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Genetic Influence on Impulse and Aggression Related Crime: A Historical Review of Related Research Data. and Field Research Project

Catherine A. Newell
Southern Illinois University Carbondale

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**Genetic Influence on Impulse and Aggression Related Crime:
a historical review of related research data:
and field research project**

By:

Catherine A Newell A.A.S.
Senior, Administration of Justice

Under the Supervision of:

Dennis A. Anderson Ed.D.
Associate Professor, Administration of Justice Department

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Chapter 1~ Introduction

Is human behavior a result of biological factors, such as genes, brain structure and chemistry? Or, are we the product of our environment? This nature/nurture debate has been raging for hundreds of years. What if our behavior *is* partially mediated by biological factors that we have no control over? Thus, are we still culpable for our behavior, or are we absolved of the consequences of the behavior since genes were a causative factor in the exhibition of the behavior? The answers to these questions have terrified society for decades. The social consequences of these answers have such profound social ramifications that theorists on both sides of the controversy have historically not been able to see the other side of the coin.

Environmental influence has historically been a popular focus in determining the origin of human behavior, but we now know that genetic predisposition also plays a very important role in the exhibition of human behavior. Over the past 80 years, genetic research has revealed some startling information about how our genes affect our behavior. Cesar Lombroso was the first to begin questioning the influence of biology on our behavior. He postulated that there was a “born criminal” with a distinctive physique and stigmata associated with criminality. It didn’t take long, however, for sociological theorists to disprove Lombroso’s original theory, but in the early 1900’s, Lombroso’s original theory began to take on airs of credibility again. With the discovery of Minor Physical Anomalies(MPA’s), individuals with criminal tendencies began to be reexamined for biological causality. Scientists began to find a wide range of common minor characteristics within this group of individuals.

Once again, the search for a biological influence of criminality was in full swing. Knowing that genes greatly influence one’s physical characteristics, the physique of their body, Minor Physical Anomalies, and an individual’s personality characteristics, a wide variety of genetic research and other related research began to investigate the link between genes, the body, personality and behavior, and delinquency and criminality. Scientists began to recognize common, discrete facial and body characteristics of criminals; they discovered that criminals tended to have similar body physique and similar hormonal and androgen levels; and scientists recognized similarities in pain tolerance and mental functioning among criminals. Scientists also began to notice similar brain structure and neurological functioning in the area of arousal and pain sensitivity, and research on personality and mood began to reveal that many criminals had similar personality characteristics and common psychiatric diagnoses. This essay will explore these topics in Chapter 2 and some prominent research findings about criminality and these subjects.

One would wonder why is genetics even important to behavior? Although people have little difficulty understanding that genes influence eye color, skin color, height, and medical disorders;

many find it quite difficult to comprehend the fact that our genes affect our behavior, personality and moods.

The “free will” theory of criminality and behavior has long emphasized that people actively choose their behavior and actions. It is the thought of disproving this “free will” concept that begins to frighten people about the affect of genes on behavior. If genes affect behavior, and we have no control over our selection of genes, what implications does this have on our justice system and the safety of our family and communities? Will people be absolved of genetically predisposed behavior and will our society become filled with individuals using a “genetic twinkie defense” in criminal cases? How will society know what genes do affect or do not affect in relationship to our behavior and our environment? Chapter 3 of this essay will explore the answers to these questions and challenge some of the commonly expressed fears about behavior genetics.

Research Questions

This essay will explore answers to the following questions. 1.) Can genes influence behavior? 2.) Can genetic influence make someone predisposed to aggression, impulsivity, delinquency or criminality? 3.) How does environment affect genetically influenced behavior? 4.) What are some aspects of behavior that genetics can or cannot account for? Finally, 5.) What are some genetically influenced disorders characteristic of aggressive, impulsive, delinquent or criminal behavior?

In Chapter 2, this essay will explore historical and recent research findings that indicate individuals with impulse control problems and aggressive tendencies may have a biological/genetic causality influencing their criminal tendencies. In Chapter 3, this essay will attempt to dispel some of the common myths about what genetic research can and cannot explain in relation to human behavior and, in Chapter 4, it will also examine known genetic influence in a variety of personality characteristics and psychiatric diagnoses known to be related to impulsive and aggressive behavior as well as delinquent or criminal behavior. Chapter 5 will outline the personal research project, analysis of data and discussion, and finally, Chapter 6 of this thesis will contain the conclusion.

Term Definitions

Research over the past 100 years has enforced the hypothesis that biological/genetic predispositions are influential in delinquent and/or criminal behavior. However, research also indicates that environmental factors interact in complex fashions with the genetic propensities toward delinquent/criminal behavior to influence the exhibition of these delinquent/criminal tendencies of an individual. To understand how genes influence behavior, it is first important to understand some of the terminology and concepts related to behavior genetics.

Heritability(300f)(77)

Heritability is the proportion of phenotypic difference among individuals that can be attributed to genetic differences in a particular population. (313)¹ It is the statistic that estimates the genetic effect. Monozygotic(MZ, or identical) twins share 100% of the same genes. If heritability is 100%, their correlation would be 1.0. Dizygotic (DZ, fraternal) twins and other first degree relatives (mother/child, a father/child and siblings with the same parents) share 50% of the same genes. So, if heritability is 100%, their correlation would be .50. Adopted children share 50% of their genes with each of their biological parents. Adoption studies have provided valuable information about the effects of environment on genes and behavior. This will be examined later in the essay.

Heritability estimates include error of estimation, often creating very wide ranges for the given statistic, but studies based on one set of data and small studies need to be considered very carefully before generalizing such data to larger populations. Although research may be valid and accurate, the estimates of heritability may not be generalizable to other populations, making the findings limited in their applicability. Heritability describes a particular population at a particular time. It describes what 'is' rather than what 'could be.'

For behavioral disorders and dimensions, the links between specific genes and behavior are weaker because behavioral traits are usually influenced by multiple genes, thus genetic influence of behavior involves probabilistic propensities rather than predetermined programming. (85)⁴

Concordance

Concordance "is the presence of a particular condition in two family members, such as twins."(312)¹ Concordance is a yes or no answer to a question. For instance, one twin has Attention Deficit Hyperactivity Disorder, ADHD. If the other twin *does not* have ADHD, then they are "discordant;" if the other twin *does* have ADHD, they are "concordant."

Shared vs. non shared Environment

Shared environment is the environmental factor responsible for the resemblances between family members. (316)¹ The non-shared environment consists of influences that contribute to the differences between family members. (315)¹

Gene-Environment Interaction

Gene-Environment interaction has been studied for many years. Sigmund Freud was one of the first people to implicate the affects of environment on people. Freud developed the 'schizophrenogenic' mother theory that stated that mothers of a particular personality type or psychiatric disorder would cause children to have the disorder or behave in the same manner by affecting their environment. Freud's original theory was quite flawed.

Schizophrenia was one of the first psychiatric disorders to be studied for the effects of genes versus environment. Twin and adoption studies have proven to be of great importance in illustrating effects of genes versus environment on some behavior and psychiatric disorders.

Irving Gottesman (1991) evaluated results of four recent schizophrenia studies to find that the studies suggest a heritability of 60 percent for identical twins. (171)¹ This indicates the incredible influence of genes on our body and behavior.

Another twin study on schizophrenia illustrates the possibility of passing on genes for a disorder that is not evident in the parent. This study by Gottesman and Bertelsen (1989), evaluated discordant schizophrenic twins; thus, one twin had schizophrenia and the other did not. This study reflected that although the discordant twin does not manifest schizophrenia, the discordant twin nonetheless transmits the illness to offspring via genes to the same extent as does the schizophrenic twin. (173)¹ This demonstrates that individuals may not manifest disorders or behavior, nevertheless, they may carry genes for the disorder and may pass the disorder on to their children through their genes. Many myths about genetics circulate around this principal. These myths are examined further in chapter 3 of this thesis. The ability to carry genes for a disorder and not manifest the disorder will also be further explained in the discussion of the Diathesis Stress Model.

Although twin and adoption studies on schizophrenia and psychiatric disorders have been very reliable in the results, twin and adoption studies on crime have provided less definitive information about the effect of genes and environment on criminal behavior. In criminality studies, environmental influence on delinquent or criminal behavior seems to vary throughout the life span. A recent twin study by Lyons (1996), studied self reported arrests of more than 3000 sets of twins, both of which served in the Vietnam War. The study showed genetic influence on self-reported arrests and criminality, but did not show significant genetic influence on delinquency before the age of 15.(211)¹ Shared environment between the twins was of major importance before the age of 15 in relation to delinquency, but after the age of 15 genetic influences appeared to be more important in influencing delinquency. Genetic research on Antisocial Personality Disorder, a common factor in criminal personalities, has provided similar findings; this will be explored in Chapter 4.

Genetic influence on environmental variables also extends beyond the family environment. Genetic influence has been found in characteristics such as peer groups, classroom environment, work environment, childhood accidents, divorce, and exposure to trauma.(268)¹ These characteristic have historically been assumed to be purely environmentally influenced.

Diathesis Stress

In 1913 Goring was in agreement with Lombroso that biological factors did have a dominating influence; however, he disagreed that there was such a thing as a born criminal. Instead, he suggested the concept of the “criminal diathesis.” This was the earliest form of the now known “diathesis model” or “diathesis stress model.” Goring implicated a mixture of physical, psychological and social characteristics being of importance in varying degrees in each individual, but never singly being causative of criminality. Goring postulated that the probability of criminality increases as the diathesis increases. This diathesis is the potential for

criminality of the individual. This diathesis varies depending on many factors including stress, unemployment, and other social and environmental variants.

Irving Gottesman outlined the diathesis-stress model of psychopathology in 1991. The diathesis-stress model states that individuals at genetic risk for psychopathology (diathesis) are especially sensitive to the effects of stressful environments. (271)¹ Individuals with genetically predisposed impulsive and aggressive tendencies tend to be especially sensitive to their environment since the environment is an important factor in the expression of behavior.

One's genetic make-up influences the environment people actively seek out once the individual is old enough to actively seek out and participate in different environments. Environments conducive to these behaviors (psychopathology, criminality) may exacerbate the expression of these types of behaviors. For instance, individuals prone to aggressive behavior may be more quickly provoked to aggressive behavior during times of high stress within the family, job stress, and during stressful school experiences. The environment may also provoke this behavior since these individuals may actively seek out environments consistent with their need for increased stimulation. This is very characteristic of individuals with ADHD, behavior disorders and hypoactive frontal lobe disorders.

Defining Criminality versus Delinquency

It should be noted that the definition of criminality and delinquency varies across some research studies and across the various fields of criminology and psychology. Various research will make the distinction between delinquency and criminality. Some researchers note criminality to be of a victimful sort, while other researchers will consider all illegal behavior to be criminal. "Victimful" crime is considered to be crime that is perpetrated against another person.

In the field of criminology, the distinction between delinquency versus criminality is usually considered to be the difference between being considered a "juvenile" within the court system to being considered an "adult" within the court system. In most states within America, this is considered to be age 17, unless the juvenile has committed a particularly violent crime or has an excessive history of juvenile convictions. The behavior addressed in this essay will be considered to be socially unacceptable, aggressive and/or impulsive behavior extreme enough to be considered illegal in most social classes and across cultures.

While this essay will concentrate on research findings that indicate individuals with impulse control problems and aggressive tendencies may have a biological/genetic causality influencing their criminal tendencies, it will also focus on causality of the "street crime" as opposed to "white collar crime." This distinction will be made since criminals with impulsive or aggressive behavior tend to perpetrate "street crime" or "victimful" types of crime. On the other hand, white collar crime tends to be of the victimless crime and tends to be perpetrated by individuals with much different personality and genetic characteristics than those of the street crime type. This is not to make any moral judgment or conclusion, or to consider one type of crime "more" wrong than another, rather it is to note that this thesis will focus on crimes of impulsive or

aggressive nature. To begin, we will first examine some of the historical perspectives of biological/genetic criminology theory.

Chapter 2~ Historical review of biological and genetic criminology theory

Over the past 200 years, the study of biological theories of crime has taken on an unending metamorphosis. In the 1800's, crime was theorized by "topological" or "bio-topological" theorists to be committed by criminals quite different from non-criminals in certain physical characteristics and personality which promoted the tendency to commit crimes. At this time, these theorists did not consider the influence of environment to be relevant in the exhibition of behavior. The original, criminal man was thought to be not only predisposed, but predetermined to be criminal.

By the early 1900's, the biological theories of crime had created a completely new set of wings by which to navigate toward a greater understanding of the human brain, genetic influence, development of human behavior and the complex interaction between these factors and the individual's surroundings.

As scientific research and technology continues to illuminate new findings in the fields of genetics, we must continue to change and adapt criminologic theory. Once again a shift toward a biological focus of crime causality is necessary to illuminate the fact that environment, and "free will" alone are not the exclusive causative variables in crime. This is evident since the field of behavioral genetics is constantly providing evermore impressive evidence of the strong, genetic influence on human behavior.

A. Lombrosians. Cesar Lombroso and atavistic anomalie (54)¹

In the mid 1800's, Cesar Lombroso proposed the first biological theory of crime and was the leader of the "Italian School." Lombroso published a theory that made the following propositions: "(a) Criminals are by birth a distinct type. (b) This type can be recognized by stigmata or anomalies, such as asymmetrical cranium, long lower jaw, flattened nose, scanty beard and low sensitivity to pain. The criminal type is clearly represented in a person with 5 such stigmata, incompletely represented by three to five, and not necessarily indicated by less than three. (c) These physical anomalies do not in themselves cause crime rather they identify the personality which is predisposed to the savage type—an atavism—or else degeneration, especially akin to epilepsy. (d) Because of their personal natures, such persons *cannot* refrain from crime unless the circumstances of life are unusually favorable. (e) Some of Lombroso's followers also concluded that the several classes of criminals, such as thieves, murderers, or sex offenders are differentiated from each others by physical stigmata." (54)²

As a result of Lombroso's postulations, especially his point that some individuals are destined to be criminals, a great debate arose about the validity, racist implications and motivation for such a theory. Despite the fact Lombroso made valid observations about the incidence of epilepsy and some common, physical characteristics in individuals exhibiting criminal tendencies, by excluding the possible interaction between the environment and these cited characteristics on

behavior, Lombroso ignited an onslaught of ammunition for sociological theorists to debunk Lombroso's biological theory of crime and other biological theories of the time period.

By 1913, a British investigator, C.B. Goring conducted anatomical comparison studies that completely disproved Lombroso's stigmata theory and he theorized that the typical "criminal anatomy" did not exist. (18)³

B. MPA's (Minor Physical Anomalies)(20)³

Despite Goring's denouncement of the criminal anatomy, more recent work on physiological characteristics shows that there may actually be some merit to Lombroso's original assumptions. Today these physical characteristics are called MPA's, or minor physical anomalies. MPA's are factors found to be present at birth and are assumed unlikely to change throughout the life span. Interest in MPA's goes back to the 1860's findings about Downs Syndrome and "Mongolism." By the 1900's some of these anomalies were beginning to be noted in children with hyperactivity, behavioral disorders and schizophrenia and also in adults with antisocial personality disorder. (20)³ By the mid 1900's to the present, a wide variety of studies have shown a particularly high incidence of MPA's in active, aggressive, and impulsive behavior in preschool boys. (20)³

Minor physical anomalies, carefully measured on a quantitative basis have been shown to be associated in children and adults with types of behavior and personality that were more frequently found in criminals than in non-criminals; however, there is no direct evidence of an association with criminality since, unfortunately, there have been no studies comparing criminals to non-criminals in studies of MPA's.

In a study by Masters and Greaves, plastic surgeons, in 1967, more than 11,000 photographs of criminals were studied comparing them with more than 7,000 photos of noncriminals. Masters and Greaves studied the photographs for characteristics defined as "surgically correctable facial defects," such as protruding ears, nasal deformity, receding chin, acne scars, scars of face, and eye deformity. They gave estimates of 60% deformity for criminals compared to 20% for noncriminals. Among males, the estimates were 57% and for females 68%. Protruding ears accounted for about half the deformity for males and nasal deformities similarly for females. (21)³ Although the criterion was not the same as Lombroso's stigmata, it does lend credence to his basic underlying theory. Since facial characteristics are partially to completely genetically mediated, this also indicates obvious genetic influence in characteristics of criminality.

C. Criminality and Physique

By the early 1900's, the shape and size of the body had become an important focus in the formulation of criminological theory. Over the years, there have been a variety of names for different types of physiques, but most scientists have quite uniformly agreed on three basic types. These three types essentially date back to a French writer named Rostan in 1828. Today, these

three types are most commonly noted as the mesomorph, the endomorph and the ectomorph. A normal or more balanced physique was also recognized by many scientists during this time.

The physical characteristics of the mesomorph were considered to be of a muscular, athletic build; the endomorph being of a round, thickset build; and the ectomorph being of a thin, lanky build. It was widely recognized that many criminals tended to be of the mesomorphic body type. In the early 1940's, Kretchmer expanded on the original three body types and added a temperamental topology to the body types. (24)³

Much of the early research on criminality and physique has been strongly criticized, especially research by Goring and E. A. Hooton. Goring's research finds that a criminal tended to have a "generally defective physique" and a significant defect in general intelligence, while Hooton postulated that the main cause of crime was "biological inferiority."⁽³³⁾³ Since neither scientist controlled for possible poor nutritional conditions, their results have been difficult to replicate and are not generalizable to larger populations.

Until the mid-1900's much of the early research was flawed in its validity, or produced inconclusive results, but in a landmark study by Glueck and Glueck (1956) involving 500 delinquent boys and 500 carefully matched controls, the Gluecks found that 60% of their delinquents were predominantly mesomorphic, compared with only 31% of the non-delinquent group. This finding was of major significance. The Gluecks also noted that the delinquent group contained a lower ectomorphic, thin or lanky, body builds. (33)³

In another compelling study, Seltzer (1950, 1951) found delinquents to be "absolutely and relatively more mesomorphic than the non-delinquents." His data indicated that extreme endomorphs are more common among non-delinquents, but "apart from these cases the relative endomorphic strength of delinquents is by and large greater than that of the non-delinquents."⁽³⁸⁾³

Considering data from many studies conducted on physiques, there is little debate that mesomorphic body builds are associated with delinquency. This is relevant to genetics since the genotype is largely responsible for the physique of an individual. It would be interesting to see if there is distinct difference in physique in relation to type of crime; unfortunately, there is a lack of research in this area.

D. Arousal Theories

Over the years, the arousal state of individuals became of great interest when studying criminology and psychology. Arousal is descriptively referring to the various states of consciousness that individuals go through. Individual states of arousal have been found to vary greatly in individuals even when faced with identical situations or circumstances. Arousal theories originated with the study of activity in the cortical area of the brain. Originally, it was

thought that individuals quite prone to criminality had a low level of arousability in this area of the brain.

Hans Eysenck (1967), one of the first scientists to study arousability, suggested that cortical arousal, mediated by ascending reticular formation was responsible for differences in extroversion and introversion. Extroverted individuals were considered difficult to arouse, and introverted people were characteristic of considerably higher levels of arousal than extroverted individuals when facing identical situations. In 1964, Eysenck extended this theory to criminality. (110)³ Eysenck suggested that low arousability/arousal was a biological factor responsible in part for criminal and antisocial behavior. Eysenck also postulated that criminal individuals were characteristically extroverted, thus connecting the personality with the arousal system.

Research shows that extroverts experience less pain as a result of a higher pain threshold as compared with introverts. This is very evident in some criminal behavior. Since criminals with extroverted personalities experience less pain, at higher thresholds than many people, theoretically, there is a lack of fear related to possible painful consequences of their behavior. Thus, rewards of criminal behavior may theoretically outweigh possible negative consequences of their criminal behavior. With minimal fear of painful consequences, extroverted individuals may have difficulty resisting possibly dangerous behavior. This lower pain threshold may be a factor in the risk taking behavior of criminal and highly extroverted individuals.

Gray (1981) expanded on Eysenck's original theory. Gray stated that extraverts condition better to *positive* (rewarding, pleasant) stimuli whereas introverts condition better to *positive* (painful, harmful) stimuli. (121)³ Thus, individuals receiving positive reward, i.e., monetary, material gain, excitement, etc. are prone to continue such behavior despite its possible criminal nature. Eysenck cites a large set of studies indicating that seriously criminal or psychopathic persons show signs of less or marked or slower shift toward high arousal when threatened with pain or punishment than do persons with no serious criminal or psychopathic histories. (122)³ From these arousal studies, Eysenck cites eight major points. It is quite evident how these characteristics could be apply to criminality.

1. Resistance to punishment or defiance of punishment by parents and other persons in authority (Satinder, 1977)
2. Impulsiveness and non-persistence at tasks assigned and coordinated by others (Farley, 1986)
3. Childhood hyperactivity (Bell, Alexander, & Schwartzman, 1983; Satterfield & Dawson, 1971; Shouse & Lubar, 1978; Stewart, 1970; Zentall, Gohs & Culatta, 1983)
4. General risk taking, excitement seeking (including gambling) (Blaszczynski, 1985; Lykken, 1982)

5. Neurologically active recreational drug use, including heavy alcohol use (Tarter, Alterman, & Edwards, 1984)
6. Preference for active, rather than for quiet social interactions (H.J. Eysenck, 1977; McEwan & Devins, 1983; Nichols, 1974)
7. Broad-ranging sexual experiences (or at least a preference for such) and unstable bonding tendency (H.J. Eysenck, 1976; Farley, 1986)
8. Poor academic performance other than that which is attributable to intellectual deficit (H.J. Eysenck & Cookson, 1969; Wankowski, 1973)

By examining this list of criteria associated with low cortical arousal, it is easy to understand why the hypothetical intolerance to low levels of stimulus lead extroverts to seek out more stimulating environments to increase their arousal levels. More recent research had continued to endorse Eysenck's and Gray's theories, at least in part. Low arousability has more recently been linked to the frontal lobe of the brain and the prefrontal cortex of the brain. Slower functioning in the frontal lobe, slow glucose metabolism in the frontal lobe, and decreased blood flow to the frontal lobe have more recently been linked with hyperactivity and impulsivity. Research conducted by Chelune, Ferguson, and Richard (1986) and of Lou, Henriksen, and Bruhn (1984) support frontal lobe underactivity as highly correlated with ADHD. (444)⁴ The limbic and prefrontal regions, along with thalamic regions, have been implicated in frontal inactivity as well.

A recent study by Cook et al. (1995) supports the strong genetic link in ADHD. Cook et al. linked ADHD with dopamine processing and the dopamine transporter gene. (444)⁴ This research parallels the frontal lobe research since dopamine processing is especially important in the frontal lobe of the brain. Excessive dopamine in the frontal lobe will cause delusions and other behaviors characteristic of schizophrenia, while a lack of dopamine in the frontal lobe is indicative of under-stimulation of the brain or hypoactivity in the frontal lobe of the brain, theoretically causing the individual to seek out more stimulating environments. This will be addressed later with the discussion of AD(H)D.

E. Hormone Theories

Although it is quite clear how the brain could be responsible for states of low arousability, it has also been postulated that androgens(male sex hormones) are responsible for low arousability of criminals. Historically, hormone theories have been a popular basis for biological theories of crime, but Ellis postulates that androgens not only affect arousability, but also other physiological processes related to crime.

After reviewing more than 50 studies related to crime, age and sex, Ellis indicated a direct, declining relationship between age and sex effects on aggressive, injurious and property offensives respectively. (126)³ It is widely accepted that property crime is highest between 15-18 years of age and violent crime probabilities are highest somewhere between 21-25 years of age. Ellis also notes that the studies placed males above females in property crime at a multiple of 4-6 and for violent offenses at a multiple of 6-10. (127)³ Ellis, like many others, related this

phenomenon directly to the effects of male hormones and the age at which male adolescents mature. After considering these facts, it is not difficult to understand why criminality and androgens were historically linked together. However, more recent studies on the effects of testosterone have been varied in genetically linking criminality to testosterone, and many studies have produced inconclusive data.

Androgens have also been linked to hyperactivity in studies by the knowledge that hyperactivity is four to six times more common in males than in females throughout the world. (129)³ However, recent genetic studies indicate that female children may be somewhat closing the gap between males and female children with ADD. This more recent research somewhat disproves the link between testosterone and hyperactivity, however, some continue to study the difference between the incidence of male and female criminality, considering testosterone to possibly be a factor in this disparity.

Research on pain and androgens has also linked androgens to criminality. Pain studies indicated that exposure to androgens (converted to estradiol) created varied sex difference in pain tolerance. Studies by Buchsbaum, et al. 1981, McGrew 1979, Woodrow et al. 1977, and N. Wright, 1974, indicate that males are more likely to tolerate pain at a given intensity than females. (130)³ This information also supports the theory that individuals with criminal tendencies may have less fear of painful consequences of their behavior than other individuals with lower pain tolerances.

During puberty, one's genes influence the activation of androgens. Muscle and nerve cells develop quickly into mesomorphic body types during high exposure to androgens. The fact that most criminals tend to be of the mesomorphic body type also supports the genetic theory about the influence of the androgens on criminality.

After concluding the discussion on biological theories of crime, it is evident how many genetic influences or predispositions may factor into aggressive, impulsive, and socially unacceptable behavior. Since genes affect body shape and size, behavior and personality, impulsivity and pain tolerances, the genetic link between these factors and criminality is often obscure to most individuals, but nevertheless evident as common underlying or secondary characteristics of criminal individuals. Before examining genetic research about common disorders found among delinquents or criminal individuals, common myths about the implications of genetics on criminality will be explored.

Chapter 3~ Common myths of genetics and implications on delinquent, criminal behavior

The second part of this thesis will consider the common myths about genetics and the relevant application to delinquent or criminal behavior. It is important to consider some of the ethical questions and serious misunderstandings about what genetics can and cannot accomplish when considering the implications of genetic influences on behavior. Many of the myths of genetics have fueled societies' fears about genetics and what possible atrocities could be accomplished by the exploitation of genetic research and technology. A more thorough understanding of the implications and limitations of genetic findings should assist in alleviating some of these fears. Michael Rutter and Robert Plomin adeptly define these misconceptions and some important values of genetic research in their article, "Opportunities for psychiatry from genetic findings."⁵

Myth: Heritability estimates have a "true" fixed value

The major misconception about genetic research is that heritability estimates have a "true" fixed value for each trait. Note that heritability estimates may be quite different per population since populations may differ dramatically in genotype, or genetic make-up, thus creating the misconception that heritability estimates derived from research are generalizable to all populations. This is not necessarily true. When considering implications of genetic research, features and characteristics of the subject population should be considered before generalizing any data to other populations. This is an important issue when researching criminality, delinquency and disorders characterized by behaviors prone to be deemed as criminally deviant. Although research may be valid and reliable, the population researched may not be representative of all populations, thus creating somewhat biased results.

Myth: Environment has little affect on characteristics highly influenced by genes

A second misconception is that if something has a very high genetic influence, (note: genetic influence is not to be confused with genetic abnormality) then it is unlikely that environmental interventions will have much influence on the phenotypic, observable, characteristic influenced by the genes. Rutter notes that even a heritability as high as 90 percent carries no implications that environmental effects will not bring about big changes in the behavior or characteristic in question. It is this misconception that may drive society's erroneous belief that if criminality is truly genetic, then society is doomed to face a plague of crime that would be insatiable and unabated by environmental intervention. The fact that environmental intervention may dramatically affect disorders, individual characteristics and behaviors that are highly heritable is proof that genetic research is crucial in developing environmental interventions for such problems. Exploring the influence of genes on behavior will aid the ability to devise

environmental intervention for individuals with genetic propensities for particular behaviors, characteristics and disorders.

Myth: Genetically determined abnormalities cannot be environmentally manipulated

Another misconception is that a genetically determined abnormality cannot be changed by environmental manipulation. This is not true with even single gene disorders. Single gene disorders are obviously created by a single known gene, and these are usually very rare disorders. An example is the metabolic disorder phenylketonuria, or PKU. When someone is born with PKU, the body cannot metabolize phenylalanine in the diet. If phenylalanine is not restricted, such an individual may become mentally retarded as a result of the unmetabolized phenylalanine in the body. If this individual has a diet restricted from phenylalanine, the body and brain develop normally, without mental retardation.

Unfortunately, psychiatric disorders and characteristics influencing criminality are not this simplistic. With many psychiatric disorders, it is believed that genetic factors operate, at least in part, by creating a vulnerability to environmental risks such as extremely stressful events, i.e., death of a loved one, prolonged high stress levels, etc. This is believed to be a causal mechanism with depressive disorders and antisocial disorders as well. It is believed that environmental manipulation may be most beneficial to individuals with high genetic susceptibility to genetic disorders; thus, like single gene disorders, polygenic and multifactoral disorders like Antisocial Personality Disorder (ASP) and criminality can be greatly influenced by environmental manipulation.

Myth: Genes are determinative

Another misconception is that genes are determinative. This means that if one has a gene for a particular disorder, then the individual will inevitably get the disorder. In a great majority of the cases this is not true, especially with psychiatric disorders. Most psychiatric disorders are multifactoral, meaning that they are manifested by the interplay of genes, environment and protective factors. An example of a protective factor would be a strong, supportive home-life which decreases the degree of influence of environmental stress. In the case of genetically influenced criminality and disorders that frequently accompany criminal behavior, a great fear of many people is that the acknowledgment of genetic influence in criminality will remove the 'free will' concept from crime. To the contrary, even genetic disorders causing some of the most severe, mental impairment like Downs Syndrome and Huntington's Disease cannot be merely reduced to the disease exclusively controlling the individual's behavior. Thus, antisocial behavior and criminality also cannot be reduced to genetic influence alone predetermining the action of one's behavior.

Myth: “Genetic” means abnormal

Another misconception is that ‘genetic’ means abnormal genes. Although there are thousands of rare, single gene disorders, most common psychiatric disorders show no evidence of a single gene or even major gene effects. Another important note is that most of these genes are normal variations of the gene and not a mutated, or abnormal gene.

Although people all have the same number of chromosomes, there are many variations of genes on the chromosomes that create the wide range of normal variations within individuals. When a characteristic is polygenic, or influenced by many genes, the outcome can best be understood by imagining the genetic product on a continuum or bell curve, the normal or typical variations being in the center and the extreme variations, despite the influence of ‘normal’ genes, being on the ends. This phenomenon explains the development of personality disorders. Development and research about personality disorders and the influence on criminality will be discussed later in this essay.

Some genes, although normal, influence an individual’s susceptibility toward a disorder or particular behavior, but what is a protective factor for some may actually be a risk factor for others, i.e., the extremes of the norm. This is notable in many personality disorders. To elaborate on this concept, Rutter notes that many Asiatic people possess a gene that causes a flushing response to the consumption of alcohol. This significantly protects them from the dangers of alcoholism, while many Native Americans tend to be genetically very susceptible to alcoholism. They seem not to have even the protective factors from the effects of alcohol that Caucasians and African Americans have. Alcoholism has been implicated in criminality. Research on criminality and alcoholism will be discussed later in this essay.

In the majority of psychiatric disorders, susceptibility genes play only a contributory part in the causal process. Their presence means that an individual’s probability of manifesting a disorder may be substantially raised, but not positively determined. For instance, a Native American that is genetically susceptible to alcoholism will obviously never manifest the disorder if he never consumes alcohol. This latent behavior may also be observed in the case of the “late bloomer” criminal. This type of criminal behavior has been proven to be influenced by genes in research. The “late bloomer” is an individual that does not exhibit criminal tendencies until adulthood. This is believed to occur in an individual with genetic susceptibility to criminality, but probably had the benefits of a supportive home life that may have postponed the exhibition of this behavior until the individual was living outside the childhood home. (339)⁶

Myth: Just exterminate “bad” genes

Another misconception is that genes associated with disease are bad, and therefore, must be exterminated. Contrary to popular belief, we cannot simply “exterminate” genes that we might consider to be bad in the case of psychiatric disorders since many genes play a role in the manifestation of behavior or symptoms of a psychiatric nature.

This may be easier to comprehend by considering genes influencing psychiatric disorders on a continuum. For instance, a simplistic example would be to consider the gene or genes that influence eye color. Despite the fact that the genes are quite normal and necessary, there is a long continuum of the possible eye color effects that may result from these genes. Now extend this theory to behavior which is genetically influenced. Research has shown that behavioral inhibition is a risk factor for anxiety disorders, but a protective factor for antisocial behavior. Most people carry a gene or genes that are related to a particular disorder that they don't even know they have because they have not developed the particular disorder. Thus, to exterminate all genes that are associated with disease would be to wipe out most all of the world's population.

Myth: Bad genes justify eugenics

The last misconception to be discussed is the theory that "bad genes" justify genetic screening, and eugenics, and termination of pregnancy. Society seems to believe that the next rational step to finding bad genes is to exterminate them, replace them, or terminate fetuses carrying these genes all together. Despite the extreme ethical implications of such action, and with the exception of altering the process of rare single gene disorders, the process would be virtually impossible for psychiatric related disorders, delinquency and criminality.

If genes affect criminality, then criminals might be considered by many to be genetically flawed, however, the complex interaction between genes and environment makes the expression of behavior variable over the life span and in different situations. As already mentioned, almost everyone carries genes that contribute to multifactorial disorders, but simply carrying genes for psychiatric disorders does not mean that someone will absolutely manifest the disorder. This is also applicable to delinquent and criminal behavior.

Since multiple genes relate to multifactorial disorders, genetic screening and genome mapping are costly procedures that would provide very limited information, and these procedures cannot delineate the complex interaction between genes and environment, i.e., protective factors versus risk factors, and, thus, would provide inaccurate, inconsistent, and inconclusive information at best. All of these considerations indicate that there are very severe constraints on the practicality and utility of genetic screening.

Now that historical theories of criminality and myths about genetic research have been addressed, common psychiatric diagnoses and characteristics common to delinquents and criminals will be explored.

Chapter 4~ Diagnoses and characteristics (of genetic predisposition) related to crime and delinquency

A. Childhood Disorders

This section of the essay will focus on childhood disorders that may be characteristic of impulsive and/or aggressive behavior, or behavior that may be considered to be delinquent in nature. The term “disorder,” as used by the medical community, is often construed in a very negative way. The following “disorders” of childhood and adulthood are often considered to be very controversial since many, if not most, individuals have some personality characteristics that make up these diagnoses. The more important aspect of these disorders is the degree of impairment they cause in each individual. As with many medical conditions, the degree of impairment may vary greatly per person, environment, and genetic predisposition.

A better way to consider these “disorders,” would be to consider the behavior on a continuum, with more extreme behavior being at either end. Although genetic predisposition is an important aspect in the following disorders, it is important to remember that the environment plays a crucial role in how people develop and behave.

1. Attention Deficit Hyperactivity Disorder

Attention Deficit Hyperactivity Disorder (ADHD), as defined by the DSM-IV, is characterized by poor attention span and restlessness often accompanied by impulsivity and hyperactivity. About 20-25 percent of children with ADHD have learning disorders. (409)⁷ Even when learning disorders don't accompany ADHD, a child frequently has difficulty following directions in school, remaining seated, completing tasks, comprehending school work, and socializing with peers. This, in turn, causes difficulty with learning not directly related to a learning disability. Also, children with some of the subtypes of ADHD are often quite hyperactive, have very little patience, may be aggressive and even violent. These behaviors often lead to difficulties with peers, parents and other authority figures, i.e., teachers, coaches and law officials. In chapter 5, answers from the questionnaire illuminate how these behaviors of children with ADHD can become delinquent in nature.

Research on ADHD has shown it to be substantially heritable, although it is not exactly known what is inherited. Recent studies on ADHD have indicated that brain metabolism is slower in females, but not in males, while MRI studies indicate a smaller frontal lobe in males with ADHD than normal boys. Still other studies on ADHD show poorer performance in frontal lobe

functioning (such as inhibitory response.)(410)7 Research in these areas is still relatively new, but twin studies have been quite consistent in showing strong genetic influence in ADHD.

Regardless of the type of study, a genetic heritability of about 70 percent seems to be a reasonable estimate. (189)1 Estimates from Barkley, 1990, indicate the prevalence of ADHD in North America to be about 4 percent, with boys greatly outnumbering girls. (189)1 However, more recent research indicates that girls are more frequently being diagnosed with ADHD than in the past. Studies show that females tend to have the inattentive subtype of ADHD rather than the overactive/impulsive subtype.

In various studies, estimates for ADHD range as high as 10 percent for school age children. Understanding the maladaptive as well as adaptive aspects of ADHD gives insight to its high rate of prevalence. ADHD individuals tend to be risk takers, fear failure less than most, are creative and energetic, and can be quite motivated when controlling the ADHD effectively, however, the negative outcomes of ADHD, i.e., behavioral disorders, substance abuse, and jail time which are all associated with childhood aggression (Baker, 1995; Barkley, 1990)⁸, get the major attention.

ADHD and delinquent behavior

Simply indicating that an individual has ADHD does not dictate that the individual will be delinquent or criminal; however, the genetic predisposition for such behavior will greatly influence the exhibition of possible inappropriate behavior. As noted earlier, genes affect the environment that someone actively seeks out, and the environment which an individual with ADHD seeks out may become a catalyst for inappropriate behavior.

It is also important to note that childhood disorders, as well as the adult disorders to be discussed have a high rate of co-morbidity with other problems and diagnoses; thus, they may coexist with other problems such as learning disabilities, problems with anxiety and depression, as well as obsessive/compulsive type behavior or disorders. Research indicates that anxiety and depression, commonly co-morbid with ADHD and Conduct Disorder, have a co-morbidity rate of 15-45 percent. (416)7 It is difficult to make a differential diagnosis between ADHD and Conduct Disorder since there is an overlap of 30-90 percent. (410)7 Thus, 30-90 percent of the time, the individual with ADHD will have also have conduct disorder and vice versa. When these two disorders occur in the same child, the worst of both symptoms tends to manifest. These children tend to have the most serious antisocial behavior and have the worst prognosis of these disorders. (410)7

Historically, it was thought that individuals with ADHD grew out of the behavior by adolescence, but recent longitudinal studies indicate that 70 percent of children with a childhood diagnosis of ADHD will continue to manifest the symptomology into adolescence, and 18-65 percent will continue the symptomology into adulthood. Adolescents with ADHD tend to have more difficulty in school than otherwise normal adolescents since it is more imperative they remain quiet and attentive in high school than in grammar school. They tend to have a high

incidence of vehicular accidents resulting from their inattention, and they have a high incidence of emergency room visits resulting from personal injuries. Teens with ADHD and behavior disorders are more prone to risk taking and impulsive behavior often considered to be unacceptable or foolish by other adolescents.

Research indicates these individuals try more experimental drugs at a younger age and use “more serious” drugs than the typical experimenting teen. Teens with conduct and inattention disorders tend to use experimental drugs and alcohol as forms of self medication, and thus, quickly become dependant upon drugs and alcohol. These facts are really not surprising considering the number of individuals that contend with excessive impulsive, inattentive and aggressive behavior in adulthood and the social consequences that accompany such behavior.

2. Conduct Disorder

Conduct Disorder is the second childhood disorder to be discussed. The DSM-IV criteria for conduct disorder include aggression, destruction of property, deceitfulness or theft, and other serious violations of rules such as running away from home. (189)1 Approximately 5-10 percent of adolescents meet the criteria for Conduct Disorder. Boys also outnumber girls for diagnosis of Conduct Disorder. Conduct Disorder has shown in research to have only a moderate genetic component when it occurs in the absence of hyperactivity or inattention(ADHD); however, it should be noted that an individual with Antisocial Personality Disorder (which has shown to be genetically influenced) nearly always has a childhood incidence of Conduct Disorder symptomology.

There is a considerable overlap in symptomology for ADHD and conduct disorder. In a twin study of adolescent males utilizing latent class analysis, which attempts to hypothesize underlying (latent) classes, researchers found one class involving symptoms from both ADHD and Conduct Disorder to have a strong genetic influence, while finding minimal genetic influence for a “pure” class of conduct disorder without hyperactivity (Silberg et al., 1996). (190)1 It is this overlap of diagnoses that complicate the treatment and indicate the most severe behavior patterns of children with these disorders. ADHD and Conduct Disorder are common diagnoses in children and teens considered to have delinquent behavior.

3. Juvenile Delinquency

Although juvenile delinquency is not a DSM diagnosis, research on delinquency will be covered in this section. Although delinquency is quite prevalent, research into juvenile delinquency has indicated only a modest genetic influence. Research on juvenile delinquency by McGuffin and Gottesman (1985), yielded concordance rated of 87 percent for identical twins and 72 percent for fraternal twins, suggesting only a modest genetic component while implicating a large influence of shared environment for these age groups. As mentioned in chapter 1, the effects of genes and environment can interact in a complex manner to influence behavior.

As previously mentioned, genetic research indicates antisocial behavior extended into adulthood indicates a substantially stronger genetic component than that which is confined to the childhood years. (190)1 Thus, the effect of genes becomes more important in influencing behavior as the individual grows older. Environmental risk factors are probably strongest with respect to an early onset of antisocial behavior that is accompanied by hyperactivity and shows a strong tendency to persist into adulthood as an Antisocial Personality Disorder. (190)1 For instance, this may be a child with comorbid Conduct Disorder and ADHD, who grows into an adult with Antisocial Personality Disorder, and also lives in and seeks out an environment conducive to antisocial and delinquent behavior.

Familial Tendencies of Delinquency and Criminality

In several research studies, family incidences of criminality or psychopathology have shown to be indicative of genetic influence on adolescent delinquency. An adoption study of aggressive Conduct Disorder found increased rates of psychopathology in the biological mothers (Jary & Stewart, 1985), and family studies show that criminality in the parent functions both as an environmental and genetic risk factor (Rutter & Giller, 1983). (190)1 Adoption studies allow researchers to understand the influence of genes on behavior since the adopted individual is not in the same environment as the biological parents, and family studies allow researchers to investigate the effect of genes and shared environment on behavior.

Population-based studies indicate that conduct disorder is common among societies. These teens are defiant, truant, lack remorse for their behavior, are resistive to authority and often engage in aggressive or unlawful behavior. Most criminals of the physically violent kind, e.g., burglary, forcible rape and aggravated assault, are largely crimes of male adolescents. Research indicates the incidence of serious lawbreaking peaks at the age of 17 and drops precipitously in young adulthood (Moffit, 1993)(416)7. By their late twenties, most of these violent offenders have stopped offending(Blumstein & Cohen, 1987)(416)7. Although not all criminal acts are marked by violence and disregard for harm done, these figures help illuminate the problem of a genetic predisposition to impulsivity, aggression and criminality.

B. Adult Disorders Characteristic of Impulsivity and Aggression

1. ADHD

Although ADHD has traditionally been thought to be a disorder of childhood, new research is indicating that this is not actually true. As previously mentioned, ADHD is believed to persist into adulthood at a rate of 18-65 percent. Refer to the childhood disorders for ADHD symptomology and statistics.

2. Antisocial Personality Disorder (ASP)

Antisocial Personality Disorder (ASP) has been researched more than any other personality disorder.(211)1 ASP may be characterized by lying, cheating, and stealing. The extreme end of ASP is frequently characterized by chronic indifference to and violation of the rights of others. Although adolescent delinquency is frequently associated with ASP, it should be noted that most adolescent delinquents do not grow up to manifest ASP. It is also important to recognize that ASP persists throughout the lifespan and is a stable part of the individual's personality characteristics. Approximately one percent of females and four percent of males from 13 to 30 years of age have ASP (Kessler et al., 1994). (211)1

Family studies show that ASP runs in families, and an adoption study found that familial resemblance is largely due to genetic influence rather than shared environment (Schulsinger, 1972). (211)1 This adoption study by Schulsinger, in 1972, shows that the risk for antisocial personality disorder is increased fivefold for first-degree relatives of ASP males whether living together or apart, and the risk for first-degree relatives of ASP females is increased 10 fold whether living together or apart. This indicates that females need a much higher genetic loading to manifest ASP symptoms than males. For instance, a male and female with the same amount of genetic predisposition would not manifest the disorder the same. The male may display the disorder while the female with the same genetic loading may not. However, both have the same propensity to transmit it to their children.

However, since females need more genetic predisposition to manifest ASP, they will thus have much more genetic predisposition to pass to offspring than a male experiencing ASP. This study provides strong evidence that this behavior is partially mediated by genetic influence. Another important note of this study is the difference in genetic loading between males and females. This difference in genetic loading would theoretically explain the much higher incidence of ASP in males than females, and possibly explain the higher incidence of crime among males than females.

Although antisocial personality disorder does not dictate that an individual will be a criminal, much of the ASP research has been focused toward criminality. ASP research shows that 40 percent of male criminals and eight percent of female criminals qualify for a diagnosis of ASP. (Rutter, 1996a)¹ Although research indicates an estimate of 40 percent of male criminals with ASP, I would personally estimate the incidence to be higher than that, especially in Illinois. Unfortunately, there is a lack of genetic research studies on inmates to provide extensive information about criminals. During a recent internship to Tamms Correctional Center in Tamms, Illinois, approximately 95-98 percent of the male inmates had a diagnosis of ASP; however, the inmates at Tamms would presumably be a biased selection of inmates, since the correctional facility is designed to house the most violent and behaviorally unacceptable inmates within the state of Illinois.

3. Criminality

Like juvenile delinquency, criminality is not a psychiatric disorder, however, since genetic research has been done on criminality, it will be covered in this section. Genetic research has indicated strong importance for both genetic and environmental influence in criminality. One of the best twin studies on criminal behavior included all of the male Danish twins born from 1881 to 1910 (Christianson, 1977). (212)¹ In this study, more than 1000 twins were studied to find a concordance rate of 51 percent for male MZ twins and 30% for male-male DZ twins. More recent research findings have confirmed Christianson's early findings. Danish studies also confirm the importance of environmental influence in criminal behavior. The Danish studies showed that the group of adoptees with both biological and adoptive fathers who were criminal were themselves the most likely to be criminal (24%). The next largest group was the adoptees with only a criminal biological father (20%). This suggests that genetic influence has importance in criminal outcome, but that environment also has importance in raising the 13 percent base rate of criminality. (126)²

In another adoption study, Cloninger, Sigvardsson, Bohman, and von Knorring (1982) studied adult male criminal adoptees and found that men whose adoptive environments included criminal relatives, but whose biological parents were *not* criminal, were twice as likely to be criminal themselves (6.7%) compared with adoptees with no adoptive or biological criminal background (2.9%). (126)⁸ Adoptees who had no criminal adoptive parents, but did have criminal biological parents were found to be four times as likely to be criminal (12.1%). Adoptees that had biological and adoptive parents that were both criminal in nature were 14 times more likely to be criminal (40%). This study exemplifies the intricate interaction between genotype and environment. This study implies that the complex interaction of genetic predisposition and environment of criminality significantly raised the risk of criminality far above what the factors would have seemingly increased the risk by simply adding risk factors together, i.e., 6.9% + 12.1% + 2.9%=21.9%. This "additive" type of effect may have profound implications toward the incidence of crime in this nation.

In 1987, in one of the foremost adoption studies on criminality, Mednick and colleagues found that genes had a strong influence on criminality. In a landmark adoption study by Crowe, (1974) women studied from an Iowa prison that gave their children up for adoption appear to indicate that there are genetic but not early environmental predispositions to both criminality and antisocial personality. (Note: These findings may, in part, result from first degree relatives of ASP females having a 10-times greater incidence of ASP, and most likely even higher incidences of an exhibition of antisocial behavior.)

Chapter 5~ Field Research

Purpose:

In an attempt to evaluate the prevalence of individuals with aggression and impulse related problems in the local area, a questionnaire was mailed to local psychiatrists and psychologists in the area. The questionnaire focused on symptomology and other variables of disorders characteristic of aggressive and impulsive disorders. Although genetic research indicates a strong genetic component for these disorders, a major focus of the questionnaire was to evaluate the perceptions of practicing clinicians about the prevalence, causality, other variables of these disorders. It was my hypothesis that the answers from the clinicians would vary greatly on the issues of prevalence within the local area, age of onset of symptoms, the age at which the major symptoms cease, the causality of the symptoms and the influence aggression and impulsivity has on delinquency and criminality. Following are the primary purposes of the research questionnaire.

1. Outline the prevalence of disorders characteristic of aggression and impulsivity within this local area.
2. Evaluate the clinician's perceptions about causality, age variables, diagnoses, delinquency/criminality, and treatment of these types of disorders and problems.
3. Evaluate or analyze the clinician's responses in relation to genetic research findings about prevalence, diagnoses, age variables, criminality and delinquency.

Methodology:

The subjects selected and issued the research questionnaire were local psychiatrists and psychologists within a 50 mile radius of the Carbondale, Illinois. The subjects recruited treated adults, children, and mixed adult/child clientele. A questionnaire was designed to evaluate aggression and impulsivity in males, females, adults and children. The questionnaire was focused on local prevalence of the disorders, factors of causality, concurrent/aggravating factors, factors related to age of onset and "aging out," incidence of criminal and delinquent behavior. The most important objective was to evaluate the individual clinician's perceptions of impulsivity and aggression and the variables addressed by the questionnaire.

Prior to mailing the questionnaire, it was evaluated for validity, content and clarity by doctoral students of the Southern Illinois University Psychology Department, by a local practicing child and adult psychiatrist, and Dennis Anderson, Ed.D., of the Administration of Justice Department at Southern Illinois University.

Attempts were made to contact all clinicians prior to mailing the questionnaires. Since all of the clinicians were actively seeing clients, many of the clinicians were not spoken to personally as they were busy with clients. The questionnaires contained self addressed stamped envelopes for return. The questionnaire also contained phone information to allow respondents to contact myself or Dr. Dennis Anderson for clarification or questions about the questionnaire or research. Five of the six respondents were psychologists, one of whom was also a MD. One psychiatrist and one psychologist saw both adults and children while the other three respondents saw only adult clients. Although the response rate was much less than expected, the data returned helps illuminate some of the major points of this thesis. The sixth respondent was a licenced clinical counselor with a Master's degree in psychology.

The following questionnaire was posed to the respondents. The number of actual responses to each question is in parentheses next to the answers. The number outside the parentheses indicates the number of years the clinicians have been practicing. This may add insight about the rationale for each clinician's answers. An evaluation of the responses is added at the end of many questions. Note that some respondents did not answer all questions. Some clinicians did not answer questions that pertained to children clientele, and some clinicians did not speculate about prevalence, despite the fact that the questions may have only requested the clinician's opinion.

Thesis Questionnaire and Critical Analysis of Data

1. How long have you been practicing or involved in patient treatment?

- A. 0-5yr B. 6-10yr (2)PhD treats adults; L.C.P.C/NCC C. 11-15yr (2) MD/PhD treats both; PhD treats both;
D. 16-20yr E. 21+ (2)PhD treating adults/teens; PhD treats adults

2. Does your practice treat? :

- A. Adults (3) B. Children C. Both (3)

4. In your current practice, how prevalent is the treatment of individuals with *aggression*?

- A. very prevalent B. moderately prevalent (2) C. scarcely prevalent (4)

5. In your current practice, how prevalent is the treatment of individuals with *impulse control* problems?

- A. very prevalent (1) B. moderately prevalent (4) C. scarcely prevalent (1) 6-10

Note: Almost all of the clinicians find impulsivity to be moderately to very prevalent in their practices.

6. Over time, has treatment of individuals with *aggression* problems become:

- A. More prevalent (3) 6-21+ B. Less prevalent (1) 21+yrs C. Remain unchanged (2) 11-15

7. Over time, has treatment of individuals with *impulse control* problems become:

- A. More prevalent (3) 11-21+ B. Less prevalent C. Remain unchanged (3)11-21+

Note: Most of the clinicians believe the incidence has either remained unchanged or become more prevalent.

8. Do you feel the *change* has been *contributed to* :

- A. Education of physicians and clinician (1) B. Excessive media coverage (1)
C. Biological/genetic predisposition D. Decline of nuclear family (1)
E. Over/Under diagnosing (2) F. Other (3) 1-Better screening--doesn't see aggressive patients; 1-inability to manage anger; 1-change in practice focus(similar to education)

9. Whom do you treat more often for problems with *aggression*?

- A. Males (4) B. Females C. Equal in prevalence (2)

Impulse control problems?

- A. Males (1) B. Females(1) C. Equal in prevalence (3)

Concurrent Aggression/Impulse control problems?

- A. Males (4) B. Females C. Equal in prevalence (2)

Note: Males tend to have more difficulty with aggression, while females equal males in prevalence when the problems are confined to impulsivity.

10. Of the adult male clientele you see, what percent have *aggression* problems?

- A. 2-20% (5) B. 21-40% (1) C. 41-60% D. 61-80% E. 81-100%

Impulse control problems?

- A. 2-20% (5) B. 21-40% (1) C. 41-60% D. 61-80% E. 81-100%

Concurrent aggression/impulse control problems?

- A. 2-20% (5) B. 21-40% (1) C. 41-60% D. 61-80% E. 81-100%

Note: The clinician treating 21-40% of male clientele with aggression/impulsivity was a PhD with 21+ years of experience treating adults. This clinician also states that he/she treats adolescents which are considered to be adults in this clinician's answers.

11. Of the **adult female** clientele, what percent clientele has **aggression** problems?

A. 2-20% (6) B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Impulse control problems?

A. 2-20% (5) B. 21-40% (1) C. 41-60% D. 61-80% E. 81-100%

Concurrent aggression/impulse control problems?

A. 2-20% (6) B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Note: The clinician treating 21-40% of female clientele with impulse control problems is the same clinician noted in question #10.

12. Of the **child male** clientele, what percent clientele has **aggression** problems?

A. 2-20% (4) B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Impulse control problems?

A. 2-20% (4) B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Concurrent aggression/impulse control problems?

A. 2-20% (4) B. 21-40% C. 41-60% D. 61-80% E. 81-100%

13. Of the **child female** clientele, what percent clientele has **aggression** problems?

A. 2-20% (4) B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Impulse control problems?

A. 2-20% (4) B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Concurrent aggression/impulse control problems?

A. 2-20% (4) B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Note: Only four clinicians answered this question and some of the other questions focused on children. It is evident that the clinicians treat less than 20% of their clientele for problems of aggression and impulsivity as a general rule.

14. Of **males**, what is the typical **age of onset** for **aggression** problems?

A. 0-5 (1) B. 6-10 (2) C. 11-15 (2) D. 16-25 E. 26-45 F. >46

Impulse control problems?

A. 0-5 (1) B. 6-10 (2) C. 11-15 (2) D. 16-25 E. 26-45 F. >46

Concurrent problems aggression/impulsive problems?

A. 0-5 (1) B. 6-10 (2) C. 11-15 (2) D. 16-25 E. 26-45 F. >46

Note: The L.C.P.C answered C. to the entire question, but the remainder of the C. answers did not come from the same clinician. One PhD/treating adults/21+years of experience finds the age of onset for aggression to be 11-15 as opposed to the age of 6-10 for impulsive and concurrent problems, while one PhD/treating adults/21+years finds the age of onset for aggression to be 6-10 as opposed to the age of 11-

15 for impulsive and concurrent problems--exactly the opposite of the first. I have no theory of explanation for this finding, except that the age group separations were too close together to be accurately separated.

Note: These finding may be a result of different training and education amongst clinicians. One clinician made a notation that clients were not usually seen until after the age of six, thus the possible rationale for the later age of onset selection.

15. Of females, what is the typical age of onset for aggression problems?

A. 0-5 (1) B. 6-10 (2) C. 11-15 (2) D. 16-25 E. 26-45 F. >46

Impulse problems?

A. 0-5 (1) B. 6-10 (2) C. 11-15 (2) D. 16-25 E. 26-45 F. >46

Concurrent aggressive/impulsive problems?

A. 0-5 (1) B. 6-10 (2) C. 11-15 (2) D. 16-25 E. 26-45 F. >46

Note: The answers for this question are identical to #14.

- | | |
|---|------------------------------------|
| A. Attention Deficit Disorder | E. Major Depression |
| B. Attention Deficit/Hyperactivity Disorder | F. Antisocial Personality Disorder |
| C. Oppositional Defiant Disorder | G. Borderline Personality Disorder |
| D. Conduct Disorder | H. Other _____ |

16. What are the most prevalent Dx./diagnoses for adult females with aggression problems?

A B C D E (1)MD F G (3)BPD H (1)Post Traumatic Stress Disorder(PTSD)

Impulse problems?

A B C D E (2) F G (2) H(2) PTSD/Impulse Control Disorder

Concurrent problems?

A B C D E (2) F G (2) H(2) PTSD/Impulse Control Disorder

Note: It is interesting that no clinicians gave adult females a diagnosis of Antisocial Personality Disorder.

Note: Another note is that the individual correlating impulse control/concurrent problems with Major Depression correlated aggressive tendencies in females with Borderline Personality Disorder. This clinician is a PhD treating adults who has 6-10 years of experience. This clinician also confined males to Major Depression, and female children's diagnoses to Oppositional Defiant Disorder (which is characteristic of aggression and impulsivity.)

Note: It should also be noted that three clinicians indicated major depression or PTSD to be indicative of aggression and impulsivity in their clientele. This is somewhat unusual since these symptoms are not usually characteristic of these disorders; however, without examination of the client cases, criticism of the diagnoses may be premature and unfounded since co-morbidity is high among these types of disorders.

Note: Although the pattern of answers is seemingly unusual, any theory for this pattern of answers would be purely speculative on my part. This pattern may be related to clinician education, years of practice or it could be related to clientele symptomology.

Note: One clinician screens patients and made the notation, “does not wish to treat patients with aggression problems.”

- | | |
|---|------------------------------------|
| A. Attention Deficit Disorder | E. Major Depression |
| B. Attention Deficit/Hyperactivity Disorder | F. Antisocial Personality Disorder |
| C. Oppositional Defiant Disorder | G. Borderline Personality Disorder |
| D. Conduct Disorder | H. Other _____ |

17. What are the most prevalent Dx./diagnoses for adult males with *aggression* problems?

A B C D E (2) F (2) G H (1) Mixed Personality Disorder
Impulse problems?

A B C D E (2) F (1) G H (2) Mixed PD/ Impulse Control Disorder

Concurrent problems?

A B C D E (2) F (1) G H (2) Mixed PD/ Impulse Control Disorder

Note: It should be noted that the individual correlating all males in this question with Major Depression, also correlated all females of the same symptomology with PTSD. See the above note #16 for further explanation. The LCPC also categorized all males into the Major Depression category. As mentioned in #16, this is somewhat unusual in my opinion, but Major Depression seems to be a “catch all” category for patients. The diagnosis also carries minimal stigma compared to other psychiatric diagnoses, and is usually adequately covered and compensated by insurance companies with minimal resistance.

Note: Another finding is that the PhD with 21+ years of experience, treating adults and adolescents, diagnosed all the above males with Mixed Personality Disorder. Upon investigation, I discovered that the DSMIV doesn’t carry such a diagnosis, but that a Personality Disorder of an undifferentiated type does exist; this may be what the clinician is referring to. The psychiatrist I consulted did state that the

prevalence of such disorder is somewhat unusual since the criteria for diagnosis is very specific and requires that individuals must not fit into other personality disorder categories.

Note: Another notable finding is that this clinician finds these problems have become more prevalent over time, but causality for change is related “exclusively” to the decline of the nuclear family as noted by this individual’s answer.

Note: There seems to be a large disparity among clinicians’ choices of adult diagnoses. Only one clinician felt the change in aggression/impulsivity diagnosis was related to education of clinicians and only two clinicians felt the change was related to under or over diagnosing of these problems. Although the clinicians have similar education, and clinicians and their clientele have similar demographic factors, there is an inconsistent variety of theories about prevalence, symptomology, etiology, diagnosing criteria and treatment practices among local clinicians. I did expect to receive these findings.

18. What are the most prevalent Dx./diagnoses for female children with *aggression* problems?

A B C (2) D (2) E F G H _____

Impulse problems?

A (1) B (1) C (2) D E F G H _____

Concurrent problems?

A (1) B (1) C (2) D E F G H _____

19. What are the most prevalent Dx./diagnoses for male children with *aggression* problems?

A B (1) C D (2) E F G H _____

Impulse problems?

A (1) B (1) C (2) D E F G H _____

Concurrent problems?

A (1) B (1) C (2) D E F G H _____

Note: The responses of the clinicians seem to be consistent with that of current research.

20. What percent of adult males with *aggressive and/or impulsive* characteristics do you find had **childhood disorders with similar symptoms?**

A. 0-20% (2) B. 21-40% (1) C. 41-60% D. 61-80% (1) E. 81-100% (1)

Note: The clinician that chose “D” was a PhD that treated adults and teens for 21+years.

21 . What percent of adult females with *aggressive and/or impulsive* characteristics do you find had childhood disorders with similar symptoms?

- A. 0-20% (2) B. 21-40% (1) C. 41-60% (1) D. 61-80% E. 81-100% (1)

Note: There is a wide disparity among clinicians for these two questions. The LCPC felt 81-100 percent of clients had some childhood problems with aggression and impulsivity. This would be consistent for diagnoses of ADHD, Antisocial Personality Disorder, and Conduct Disorder since these characteristics tend to be stable, long-standing characteristics of the personality or behavior. However, this individual indicated adults with these characteristics had diagnoses of Major Depression, which may also be long standing, but they are not required to have an onset in childhood or adolescence. The individual that chose "C" was a PhD that treated adults and teens for 21+years; many of this individuals answers tend to mirror the results from genetic research. It is surprising that most of the clinicians believe that many of the individuals in question did not have childhood symptomology.

For the following questions regarding concurrent (and/or) aggravating factors of clients with aggression/impulse control problems, use the following categorical answers:

- | | |
|---|---|
| A. childhood physical abuse, | H. espousal abuse physical |
| B. childhood sexual abuse, | I. espousal abuse multiple form |
| C. childhood mental abuse, | J. familial/genetic predisposition |
| D. divorce/1 parent family | K. ETOH/ drug abuse |
| E. learning disorders | L. Other (traumatic experience, deaths, etc.) |
| F. ADHD/ADD | |
| G. Pathophysiologic problems, i.e., disease, difficulty during childbirth, mental retardation, etc. | |

22. What are common concurrent/aggravating factors of adult females with problems of aggression?

- A. (5) B. (5) C. (4) D. (1) E. F. (2) G. H. (2) I. (2) J. (1) K. (1) L. (2)

Impulse control?

- A. (3) B. (4) C. (3) D. E. F. (3) G. H. (2) I. (2) J. K. (1) L. (2)

Concurrent aggression/impulse control?

- A. (4) B. (5) C. (4) D. (2) E. F. (3) G. H. (2) I. (2) J. (1) K. (1) L. (2)

Note: The clinicians seem to be in agreement that childhood abuse severely affects the causality of adult female problems with aggression and impulsivity and half believe that impulsivity may be related to ADHD, but almost none believe in familial/genetic predisposition. Overall, there seems to be disparity among the clinicians choices, or a wide range of causality.

Note: One clinician chose only "B" answers to the above question. It is difficult to believe that childhood sexual abuse is the only predisposing factor to aggression and impulsivity for adult females.

23. What are common concurrent/aggravating factors of adult males with problems of *aggression*?

A. (5) B. (2) C. (3) D. E. (1) F. (3) G. H. (2) I. (2) J. (3) K. (2) L. (2)
Impulse control?

A. (3) B. (1) C. (2) D. E. F. (5) G. (1) H. (2) I. (2) J. (3) K. (2) L. (2)
Concurrent aggressive/impulsive problems?

A. (4) B. (2) C. (3) D. E. F. (3) G. H. (2) I. (2) J. (3) K. (2) L. (2)

Note: One of the above clinicians chose only “J” (genetic/familial disposition) answers for these questions. This is unexpected since the clinician indicted the prevalence of aggression has become more prevalent over time(#6), but the assumed change was related to inability to control anger(#8) and not genetic/familial disposition.

Note: It should be noted that three clinicians find these problems to be relative to genetic predisposition, but these clinicians also rarely cited these individuals to have these problems in childhood. These findings are quite inconsistent with each other, unless the clinicians consider these tendencies to express themselves only in adulthood. In reality, this phenomenon would be highly unlikely.

Note: Another note is that most of the clinicians related adult male aggression with childhood physical abuse, but correlated impulsivity with ADHD. This would be somewhat consistent with research findings. This is also a curious finding since only one clinician related any change in aggression/impulsivity over time to decline of nuclear family, and no one indicated these problems in adult males were related to divorce or single parent family. However, abuse can obviously be present without having divorce or separation from the nuclear family. This is interesting since society, media, etc. has blamed the rise of aggressive acts and criminality largely on these variables.

24. What are common concurrent/aggravating factors of female children with problems of *aggression*?

A. (2) B. (2) C. (2) D. (2) E. F. G. H. I. J. K. L.
Impulse control?

A. (1) B. (1) C. (1) D. (1) E. F. (1) G. H. I. J. (1) K. L.
Concurrent aggressive/impulsive problems?

A. (2) B. (2) C. (2) D. (1) E. F. G. H. I. J.(1) K. L.

Note: One clinician chose only “D” (divorce) answers for these questions; however, the clinician did not indicate divorce or single parent family to be a factor in change across time, the change was indicated to be related to inability to manage anger. This individual only chose “B” (childhood sexual abuse) answers for question #22. It would seem reasonable that if childhood sexual abuse is the factor influencing aggression/impulsivity in adult females, this would indicate this would be a factor in

child/female clientele with aggression/impulsivity problems. Thus, the rationale for the choice of answers seems to be inconsistent.

Note: Three clinicians answered this question. The clinicians did seem to agree that childhood abuse is correlated with aggression in female children. One clinician did consider impulsivity to be related to ADHD and considered this to be also related to genetic predisposition. This would be consistent with research findings.

25. What are common concurrent/aggravating factors of male children with problems of aggression?

- A. (2) B. (2) C. (2) D. (1) E. F. G. H. I. J. (1) K. L.
Impulse control?
A. (1) B. (1) C. (1) D. E. F. (1) G. H. I. J. K. L.
Concurrent aggressive/impulsive problems?
A (2). B. (2) C. (2) D. (1) E. F. G. H. I. J. (1) K. L.

Note: One of the above clinicians did not answer these questions. The rationale for these choices of answers is quite unclear.

Note: The clinicians also seemed to agree that aggression is related to child abuse in male children.

Note: The above clinician that considered ADHD to be related to impulsivity and have genetic/familial disposition in female children did *not* consider impulsivity in male children to be related to genetic/familial disposition. This seems somewhat inconsistent for females to have a genetic predisposition, but not males. However, this clinician *did* consider impulsivity in male children to be correlated with ADHD. This clinician considered aggression to be genetic/familial in these male children rather than impulsivity. The rationale for these answers is unclear.

26. What types of *treatment* do you, your clinic, or facility provide?

- A. Behavioral (3) D. Group Counseling (1) G. Family counseling (5).
B. Cog./Behavioral (5) E. Psychoanalysis H. Parent Management Training (4)
C. Medication (2) F. Hypnosis/Relaxation (3) I. Humanistic (4)
J.(1)-Psychotherapy; (1)-Anger Mgt.
(1)strategic (1)learning skills; (1)Education

clinicians. They may have assumed I was implying that the adults needed 'their' parents to attend parent management rather than the client themselves participating in parent management therapy.

Note: One interesting note is that all five clinicians indicate clients with Antisocial Personality Disorder use medication.

Note: It is surprising that family counseling is used as rarely as it is. I make this assertion on the basis that these disorders not only affect the client, but the way the client socializes and relates to their family. Like alcoholism, disorders such as ADHD, Conduct Disorder, Oppositional Defiant Disorder and Antisocial Personality Disorder affect not only the individual, but everyone close to the individual.

29. Do you find that the "majority" of improvement in male children with aggressive/impulsive characteristics tends to be related to? :

A. Medication/Treatment (1) B. growing older (1) C. Both (1)

30. Do you find that the "majority" of improvement in female children with aggressive/impulsive characteristics tends to be related to? :

A. Medication/Treatment (1) B. growing older (1) C. Both (1)

Note: Two clinicians declined to answer. I have no theory for the rationale.

The MD/PhD chose "C" for both answers, possibly recognizing the combined effectiveness of medication/ treatment modalities plus the maturation factor of growing older.

Note: The clinician choosing "A Medication/Treatment" seems not to believe in the possibility of "aging out" of these behavior characteristics. It is also interesting to note that this clinician indicated the age of onset for these behaviors in males and females to be 0-5 years of age, but does not indicate any genetic/familial relationship to this behavior(#8); however, this clinician does indicate etiology of aggression/impulsivity for males and females to be both genetic and environmental in nature (#47&48). Another note is that this clinician finds impulsivity to be more prevalent over time, but indicates these changes to be relative to education of physicians and clinicians, over/under diagnosing practices and excessive media coverage.

Note: The clinician that noted "growing older" to be the major causality for improvement, also had the peculiar diagnosis answer pattern to #22-24. (#22-B to all)(#23-J to all)(#24-D to all)(#25 no answer). This clinician only answered #32&34. From these answers, one may conclude that this clinician treats primarily females with a history of child abuse, thus indicating the rationale for the dissimilar answers. Hopefully there are truly better treatments for impulsivity and aggression than "just" aging.

31. What percent of male children do you find *don't improve* with treatment?

- A. 0-15% (1) B. 16-30% C. 31-45% D. 46-60% E. 61-75% F. 75-100%

Note: Only one clinician answered this question.

32. What percent of female children do you find *don't improve* with treatment?

- A. 0-15% (1) B. 16-30% C. 31-45% D. 46-60% (1) E. 61-75% F. 75-100%

33. What percent of male adults do you find *don't improve* with treatment?

- A. 0-15% (2) B. 16-30% (1) C. 31-45% D. 46-60% E. 61-75% F. 75-100% (1)

34. What percent of female adults do you find *don't improve* with treatment?

- A. 0-15% (2) B. 16-30% (1) C. 31-45% (1) D. 46-60% E. 61-75% F. 75-100%

Note: The MD/PhD and LCPC (adult males and females) find only 0-15 percent of individuals do not improve with treatment. I find this to be overly optimistic.

Note: One clinician chose not to answer the questions, noting he/she did not want to speculate without any data. Another clinician also did not answer.

Note: The PhD treating adults and teens only answered #33&34, thus, leading one to speculate that this clinician may primarily treat males. This clinician finds 16-30 percent of males do not improve with treatment. This seems to be close to research estimates. This clinician indicated the concurrent/aggravating factors for adult males to be childhood physical and mental abuse, ADHD, physical and multiple espousal abuse as well as "other" factors. This clinician did not correlate ADHD and genetic/familial predisposition.

Note: The clinician seeming to treat primarily females indicated 46-60 percent female children will not improve, and 31-45 percent of female adults will not improve with treatment. It should be noted that this clinician indicates that "growing older" equates the majority of improvement in males and females. Unfortunately, this seems to be a quite pessimistic prognosis for these individuals. Possibly the severity of sexual abuse may strongly affect these outcomes.

35. At what age do you find that "most" male children tend to "age-out" of their *aggressive* behavior?

- A. 10-15 (1) B. 16-20 (1) C. 21-30 (1) D. 31-45 (1) E. 46+ F. Never

Impulsive behavior?

- A. 10-15 (1) B. 16-20 C. 21-30 D. 31-45 (2) E. 46+ F. Never

Concurrent Aggressive/Impulsive behavior?

- A. 10-15 (1) B. 16-20 (1) C. 21-30 D. 31-45 (2) E. 46+ F. Never

Note: It is unclear why only 2 individuals answered #35.b.

36. At what age do you find that “most” female children tend to “age-out” of their *aggressive* behavior?

A. 10-15 (1) B. 16-20 (1) C. 21-30 (1) D. 31-45 (1) E. 46+ F. Never

Impulsive behavior?

A. 10-15 (1) B. 16-20 (1) C. 21-30 (1) D. 31-45 (1) E. 46+ F. Never

Concurrent Aggressive/Impulsive behavior?

A. 10-15 (1) B. 16-20 (1) C. 21-30 (1) D. 31-45 (1) E. 46+ F. Never

Note: It is evident that there is disparity between the clinicians in belief of “aging out.” The MD/PhD indicated that male children age out “C, D, D” respectively, and the LCPC chose “D” exclusively. The MD clinician tends to find more genetic liability for impulsivity and ADHD; thus, the possible rationale for the later “aging out” of impulsivity compared to aggression in males. This clinician indicated females all age out between ages 21-30. The LCPC finds “aging out” to be between ages 31-45 for males and females.

Note: The PhD treating adults and teens indicated that males and females all tend to age out between ages 10-15.

Note: The clinician treating primarily females finds most males and females tend to age out between 16-20. This clinician did not answer #35b.

37. Despite empirical data results, what percent of all females do you believe *do not seek and/or receive treatment* for problems with *aggression*?

A. 0-15% (1) B. 16-30% (2) C. 31-45% D. 46-60% E. 61-75% (1) F. 75-100%

Impulsive behavior?

A. 0-15% B. 16-30% (2) C. 31-45% (1) D. 46-60% E. 61-75% (1) F. 75-100%

Concurrent aggressive/impulsive behavior?

A. 0-15% B. 16-30% (2) C. 31-45% (1) D. 46-60% E. 61-75% (1) F. 75-100%

38. Despite empirical data results, what percent of all males do you believe *do not seek and/or receive treatment* for problems with *aggression*?

A. 0-15% B. 16-30% C. 31-45% (2) D. 46-60% (1) E. 61-75% (1) F. 75-100%

Impulsive behavior?

A. 0-15% B. 16-30% C. 31-45% (2) D. 46-60% (1) E. 61-75% (1) F. 75-100%

Concurrent aggressive/impulsive behavior?

A. 0-15% B. 16-30% C. 31-45% (2) D. 46-60% (1) E. 61-75% (1) F. 75-100%

Note: It is interesting to note that the PhD with 21yrs experience finds 61-75 percent of all males and females do not seek treatment. This clinician indicated the his male clientele had diagnoses of Mixed Personality Disorder. If this clinician is seeing patients primarily with personality disorders, the answers given for males are quite consistent with the fact that males with personality disorders rarely seek treatment, since they tend to feel they have no “problem” with their behavior or personality characteristics. However, the clinician indicated the adult females with aggression problems have primarily Borderline Personality Disorder, but when impulsivity is added to the characteristics of the female, the diagnosis changes to Major Depression.

Note: Although there seems to be disparity among the answers, the type of clientele and diagnosis of individuals somewhat dictates whether or not the individual seeks treatment. As a general rule, women tend to seek treatment more often than men, but factors such as culture, socioeconomic status and other variables may affect the rate at which individuals seek treatment.

39. What percent of all females with *aggressive and/or impulsive* problems do you believe are mis-diagnosed?

- A. 0-15% (2) B. 16-30% C. 31-45% (2) D. 46-60% E. 61-75% F. 75-100%

40. What percent of all males with *aggressive and/or impulsive* problems do you believe are mis-diagnosed?

- A. 0-15% (2) B. 16-30% (1) C. 31-45% D. 46-60% (1) E. 61-75% F. 75-100%

Note: It is interesting that the MD finds 46-60% of men to be mis-diagnosed. This individual indicated that all adult males in question fall within a diagnosis of Antisocial Personality Disorder. The clinician believes that only 0-15 percent of these men and women may not improve with treatment. This is precisely one of the major points of this essay.

The LCPC did not answer #37-40.

Delinquent behavior: truancy, verbal aggression toward authority figures, physical aggression/without harm, disobedient with parents/authority figures, lying, possible drug/ETOH use

Criminal behavior: theft, robbery, physical assault, fraud (checks, etc.), gambling, drug/ETOH abuse. For purposes of this questionnaire, *criminal* behavior will include any arrests, and trouble with the law.

41. In male children (0-16), how often do problems with (*aggression*) influence “*delinquent*” behavior?

A Almost never B. Rarely C. Occasionally (1) D. Frequently (1) E. Often (2)
(*Impulsive* behavior)

A Almost never B. Rarely (1) C. Occasionally D. Frequently (1) E. Often (2)
(*Concurrent aggressive/impulsive* behavior)

A Almost never B. Rarely C. Occasionally (1) D. Frequently (1) E. Often (2)

42. In male children (0-16), how often do problems with (*aggression*) influence “*criminal*” behavior?

A Almost never B. Rarely C. Occasionally D. Frequently (2) E. Often (1)
(*Impulsive* behavior)

A Almost never B. Rarely C. Occasionally D. Frequently (2) E. Often (1)
(*Concurrent aggressive/impulsive* behavior)

A Almost never B. Rarely C. Occasionally D. Frequently (2) E. Often (2)

Note: Although clinicians may differ in opinion about age of onset for impulsivity and aggression, it is evident that clinicians feel that aggression and impulsivity often influence delinquency and frequently influence criminality.

43. In female children (0-16), how often do problems with (*aggression*) influence “*delinquent*” behavior?

A Almost never B. Rarely C. Occasionally (2) D. Frequently E. Often (2)
(*Impulsive* behavior influence)

A Almost never B. Rarely (1) C. Occasionally (1) D. Frequently (1) E. Often (1)
(*Concurrent aggressive/impulsive*)

A Almost never B. Rarely C. Occasionally (2) D. Frequently E. Often (2)

44. In female children (0-16), how often do problems with (aggression) influence “criminal” behavior?

- A Almost never B. Rarely C. Occasionally D. Frequently(2) E. Often (1)
(*Impulsive* behavior)
- A Almost never B. Rarely C. Occasionally(1) D. Frequently (1) E. Often (1)
(*Concurrent* aggressive/impulsive behavior)
- A Almost never B. Rarely C. Occasionally D. Frequently (1) E. Often (2)

Note: It seems unusual that more clinicians believe that female children more frequently become criminal than delinquent. Theoretically, the normal progression would be from delinquency toward criminality.

45. In adult males (17+), how often do problems with (aggression) influence “criminal” behavior?

- A Almost never B. Rarely (1) C. Occasionally (1) D. Frequently (2) E. Often (2)
(*Impulsive* behavior influence)
- A Almost never B. Rarely (1) C. Occasionally (2) D. Frequently (2) E. Often (1)
(*Concurrent* aggressive/impulsive behavior)
- A Almost never B. Rarely (1) C. Occasionally (1) D. Frequently (2) E. Often (2)

46. In adult females (17+), how often do problems with (aggression) influence “criminal” behavior?

- A Almost never B. Rarely (1) C. Occasionally (4) D. Frequently E. Often (1)
(*Impulsive* behavior influence)
- A Almost never B. Rarely (2) C. Occasionally (3) D. Frequently E. Often (1)
(*Concurrent* aggressive/impulsive behavior)
- A Almost never B. Rarely (1) C. Occasionally (3) D. Frequently (1) E. Often (1)

Note: The clinician that chose all the “B. rarely” answers had the notable pattern of diagnosing as cited earlier in the questionnaire. This individual did not answer #43&44.

The LCPC selected “E. Often” for #41-46. This individual finds aggression scarcely prevalent in practice, but finds impulsivity “very prevalent” in practice.

Note: There is obvious disparity among clinicians within these two questions.

47. Do you believe the etiology of aggressive behavior in males tends to be? :

- A. Genetic B. Environmental (2) C. Both (4)
Impulsive behavior?
- A. Genetic B. Environmental (2) C. Both (4)
Concurrent Aggressive/Impulsive behavior?
- A. Genetic B. Environmental (2) C. Both (4)

48. Do you believe the etiology of aggressive behavior in females tends to be? :

A. Genetic B. Environmental (3) C. Both (3)

Impulsive behavior?

A. Genetic B. Environmental (3) C. Both (3)

Concurrent Aggressive/Impulsive behavior?

A. Genetic B. Environmental (3) C. Both (3)

Note: One clinician indicated that etiology of females tended to be environmental, while the etiology of males was both environmental and genetic.

Note: One clinician chose the environmental option, but drew arrows toward “C. Both” indicating the clinician possibly believed the environmental influence was most important, but that genetics was also possibly a factor.

Note: It is evident that clinicians tend to believe the problems of aggression and impulsivity are more related to genetics than females.

49. Please comment on any information you feel is important but was not covered.. Feel free to clarify any information that was not covered to your satisfaction? _____

Discussion About Research Findings.

Although the clinicians were assumed to have clientele with similar demographic factors, there is a variety of theories about prevalence, symptomology, etiology, diagnosing criteria and treatment practices among local clinicians. However, inconsistency among the answers from clinicians was expected. During ten years practicing as a registered nurse, spending four years in child and adolescent psychiatric nursing and two more years in a state medium/maximum security correctional facility, it has become evident to me that diagnosis and treatment of disorders characteristic of impulsivity and aggression varies greatly in the southern Illinois area.

Although most clinicians surveyed believe that these problems affect less than 20 percent of their clientele, they all tend to agree that these characteristics frequently or often are causative factors of delinquency and criminality. This questionnaire helps illuminate some of the beliefs clinicians, in the southern Illinois area, have about impulsivity, aggression, delinquency and criminality. Unfortunately, this inconsistency of beliefs and knowledge allows for inconsistency of treatment, and thus, progress for individuals with aggressive and impulsive symptomology varies greatly.

Below are some of the major themes indicated by the responses from the clinicians:

1. Males tend to have more problems with impulsivity and aggression, while female problems tend to be confined to impulsivity with lesser aggressive tendencies.
2. Most of the responding clinicians believed that 0-20% of male and female clientele have problems with aggression and impulsivity.

Note: This information corresponds with the research cited within this essay; however, most of the respondents felt the incidence of impulsivity among their clients to be of moderate prevalence in their personal practice.

3. The age of onset for problems with aggression and impulsivity for males and females varied from 0-15, with 6-10 and 11-15 being split evenly between most clinicians.
4. There tended to be a great disparity between diagnoses for the professionals. Male clinicians tended to answer the questions about diagnoses somewhat differently than females. This may be directly related to the difference in clinician clientele and not directly related to the gender of the clinician; however, it is impossible to make any inferences about the rationale for the answers. Women with aggression never received a diagnosis of Antisocial Personality Disorder, however, men with the same symptomology did receive diagnoses of Antisocial Personality Disorder.
5. There was also a great disparity in clinician estimations about the expected number of clients that had problems with impulsivity and aggression in childhood; however, most clinicians related aggression in males and females to childhood abuse. It seems inconsistent that most of the adult individuals with aggressive and/or impulsive behavior experienced childhood trauma, but did not act out impulsively or aggressively until adulthood.
6. When assessing the possible concurrent/aggravating factors for females with aggression, the clinician selected the following answers from greatest number of responses to least number of responses respectively: childhood physical abuse, childhood sexual abuse, childhood mental abuse, divorce/1-parent family, ADD/ADHD, spouse physical abuse, spouse multiple abuse, familial/genetic predisposition, other traumatic events.

7. When assessing the possible concurrent/aggravating factors for adult females with impulsivity the clinicians selected the following answers from greatest number of responses to least number of responses respectively: childhood physical abuse, childhood sexual abuse, childhood mental abuse, ADD/ADHD, espousal physical abuse, spouse multiple abuse, ETOH/drug use, and familial/genetic predisposition.
8. The clinicians seem to be in agreement that childhood abuse severely affects the causality of adult female problems with aggression and impulsivity, and half believe that impulsivity may be related to ADHD, but almost none believe in familial/genetic predisposition for females. Overall, there seems to be disparity among the clinician's choices, or a wide range of causality.
9. It should be noted that three clinicians find male problems to be relative to genetic predisposition (#23), but these clinicians also rarely cited these individuals as having these problems in childhood. These findings are quite inconsistent with each other, unless the clinicians consider these tendencies to express themselves only in adulthood. In reality, this phenomenon would be highly unlikely. Another note is that most of the clinicians related adult male aggression with childhood physical abuse, but correlated impulsivity with ADHD. This would be somewhat consistent with research findings. It is also notable that four of the six clinicians indicated that the etiology of male problems were related to both genetic and environmental predispositions (#47). The clinicians were split three to three in that female problems were caused by both environmental and genetic predisposition, or environmental factors alone (#48).
10. This is also a curious finding since only one clinician related any change in aggression/impulsivity over time to decline of nuclear family, and no one indicated these problems in adult males were related to divorce or single parent family. However, abuse can obviously be present without having divorce or separation from the nuclear family. It is interesting to note that clinicians don't attribute the problems of aggression and impulsivity to divorce or single parent family since society, media, etc. has blamed the rise of aggressive acts and criminality largely on these variables.
11. When evaluating treatment, it is surprising that family counseling is used as rarely as it is. I make this assertion on the basis that these disorders not only affect the client, but the way the client socializes and relates to their family. Like alcoholism, disorders such as ADHD, conduct disorder, Oppositional Defiant Disorder, and Antisocial Personality

Disorder affect not only the individual, but everyone close to the individual. Overall, most of the clinicians used cognitive/behavioral therapy for their clients. For aggression and impulsivity, this therapy is used most often and is frequently successful. Research indicates that it tends to be quite effective when paired with medication and family therapy.

12. For the last point, I will reiterate that it is interesting that the MD finds 46-60 percent of men to be mis-diagnosed. This individual indicated that all the adult males with aggressive and impulsive symptomology fall within a diagnosis of Antisocial Personality Disorder, and the clinician believes that only 0-15 percent of these men and women may not improve with treatment, thus the individuals are frequently mis-diagnosed, not appropriately treated and at least 85 percent *would* improve with appropriate treatment. This is precisely one of the major points of this essay.

Overall, this questionnaire seems to indicate a wide variety of beliefs and practices among local clinicians. This variability seems to be somewhat characteristic of clinicians in the southern Illinois region, in my own experience. Hopefully these findings are not generalizable to wider regions or other states; however, by evaluating other states' correctional populations and incidences of adolescent delinquency in comparison with Illinois, we may learn if these issues are similar in other regions of the country.

Chapter 6~ Conclusion

In conclusion, before reiterating the influence genes have on aggression and impulsivity, it should once again be noted that genetic influence on behavior is just that--an influence and not a causative factor. Even when considering behavior and disorders that may be highly genetically mediated, environmental factors are very important in determining the expression of the behavior or the expression of a disorder. However, it is essential to at least recognize that behavior may be genetically mediated, especially when attempting to modify any given behavior. Without thoughtfully considering the genetic predisposition of some behavior, the attempts to modify such behavior without addressing underlying causality may be painfully unsuccessful. This is quite evident in the rehabilitation efforts of our correctional systems.

To begin to understand how genes may affect criminality, it is first important to get away from thinking that genetic factors apply only to diseases, and instead begin to contemplate that genes apply to all aspects of human functioning and behavior. In their article, "Heterogeneity of causes for delinquency and criminality: Lifespan perspectives," Lisabeth DiLalla (SIU Department of Behavioral and Social Sciences, School of Medicine) and Irving Gottesman defined criminals into three categories for their research and research analysis, these categories being continuous antisocials, transitory delinquents and late bloomers.⁶ Continuous antisocials are youths who are delinquent and then criminal as adults; transitory delinquents are youths who are delinquent but not criminal; and late bloomers are adults who are criminal but were not delinquent as adolescents. These categories enable one to more easily separate the difference in delinquency and criminality that may be related solely to environmental factors and delinquency, and criminality that may have underlying genetic causality.

Because delinquency is fairly common in adolescence, determining heritability of delinquency in adolescence is difficult. It is easier to separate the continuous antisocial from the transitory delinquents to determine the extent of genetic influence on deviant behavior. The continuous antisocials tend to exhibit antisocial behavior and criminality well into adulthood. It is these individuals that are believed to have the highest genetic loading, or they have the highest cumulative, or additive effect of genes influencing their criminal behavior. Despite the difficulty in proving the differences in environmental and genetic influences on criminal behavior, there

are several childhood disorders that frequently accompany delinquent tendencies that have proven to be genetically influenced.

One cannot discount the importance of environmental influence on delinquent and criminal behavior. Research indicates that environmental risk factors are probably strongest with respect to early onset antisocial behavior that is accompanied by hyperactivity and shows a strong tendency to persist into adulthood as an Antisocial Personality Disorder. (190)¹ This essentially means that the environment is especially important in influencing the exhibition of behavior when an individual has a genetic predisposition toward hyperactive and antisocial behavior that begins in childhood and persists into adulthood.

Childhood behavior disorders seem to be catalysts for antisocial and criminal behavior. The first childhood disorder discussed was Attention Deficit Hyperactivity Disorder. ADHD is characterized by a poor attention span combined with hyperactivity. These children tend to be risk takers and are very impulsive in their behavior. ADD is the same as ADHD, but without the characteristic hyperactivity. They frequently tend to have difficulty in school, difficulty following teachers and parents directions, and become bored very easily. Only in about one third of the cases does a learning disorder accompany the diagnosis, otherwise they tend to have an average to well above average IQ. ADHD has been consistently proven in research to be genetic. Putting the research together, a heritability of about 70 percent seems to be a reasonable estimate(189.)¹

Although criminality may not follow AD(H)D, the continuation of this type of behavior well into adulthood indicates a much stronger genetic influence in ASP in adults than the ADD in childhood. If someone carries this unconstructive behavior into adulthood, they frequently receive an adult diagnosis of Antisocial Personality Disorder. As mentioned earlier, the importance of genetic influence on behavior increases as one grows older. When ADD has been successfully controlled in childhood and adulthood, this disorder has proven to produce some of the most creative and intelligent producers, inventors, doctors, and creative thinkers, including the likes of Albert Einstein. When the disorder is not well controlled and the resulting energy is not channeled properly, it can produce some of the most creative and ingenious criminals.

Conduct Disorder was the second childhood behavior disorder discussed. Although conduct disorder shows only moderate genetic influence in research, conduct disorder almost always precedes the adult diagnoses of ASP. Although Conduct Disorder itself shows only moderate heritability, it has been researched and repeatedly shown to be prevalent in the siblings of

AD(H)D children, thus indicating an obvious common genetic relationship between ADD, CD and adult ASP. Female children are more frequently being diagnosed with Conduct Disorder, especially female family members of someone with ADHD and ASP. These females have been repeatedly shown to be at risk for antisocial and criminal behavior.

There have been numerous genetic research studies indicating a genetic influence on criminality. Traditionally, adoption studies have provided much of the genetic research about criminality. Although adoption studies cannot delineate the difference in genetic versus environmental variances, the home environments of adoptees tend to be selected carefully and tend not to be detrimental or abusive given the screening for healthy, stable families; thus, the environmental variance is restricted.⁹

In 1987, in one of the foremost adoption studies on criminality, Mednick and colleagues found that genes had a strong influence on criminality and in a landmark adoption study by Crowe, (1974) data from women studied in an Iowa prison that gave their children up for adoption appear to indicate that there are genetic but not early environmental predispositions to both criminality and antisocial personality. (Note: These findings seem to support Schulsinger's research results that indicate first degree relatives of ASP females have a 10-times greater incidence of ASP, and most likely even higher incidences of exhibiting antisocial behavior.)

The adoption study by Schulsinger in 1972, shows that the risk for Antisocial Personality Disorder is increased fivefold for first-degree relatives of ASP males, whether living together or apart, and the risk for first-degree relatives of ASP females is increased 10 fold, whether living together or apart. (211)¹ This indicates that to exhibit Antisocial Personality Disorder, females need a greater genetic loading, i.e., more additive effect of genes, to exhibit the disorder. This may account for the fact that there is a much higher rate of criminality among men as opposed to women.

It is also generally accepted that from adolescence to adulthood, genetic influence increases for ASP symptoms, and environmental influence decreases (DiLalla & Gottesman, 1989)(211)¹ This indicates that as an individual gets older, his/her genes are more and more responsible for influencing his actions. Although Antisocial Personality Disorder does not dictate that an individual will be a criminal, research shows that 40 percent of male criminals and eight percent of female criminals qualify for a diagnosis of ASP. (Rutter, 1996a)¹

As noted before, ASP does not dictate criminal behavior; however, ASP is characterized by lying, cheating, and stealing, with chronic indifference to the violation of others, and lack or remorse or conscience for the consequences of his or her own behavior. Since the ASP criminal seems to lack remorse or accept responsibility for his behavior, society quickly considers the individual to be a dispensable member of society that chose his course of actions, and thus deserves the punishment. It should be clear that I do not suggest or support the idea that convicted criminals with Antisocial Personality Disorder should receive lesser punishment for their crimes than anyone else. However, I feel it is important for clinicians and society to become educated to the fact that our prison system is filled with criminals with Antisocial Personality Disorder that may have committed crimes partly as a result of a genetic predisposition. Until this fact is recognized, we will continue to see high rates of recidivism for these individuals and we, as tax payers, will continue to pay for their crimes.

As we now see, the peculiarities of criminality and delinquent behavior are much more complex than once thought to be. Society is not accepting of the notion that behavior is not simply a matter of choice, but a complex interaction between genes, environment and free will. The only way to become successful at treating high rates of criminality is to begin to address the need for a proverbial “immunization” for the problem. Since crime is not always a function of society, we must begin to treat crime as having probable biological causality in many individuals. Although great ethical caution should be utilized in researching criminality, delinquency, and psychiatric disorders characteristic of these behaviors, further research in this area is imperative to future treatment of these disorders.

Recognizing the multifactoral causality of criminality may mean that we must seek medical intervention to correct or intervene in some manner to help the individual have more control over the criminal tendencies he may have. Medication and medical intervention have proven to be quite effective in Attention Deficit Disorder, Conduct Disorder and other behavior disorders in children. The treatment of these disorders is most successful when coupled with behavioral/cognitive therapy. Unfortunately, we do not have a successful treatment or medication regimen for Antisocial Personality Disorder in adults at this time. This may be primarily the result of not treating the disorder as having biological causality.

Behavior therapy alone has not been proven to be successful in these individuals. Since these individuals do not experience any type of “psychoses,” they are rarely medicated within the prison system unless they have an Axis I diagnosis, i.e., Major Depression, Anxiety Disorder, Schizophrenia, etc, that prompts the initiation of medication therapy. Research also indicates

that individuals with ASP rarely seek treatment when living within the general population. Since ASP is a part of the individual's personality, usually the individual does not consider the disorder to be a problem. These individuals considers others to have the "problem" since they are not accepting of the individual's behavior. Often, if treatment is sought, it is ordered by the court system when the individual is processed for criminal offenses such as drug and alcohol related crimes.

In my opinion, without treating this biological causality, we cannot successfully prevent or treat someone's criminal tendencies. Just as a diabetic cannot "will" himself not to be a diabetic, many criminals cannot "will" themselves not to be criminal. This is why our current system of rehabilitation is so unsuccessful.

As the scientific community develops new research methods to investigate the action by which genes influence behavior, slowly scientists begin to understand how genes and environment interact to produce behavior and individual characteristics. Scientists are finding that not only do genes affect behavior, but genes affect how an individual perceives and reacts to his environment. Since genes partially dictate an individual's likes and dislikes, the genes also somewhat determine the individual's active choice of environment. Only with continued research in the fields of behavior genetics will we be able to more fully understand these mechanisms and how they affect criminality. I do not feel that these criminal individuals shouldn't receive just and severe punishment for criminal behavior; however, I do believe that more multifactoral treatment with a biological treatment component will be necessary in the future to successfully treat criminality.

Appendix A

Questionnaire for Senior Thesis

Date: _____

Job Title,(e.g. Medical Dir.) : _____

Credentials: _____

Training and Education, (e.g., BS
from SIU) _____

1. How long have you been practicing or involved in patient treatment?
A. 0-5yr B. 6-10yr C. 11-15yr D. 16-20yr E. 21+
2. Does your practice treat:
A. Adults B. Children C. Both
4. In your current practice, how prevalent is the treatment of individuals with *aggression*?
A. very prevalent B. moderately prevalent C. scarcely prevalent
5. In your current practice, how prevalent is the treatment of individuals with *impulse control* problems?
A. very prevalent B. moderately prevalent C. scarcely prevalent
6. Over time, has treatment of individuals with *aggression* problems become:
A. More prevalent B. Less prevalent C. Remain unchanged
7. Over time, has treatment of individuals with *impulse control* problems become:
A. More prevalent B. Less prevalent C. Remain unchanged

8. Do you feel the *change* has been *contributed to*:
- | | |
|--|------------------------------|
| A. Education of physicians and clinician | B. Excessive media coverage |
| C. Biological/genetic predisposition | D. Decline of nuclear family |
| E. Over/Under diagnosing | F. Other _____ |

9. Who do you treat more often for problems with *aggression*?

A. Males B. Females C. Equal in prevalence

Impulse control problems?

A. Males B. Females C. Equal in prevalence

Concurrent Aggression/Impulse control problems?

A. Males B. Females C. Equal in prevalence

10. Of the adult male clientele you see, what percent has *aggression* problems?

A. 2-20% B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Impulse control problems?

A. 2-20% B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Concurrent aggression/impulse control problems?

A. 2-20% B. 21-40% C. 41-60% D. 61-80% E. 81-100%

11. Of the adult female clientele, what percent clientele has *aggression* problems?

A. 2-20% B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Impulse control problems?

A. 2-20% B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Concurrent aggression/impulse control problems?

A. 2-20% B. 21-40% C. 41-60% D. 61-80% E. 81-100%

12. Of the child male clientele, what percent clientele has *aggression* problems?

A. 2-20% B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Impulse control problems?

A. 2-20% B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Concurrent aggression/impulse control problems?

A. 2-20% B. 21-40% C. 41-60% D. 61-80% E. 81-100%

13. Of the child female clientele, what percent clientele has *aggression* problems?

- A. 2-20% B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Impulse control problems?

- A. 2-20% B. 21-40% C. 41-60% D. 61-80% E. 81-100%

Concurrent aggression/impulse control problems?

- A. 2-20% B. 21-40% C. 41-60% D. 61-80% E. 81-100%

14. Of males, what is the typical *age of onset* for *aggression* problems?

- A. 0-5 B. 6-10 C. 11-15 D. 16-25 E. 26-45 F. >46

Impulse control problems?

- A. 0-5 B. 6-10 C. 11-15 D. 16-25 E. 26-45 F. >46

Concurrent problems aggression/impulsive problems?

- A. 0-5 B. 6-10 C. 11-15 D. 16-25 E. 26-45 F. >46

15. Of females, what is the typical age of onset for *aggression* problems?

- A. 0-5 B. 6-10 C. 11-15 D. 16-25 E. 26-45 F. >46

Impulse problems?

- A. 0-5 B. 6-10 C. 11-15 D. 16-25 E. 26-45 F. >46

Concurrent aggressive/impulsive problems?

- A. 0-5 B. 6-10 C. 11-15 D. 16-25 E. 26-45 F. >46

A. Attention Deficit Disorder

E. Major Depression

B. Attention Deficit/Hyperactivity Disorder

F. Antisocial Personality Disorder

C. Oppositional Defiant Disorder

G. Borderline Personality Disorder

D. Conduct Disorder

H. Other _____

16. What are the most prevalent Dx./diagnoses for adult females with *aggression* problems?

- A B C D E F G H _____

Impulse problems?

- A B C D E F G H _____

Concurrent problems?

- A B C D E F G H _____

17. What are the most prevalent Dx./diagnoses for adult males with *aggression* problems?

A B C D E F G H _____

Impulse problems?

A B C D E F G H _____

Concurrent problems?

A B C D E F G H _____

18. What are the most prevalent Dx./diagnoses for female children with *aggression* problems?

A B C D E F G H _____

Impulse problems?

A B C D E F G H _____

Concurrent problems?

A B C D E F G H _____

19. What are the most prevalent Dx./diagnoses for male children with *aggression* problems?

A B C D E F G H _____

Impulse problems?

A B C D E F G H _____

Concurrent problems?

A B C D E F G H _____

20. What percent of adult males with *aggressive and/or impulsive* characteristics do you find had childhood disorders with similar symptoms?

A. 0-20% B. 21-40% C. 41-60% D. 61-80% E. 81-100%

21. What percent of adult females with *aggressive and/or impulsive* characteristics do you find had childhood disorders with similar symptoms?

A. 0-20% B. 21-40% C. 41-60% D. 61-80% E. 81-100%

For the following questions regarding concurrent (and/or) aggravating factors of clients with aggression/impulse control problems, use the following categorical answers:

- A. childhood physical abuse,
- B. childhood sexual abuse,
- C. childhood mental abuse,
- D. divorce/1 parent family
- E. learning disorders
- F. ADHD/ADD
- G. Pathophysiologic problems, i.e., disease, difficulty during childbirth, mental retardation, etc.
- H. espousal abuse physical
- I. espousal abuse multiple form
- J. familial/genetic predisposition
- K. ETOH/ drug abuse
- L. Other (traumatic experience, deaths, etc.)

22. What are common concurrent/aggravating factors of adult females with problems of *aggression*?

- A. B. C. D. E. F. G. H. I. J. K. L.

Impulse control?

- A. B. C. D. E. F. G. H. I. J. K. L.

Concurrent aggression/impulse control?

- A. B. C. D. E. F. G. H. I. J. K. L.

23. What are common concurrent/aggravating factors of adult males with problems of *aggression*?

- A. B. C. D. E. F. G. H. I. J. K. L.

Impulse control?

- A. B. C. D. E. F. G. H. I. J. K. L.

Concurrent aggressive/impulsive problems?

- A. B. C. D. E. F. G. H. I. J. K. L.

24. What are common concurrent/aggravating factors of female children with problems of *aggression*?

- A. B. C. D. E. F. G. H. I. J. K. L.

Impulse control?

- A. B. C. D. E. F. G. H. I. J. K. L.

Concurrent aggressive/impulsive problems?

- A. B. C. D. E. F. G. H. I. J. K. L.

25. What are common concurrent/aggravating factors of male children with problems of *aggression*?

A. B. C. D. E. F. G. H. I. J. K. L.

Impulse control?

A. B. C. D. E. F. G. H. I. J. K. L.

Concurrent aggressive/impulsive problems?

A. B. C. D. E. F. G. H. I. J. K. L.

26. What types of *treatment* do you, your clinic, or facility provide?

A. Behavioral D. Group Counseling G. Family counseling
B. Cog./Behavioral E. Psychoanalysis H. Parent Management Training
C. Medication F. Hypnosis/Relaxation I. Humanistic J. Other _____

27. What is a common course of *treatment* for a child with the following diagnoses?

ODD A. B. C. D. E. F. G. H. I. J. _____

ADD/HD A. B. C. D. E. F. G. H. I. J. _____

CD A. B. C. D. E. F. G. H. I. J. _____

OCD A. B. C. D. E. F. G. H. I. J. _____

LD A. B. C. D. E. F. G. H. I. J. _____

Depression A. B. C. D. E. F. G. H. I. J. _____

28. What is a common course of *treatment* for an adult with the following diagnoses?

ODD A. B. C. D. E. F. G. H. I. J. _____

ADD/HD A. B. C. D. E. F. G. H. I. J. _____

CD A. B. C. D. E. F. G. H. I. J. _____

OCD A. B. C. D. E. F. G. H. I. J. _____

LD A. B. C. D. E. F. G. H. I. J. _____

Depression A. B. C. D. E. F. G. H. I. J. _____

AntisocialPD A. B. C. D. E. F. G. H. I. J. _____

BorderlinePD A. B. C. D. E. F. G. H. I. J. _____

29. Do you find that the “majority” of *improvement* in male children with *aggressive/impulsive* characteristics tends to be related to:

A. Medication/Treatment B. growing older C. Both

30. Do you find that the “majority” of *improvement* in female children with *aggressive/impulsive* characteristics tends to be related to:
 A. Medication/Treatment B. growing older C. Both
31. What percent of male children do you find *don't improve* with treatment?
 A. 0-15% B. 16-30% C. 31-45% D. 46-60% E. 61-75% F. 75-100%
32. What percent of female children do you find *don't improve* with treatment?
 A. 0-15% B. 16-30% C. 31-45% D. 46-60% E. 61-75% F. 75-100%
33. What percent of male adults do you find *don't improve* with treatment?
 A. 0-15% B. 16-30% C. 31-45% D. 46-60% E. 61-75% F. 75-100%
34. What percent of female adults do you find *don't improve* with treatment?
 A. 0-15% B. 16-30% C. 31-45% D. 46-60% E. 61-75% F. 75-100%
35. At what age do you find that “most” male children tend to “age-out” of their *aggressive* behavior?
 A. 10-15 B. 16-20 C. 21-30 D. 31-45 E. 46+ F. Never
Impulsive behavior?
 A. 10-15 B. 16-20 C. 21-30 D. 31-45 E. 46+ F. Never
Concurrent Aggressive/Impulsive behavior?
 A. 10-15 B. 16-20 C. 21-30 D. 31-45 E. 46+ F. Never
36. At what age do you find that “most” female children tend to “age-out” of their *aggressive* behavior?
 A. 10-15 B. 16-20 C. 21-30 D. 31-45 E. 46+ F. Never
Impulsive behavior?
 A. 10-15 B. 16-20 C. 21-30 D. 31-45 E. 46+ F. Never
Concurrent Aggressive/Impulsive behavior?
 A. 10-15 B. 16-20 C. 21-30 D. 31-45 E. 46+ F. Never

37. Despite empirical data results, what percent of all females do you believe *do not seek and/or receive treatment* for problems with *aggression?*
 A. 0-15% B. 16-30% C. 31-45% D. 46-60% E. 61-75% F. 75-100%
- Impulsive behavior?*
 A. 0-15% B. 16-30% C. 31-45% D. 46-60% E. 61-75% F. 75-100%
- Concurrent aggressive/impulsive behavior?*
 A. 0-15% B. 16-30% C. 31-45% D. 46-60% E. 61-75% F. 75-100%
38. Despite empirical data results, what percent of all males do you believe *do not seek and/or receive treatment* for problems with *aggression?*
 A. 0-15% B. 16-30% C. 31-45% D. 46-60% E. 61-75% F. 75-100%
- Impulsive behavior?*
 A. 0-15% B. 16-30% C. 31-45% D. 46-60% E. 61-75% F. 75-100%
- Concurrent aggressive/impulsive behavior?*
 A. 0-15% B. 16-30% C. 31-45% D. 46-60% E. 61-75% F. 75-100%
39. What percent of all females with *aggressive and/or impulsive* problems do you believe are misdiagnosed?
 A. 0-15% B. 16-30% C. 31-45% D. 46-60% E. 61-75% F. 75-100%
40. What percent of all males with *aggressive and/or impulsive* problems do you believe are misdiagnosed?
 A. 0-15% B. 16-30% C. 31-45% D. 46-60% E. 61-75% F. 75-100%

I am attempting to relate possible consequences of ADD, ADHD and other disorders with aggressive and impulsive characteristics toward social norms and relate the impact that these problems may have on the criminal justice system; therefore, delinquent and criminal tendencies will be explored in the questionnaire.

Delinquent behavior: truancy, verbal aggression toward authority figures, physical aggression/without harm, disobedient with parents/authority figures, lying, possible drug/ETOH use

Criminal behavior: theft, robbery, physical assault, fraud (checks, etc), gambling, drug/ETOH abuse. For purposes of this questionnaire, *criminal* behavior will include any arrests, and trouble with the law.

41. In male children (0-16), how often do problems with (*aggression*) influence “*delinquent*” behavior?

A Almost never B. Rarely C. Occasionally D. Frequently E. Often
(*Impulsive* behavior)

A Almost never B. Rarely C. Occasionally D. Frequently E. Often
(*Concurrent* aggressive/impulsive behavior)

A Almost never B. Rarely C. Occasionally D. Frequently E. Often

42. In male children (0-16), does problems with (*aggression*) influence “*criminal*” behavior?

A Almost never B. Rarely C. Occasionally D. Frequently E. Often
(*Impulsive* behavior)

A Almost never B. Rarely C. Occasionally D. Frequently E. Often
(*Concurrent* aggressive/impulsive behavior)

A Almost never B. Rarely C. Occasionally D. Frequently E. Often

43. In female children (0-16), does problems with (*aggression*) influence “*delinquent*” behavior?

A Almost never B. Rarely C. Occasionally D. Frequently E. Often
(*Impulsive* behavior influence)

A Almost never B. Rarely C. Occasionally D. Frequently E. Often
(*Concurrent* aggressive/impulsive)

A Almost never B. Rarely C. Occasionally D. Frequently E. Often

44. In male children (0-16), does problems with (*aggression*) influence “*criminal*” behavior?

A Almost never B. Rarely C. Occasionally D. Frequently E. Often
(*Impulsive* behavior)

A Almost never B. Rarely C. Occasionally D. Frequently E. Often
(*Concurrent* aggressive/impulsive behavior)

A Almost never B. Rarely C. Occasionally D. Frequently E. Often

45. In adult males (17+), does problems with (*aggression*) influence “*criminal*” behavior?

A Almost never B. Rarely C. Occasionally D. Frequently E. Often
(*Impulsive* behavior influence)

A Almost never B. Rarely C. Occasionally D. Frequently E. Often
(*Concurrent* aggressive/impulsive behavior)

A Almost never B. Rarely C. Occasionally D. Frequently E. Often

46. In adult females (17+), does problems with (*aggression*) influence "*criminal*" behavior?
 A Almost never B. Rarely C. Occasionally D. Frequently E. Often
 (*Impulsive* behavior influence)
 A Almost never B. Rarely C. Occasionally D. Frequently E. Often
 (*Concurrent* aggressive/impulsive behavior)
 A Almost never B. Rarely C. Occasionally D. Frequently E. Often

47. Do you believe the etiology of *aggressive* behavior in males tends to be:
 A. Genetic B. Environmental C. Both
Impulsive behavior?
 A. Genetic B. Environmental C. Both
Concurrent Aggressive/Impulsive behavior?
 A. Genetic B. Environmental C. Both

48. Do you believe the etiology of *aggressive* behavior in females tends to be:
 A. Genetic B. Environmental C. Both
Impulsive behavior?
 A. Genetic B. Environmental C. Both
Concurrent Aggressive/Impulsive behavior?
 A. Genetic B. Environmental C. Both

49. Please comment on any information you feel is important but was not covered. Feel free to clarify any information that was not covered to your satisfaction? _____

Thank you very much for the completion of this questionnaire. Your time and effort is greatly appreciated.

Appendix B

Catherine Newell, R.N.
Senior, Admin. Of Justice
Minor, Psychology
306 S. Hickory
DeSoto, Il 62924

Southern Illinois University
Administration of Justice
Southern Illinois University at Carbondale
Carbondale, Illinois 62901 - 6517

Consent Form

Thank you again for agreeing to participate in this research project for my Honors Thesis by completing the questionnaire regarding your treatment of individuals with aggressive and impulsive characteristics. This research project is a study about individuals with aggressive and/or impulsive characteristics and the continuance of these characteristics into adulthood. This information will be used for the purposes of my honors thesis and a basis to formulate a theory for my future masters thesis.

Although research in the fields of psychology and behavior genetics provides information about disorders characterized by aggressive and/or impulsive symptomology, the purposes of this study are to better understand how local clinicians diagnose and treat disorders with aggressive and/or impulsive characteristics and to better understand how prevalent clinicians perceive these disorders to be. I am also interested in what clinicians perceive the etiology and prognosis of these disorders to be.

The enclosed questionnaire is designed to describe variables of the disorders in question that you as a clinician observe in patients attending your clinic, facility or practice. It is also designed to simplistically outline your perception of these variables. The questionnaire items are designed to address a number of behaviors and perceptions that are not intended in any way to be judgmental. The approximate time needed to complete this questionnaire is 20 minutes. If you are concerned about any of the items on the questionnaire, please feel free to call me or Dr. Dennis Anderson at the number below for clarification.

All the questionnaires will be identified only by a number that has been assigned to them. Your name will never be placed on the questionnaire. Your name, address and phone number will be maintained in a confidential file until this project is completed at which time they will be destroyed. Your job title, credentials and education as listed on the questionnaire will also remain confidential. The information will only be used to categorize clinicians receiving the questionnaire.

If you have any further questions about this research, please feel free to contact me at (618)867-2460 or my director, Dr. Dennis Anderson at the SIU Crime Studies Center (618)453-5701.

Your time and effort are greatly appreciated.

References

Glueck, D., & Glueck, E. *Physique and delinquency*, New York, Harper, 1956.

Masters, F. W., & Greaves, D. C. The Quasimodo Complex, *British Journal of Plastic Surgery*, 1967, 20, 204-209.

1. Plomin, Robert; DeFries, John; McClearn, Gerald; Rutter, Michael; *Behavioral Genetics, Third Edition*, W.H. Freeman and Company, New York, 1997.

2. Sutherland, Edwin; Cressey, Donald, *Principles of Criminology, Sixth Edition*, J.B. Lippincott Company, New York, 1960.

3. Eysenck, Hans; Goudjonsson, Gisli, *The Causes and Cures of Criminality*, Plenum Press, New York, 1989.

4. Shelley-Tremblay, John, "Attention deficit hyperactivity disorder: An evolutionary perspective," *The Journal of Genetic Psychology*, New York, Dec. 1996.

5. Rutter, Michael; Plomin, Robert, "Opportunities for psychiatry from genetic findings," *British Journal of Psychiatry*, London, Sept. 1997.

6. DiLalla, Lisabeth Fisher; Gottesman, Irving, "Heterogeneity of causes for delinquency and criminality: Lifespan perspectives," *Development and Psychopathology*, 1(1989), 339-349, Cambridge University Press, 1990.

7. Davison, Gerald; Neale, John, *Abnormal Psychology, seventh edition*, John Wiley & Sons, Inc. New York, 1998.

8. Shelley-Tremblay, John, "Attention deficit hyperactivity disorder: An evolutionary perspective," *The Journal of Genetic Psychology*, New York, Dec. 1996.

9. DiLalla, Lisabeth Fisher; Gottesman, Irving, "Biological and Genetic Contributors to Violence--Widom's Untold Tale," *Psychological Bulletin*, 1991, Vol. 109, No. 1, p 125-129.