochemical deficiencies or abnormalities in the body and may be seen as anti-social: (1) Perceptual changes due to nutritional disorders; (2) perceptual changes due to brain allergy; (3) hyperactivity due to nutritional defficiencies; and (4) hyperactivity due to hypoglycemia. (Hoffer, 1975). Nutritionists relate these symptoms to high consumption of products containing large quantities of refined sugars and starches, and to poisonous food additives. (Hall, 1974).

The specific symptoms of hypoglycemia are numerous and persons exhibiting such symptoms have often beem diagnosed or misdiagnosed under many psychotherapeutic headings. Medical experts in the field report that hypoglycemia can have an amazing effect on behavior, in some cases producing symptoms of lethargy and depression, and in other cases, irritability, suspiciousness, bizarre thoughts, hallucinations, extreme mania, anxiety, and violent behavior. These persons are certainly capable of such acts, for example, as stealing, rape, arson, assault and homocide. (Hippchen, 1978). It has been estimated that 90% of the criminals, imprisoned for homocide, which were diagnosed as paranoid or schizophrenics, were really suffering from hypoglycemia or some form of vitamin deficiency. (Hall, 1974).

Bonnet and Pfeifer (1976) also believe hypoglycemia to be a contributing factor to delinquency and cite symptoms of irritability,

depression, rage, mood swings, and aggression. This condition is aggravated by the refined carbohydrate, high sugar, low protein, junk food diet. Similarly, cravings for candy, tabacco, caffeine, or alcohol may be symptoms. Chereskin and Ringsdorf (1977) believe there is an epidemic proportion of hypoglycemia in America, nearly ten percent of the population. They note such symptoms as, irrational behavior, emotional instability, distorted judgement, and nasty personality defects. Dr. Joseph Wilder of New York, a specialist in psychiatry and neurology, has found that with heavy sugar intake a child may be neurotic and psychopathic, and be subject to anxiety, running away tendencies, aggressiveness, a blind urge to activity and aggressiveness with impairment of moral sensibilities.(Hippchen, 1978). The impairment of moral sensibilities was noted by other researchers who felt that adult crimes, including murder, may be hypoglycemia related. (Abrahamson, 1978; Gyland, 1976). Abrahamson attributed the moral impairment to chronic sugar starvation of the brain cells.

Rojas and Sanchi (1941) reported in their examination of 129 delinquents convicted of offenses against persons and property, revealed low blood sugar in all but thirteen. In one of the more detailed and scientifically controlled studies, the Qolla, a hostile Peruvian Indian Tribe, was examined. (Bolton, 1973). Bolton hypothesized that the exceptionally high level of social conflict and hostility in this society could be partly explained by the tendency to hypoglycemia among the community residents. A chi-square analysis of

data showed a statistically significant relationship between aggression ranking and the change in blood glucose levels during the test. Moyer (1977) noted these findings as remarkable and states that this relationship must be a powerful one.

Other researchers in the field of biological causes of criminal behavior seem to agree on the symptoms of hypoglycemia and its tendency to lead to irrational and hostile behaviors. Dr Carlton Fredricks (1976) believes that severe hypoglycemia is present in sixty percent of all schizophrenics, and is also capable of mimicking neurosis and psychosis.

J.I. Rodale, a leader in the area of nutrition and health, cites several articles and studies relating to the hypoglycemic person and his tendency to criminal activity. One such study (Rodale, 1971) noted that ninety percent of suicide cases tested were found to be suffering from acidosis which is caused by large quantities of sugar and refined carbohydrates such as cakes and cereals. He also cites an article by Dr. Joseph Wilder M.D. (4/1943) who commented that it was little wonder that a considerable number of criminal and semi-criminal acts have been observed in children's hypoglycemic (low blood sugar) states ranging from destructiveness and violation of traffic regulations all the way to beastiality, arson, homocide and other violent aggressiveness. (Hoffer, 1975; Rodale, 1971). Rodale (1971) also pointed out the relationship between vitamin B deficiencies and sugar or a hypoglycemic condition. The practice of consuming sugar results in the robbing of the body of its vitamin B. Vitamin B plays so big a

part in nerve health that it is often referred to as the "morale" vitamin.

Orthomolecular Theory Applied

Application of these findings is wide spread and includes use in general psychiatric practice, family counseling, child and adolescent care, as well as probation and correctional applications. In Alameda County Correctional Facility and others in California (12/1979) a great deal is being paid to the inmate's diet. The most striking trend is the banishment of sugar, the same substance linked to hyperactivity in children and other symptoms previously discussed. California probation officer Janice MacLaren (12/1979) noticed what she termed as a "dramatic" improvement in an incorrigible, hyperactive eleven year old when she advised the parents to keep him off Pepsi, cake and cookies. A number of medical practitioners have reported striking results in the use of orthomolecular approaches to treatment of crime related types of behavior. (Meier, 1977). Russell Smith (1972) a physician at Brighton Hospital in Detroit treated alcoholics with massive doses of vitamins B-3 over a two year period with a 71 percent rate of recovery. Similarly, Vic Pawlak (1972) director of a drug center in Phonex, Arizona has reported an 80% successful treatment rate using vitamin B-3 and C therapy. David Hawkins (1972, Hoffer and Osmond (1972), Philpott (1974), and Mandell and Newbald (1972) have all received similar results in treating criminal types with megavitamins, particularly the B vitamins.

While there appears to be a great deal of evidence to show that

orthomolecular theory has a place and usefulness not only in explaining criminal types of behavior, but also as an effective and non-complicated method of treatment, it still has not become widely accepted or practiced.

Research Hypothesis

The purpose of this research will be to add to the orthomolecular theory, stressing the impact of our diet, particularly refined carbohydrates and sugars, upon both the physical and the psychological, personality symptoms which can be identified as anti-social, criminal or maladaptive in nature.

It is therefore hypothesized that chronic ingestion of refined carbohydrates, sugars, including alcoholic beverages, will produce a certain set of symptoms as have been accounted in the preceding review of the literature. Further, that these symptoms can be measured both in biological terms (symptomatology), and by means of psychological, personality tests. It is hypothesized that those inmates who report high sugar, refined carbohydrate, alcohol intake should produce significantly more of the biological and psychological symptoms which have been associated with criminal or maladaptive behaviors. These inmates, it is hypothesized, will show a significantly greater number of assaultive crimes as well. The null hypothesis is also stated in that the data gathered may clearly indicate that there is no relationship between refined carbohydrate, sugar, and alcohol ingestion with scores achieved on the hypoglycemic scale and upon the psychological, personality indicators, and the number of assaultive crimes.

CHAPTER 2

METHODOLOGY: VARIABLES

Research Site

The location for this study was the Ingham County Jail in Mason, Michigan. The Ingham County Jail was chosen because of its accessibility to the inmate population and the cooperation extended by the Sheriff, Jail Administrator and other correctional staff. This site was also chosen because of its large inmate poulation (240) from which to draw the research, test group. Further, this facility, unlike prisons, houses both sentenced and unsentenced inmates and both felons and misdemeanants. Finally, this site was chosen because of the accessibility of baseline data and statistical information on the inmate population as a whole, by which this researcher could compare the test group for representativeness of the sample. Testing facilities such as large conference rooms were also available to facilitate the testing procedure over a short period of time and thus tightening control over some of the extraneous variables such as weather, overcrowding, medical epidemics which might disrupt the testing if given over a longer period of time.

Research Subjects

The subjects for this study were inmates located at the Ingham County Jail. They were comprised of both sentenced and unsentenced, felons and misdemeanants. The study group originally consisted of

ninety-three (93) inmates. Seven of these were unable to either produce a valid Bipolar Psychological Inventory or did not complete one of the questionnaires, resulting with a test sample of eighty-six (86) valid cases. From those 86 cases, the following univariate statistics are presented:

Race

White	59%
Black	27%
Hispanic	5%
American Indian	3%

Age

Subjects ranged in age from 17 - 52

Mean age	26.3
Mode	18
Median	23.9

92% of the test group were between the ages of 17 and 36

Sex

All test subjects were males

Days in Jail

Subjects ranged in days in jail from 1 to 293

Mean Days in Jail	57.4
Mode	3.0
Median	33.5

Sentencing Status

Sentenced	76%
Unsentenced	24%

Felony/Misdemeanor Status

Felons	50%
Misdemeanants	50%

Time Yet to Serve (months)

Subjects ranged in time yet to serve from	1 to 180
Mean	22.8
Mode	1.0
Median	4.7

The eighty-six men that comprised the test group represented nearly 36% of the total population of 239 at the time of testing, which represents a sufficient number to adequately assume a representative sampling of the inmates.

Variables

In attempting to isolate the conditions that give rise to the hypothesized personality variables of depression, social deviency, impulsiveness, and hostility as measured by the Bipolar Psychological Inventory, assaultive crimes, and the biological indicators as noted on Dr. Bumpus' hypoglycemia questionnaire, several independent variables were examined. Many of these independent variables were also selected in order to determine if the test subjects were, indeed, a representative sample of the total jail population. The frequency at which various ages, races and other descriptive characters appear will be compared with similar statistical data which is available through the Intake-referral Coordinator's Office at the Ingham County Jail. The variables of age and race, as well as days in jail and sentencing status, may in themselves be important in terms of scaling on the Bipolar Psychological Inventory, particularly in regard to depression and social deviency. It is possible that depression may

be a direct result of facing a long sentencing term. Hostility similarly may be more prevalent among those that are unsentenced, and even more so with those facing a long prison term. The amount of time an inmate has already served in jail will also be examined to determine if there is any influence on any of the four personality variables being examined.

The two independent variables of primary concern being considered are sugar and refined carbohydrate intake, and alcohol consumption. Each of these has been linked to hypoglycemia or low blood sugar which has been hypothesized to effect the test subjects both physically and psychologically. A close look will need to be taken to see if the effects of assault may be due to the direct effects of the alcohol, rather than the carbohydrate, sugar content. The beverage alcohol, whether found in wine, beer or distilled spirits, has often been linked with anti-social or criminal behaviors. (Wilder, 1940; Yates, 1979; Gotcher, 1974; Pittman and Gordon, 1958). The relationship between alcoholism and hypoglycemia is also becoming clearer as several researchers have begun to study the alcoholic populations in a more detailed manner. (Fredricks and Goodman, 1969; Meiers, 1973; Milan, 1974). Poulos (1976) found that 96% of an alcoholic group studied to be diagnosed as hypoglycemic. Similarly, Dr. R. Meiers (1973) found 95% of an alcoholic group to be hypoglycemic. Dufty (1975:24) noted that during prohibition sugar consumption skyrocketed. It will be noted in this study just what happens to sugar intake for those

individuals who drank a lot of alcohol prior to incarceration. Therefore, while alcohol appears to act independently, some of the same physiological systems of reaction are put into motion and a hypoglycemic state seems to result, or at least be promoted. Fishbein (1981) gives a precise and detailed account of the metabolic process of interaction of alcohol with a hypoglycemic state.

Six dependent variables are being considered in this study: physiological symptoms of hypoglycemia, assaults, and the four personality variables of hostility, depression, social deviency and impulsiveness as measured on the Bipolar Psychological Inventory. While the effects of hypoglycemia (low blood sugar) have been examined in detail in the preceding pages, hypoglycemia has been excluded as an operational dependent variable for several reasons. First, the test to determine hypoglycemia, the Glucose Tolerance Test (GTT), requires medical personnel and laboratory tests which are both extremely expensive. The GTT also requires the subject to maintain a high carbohydrate intake the days before the testing and a twelve hour period of fasting with restrictions on caffeine and tobacco. After being fed a pure glucose solution, blood samples are taken over a four hour period. Generally such tests are administered within a hospital or medical clinic where close observation of the subject may be maintained. Lastly, while the GTT is the most accurate of tests yet devised, there has been some controversy in interpretation and levels of significance. (Hofeldt, 1965; Permutt, 1976; Roberts and

Hartman, 1980).

In the absence of a physiological measure of hypoglycemia and levels of sugar and refined carbohydrate intake, two independent questionnaires were used. The first questionnaire constructed to measure symptoms of hypoglycemia was developed by a Denver physician-surgeon, Dr. John Bumpus. (Cheraskin and Ringsdorf, 1976). Dr. Bumpus who specializes in cases involving hypoglycemia, devised his own questionnaire which includes a listing of 48 symptoms related to this condition. "Yes" answers to 25 or more of the items is an initial indicator of hypoglycemia and a need for further tests. "Yes" responses to 3 of 8 critical symptoms indicates that the client is at least suffering from some sugar intolerance. A nearly identical symptomology exam was used by Fishbein (1981) which was derived from Reed's extensive list of symptoms associated with hypoglycemia (Reed, 1977). Reed noted that individuals indicating more than 25 symptoms generally obtained a positive GTT. While no reliability or validity analyses were found on these individual questionnaires, they adequately provide a tool needed for a comparative and correlative analyses. This, however, must be noted as a weakness of the research and points to a need for development of a formally tested, non-physiological indicator of hypoglycemia.

A second questionnaire was constructed by this researcher in order to measure, in a comparative rather than absolute manner, intake of sugar and refined carbohydrates, including alcoholic beverages.

Responses to questions regarding sugar intake both prior to incarceration and within the jail were solicited in order to get a more accurate picture of each subject's intake. Many inmates do not have an adequate amount of money in their jail account to purchase such items as candy bars, cool aid, and thus it was important to determine their intake prior to jail. Alcohol, of course, was only available prior to incarceration. Each response was converted to grams for purposes of analysis. This food frequency questionnaire was not intended to measure total dietary intake of sugars and refined carbohydrates, but to measure in a comparative way between subjects their intake of some of the more common items which were available both in and out of jail.

The second dependent variable being examined is assaultive crimes. The crimes of Arson, Simple Assault, Assault and Battery, Aggravated Assault, Assault w/Dangerous Weapon (Felonious), Assault w/Intent to Commit Felony, Assault - Great Bodily Harm, Assault w/ Intent to Maim, Assault w/Intent to Rob (Armed), Assault w/Intent to Rob (Unarmed), Assault w/Intent to Murder, Manslaughter, Open Murder, Murder - 1st Degree, Murder - 2nd Degree, Murder - Felony, Kidnapping, Larceny from a Person, Malicious Destruction of Personal Property, Malicious Destruction of Real Property, Criminal Sexual Conduct - 1st, 2nd and 3rd Degrees were all considered as assaultive crimes where a person was under direct threat of harm or property damaged or destroyed. Each subject was asked to list those crimes of an assaultive nature for

which they had been arrested, but not necessarily convicted. Criminal records were viewed also to assess the accuracy of responses given by the subjects.

The remaining dependent variables of depression, social deviency, impulsiveness and hostility are all measures of the Bipolar Pyschological Inventory (BPI) which was administered to each subject. The BPI was chosen over other measures because of its ease of administration and scoring, ease of interpretation, and because it is relatively short (45 minutes for someone with an eighth grade education). The BPI is standardized and has been normed for offenders. The BPI has a built in validity scale, lie - honest scale, and measures thirteen different psychological variables among which are the four above mentioned. Payne and Roe (1972) performed a test on the test - retest reliability of the BPI scales. Their study showed a mean reliability of .84 with individual subscales ranging from .67 to .91. These reliabilities are somewhat better than the test - retest reliabilities ranging from .71 to .83 which were reported by Rotter (1949) on the MMPI. Kelly (1965) testing 200 prisoners found a test - retest reliability range for the BPI from .49 to .87 with a median of .80. No reliability test were run on the BPI validity scale because of its small variability. Pryor (1971) compared the MMPI with the BPI and found that the results showed that the BPI revealed more numerous and highly significant correlations with incarceration than did the MMPI. The scaling of the BPI has also been found to be more independent than that of the CPI

or MMPI (Roe, 1974; Crites, 1961); Kasselbaum, Couch, and Slater, 1959).

One last consideration was given to the BPI and that was the scoring for each personality variable could be placed on a percentile grid for comparative analytical purposes.

Other tests such as the Minnisota Multi-Phasic Inventory were considered, however, the MMPI besides its previously mentioned shortcomings, contains twice the number of items as the BPI, is more difficult to interpret and the scales tend to overlap, so that the specific personality characteristics this study is looking for would be obscured.

CHAPTER 3

METHODOLOGY: DESIGN AND IMPLEMENTATION

General Population Characteristics

The Ingham County Jail in Mason, Michigan has an inmate capacity of 240. Throughout the course of the 1980 year nearly 5,500 inmates were booked at this facility. The jail population characteristics over the past four years have stayed quite constant. Following is a general breakdown of some of the deographic inmate statistics for 1980 as reported by the Intake-Referral Coordinator (Lowe, 1980).

Sex	Gen. Popul. %
Male	92.33
Female	7.67

Race	
White	58.54
Black	31.18
Hispanic	9.59
Am. Indian	.69
Employment	
Full time	27.70
Self-employed	3.67
Part time	5.57
Unemployed	63.06
Educational Background	
College	4.87
High School Diploma	21.42
G.E.D.	9.58
9-12	54.71
Below 9	9.40
Prior Arrests	
Yes	90.06
No	9.94
Marital Status	
Married	15.50
Single	60.80
Separated	5.06
Divorced	18.64
Jail Status	
Sentenced	36.23
Unsentenced	63.77
Age	
21 and Under	35.37
22-28	33.27
29-35	18.47
36 and Over	12.89
Substance Abuse Problems	
Alcohol	32.93
Heroin	3.66
Other Drugs	10.97
None Reported	52.44
Charge	
Breaking and Entering	13.06

B/W Support	12.20
DUIL, Disorderly	9.06
Robbery	4.00
Larceny	15.34
U&P, Forgery	5.22
Traffic	2.62
CCW	1.05
Assaults	12.02
Receiving & Conceal.	3.14
Possession of Drugs	1.57
Sale/Del. of Drugs	2.97
Violation of Prob.	7.48
Criminal Sex. Cond.	5.05
Solicit., Prostitu.	1.57
Other	3.65

From the Intake-Referral Coordinator's report, it is clear that at least twenty percent of those booked at the Ingham County Jail have been arrested for crimes of an assaultive nature. It is also clear that nearly a third of the population has reported abuse problems with alcohol. It is hypothesized in this research that these two characteristics will likely overlap in the research population. According to Lowe (1980) the typical Ingham County Jail inmate is male, either black or white, and between the ages of 18 and 28. He is single and most likely unemployed or underemployed in an unskilled job. He is a high school drop out or has been expelled from school. There is a ninety percent chance he has a previous record of involvement with a law enforcement agency. He will most likely have a problem with alcohol or illegal drugs and may be in heavy denial of having any difficulty with these. His reason for being in jail will most often be larceny, breaking and entering, assaultive behavior, or non-payment of child support.

Research Design

Inmates to participate in this research were selected by dorm. Normally, each dorm contains from one to twelve residents. At the time of testing, the jail was nearly at capacity and each of the dorms tested contained ten to twelve inmates. The dorms were notified approximately one hour before testing that they would be called out at a designated time to take some tests. They were not told what the tests were nor why they were requested to take the tests, nor were the inmates told that they had to take the tests. Several of the subjects believed the tests to be screening tests prior to movement into the newly constructed jail facility. Each dorm test group was divided into two test rooms, attorney conference rooms on the floor, where there would be adequate light, a quiet atmosphere, and a conference table upon which to complete the psychological test and questionnaires. Test booklets and questionnaires were distributed to each group of five or six test subjects. The subjects were informed that all of the results would be confidential and that their anonymity would be maintained. Each group was then given individual instructions for completion of the Bipolar Psychological Inventory, as well as directions for the hypoglycemia symptomology questionnaire and the questionnaire regarding intake of sugar, refined carbohydrates and alcohol. When requested, a short explanation of the testing purpose was given. Subjects were given an opportunity to ask any questions prior to beginning the tests and then told to begin. A five minute obser-

vation period was made to be certain each subject had accurately understood and followed directions. The examinees were requested to remain in the test room until all had finished the test and questionnaires. While giving directions, each subject was encouraged to be as honest and thorough as he could be. All of the subjects were tested over a three day period. Each testing session lasted from seventy to ninety minutes. Ten testing sessions were needed in all.

Upon completion of the testing, all BPI's were hand scored and the results transferred to a profile sheet which gives percentile ratings for each of the personality variables being considered and gives a determination of whether or not the test is valid. Those tests which were invalid and those questionnaires which were incomplete were omitted from the data. The hypoglycemia symptomatology questionnaire was scored next and the total number of "Yes" responses noted. The total number of assaults was tabulated from the questionnaire and each subject's criminal record, when available, reviewed for accuracy. Lastly, the results of the sugar, refined carbohydrate and alcohol intake questionnaire were tabulated and converted to sugar gram equivalents with a total score recorded. The number of alcoholic beverages was also tabulated and recorded.

Lastly, all the data from each of the test and questionnaires were coded and placed upon a computer coding form to facilitate keypunching of the information onto computer cards. Other information such as

days in jail, sentencing status, felony/misdemeanor status, amount of time facing if unsentenced, age and race were also coded for computer analysis.

Upon keypunching of all the data, information was entered into the Michigan State University computer and the Statistical Package for Social Sciences (SPSS) applied. Of primary concern in the experimental design was to gather enough information and code it so that correlations could be sought to determine if indeed those inmates who ingest greater amounts of sugars, refined carbohydrates, and alcohol will show more physiological and psychological symptoms (depression, hostility, social deviency, and impulsiveness) and more assaultive crimes than those who consume lesser amounts.

Strengths and Weaknesses

While this research will likely not be conclusive nor predictive, it is intended that it will add to the orthomolecular theory of behavior as discussed in Chapter 1.

One of the primary weaknesses of this research is in respect to the questionnaire used to collect data on sugar and refined carbohydrate consumptions. It is felt that the questionnaire was not nearly extensive enough, though it did provide an accurate assessment of specific food stuffs which were available both in and out of jail. Some tests for reliability on this questionnaire should be run after revision to provide a more reliable instrument for future research. Similarly, while Dr. Bumpus' hypoglycemia questionnaire clearly

possesses symptoms of hypoglycemia as noted in the introducation, this instrument did not have any know reliability or validity studies conducted upon it. It is also evident that some of the symptoms given on his questionnaire could be symptoms of some other disorder other than hypoglycemia. However, for comparative analysis his questionnaire appears to be adequate and the most precise non-physiological test available. Fishbein (1981) suggests that these one time food frequency questionnaires may be more reliable and less conducive to falsification than some of the historical types of questionnaires. Sefanik and Trulson (1962) similarly found that after extensive reliability and validity analyses of the Food Frequency Questionnaire, that one time assessment provides concise, descriptive information of dietary intakes through a single interview and within a short period of time. In most cases subjects asked to record or recall specific diets may forget or tend to falsify the questionnaire.

The reliability of reports of assaultive crimes is also questionable, and while many of the test subjects had prior arrest histories which were available to this researcher, many did not, and some may have had arrests in other locations which were not recorded at the Ingham County Sheriff Department. Thus verifying all of the assault responses was not possible and is perceived as a weakness. While it is likely, it cannot be assumed that all the subjects would tend to falsify this information in a similar direction.

Therefore, the greatest weaknessess in this research appear to be the lack of a physiological test for hypoglycemia, and in lieu of a physiological test, there appears to be a deficiency in validity and reliability testing on the available non-physiological measures for hypoglycemia. The lack of a reliable and thorough indicator of sugar and refined carbohydrate intake also is a flaw in this research. However, these are not seen as fatal flaws to the research which would render any conclusions to be invalid. Rather, these are points made by this researcher pointing to a weakness to be considereed and addressed in future research.

The strengths of this research appear to be in the research design. Many extraneous variables were controled for by quick and careful testing procedures. All of the subjects were confined in similar quarters, with an equal number of roommates, with similar priveleges and opportunities, and like foods. None of the test subjects knew ahead of time what the researcher was looking for from the data and thus the likelihood of falsifying responses in a given direction was eliminated. Further, all the tests and questionnaires were administered by the same researcher, given the same directions and procedures, and all the tests were taken in a similar environment. Three subjects who indicated that they wanted to refuse to take the tests were eliminated by returning to their dorm. It was later learned that two of these could not read and were embarrasse to take the tests and would have produced invalid tests anyway. Use of the Bipolar

Psychological Inventory is considered a strength as it is a highly regarded instrument for personality testing particularly among inmate populations. Tests to determine reliability and validity are sufficient and show this instrument to be highly reliable and valid (Roe, 1972). Further, the BPI measures most distinctly those specific personality variables hypothesized to be effected by heavy sugar and refined carbohydrate intake, unlike other tests such as the MMPI (Pryor, 1971).

The analysis performed on the data also lends a great deal of substantiality to the research, and tended to isolate as well as group those independent variables that appeared to have the greatest influence on the dependent variables, and controled for various factors as well. Several specific controls were added to the research design such as length of time in jail, sentencing status, felony/misdemeanor status, and mount of time an inmate was facing if he was unsentenced in order to discover if these variables in an of themselves might be producing the differences found among the dependent variables.

In short, the research design is tight and well controlled giving greater assurance of the findings being attributable to those designated and hypothesized variables.

CHAPTER 4

DATA ANALYSIS

Statistical analysis was computed using the Michigan State University computer, applying various statistical procedures as described in the Statistical Package for the Social Sciences (SPSS) manual (Nie et. al., 1975). The first statistical procedure applied to the data was Pearson's Correlational Analysis to determine if there was any significant relationships between the stated independent variables of sugar and refined carbohydrate intake, and alcohol consumption with the dependent variables of reported hypoglycemia symptoms, assaults, and the four personality variables of depression, social deviency, impulsiveness, and hostility as measured by the Bipolar Psychological Inventory.

Pearson's Correlational Analysis, which results in Pearson's "r", serves a dual function. First, it gives an indication of the goodness of fit of the linear regression. Secondly, it is a measure of association designating the strength of the linear relationship between the two variables being considered. Pearson's "r" which ranges from -1 to +1 can tell whether the relationship is a positive one or a negative one, and the closer to +1 or -1, the stronger the relationship is. Further, if Pearson's "r" is squared, the strength of the relationship is further explained by telling us what proportion of the variance in one variable is explained by the other.

Partial correlational coefficients were also computed in order to determine the degree of association between variables while controlling for the effects of certain other selected variables. As there were four different racial groups studied and coded in the analysis, the partial correlation coefficients were tabulated while controlling for race.

Pearson's correlational coefficients were tabulated also to determine what relationship exited between the hypoglycemia questionnaire and reported sugar and refined carbohydrate intake. It has been hypothesized that the hypoglycemia scale should be responsive to sugar intake (grams). However, it is important to note at this point that these two questionnaires are not measures of the same things in that the hypoglycemia questionnaire is an indicator of symptoms while the sugar and refined carbohydrate questionnaire is a reported record of ingestion of specific foodstuffs.

Additional data analysis utilizing regression analysis and multivariate analysis of variance was performed on the data. In applying multivariate analysis of variance, groupings of covariates were made to determine what groupings or which individual independent variabe is having the greatest impact upon the dependent variable being considered. Specifically, multivariate analysis of variance was performed to determine the impact of these various groupings upon the four personality variables measured by the BPI and upon assaults. Independent variables of sentencing disposition, jail status,

race, race by status, disposition by status, race by disposition by status were considered.

Lastly, regression analysis was applied to the data. While this is generally considered a descriptive statistic, it helped to more clearly define and indicate what change might be expected from each dpendent variable with a change in one of the independent variables when the other independent variables were held constant. This researcher again examined the dependent variables of assaults, depression, social deviency, impulsivity and hostility. The covariates that were considered are age, days in jail, hypoglycemia score, grams, alcohol consumption, and time facing on a charge if unsentenced.

CHAPTER 5

FINDINGS

Br the initial analysis, inmate subjects were grouped by race and an analysis of variance with a posteriori analysis was run to see if there were any significant differences between these groups or within these groups when the variables of age, days in jail, depression, social deviency, impulsiveness, hostility, assaults, scores on the hypoglycemia scale, intake of sugar and refined carbohydrates, alcohol consumption, and sentencing status are considered. By referring to Table 1. it is evident that none of the F probabilities are significant differences between the groups or within the groups in regard to the variables that were considered. In short, while some differences between races could be noted, there was not enough variablity to be significant, and for all practical purposes of this research the racial groupings could be collapsed into one with fear of obscurring the data or test results.

TABLE 1

Analysis of Variance between and within the four racial groupings of Blacks, White, Latino, and American Indian in relation to the variables of age, days in jail, depression, social deviency, impulsiveness, hostility, assaults, grams of sugar intake, scores on hypoglycemia indicator, alcohol consumption and current sentencing status.

Variable	D.F. Between/Within	F ratio	F. Prob.
Age by Race	3/82	.857	.467
Days by Race	3/82	.757	.521
Depression by Race	3/82	.504	.680

TABLE 1. continued

Soc. Dev. by Race	3/82	.504	.680
Impulsiv. by Race	3/82	.66	.978
Hostility by Race	3/82	1.421	.243
Assault by Race	3/82	1.471	.228
Grams by Race	3/82	.171	.916
Hypo. by Race	3/82	.701	.554
Alcohol by Race	3/82	.961	.415
Status by Race	3/82	.767	.516

Pearson's Correlational Analysis was next applied to the data to determine the degree to which the variation from the mean of one variable is related to the variation from the mean of another. Of particular interest was the relationship of the independent variables to the dependent variables, however, relationships between and within each of the two subsets was explored. Pearson's coefficient "r" was computed for the research population (N=86) and the test for significance run. "r^2" was also computed for analysis.

Relationships between the independent variable of sugar and refined carbohydrate intake (Grams) with the dependent variables of assaults, hypoglycemia scale, depression, hostility, impulsivity, and social deviancy are presented in Table 2.

TABLE 2

Correlations between reported sugar and refined carbohydrate intake (Grams) with scores on the BPI for depression, social deviency, impulsivity, hostility, reported prior assaultive arrests, and scores on the hypoglycemia scale.

	r	r^2	Sig. of r
Grams w/ Depression	.1665	.0277	.125
Grams w/ Soc. Deviency	.3529	.1245	.001
Grams w/ Impulsivity	.2212	.0489	.041
Grams w/ Hostility	.2923	.0854	.006
Grams w/ Hypo.	.5416	.2933	.001
Grams w/ Assaults	.2963	.0877	.006

At least two significant relationships can be noted from the analysis. First, grams of sugar intake is positively correlated with social deviency with a significance level of .001. This finding upholds this researcher's hypothesis and earlier findings by Abrahamson (1978), Rojas and Sanchi (1941), Gyland (1976), Bonnet and Pfeifer (1976) and others. An even stronger correlation was found between grams of sugar and scores on t..e hypoglycemia scale as might be predicted as indicated in the review of literature (page 2). This correlation was also significant at the .001 level. This particular finding tends to enhance the validity of the hypoglycemia scale, as heavy sugar intake is the primary cause of symptoms suggested by Dr. Bumpus on his hypoglycemia questionnaire. Another though not as strong of a correlation is found between grams of sugar intake and reported assaults and with hostility. While the significance level for both of these is .006, there is a definite indication of a mild relationship here which again adds further support to prior research.

Table 3 explores the relationships between reported alcohol consumption and the dependent variables of depression, social deviency, impulsivity, hostility, hypoglycemia score and reported assaults.

TABLE 3

Correlations between alcohol consumption and scores on the BPI for depression, social deviency, impulsivity, hostility, reported prior assaultive arrests, and scores on the hypoglycemia scale.

	r	r^2	Sig. of r
Alcohol w/ Depression	.0858	.0073	.432
Alcohol w/ Soc. Deviency	.3554	.1263	.001
Alcohol w/ Impulsivity	.1834	.0336	.091
Alcohol w/ Hostility	.2390	.0571	.027
Alcohol w/ Hypo.	.3888	.1511	.001
Alcohol w/ Assaults	.2963	.0877	.006

Correlations in Table 3 indicate that there is a significant positive relationship between alcohol and social deviency, and between alcohol consumption and scores on the hypoglycemia scale. Alcohol with assaults also appears to present a significant but rather mild relationship. These findings support earlier research done by Hoffer (1975) and Rodale (1971) and Gotcher (1974). From this analysis it would be likely that a common denominator would be found between alcohol and grams of sugar intake. When Pearson's r was tabulated for this relationship (Table 4) a strong linear relationship was found at the .001 significance level. This relationship also tends

to add credence to Dufty's findings (1975) regarding increased sugar consumption during prohibition when alcohol was not readily available. Being in jail is somewhat similar to prohibition in this regard.

TABLE 4

Correlation between alcohol consumption and grams of sugar intake.

	r	r^2	Sig. of r
Alcohol w/ Grams	.7901	.6242	.001

The same dependent variables of depression, hostility, impulsiveness, social deviency, hypoglycemia score, and reported assaults were again analyzed controlling for race. These partial correlations produced coefficients nearly identical to Pearson's r correlations as might be expected as the analysis of variance run on race produced no significant differences between or within any of the foregoing variables.

TABLE 5

Partial correlation coefficients for sugar and alcohol intake with the dependent variables of depression, social deviency, impulsiveness, hostility, hypoglycemia score and reported assaults while controlling for race, and comparisons with Pearson's r coefficients.

	r	sig. of r	Pearson's r
Grams w/ Depression	.1681	.062	.1665
Grams w/ Soc. Dev.	.3631	.001	.3529
Grams w/ Impulsiveness	.2205	.021	.2212

TABLE 5 continued

	r	Sig. of r	Pearson's r
Grams w/ Hostility	.3054	.002	.2923
Grams w/ Hypoglycemia	.5378	.001	.5416
Grams w/ Assaults	.3200	.001	.2963
Alcohol w/ Depression	.0863	.216	.0858
Alcohol w/ Soc. Dev.	.3600	.001	.3554
Alcohol w/ Impulsiveness	.1838	.047	.1834
Alcohol w/ Hostility	.2446	.012	.2390
Alcohol w/ Hypoglycemia	.3881	.001	.3888
Alcohol w/ Assaults	.2975	.003	.2963

Next multivariate analysis of variance (MANOVA) was applied to the dependent variables of depression, social deviency, impulsiveness, hostility, and assaults, adjusting for the following covariates and multiple groupings thereof in order to determine what individual covariate or combination of covariates has the greatest impact upon or correlation with the dependent variables. The covariates are:

1) Race
2) Sentencing Disposition (sentenced or unsentenced)
3) Jail Status (felony or misdemeanor)
4) Race by Disposition
5) Race by Status
6) Disposition by Status
7) Race by Disposition by Status

TABLE 6

Correlation coefficients demonstrating the effects of the selected covariates of race, sentencing disposition and jail status, and groupings thereof, upon the dependent variables of depression, social deviency, impulsiveness, hostility, and assaults, with .95 confidence limits.

	D.F.	Coeff.	T-Value	Sig. of T
Variable : Depression				
Race	1	2.56129	.58201	.56260
Disposition	1	-3.25309	-.62474	.53436
Status	1	-3.56340	-.68778	.49408
Race by Disposition	1	-3.18892	-.74776	.45734
Race by Status	1	.91124	.21194	.83283
Disposition by Status	1	2.98680	.59637	.55303
Race by Dispo. by Status	1	1.65885	.38815	.69919
Variable: Social Deviency				
Race	1	-1.07004	-.22211	.82494
Disposition	1	2.4313	.42789	.67017
Status	1	-4.60964	-.81272	.41939
Race by Disposition	1	-3.23092	-.69205	.49141
Race by Status	1	6.92333	1.47092	.14621
Disposition by Status	1	1.66496	.30362	.76240
Race by Dispo. by Status	1	3.66191	.78270	.43669
Variable: Impulsiveness				
Race	1	-.11969	-.02583	.97948
Disposition	1	1.38964	.25341	.80076

TABLE 6 continued

	D.F	Coeff.	T-Value	Sig of T
Status	1	-3.87840	-.71080	.47979
Race by Disposition	1	2.82110	.62813	.53215
Race by Status	1	6.27543	1.38593	.17058
Disposition by Status	1	1.31762	.24981	.80353
Race by Dispo. by Status	1	2.66445	.59200	.55594
Variable: Hostility				
Race	1	-12.43951	-2.53551	.01638
Disposition	1	6.85254	1.18045	.24219
Status	1	-2.08858	-.36160	.71884
Race by Disposition	1	6.00250	1.26253	.21134
Race by Status	1	8.21390	1.71366	.09143
Disposition by Status	1	-.41812	-.07309	.94196
Race by Dispo. by Status	1	-4.33576	-.91003	.36622
Variable: Assaults				
Race	1	-.12256	-.48368	.63026
Disposition	1	.48612	1.62134	.10986
Status	1	.29094	.97523	.33312
Race by Disposition	1	-.05555	-.22622	.82175
Race by Status	1	.25276	1.02098	.31111
Disposition by Status	1	.02493	.08646	.93137
Race by Dispo. by Status	1	-.12093	-.49144	.62480

From the preceding tables of multivariate analysis there is only one significant finding that deserves attention and that is the relationship of the variable race with with hostility as there is a significant relationship at the .00368 level. However, when race is combined with any of the other covariates this relationship appears to be obscured. All other multivariate coefficients do not show any significant relationships. While this is not in itself a significant finding, it does lend more assurance that it is the independent variables and not these control variables that are impacting upon the dependent variables. Controls for race, status, and jail disposition alone or in combinations thereof, with the exception of race with hostility, can then be disregarded as having any significant relationship to the personality scales on the BPI or upon assaults.

Finally, a regression analysis was performed upon the data to see what impact the following covariates or combinations have upon the dependent variables:

1) Age
2) Days in Jail
3) Hypoglycemia scale score
4) Grams of sugar and refined carbohydrate intake
5) Alcohol consumption
6) Time facing if unsentenced

When the regression analysis was run, it became clear that these particular covariates had little effect upon the dependent

variables with one exception. It became clear that when the covariates of age, days, grams, alcohol and facing are held constant, that scores on the hypoglycemia scale appear to be most significantly correlated to depression, with a Beta Coefficient of .61722, a T value of 4.58917 and a significance level of T at .00002. Therefore, the greatest indicator of depression might well be the score on the hypoglycemia questionnaire. This is a very positive correlation. The results of the regression analysis are found in Table 7 following.

TABLE 7

Regression analysis for within cells for five dependent variables of Depression, Social Deviency, Impulsivity, Hostility, and Assaults, controlling for Age, Days in Jail, Hypoglycemia Scores, Grams of Sugar Intake, Alcohol Intake, and Time Facing if unsentenced.

	Beta	T-Value	Sig. of T
Variable: Depression			
Age	-.02449	-.21060	.83387
Days	-.18231	-1.70181	.09365
Hypo	.61722	4.58917	.00002
Grams	-.01865	-.09350	.92580
Alcohol	-.10718	-.58583	.56005
Facing	.15985	1.51802	.13393
Variable: Social Deviency			
Age	-.18354	-1.45839	.14962
Days	.10271	.88605	.37891
Hypo	.10772	.74020	.46189
Grams	.26205	1.21413	.22916

TABLE 7 (Continued)

	Beta	T-Value	Sig. of T
Alcohol	.13361	.67491	.50217
Facing	.02770	.24312	.80869
Variable: Impulsiveness			
Age	.04048	.30068	.76464
Days	.10390	.11207	.91111
Hypo	.15542	.99825	.32192
Grams	.25240	1.09307	.27846
Alcohol	-.06549	-.30922	.75816
Facing	.13227	1.08506	.28197
Variable: Hostility			
Age	-.14771	-1.13119	.26220
Days	.04668	.38808	.69924
Hypo	.16284	1.07841	.28490
Grams	.10076	.44967	.65447
Alcohol	.22714	1.10582	.27294
Facing	.03455	.29226	.77103
Variable: Assaults			
Age	-.00054	-.00411	.99673
Days	-.03759	-.31270	.75552
Hypo	.12541	.83085	.40915
Grams	.14886	.66498	.50845
Alcohol	.18206	.88671	.37855
Facing	.17672	1.49549	.13970

Several significant findings can be summarized from the data analysis. First, race appears to have little significant effect upon any of the relationships with the exception of race in relation to hostility which showed a significant correlation (.00368) when multivariate analysis was run. However, when ANOVA was computed without the covariate controls, race did not show this relationship and there was no significant differences between or within the four racial groupings.

Secondly, when Pearson's r was computed for the relationship between grams of sugar intake with the six dependent variables of assaults, depression, social deviancy, impulsiveness and hostility, five significant correlations were found as illustrated in Table 2. It appears that nearly 12% of the social deviancy can be attributed to the intake of sugar. Similarly over 8.5% of the assaults and hostility appear to be a function of sugar intake. These significant correlations do much to support prior research which have found similar conclusions, though they have not specified to what degree these functions are attributable to sugar and refined carbohydrate intake.

Pearson's correlation for grams of sugar intake with hypoglycemia scores also produced a significant correlation, r = .5416. at the .001 level of significance. This correlation indicates that 29.33% of the scoring on the hypoglycemia scale can be a direct result of the sugar and refined carbohydrate intake. This correlation does much to support the validity of Dr. Bumpus' questionnaire.

When alcohol was paired with the six dependent variables, four additional significant correlations were found, as illustrated in Table 3. First, the correlation of alcohol with social deviancy appears to be particularly strong; r = .3554 at .001 level of significance, indicating that as much as 12.6% of the reported social deviancy may be explainable by the ingestion of alcoholic beverages. This relationship, while significant, is not conclusive, as the sedative action of alcohol upon the central nervous system which lowers one's inhibitions, must be taken into account. However, whether this relationship can be attributed to the high sugar, refined carbohydrate content of alcoholic beverages or its sedative action, the relationship is still a strong one in explaining socially deviant behavior and affect.

The correlation between alcohol and hostility, while not as strong, is still a significant and positive one, indicating that the more alcohol one consumes, the more hostile their responses are likely to be upon the BPI. Similarly, alcohol when paired with assaults produced an r = .2963 at .006 level of significance. Assaults appear to be the net result of the acting out of the perceived hostility when paired with alcohol, and this correlation appears to be responsible for explaining 8.77% of the reported assaults. Dr. Wayman Spence, M.D. (1975) indicates that 64% of all homocides are alcohol related.

Lastly, when alcohol was paired with scores on the hypoglycemia questionnaire, a strong correlation was found; r = .3888 at .001 level of significance. This finding lends more credibility to the theory that heavy alcohol consumption is a prime cause of hypoglycemia, not

only because of its high sugar and carbohydrate content, but also because of its insidious action upon the pancreas.

Finally, regression analysis uncovered one other significant relationship between scores on the hypoglycemia scale and depression, producing a Beta correlation coefficient of .61722 with a significance level of .00002. This highly significant correlation indicates that depression is one of the most significant symptoms of hypoglycemia. Similarly, it can be noted that the higher the scores on the hypoglycemia scale, the more depressed an inmate is likely to be. Pearson's correlation also showed a positive significant coefficient of $r = .4937$ at .001 level of significance, without the covariate controls of the regression analysis.

Several other significant correlations were found between the independent and dependent variables and within their respective groupings which are worthy of mentioning and are included in the summary of significant Pearson's Correlations in Table 8.

First, age showed a positive correlation with scores on the hypoglycemia questionnaire, indicating that the older the subject, the higher his score is likely to be on the hypoglycemia indicator; Pearson's $r = .3090$ at .004 level of significance. It may be that some of the symptoms on this questionnaire come with age rather than the amount of sugar intake increasing with age as this correlation partially indicates. The number of days in which the test subject had been in jail at the time of this study also showed a positive, though not as significant a correlation with scores on the hypoglycemia

TABLE 8

SUMMARY TABLE OF SIGNIFICANT PEARSON'S CORRELATION COEFFICIENTS FOR ALL STUDIED VARIABLES

Correlation variables	r	sig. (P) of r
Age w/ Hypo.	.3090	.004
Days w/ Hypo.	.2163	.045
Days w/ Alcohol	.2385	.027
Depress. w/ Impuls.	.4518	.001
Depress. w/ Asslt.	.2653	.014
Depress. w/ Hypo.	.4937	.001
Depress. w/ Dispo.	.2823	.008
Depress. w/ Facing	.2732	.011
Soc. Dev. w/ Days	.2529	.019
Soc. Dev. w/ Impuls.	.4159	.001
Soc. Dev. w/ Hostility	.4490	.001
Soc. Dev. w/ Grams	.3529	.001
Soc. Dev. w/ Alcohol	.3554	.001
Impuls. w/ Hostility	.3816	.001
Impuls. w/ Grams	.2212	.041
Impuls. w/ Hypo.	.2253	.037
Hostility w/ Grams	.2923	.006
Hostility w/ Alcohol	.2390	.027
Asslt. w/ Hypo.	.2997	.005
Asslt. w/ Grams	.3163	.003
Asslt. w/ Alcohol	.2963	.006
Hypo. w/ Grams	.5416	.001
Hypo. w/ Alcohol	.3888	.001
Grams w/ Alcohol	.7901	.001
Dispos. w/ Facing	.7077	.001
Status w/ Days	-.2946	.006
Status w/ Asslt.	-.2432	.024
Status w/ Dispo.	-.4060	.001
Status w/ Facing	-.4216	.001

scale.

The greater the number of days one has been in jail, the more socially deviant his BPI responses also seem to be as implied from a Pearson's r = .2529 at .019 level of significance.

Depression appears to be greatest for those who are unsentenced

as opposed to those who are already serving time; Pearson's r = .2823 at .008 level of significance. The more time an inmate is facing if unsentenced, the greater his depression as indicated by an r = .2732 at .011 level of significance. This finding tends to support the general theory that there is more distress, anxiety and depression among those unsentenced or serving with an unspecified release date.

Persons who score high on the BPI scale for social deviancy are likely to score high on the impulsivity and hostility scales as well as evidenced by the strong correlations of .4129 and .4490 respectively, both at the .001 level of significance. The close tie between these dependent variables gives support to this research hypothesis as they all have significant positive correlations with sugar intake (grams), as noted in Table 2.

Further it is apparent that the more impulsive the response on the BPI, the higher the score on the hypoglycemia scale. It has already been noted that impulsiveness has a positive relationship with grams of sugar intake and the high correlation between grams and hypoglycemia scores. These findings also lend credibility to several of the earlier noted studies (Abrahamson, 1978; Gyland, 1976; Chereskin and Ringsdorf, 1977, et. al.).

A negative correlation was found between status (felony/misdemeanor) and the time the subject was facing if unsentenced. Those who are in jail facing felony charges are facing more time, as might logically be expected. The data analysis also indicated that if one is charged

with a felony that he is likely to be unsentenced; r = -.4060 at .001. This is not a suprising finding, however, as the Ingham County Jail houses inmates only for periods up to one year. It was also discovered that those charged with misdemeanors have a record of fewer assaults than those subjects charged with felonies; r = .2946 at .006 level of significance.

Many of the descriptive statistics produced by this study, while not directly affecting the research hypothesis, also are of interest. For example, the mean number of alcoholic drinks consumed per day by the study group was 7.744, with the Latino race being the greatest consumers with a mean of 10.6, followed by American Indians at 9.6, Whites at 8.58 and Blacks at 5.4. Whites proved to be the biggest consumers of sugar and refined carbohydrates, followed by Blacks, Latinos and American Indians. Whites also produced the highest mean score on the hypoglycemia questionnaire. Many of these descriptive statistics provide a foundation from which future research may wish to be begun, particularly looking at some of the differences between populations for specified variables. As seen from this research, a greater population may need to be studied in order to find any significant differences between or within the groups.

CHAPTER 6

CONCLUSIONS

The hypothesis of this researcher was that those subjects who ingested the greater amounts of sugar and refined carbohydrates, including alcoholic beverages, would produce more of a certain set of symptoms which could be measured by a physiological, psychological symptomology questionnaire, and by specific responses on the Bipolar Psychological Inventory. It was also hypothesized that these same subjects would show a greater number of assaultive crimes. In short, it was hypothesized that there would be a positive correlation found between the independent variables of sugar and refined carbohydrate intake (grams) and alcoholic beverage intake (alcohol) with the dependent variables of assaults, score on the hypoglycemia questionnaire (hypo) and depression, impulsiveness, social deviancy, and hostility. The null hypothesis was also stated in that the research may find that there are no significant correlations between these two sets of variables.

This research did support the original hypothesis as several significant correlations were found. First, the greater the sugar consumption, the greater the number of assaults. The same was found to hold true for alcohol ingestion and assaults. In regard to scores on the hypoglycemia scale, both grams of sugar and alcohol intake showed significant positive correlations. No significant correlation was found between sugar intake or alcohol consumption with depression scores on the BPI, supporting the null hypothesis. However, regression

analysis did produce a highly significant positive correlation between depression and scores on the hypoglycemia questionnaire.

All of the other dependent variables of social deviency, impulsiveness, and hostility, showed significant positive correlations not only with sugar and alcohol consumption, but between themselves as well. These findings raise additional research questions which are not answered in this current effort. While this intercorrelation of personality variables seems to point to the appearance of them all being related to the consumption of alcohol, and the ingestion of sugar and refined carbohydrates, this may well not be the case. These personality traits may have preceded the compulsive use of alcohol and sugar and refined carbohydrates. If this is true, in this case orthomolecular theory may be no further ahead than many of the traditional models which also often treat the symptom rather than the cause. Further research may wish to explore additional populations in this regard, testing whether or not alcohol and sugar intake is common among non-inmate groups who score high on hostility, impulsiveness and social deviency.

Additional research may also wish to look at the immediate and direct effects of diet upon personality traits by providing a pretest personality inventory after a controlled diet without alcohol and sugar or refined carbohydrates, and a posttest administered several weeks later to the same group after a diet rich in sugar and refined carbohydrates, with an analysis run between the two testing sessions.

While this study tends to add a great deal to prior research and gives much support to the place of orthomolecular theory and practice in the field of corrections, care must be advised in generalizing any conclusions found here, especially considering the unique setting the Ingham County Jail presents.

Practical Applications

The practical application of these findings are threefold. In terms of prevention, it has been demonstrated that more care has to be taken to instruct persons as to the possible outcomes of a diet heavy in sugar and refined carbohydrates, as well as alcohol. Diet should be examined and evaluated just as much as family history or substance abuse by the courts, probation and parole personnel. This close observation of diet should be particularly examined in areas of high crime and economically depressed areas where junk food diets tend to prevail.

Secondly, this research has application in terms of early intervention as suggested by Schauss (1979), MacLaren (1979), and Rojas and Sanchi (1941). Schools with counseling offices, probate courts and others specializing in the areas of hyperactivity and delinquency need to be made aware of the foregoing outcomes.

Finally, this study has implications for taking corrective measures such as have been applied by Dr. Russell Smith (1974) at Brighton Hospital in Detroit, Michigan in the treatment of alcoholics. It has become clear from this study that a great segment of human

functioning, and a very essential and primary one, has been over looked in the criminal justice system, particularly in the correctional setting, where typically a psychoanalytic, reality therapy model is instituted for the treatment of the offender. It is not being suggested that the orthomolecular approach supplant these traditional models, but rather that it needs to be added to the repetoire in order to provide a more holistic approach to both juvenile and adult offenders.

The weaknesses discussed earlier need to be taken into account prior to conducting future research, specifically the need for a more reliable instrument to measure symptoms of hypoglycemia. Such studies would do well to examine the diet of the offender within the last three days and the hours immediately preceding the crime. The old cliche that "a man is what he eats" appears to have a great deal of practical application in the field of criminal justice, and offender treatment and rehabilitation.

APPENDIX I

BIPOLAR PSYCHOLOGICAL INVENTORY QUESTIONNAIRE

1. A person has to figure out his own problems; other people can't help him.
2. I need help.
3. I am not self sufficient.
4. I have very little desire to continue my schooling.
5. I am happiest when I am by myself.
6. I usually feel unhappy around my parents.
7. I feel good about myself.
8. I often do not do what people expect of me.
9. I have never exhibited my sexual organs to others.
10. I am in favor of mercy killing.
11. I don't like it when a criminal is freed through the arguments of a smart lawyer.
12. I often do dangerous things without stopping to think.
13. I very seldom talk back to people when they give me orders.
14. I would go without lunch rather than borrow even small amounts of money.
15. I would like to talk to a psychologist or psychiatrist about my problems.
16. I get figity when I sit very long.
17. I usually finish what I plan to do.
18. I have a very strong desire to achieve success in some areas.
19. I generally do things alone.
20. I often did things with my father.
21. I often feel humiliated.
22. I am as happy as my friends are.

23. I have often found myself looking at the sex organs of another person of my own sex.

24. I have never laughed at a trapped or caged animal.

25. I have used alcohol excessively.

26. I usually stick to an unpleasant job that I have to complete.

27. I feel that most people would take advantage of you if you gave them the opportunity.

28. I am allergic to water and air.

29. Sometimes I gossip about my friends.

30. I leave people alone and work it so that they leave me alone.

31. I am satisfied with the way things are going.

32. I feel confident with my own abilities.

33. I seldom put in extra time on the job.

34. I am usually with people rather than alone.

35. I feel very close to my family.

36. I do not put my best foot forward, volunteer, or otherwise place myself in a position where I might fall below expectations.

37. I usually feel unimportant.

38. I try to keep sex thoughts out of my mind.

39. Pain is the only thing some people understand.

40. I don't feel as bad as other people do when I have done something wrong.

41. I can usually control what I am thinking.

42. A promise of getting something for nothing would be no temptation to me.

43. I try to talk to people about my backgroud, such as family, school, work, etc.

44. I am bothered by some fears.

45. I usually ask other people's advice before doing something important.

46. When in school I worked hard to be at the top of my class.

47. I look forward to social gatherings.

48. I often argued with my parents.

49. I have several good friends that I spend time with.

50. I do well in most things that I try.

51. I have been satisfied with my sex life in the past.

52. I have used fear to control children or other people.

53. I have never been in trouble because of my behavior.

54. I often feel like doing things just for the heck of it.

55. Hitting someone is hardly ever necessary.

56. Psychologists try to get you to talk about a lot of things that are none of their business.

57. Often, for no reason, my heart pounds.

58. I am not as smart as other people.

59. I feel a strong urge or drive to get back and finish a job as soon as possible.

60. People typically annoy me.

61. I have often talked back to members of my family.

62. I seldom say much that interests other people.

63. I do a lot of things that are enjoyable and worthwhile.

64. I get sexual pleasure when I think of handling woman's clothing.

65. I often watch fights or boxing matches.

66. I think if a person wants to live a life of crime, society should let him do so.

67. I often think about quitting my job when it gets boring.

68. I feel that fighting is no way for people to settle their differences.

69. Sometimes I act lazy.

70. I don't like tests like this.

71. I bite my fingernails.

72. I feel I can't control my emotions.

73. When I do a job, I have very little desire to do my best unless I am highly interested.

74. If I am angry I can get over it best by getting away from people.

75. I have pleasant talks with members of my family.

76. I usually regard opinions of others more highly than my own.

77. My life has been a pretty happy one.

78. Sometimes I haven't been able to control my sex behavior.

79. I don't go to horror movies.

80. I would enjoy breaking the law if I thought I could get away with it.

81. I seldom feel like doing things impulsively.

82. I often tell others of my dislike for them.

83. When people tease me, I sometimes get annoyed even if it is meant in fun.

84. It embarrasses me to talk about my personal life.

85. I wish I could stop worrying about some things.

86. I have usually done what needed doing.

87. When in school I put more time in studying than many others.

88. I prefer movies to social gatherings.

89. I often talked over my problems with my parents.

90. I have a good reputation among friends and acquaintances.

91. I act happy most of the time.

92. I feel I have a sex problem.

93. Even though animals aren't human, I feel it is wrong to hurt them.

94. I go to church quite often.

95. I do many things on the spur of the moment.

96. I often think it is better to take advantage of another person before they take advantage of you.

97. I am over seven feet tall and weight over 300 pounds.

98. I think I could get some help from someone I trusted.

99. I can not think of any way in which I have failed a friend.

100. I usually give in to other people.

101. I am usually not chosen as an officer or leader in groups.

102. One thing that I enjoyed about school was the association with others.

103. There is very little love among members of my family.

104. I meet friends or associates whenever I can to have lunch or just talk.

105. I am afraid of the unhappiness the future holds for me.

106. I feel mature sexually.

107. I could never accept the torturing of prisoners-of-war as a way to get information.

108. I often ran away from home.

109. I usually carry out my responsibilities.

110. I have seldom yelled at people throughout my life.

111. I have never shared the details of my private life with people.

112. I can't handle my problems by myself.

113. I have trouble getting started on things that need doing.

114. It has never been important to me to be really successful.

115. My friends would describe me as a loner.

116. I often feel hatred or jealousy toward members of my family.

117. I feel self-critical.

118. My face and mannerisms let others know when I am blue or sad.

119. My sexual behavior has always been normal.

120. I have never read or learned about torture methods.

121. I seldom talk my problems over with other people.

122. Sometimes I do something against the law.

123. My feelings often change from one attitude to another.

124. "An eye for an eye, a tooth for a tooth" is a good philosophy to live by.

125. Even when I have not had enough sleep, I wake up as cheerful and ready to work as ever.

126. I have received help with my personal problems from my friends.

127. I'm usually relaxed.

128. I am as smart as the next guy.

129. When working on a project with others, I would rather be the boss or the assistant boss than one of the workers.

130. I often take a job where I work with others.

131. I have tried to get help from a person like a minister, caseworker, or a doctor.

132. I'm afraid I might end up in a mental hospital.

133. I have done better on jobs where I have worked by myself.

134. My parents often said they were proud of me.

135. I have been told I get along well with others.

136. I feel happy.

137. My sex behavior has never caused me any trouble.

138. Judges try to be fair.

139. I often do things just for the heck of it.

140. I stayed away from my family as much as I could.

141. I don't trust my feelings.

142. I often do just anything just to be doing something.

143. As a teenager I used to spend much more time with members of my own sex than with members of the opposite sex.

144. I have hurt people just to see their reaction.

145. I would not enjoy gambling.

146. I do crazy things.

147. I must admit that I usually laugh at the misfortunes of others.

148. Sometimes I make up excuses in order to get out of doing someone a favor.

149. I keep my feelings to myself.

150. I'm confused because so many things are going through my head.

151. I generally don't try to compete with other people.

152. I generally succeed at most things I try.

153. I usually watch a ball game on TV by myself rather than watching or going to it with my friends.

154. My parents never took much interest in any thing I did.

155. I feel good about my future.

156. I am satisfied with the way things are going for me.

157. I have never window peeked.

158. I stop and watch accidents whenever I can.

159. I follow the laws of society.

160. I can usually decide how I will feel about something.

161. I have been in my share of fights.

162. My birthday comes once every year.

163. I always live up to my responsibilities.

164. Sometimes I think there is something wrong with my mind.

165. I'm not really myself at times.

166. I will probably have a hard time just taking care of the things that need to be done.

167. I usually do not take an active part in groups that I am in.

168. I have only a few friends.

169. My parents are or were often unfair to me.

170. I am satisfied with most of the things I do.

171. I am more emotional than other people.

172. I have had homosexual experiences.

173. I don't think that war is a necessary part of life.

174. I have not live a law-abiding life.

175. I think and plan things carefully before I do something.

176. There are a few people I would like to see worked over.

177. I always feel much better after I talk over my personal problems.

178. I'm scared.

179. I take care of myself in almost any situation.

180. I feel uncomfortable if I have to be the boss.

181. Most of my recreation is with other people rather than by myself.

182. I enjoy being with my family.

183. I have few, if any, accomplishments to be proud of.

184. My future is bright.

185. I like to dance.

186. Sometimes just for kicks, I have felt like torturing animals.

187. I have done many things that have gotten me in trouble.

188. I usually do things in a hurry.

189. I wouldn't hesitate to step on people if it would benfit me.

190. I would like to be hypnotized.

191. I have nervous habits that sometimes bother other people.

192. I often ask people to help me make decisions.

193. It is important for me to gain recognition for my achievements.

194. I enjoy visiting with other people.

195. I do everything I can to make my parents happy.

196. I do most things well.

197. I have often felt depressed.

198. I sometimes wonder if I'm homosexually inclined.

199. I don't feel that suffereing is necessary in life.

200. Most laws are unfair.

201. I think out what I'm going to say before I say it.

202. I've never gone out of my way to avoid a ggod fight.

203. I can run a mile in less tahn three seconds.

204. Sometimes I daydream or get distracted when I'm supposed to be working.

205. When I have a problem, I usually discuss it with a close friend.

206. My mind is really messed up.

207. It seems that I need help with most things I try to do.

208. I have enjoyed close and lasting relationships with people of the opposite sex.

209. Being by myself for a long period of time would really bug me.

210. I have always felt my parents were proud of me.

211. I feel worthless.

212. I have tried to kill myself.

213. There have been times when I have peeked through a window to watch somebody undress.

214. Sex is probably more enjoyable when it hurts a little.

215. I think that a life of crime would be an exciting way to live.

216. I seldom feel suddenly hungry.

217. I dislike many people.

218. It is healthful to eat fruits and vegetables.

219. I am never late for my appointments.

220. I don't need any help with my problems.

221. I feel very guilty about my behavior.

222. People often correct me.

223. I have received an award for something I have done.

224. I do more reading than visiting with others.

225. My family usually does a lot of things together.

226. People tell me I'm likeable.

227. I often feel that I am doomed to ruin.

228. In the past, I have enjoyed the thought of showing my sex organs to other people.

229. I would not send many people to prison if I were a judge.

230. In school I was sometimes sent to the principal for cutting up.

231. Turning the other cheek is better than fighting.

232. I enjoy being at home more than anywhere else.

233. I usually "put my foot in my mouth" when I talk.

234. I usually wake up unhappy in the morning.

235. When on a jobu I usually work hard and do the best I can.

236. I have had sexual relations with someone considerably older or younger than myself.

237. I usually let others make decisions in important matters.

238. I feel calm.

239. Angry thoughts frequently bother me.

240. I do not mind doing one thing for a long period of time.

241. It makes me feel better to tell someone off.

242. I can hold my breath under water for hours at a time.

243. I sometimes ask people what they think of me.

244. I can't stand to think about some of the things I've done.

245. Other people often have to finish things I start.

246. I have demanded sex relations against the wishes of my pa-tner.

247. On weekends I typically get off by myself.

248. I love my mother and father very much.

249. I'm usually dissatisfied with the job I have done.

250. I generally feel sad and unhappy.

251. When I was in my teens, I dated regularly.

252. I would vote for physical punishment for some serious crimes.

253. I think that the police are honest.

254. I have trouble controlling my thoughts and feelings.

255. I very seldom threaten anyone with a physical attack.

256. Many people live in New York City.

257. I often let people know how I feel about them.

258. I get headaches frequently.

259. I feel it is best for me to seek help from others when making a decision.

260. I would rather work alone than with other people.

261. I usually eat with a group of people rather than by myself.

262. I love all members of my family.

263. I don't like myself.

264. People often tell me that I seem unhappy.

265. I would feel sickened by sexual advances by members of my own sex.

266. I wouldn't want to butcher animals.

267. I have used drugs such as marijuana, heroin or LSD.

268. I don't stay long on a job that is boring.

269. I haven't been in a fight for years.

271. I can remember at least one time when I damaged or lost someone else's property and did not replace or repair it.

270. American's speak better English than the Chinese do.

272. I like people who are interested in knowing about me.

273. Sometimes my hands shake for no good reason.

274. I feel dependent upon other people.

275. In order to be happy I have to feel like I am accomplishing things.

276. If I were a pilot I would rather fly a single seat fighter than a bomber with a crew.

277. I seldom showed respect for my family.

278. I generally do not express my opinions when I am with other people.

279. I am full of life in my work and in my play.

280. I feel guilty over some of the sexual ideas I have.

281. I go out of my way to help a person that is hurt.

282. I don't like the rules of society.

283. My feeling don't change very much from one time to another.

284. I usually do not get even with a guy who has hurt me.

285. I usually eat 14 large meals a day.

286. I enjoy takeing this test.

287. My stomach is often tied up in knots.

288. People often come to me for advice.

289. I usually stick to a job until it is finished.

290. My happiest moments are when I am with my friends.

291. I usually apologize to members of my family after a disagreement.

292. I like myself.

293. I can't do my work as well as I used to be able to.

294. Since I was 12 years of age I have had sexual play with younger children more than once.

295. The idea of any living creature being hurt bothers me.

296. I have never stolen anything I could be put in jail for.

297. I can do one thing for a long period of time.

298. I often get in fights or arguments.

299. Airplanes can fly faster today than they could 50 years ago.

300. I always admit my errors very frankly without trying to hide them.

APPENDIX II

BIPOLAR PSYCHOLOGICAL INVENTORY
INDIVIDUAL SCALE ITEMS

DEPRESSION - OPTIMISM

TRUE (Feeling)

37. I usually feel unimportant.
105. I am afraid of the unhappiness the future holds for me.
197. I have often felt depressed.
227. I often feel that I am do-med to ruin.
234. I usually wake up unhappy in the morning.
250. I generally feel sad and unhappy.

FALSE (Feeling)

22. I am as happy as my friends are.
77. My life has been a pretty happy one
136. I feel happy.
156. I am satisfied with the way things are going for me.
184. My future is bright.

TRUE (Behavior)

8. I often do not do what people expect of me.
118. My face and mannerisms let others know when I am sad or blue.
142. I often do just anything just to be doing something.
171. I am more emotional than other people.
212. I have tried to kill myself.
293. I can't do my work as well as I used to be able to do.

FALSE (Behavior)

50. I do well in most things that I try.
63. I do a lot of things that are enjoyable and worthwhile.
91. I act happy most of the time.
264. People often tell me that I seem happy.
279. I am full of life in my work and play.

APPENDIX III

BIPOLAR PSYCHOLOGICAL INVENTORY
INDIVIDUAL SCALE ITEMS

SOCIAL DEVIENCY - SOCIAL CONFORMITY

TRUE (Feeling)

40. I don't feel as bad as other people do when I have done something wrong.
66. I think that if a person wants to live a life of crime, society should let him do so.
80. I would enjoy breaking the law if I thought I could get away with it.
200. Most laws are unfair.
215. I think a life of crime would be an exciting way to live.
282. I don't like the rules of society.

FALSE (Feeling)

11. I don't like it when a criminal is freed through the arguments of a smart lawyer.
138. Judges try to be fair.
145. I would not enjoy gambling.
253. I think that the police are honest.

TRUE (Behavior)

25. I have used alcohol excessively.
108. I often ran away from home.
122. Sometimes I do something against the law.
174. I have not lived a law-abiding life.
187. I have done many things that have gotten me into trouble.
230. In school I was sometimes sent to the principal for cutting up.
267. I have used drugs such as marijuana, heroin, or LSD.

FALSE (Behavior)

53. I have never been in trouble because of my behavior.
94. I go to church quite often.
159. I follow the laws of society.
296. I have never stolen anything that I could be put in jail for.

APPENDIX IV

BIPOLAR PSYCHOLOGICAL INVENTORY
INDIVIDUAL SCALE ITEMS

IMPULSIVENESS - SELF CONTROL

TRUE(Feeling)

54. I often feel like doing things just for the heck of it.
67. I often think about quitting my job when it gets boring.
123. My feelings often change from one attitude to another.
239. Angry thought frequently bother me.
254. I have trouble controlling my thoughts and feelings.

FALSE (Feeling)

41. I can usually control what I am thinking.
81. I seldom feel like doing things impulsively.
160. I can usually decide how I will feel about something.
216. I seldom feel suddenly angry.
240. I do not mind doing one thing for a long period of time.
283. My feelings do not change very much from one time to another.

TRUE (Behavior)

12. I often do dangerous things without stopping to think.
95. I do many things on the spur of the moment.
139. I often do things just for the heck of it.
146. I do crazy things
188. I usually do things in a hurry.
268. I don't stay long on a job that is boring.

FALSE (Behavior)

26. I usually stick to an unplesant job that I have to complete.
109. I usually carry out my responsibilities.
175. I think and plan things carefully before I do something.
201. I think out what I am going to say before I say it.
297. I can do one thing for a long period of time.

APPENDIX V

BIPOLAR PSYCHOLOGICAL INVENTORY
INDIVIDUAL SCALE ITEMS

HOSTILITY - KINDNESS

TRUE (Feeling)

27. I feel that most people would take advantage of you if you gave them the opportunity.
96. I often think it is better to take advantage of another person before they take advantage of you.
124. "An eye for and eye, a tooth for a tooth" is a good philosophy to live by.
176. There are a few people I would like to see worked over.
189. I wouldn't hesitate to step on people if it would benefit me.
217. I dislike many people.
241. It makes me feel better to tell someone off.

FALSE (Feeling)

55. Hitting someone is hardly ever necessary.
68. I feel that fighting is no way for people to settle their differences.
231. Turning the other cheek is better than fighting.

TRUE (Behavior)

82. I often tell others of my dislike for them.
147. I must admit that I usually laugh at the misfortunes of others.
161. I have been in my share of fights.
202. I've never gone out of my way to avoid a good fight.
298. I often get in fights or arguments.

FALSE (Behavior)

13. I very seldom talk back to people when they give me orders.
110. I have seldom yelled at people throughout my life.
255. I very seldom threaten anyone with a physical attack.
269. I haven't been in a fight for years.
284. I usually do not get even with a guy who has hurt me.

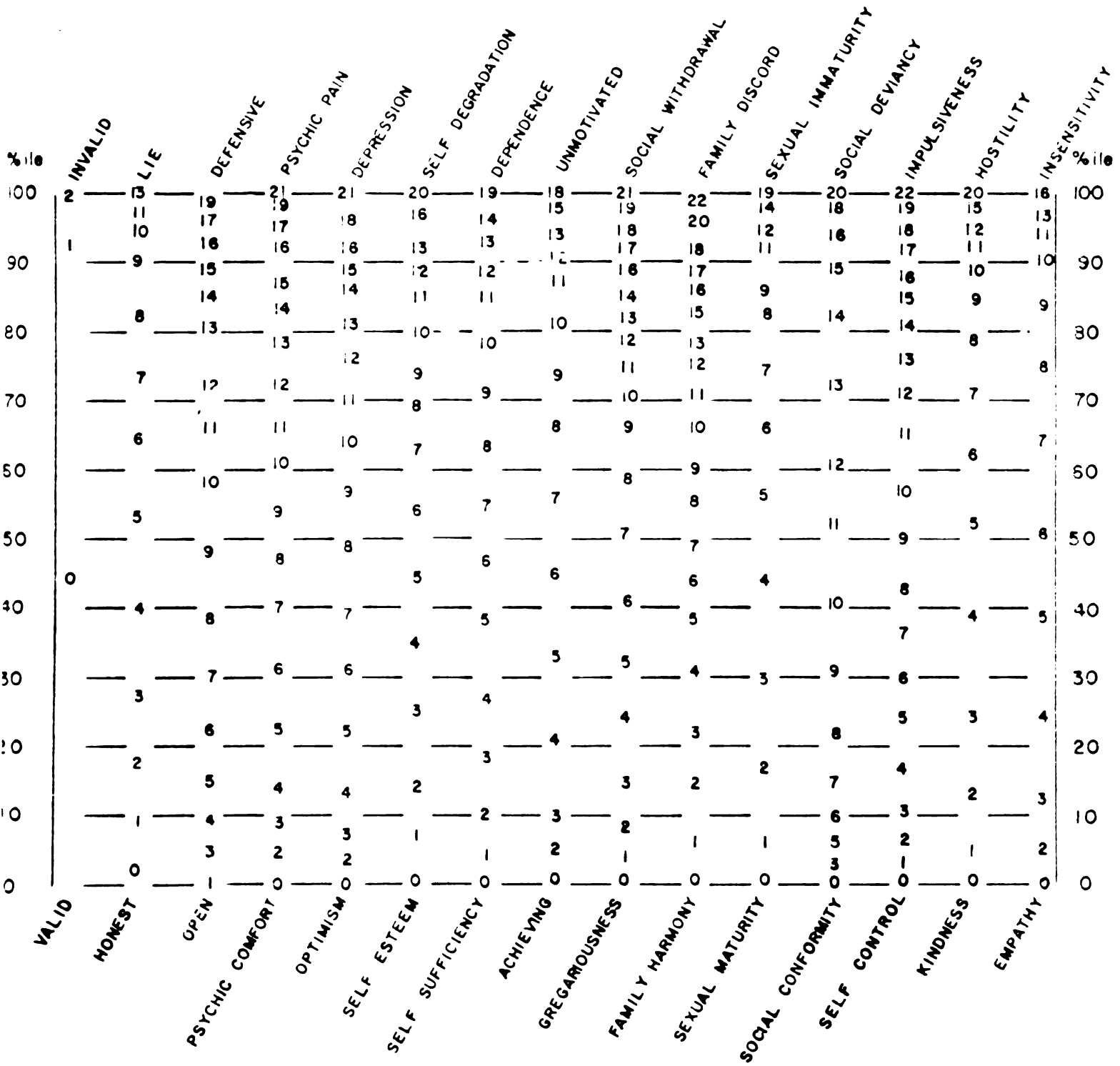
APPENDIX VI

BIPOLAR PSYCHOLOGICAL INVENTORY

OFFENDER NORMS — FORM A

MALE

Name _____ No. _____ Age _____ Date _____



APPENDIX VII

INTERCORRELATIONS BETWEEN INDIVIDUAL BIPOLAR PSYCHOLOGICAL INVENTORY SCALES

TABLE 9

Scales	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1														
2	.063													
3	-.001	.191	-.070											
4	.057	-.202	-.070											
5	.003	-.264	.137	.722										
6	.068	-.181	.213	.644	.766									
7	.072	-.180	-.078	.564	.511	.604								
8	-.006	-.141	.316	.301	.393	.491	.525							
9	-.036	-.002	.451	.254	.380	.453	.166	.384						
10	-.050	-.268	.110	.238	.378	.366	.196	.258	.332					
11	.029	-.258	-.070	.287	.277	.307	.309	.217	.172	.284				
12	-.035	-.351	.132	.132	.242	.153	.135	.279	.186	.327	.235			
13	.011	-.460	.032	.530	.567	.490	.476	.379	.230	.380	.326	.441		
14	.177	-.205	.195	.186	.238	.229	.135	.220	.208	.225	.195	.495	.443	
15	.143	-.308	.030	.059	.040	.044	.016	.044	.090	.141	.221	.309	.245	.539

APPENDIX VIII

COMPARISON OF VIOLENT AND NONVIOLENT OFFENDERS ON THE BIPOLAR PSYCHOLOGICAL INVENTORY

TABLE 10

	Nonviolent (N=73)		Violent (N=66)			
Dimension	Mean	S.D.	Mean	S.D.	t	sig.
Invalid	.33	.89	.35	.96	-0.129[a]	N.S.
Lie	5.44	2.63	5.95	3.44	-1.146	N.S.
Defensive	10.40	4.20	9.88	3.93	0.721	N.S
Psychic Pain	9.49	4.52	8.15	4.28	1.733	N.S.
Depression	9.38	4.23	7.91	4.27	2.035	.05
Self Degradation	6.78	4.02	5.39	3.80	2.017	.05
Dependence	7.08	4.04	6.33	4.72	1.083	N.S.
Unmotivated	7.51	3.14	6.38	3.93	2.102	.05
Social Withdrawal	8.78	5.41	7.55	4.83	1.335	N.S.
Family Discord	9.04	5.73	6.11	4.85	2.995	.01
Sexual Immaturity	5.22	3.18	5.56	4.09	-0.627	N.S.
Social Deviency	11.95	3.14	10.00	3.82	3.616	.001
Impulsive	10.60	5.07	8.02	4.89	2.984	.01
Hostility	6.66	3.65	5.80	3.70	1.368	N.S.
Insensitivity	6.66	3.12	6.29	2.83	0.692	N.S.

[a]A negative t ratio indicates that the nonviolent offender scored lower on the trait than the violent offender.

APPENDIX IX

COMPARISON OF FIRST-TIMERS AND RECIDIVISTS ON PESONALITY TEST SCORES

TABLE 11

	First-Timers (N=145)		Recidivists (N=130)			
Dimension	Mean	S.D.	Mean	S.D.	t	sig.
Invalid	.15	.53	.23	.64	-1.231[a]	N.S.
Lie	5.52	2.91	4.78	2.73	2.098	.05
Defensive	9.38	3.91	9.00	4.25	0.800	N.S.
Psychic Pain	9.21	4.46	7.83	4.19	0.385	N.S.
Depression	8.45	4.50	8.24	4.19	0.385	N.S.
Self Degradation	6.06	4.20	5.81	3.95	0.486	N.S.
Dependence	6.32	3.94	6.28	4.01	0.084	N.S.
Unmotivated	6.29	3.24	6.59	3.71	-0.770	N.S.
Social Withdrawal	7.35	4.77	8.50	5.30	-1.987	.05
Family Discord	6.99	5.00	7.99	6.09	-1.658	N.S.
Sexual Immaturity	4.94	3.52	5.15	3.33	-0.490	N.S.
Social Deviency	9.01	3.51	11.75	2.99	-6.444	.001
Impulsive	8.55	4.56	8.82	4.42	-0.491	N.S.
Hostility	5.03	3.13	5.85	3.45	-2.175	.05
Insensitivity	5.78	2.59	6.30	2.88	-1.656	N.S.

[a]A negative t ratio indicates that the first-time offender scored lower on the trait than the recidivist.

APPENDIX X

COMPARISON BETWEEN PRISONER AND STUDENT AFFECT SCORES
ON THE BIPOLAR PSYCHOLOGICAL INVENTORY
TABLE 12

Affect Dimensions	Prisoners (N=50) Mean	S.D.	Students (N=50) Mean	S.D	t	sig.
Defensiveness	5.64	2.37	3.48	1.93	-5.536	.001
Psychic Pain	3.06	2.13	2.26	1.94	-2.044	.05
Depression	3.34	2.00	4.74	2.18	3.179	.01
Self Degradation	2.88	2.23	1.84	1.64	-3.136	.01
Dependence	4.22	1.91	2.98	2.02	-3.031	.01
Unmotivated	.442	2.65	1.60	1.60	-8.724	.001
Social Withdrawal	4.62	2.86	3.40	2.14	-2.828	.01
Family Discord	4.78	2.98	2.22	1.72	-7.351	.001
Sexual Immaturity	3.26	2.08	2.68	1.79	-1.600	N.S.
Social Deviency	7.14	2.25	2.36	2.16	-10.948	.001
Impulsive	4.78	2.66	2.08	1.76	-7.574	.001
Hostility	3.36	1.92	4.52	2.68	2.144	.05
Insensitivity	3.36	1.35	4.48	1.97	2.811	.01

APPENDIX XI

COMPARISON BETWEEN PRISONER AND STUDENT BEHAVIOR SCORES ON THE BIPOLAR PSYCHOLOGICAL INVENTORY

TABLE 13

Behavior Dimensions	Prisoners (N=50) Mean	S.D.	Students (N=50) Mean	S.D.	t	sig.
Defensiveness	5.06	2.61	3.46	1.63	-4.866	.001
Psychic Pain	6.32	2.94	2.40	2.20	-8.820	.001
Depression	5.06	3.07	4.78	2.13	-0.651	N.S.
Self Degradation	3.50	2.63	2.78	1.91	-1.865	N.S.
Dependence	3.20	1.97	4.22	2.27	2.220	.05
Unmotivated	3.80	2.08	4.06	2.30	0.559	N.S.
Social Withdrawal	4.22	2.38	2.98	2.78	-2.206	.001
Family Discord	2.76	2.80	2.70	1.55	-0.191	N.S.
Sexual Immaturity	1.86	1.78	3.84	1.71	5.721	.001
Social Deviency	4.42	2.19	2.22	1.98	-5.492	.001
Impulsive	4.36	1.94	2.98	1.78	-3.831	.001
Hostility	3.36	2.12	2.32	1.58	-3.257	.001
Insensitivity	2.92	2.05	4.36	2.54	2.811	.01

APPENDIX XII

INTERCORRELATIONS BETWEEN SCALES OF THE MMPI AND THE BPI

TABLE 14

BPI Scales	MMPI Scales L	K	F	HS	D	Hy	Pd
Invalid							
Lie	.47	.28	-.24				-.17*
Defensive		-.20	.18*			.17*	-.25
Psychic Pain	-.25	-.55	.55	.20	.38		.35
Depression	-.24	-.48	.55		.48		.49
Self Degradation		-.38	.46	.18*	.53		.33
Dependent	-.16*	-.41	.32		.35		
Unmotivated		-.28	.37		.33		.26
Social Withdrawal		-.40	.41		.19*	-.21	.26
Family Discord		-.26	.40	-.15*			.42
Sexual Immaturity	-.28	-.28	.32		.18*		.20
Social Deviency	-.17*	-.40	.51	-.16*		-.23	.52
Impulsive	-.34	-.47	.39			-.24	.21
Hostility	-.34	-.48	.41	-.20		-.35	.17*
Insensitivity	-.30	-.39	.33			-.26	

	Mf	Pa	Pt	Sc	Ma	Si
Invalid						
Lie	-.25		-.23	-.29	-.34	-.21
Defensive		-.19*				.39
Psychic Pain	.19*	.38	.44	.48	.29	.46
Depression		.37	.48	.51	.30	.52
Self Degradation		.29	.42	.47		.60
Dependent		.21	.31	.30		.54
Unmotivated			.29	.34	.15*	.46
Social Withdrawal		.20	.18*	.26		.58
Family Discord		.17*		.27	.32	.21
Sexual Immaturity	.35	.32	.32	.36		.24
Social Deviency				.30	.42	.20
Impulsive			.18*	.33	.38	.37
Hostility		-.27			.33	
Insensitivity		-.22			.26	.18*

* = $P < .05$, all others $P < .01$. All missing values not significant.

APPENDIX XIII

COMPARISON OF SIGNIFICANT CORRELATIONS BETWEEN THE MMPI AND THE BPI WITH EDUCATION, AGE AND INCARCERATION

TABLE 15

Significant MMPI Correlations with Age, Education, and Incarceration for the Combined Samples

MMPI Scale	Incarceration	Age	Education
L	.14	.14	-.10
K	-.16*	.05	.04
F	.30**	.04	-.25**
Hs	-.09	.02	.00
D	.10	.03	-.08
Hy	-.09	-.05	-.01
Pd	.55*	.12	-.38**
Mf	-.20**	-.06	.16*
Pa	.15*	.03	-.13
Pt	.07	-.01	-.14
Sc	.18*	.00	-.17*
Ma	.30**	-.06	-.13
Si	.05	.04	-.07

*P < .05
**P < .01

TABLE 16

Significant BPI Correlations with Age, Education, and Incarceration for the Combined Samples

BPI Scale	Incarceration	Age	Education
Invalid	.03	.09	.01
Lie	-.05	.18*	-.14
Defensiveness	.11	.10	-.11
Psychic Pain	.30**	-.03	-.14
Depression	.34**	-.03	-.19*
Self Degradation	.23**	-.05	-.10
Dependence	.04	-.04	-.07
Unmotivated	.21**	-.01	-.17*
Social Withdrawal	.30**	.15*	-.12
Family Discord	.23**	-.07	-.05
Sexual Immaturity	.15*	.00	-.03
Social Deviance	.63**	.03	-.32**
Impulsivity	.12	-.12	-.02
Hostility	.26**	-.10	-.20**
Insensitivity	.16	.14	-.10

*P < .05
**P < .01

APPENDIX XIV

HYPOGLYCEMIA SYMPTOMOLOGY QUESTIONNAIRE

Directions: Please check those items in the list below which apply to you. Be as honest and accurate as you can.

1._____Abnormal craving for sweets

2._____Afternoon headaches

3._____Alcohol consumption

4._____Allergies - tendency to asthma, hay fever, skin rash, etc.

5._____Awaken after a few hours of sleep - hard to get to sleep

6._____Aware of breathing heavily

7._____Bad dreams

8._____Bleeding gums

9._____Blurred vision

10._____Brown spots or bronzing of the skin

11._____Bruise easily ("Black and blue " spots)

12._____"Butterfly stomach", cramps

13._____Can't decide easily

14._____Can't start in the morning before coffee

15._____Can't work under pressure

16._____Chronic fatigue

17._____Chronic nervous exhaution

18._____Convulsions

19._____Crave coffee or candy in the afternoons

20._____Cry easily for no reason

21._____Depressed

22._____Dizziness

23._____Drink ___ cups of coffee daily

24._____Eat often or get hunger pains or faintness

25._____Eat when nervous

26._____Faintness if meals delayed

27._____Fatigue, eating relieves it

28._____Fearful

29._____Get "shakey" if hungry

30._____Hallucinations

31._____Hand tremor

32._____Heart palpitations if meals missed or delayed

33._____Highly emotional

34._____Hunger between meals

35._____Insomnia

36._____Inward trembling

37._____Irritable before meals

38._____Lack energy

39._____Magnify insignificant events

40._____Moods of depression, "blues" or melancholy

41._____Poor memory

42._____Reduced initiative

43._____Sleepy after meals

44._____Sleepy during the day

45._____Weakness, dizziness

46._____Worrier, feel insecure

47._____Symptoms come before breakfast (yes or no)

48._____Do you feel better after breakfast than before?

Twenty-five or more"yes"answers indicate possible hypoglycemia and the neend for further testing. "Yes"to three or more of items 16,17,24,26, 27,29,43, or 44 indicates the person is likely suffering from some form of sugar intolerance.

APPENDIX XV

QUESTIONNAIRE FOR ARREST HISTORY, AND SUGAR AND REFINED CARBOHYDRATE INTAKE

NAME:_____AGE____RACE_____DATE_____

ARREST HISTORY: Please list the number and type of crimes for which you have been arrested. Be as honest and complete as possible.

_____

Please answer the following questions as honestly and accurately as you can.

1. How many candy bars did you eat daily prior to coming to jail? _____
2. How many candy bars do you eat daily now? _____
3. How many bottles of pop did you drink daily prior to jail? _____
4. How many teaspoons (packets) of sugar do you use on your cereal? _____
5. How many teaspoons (packets) of sugar did you use on your cereal prior to jail? _____
6. How many teaspoons of sugar did you use in your coffeee or tea prior to jail? _____
7. How many 8 ounce glasses of cool aid or other presweetened drink did you drink prior to jail? _____ How many now? _____
8. What quanity of alcoholic beverages did you drink daily? _____bottles of beer _____glasses of wine _____mixed drinks
9. What quanity of cookies or cakes did you eat prior to jail? _____
10. What quanity of cookies do you eat daily now? _____

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