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Intelligence and Crime

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Chapter 12: Intelligence and Crime

Intelligence is the most studied human characteristic in the world. Since World War I, millions of individuals across virtually every continent have taken intelligence tests. The information garnered from these tests has been subject to intense debate over the validity of the results and the interpretation of the patterns found. IQ (intelligence quotient, a score on any of several standardized tests), it seems, is an important predictor of life outcomes, such as the level of education one achieves and the amount of money a person will earn over his or her lifetime. IQ, however, is also linked to a number of social problems. IQ predicts the use of welfare and other social safety nets. It predicts the number of births one will have out of wedlock and, more important, it predicts criminal involvement. For these reasons, and more, it is fair to say that no other variable has generated as much debate or as much criticism as has IQ.

What is Intelligence?

Definitions of human intelligence generally point to at least three characteristics. First, intelligence is best understood as a compilation of brain-based cognitive abilities. According to 52 eminent intelligence researchers, *intelligence* reflects “a very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience” (Ellis & Walsh, 2003, p. 343).

Intelligence comprises a multidimensional set of cognitive abilities that allow an individual to cognitively assess complex situations, use reason and logic to solve problems, and formulate adaptive behavioral responses to environmental situations and alter those responses when necessary. The collection of abilities that fall under the umbrella of “intelligence” provide an individual the ability to learn, to learn from

mistakes, and to recall situations in which mistakes were made so that they will not be made again. In short, intelligence reflects a range of cognitive abilities, not just a single ability.

Second, IQ reflects the intercorrelations between these brain-based abilities. Virtually all studies find that the unique abilities that compose intelligence have a strong tendency to correlate with each other (Ellis & Walsh, 2003). Individuals who score high on measures of specific mental abilities, such as spatial visualization, are also more likely to score high on measures of other mental abilities. For example, people who are capable of using reason to solve problems are also more likely to be able to plan for the future, to seek out and to acquire information to make better informed decisions, and to be able to use that information to their advantage.

Third and finally, general intellectual abilities are hierarchical. Because unique intellectual abilities correlate strongly with a diverse array of other intellectual abilities, **[p. 94 ↓]** their patterns of correlations can be subsumed under a broad, overall quantitative assessment of general intelligence. This quantitative assessment is referred to as *g*.

To understand the hierarchical nature of *g*, think of a professional athlete. The qualities that compose professional athletes are multidimensional. Many athletes are physically strong, can endure tremendous amounts of physical stress, and are highly competitive. These components are usually visible in the best athletes—that is, these athletic abilities correlate. Now, if we wished to assess an athlete's overall level of athleticism, we could score the athlete on each of the dimensions that compose our measure of athleticism and create an overall score. Psychologists do much the same to measure *g*.

How is Intelligence Measured?

A range of intelligence tests have been created and intensively analyzed. Some of the better-known intelligence tests are the Stanford–Binet (e.g., Roid, 2005), the Wechsler Intelligence Scale for Children (e.g., Wechsler, 2003), the Wechsler Adult Intelligence Scale–Third Edition (Wechsler, 1997), the Wechsler Preschool and Primary Scale of

Intelligence–Third Edition (Wechsler, 2002), and the Kaufman Assessment Battery for Children (Kaufman & Kaufman, 2002).

These tests have been found to meet the criteria for scientific acceptance. They have high test–retest reliability, and they predict important life outcomes (i.e., they have construct validity). They also appear to be valid indicators of an individual's overall level of intellect. No critical assessement of contemporary IQ tests has yet revealed substantial bias, and no critical assessement of these tests have proven them to be invalid measures of cognitive abilities.

To aid in comparing scores on IQ tests, scientists *statistically norm* the tests. Doing this allows individual scores to be compared with others' scores and ranked accordingly. Because of the norming of the tests, the distribution of *g* follows the mathematical properties of a normal curve. Under a normal curve, which resembles the shape of a bell, scientists can easily compute the proportion of individuals with a specific IQ. For example, intelligence tests have a mean (average) of 100 and a standard deviation of 15 points. Between ±1 standard deviations (85–115 IQ points) falls slightly over 68% of the population; ±2 standard deviations (70–130 IQ points) encompasses 95% of the population.

Genetic and Environmental Influences on Intelligence

The origins of IQ have been in dispute since its inception. Prior to the 1960s, researchers were influenced strongly by *hereditarianism*, or the belief that human traits can be transmitted from parents to offspring through their genes. This perspective fell into disfavor in the 1960s and remained a politically incorrect research topic through the 1990s. Advancements in the genetic sciences at the turn of the 21st century, however, ushered in a new understanding of the origins of IQ.

No other discipline has done as much to inform us about the origins of IQ as has behavioral genetics. Behavioral genetics researchers use a variety of complex methods, including the use of large-scale twin studies, to dissect human behavior and traits into

three main components: (1) the proportion of the variance in IQ associated with genes, (2) the proportion of variance in IQ attributable to environments that are similar for all family members (i.e., shared environments), and (3) the proportion of variance in IQ accounted for by environmental influences unique to individual family members (i.e., nonshared environments).

In the study of intelligence, examinations of identical (monozygotic [MZ]) and fraternal (dizygotic) twins are preferred, because they allow researchers to estimate the degree of heritability in complex traits. *Heritability* refers to the amount of variance in a trait or behavior—in this case, IQ—that is accounted for by genetic influences. Researchers use twin data because identical twins share approximately 100% of their DNA, whereas fraternal twins share only about 50% of their genetic makeup.

If IQ is 100% heritable, then MZ twins would be *concordant* on measures of IQ—that is, they would score roughly the same. IQ scores would, however, be less concordant between fraternal twins and should be uncorrelated between individuals chosen at random. Conversely, if environmental variables are responsible for IQ differences between individuals, then estimates of heritability should be reduced substantially, and they should not follow the patterns expected by genetic theory (i.e., with MZ twins correlating higher than dizygotic twins).

Numerous behavioral genetic studies have shown that, on average, genetic influences are pervasive across a range of human traits and behaviors. Virtually any human characteristic is genetically influenced. The remaining variation in human traits, however, is usually found to be associated with nonshared environmental influences, such as unique peer group associations or differential exposure to environmental toxins. Shared environmental influences, such as socioeconomic status or parental education, frequently account for little to no variance in human characteristics.

Findings from behavioral genetic research into human intelligence indicate that intelligence is heavily influenced by genetic factors. Estimates of the heritability of intelligence generally range between 60% and 80%, with some studies finding that intelligence is almost 100% heritable. Estimates derived from twins separated at birth and reared apart also have detected very high levels of genetic influence, usually above 70%. Conversely, shared environmental influences usually show little to no influence.

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The relative contributions of environmental and genetic factors to intelligence, however, vary by age. In infancy and early childhood, estimates of heritability rarely exceed 40%, and test–retest reliabilities range from low to moderate. Estimates of common environmental effects range from 20% to 30%, on average. Unique environmental influences account for the rest of the variance in IQ early in life. This pattern reverses, however, by age 12, when genetic influences become dominant, environmental influences decline substantially, and test–retest reliabilities remain remarkably strong and consistent over time.

Estimates of heritability do not provide any information regarding which genes are associated with IQ. Recent research, however, has helped to fill in this void. Neuroscientific findings, usually based on complex brain imaging scans, have shown that IQ is moderately associated with brain size, is strongly associated with the overall number of cortical neurons, is strongly associated with the volume of grey matter in the frontal cortex of the brain, and is associated with neuronal conduction velocity (i.e., the efficiency of the neurons in transporting messages; see Ellis & Walsh, 2003). These biological functions are primarily under genetic control. Because of this, many scholars now argue that the reason IQ is highly heritable is because genes are inherited that control these basic neurological functions.

On the other hand, environmental influences on IQ are notoriously difficult to detect, because the genes associated with cognition are also associated with social behaviors. Parents who read regularly, for example, are likely to have more books in their home and to have children with above-average IQs (Ellis & Walsh, 2003). This correlation has led many social scientists to erroneously conclude that the number of books in a home positively influences a child's IQ. This conclusion is erroneous, because the correlations among parental reading, the number of books in the home, and the IQ of the child involve both genetic and environmental influences. High-IQ parents are more likely to read and hence to have more books in their home than are low-IQ parents. Once shared genetic influences are taken into account, scientists find frequently that socialization influences, such as parenting, appear unrelated to individual IQ. Indeed, planned interventions designed to permanently increase IQ, such as Head Start, have typically failed to produce lasting results (Ellis & Walsh, 2003).

Although it is fair to say that IQ likely cannot be increased, it is equally fair to say that IQ can be reduced. Evidence shows that the behavior of pregnant women can negatively influence the development of the fetus. Insults to the developing central nervous system from maternal drug and alcohol use, smoking, and high levels of stress hormones are associated with compromised neurological development and reduced IQ. Birth complications, such as oxygen deprivation and toxemia, have been found to reduce IQ. Moreover, environmental insults after birth can also occur when young children ingest lead and other heavy metals, when they sustain brain damage due to accidents or abuse, or when they are severely neglected.

IQ Differences between Criminal and Noncriminal Groups

The majority of studies have found IQ differences between offenders and nonoffenders (e.g., Ellis & Walsh, 2003). On average, the IQ for chronic juvenile offenders is 92, about half a standard deviation below the population mean. For chronic adult offenders, however, the average IQ is 85, 1 standard deviation below the population mean. A study of Texas inmates who entered the prison system in 2002 indicated that approximately 23% of the inmates scored below 80, almost 69% scored between 80 and 109, and only 9.6% scored above 110 (Ellis & Walsh, 2003).

To give readers an understanding of the relative proportions of individuals with IQs in those ranges, we offer the following statistics, from Ellis and Walsh (2003): Only 9.18% of individuals in the general population score at or below 80, 63.39% have an IQ between 80 and 109, and 25% have an IQ at or above 110. These data clearly show that low-IQ offenders (below 80) are substantially overrepresented in the Texas prison population (23%–9.18%), that those with scores between 80 and 109 are modestly overrepresented compared with the nonincarcerated population (69%–63%), and that individuals with IQ scores at or above 110 are underrepresented in the Texas prison population (9.6%–25%). Data from every other state reveal the same pattern.

IQ scores derived from prison inmates depict a clear relationship between IQ and offending; however, it is important to note that some scholars question the validity

of this association. They question whether criminal justice processes function so that intellectually dull offenders are more likely to be incarcerated. If so, the association between IQ and imprisonment would be substantially inflated. Data from nonincarcerated offenders, usually matched on criminal record, cast doubt on this criticism. Studies have found that low-IQ offenders are more likely to be involved in crime over their life course, that they are more likely to be involved in chronic property crime, and that they are more likely to commit acts of violence (Ellis & Walsh, 2003). Their overinvolvement in crime, especially crimes involving violence, account for the reasons why they are incarcerated, not their low IQ.

Even so, it is important to point out that when data are collected through self-report questionnaires, whereby respondents are asked questions about their involvement in a range of criminal and delinquent acts, the magnitude of the association between IQ and criminal/delinquent involvement diminishes (Ellis & Walsh, 2003). Whereas some scholars point to this empirical regularity as evidence of the limited explanatory power of IQ, others correctly observe that the types of behaviors being measured **[p. 96 ↓]** influence the IQ → delinquency association. For example, it is relatively common for adolescents to cheat on tests or to stay out later than their parent-imposed curfews. The majority of adolescents self-report involvement in these types of relatively innocuous behaviors. Because these behaviors are very common (some would argue normal), adolescents from all IQ ranges are equally likely to cheat or to violate their curfews.

This should not be taken as evidence that IQ is unimportant in delinquency or criminal behavior. When researchers examine self-report data that are based on measures of relatively serious crime, such as armed robbery, burglary, or assault, they note substantial IQ differences. Individuals with relatively lower IQs are more likely to report engaging in these serious criminal acts. The association between IQ and misbehavior therefore depends on the seriousness of the behavior being analyzed, with the association becoming stronger as the behavior becomes more serious.

The strength of the IQ → crime association also depends on how frequently the individual engages in criminal and delinquent behavior. Low-IQ individuals are more likely to engage in serious misbehavior more frequently than their higher IQ counterparts, and they are more likely to engage in serious misbehavior over a longer

span of their life course. Most life-course-persistent offenders also score relatively low on tests of IQ.

Another important aspect of the IQ → crime association has to do with the difference between *performance IQ* and *verbal IQ*. Verbal IQ reflects an individual's ability to read and comprehend written material and to use words correctly. Performance IQ is assessed through measures of spatial visualization, pattern recognition, and object assembly. Research has consistently shown that offenders are more likely to score lower on measures of verbal IQ than on measures of performance IQ. Explanations for this pattern are in short supply, but the association likely has to do with deficits in the language centers of the brain, specifically, Wernicke's and Broca's areas, that are indirectly assessed by the IQ test.

Language skills and abilities are crucial for healthy human development and appear universal to humans. For this reason, many linguists view language ability as innate, with the neuronal structures necessary for the development, use, and comprehension of language embedded in our DNA. Indeed, so strong is the “language instinct” that, barring any biological or genetic insult, all humans will develop the use of a language.

The use of language allows individuals to discuss problems and negotiate conflict. It allows for the use of instructions in learning, and it allows for feedback, teaching, and training. Reading comprehension, moreover, gives one the ability to learn from outside sources and to understand complexity in day-to-day encounters.

Language abilities emerge early in the life course, with verbal deficits identifiable by age 3. Unfortunately, language abilities become resistant to change by about age 9 or 10, when the language centers of the brain appear to formalize. These abilities are highly heritable, so whereas approximately 80% to 85% of the words an individual has in his or her vocabulary overlap with his or her parents' vocabulary, the architecture that allows for these abilities appears to be genetic.

Verbal IQ also correlates moderately with the ability to think abstractly. Individuals capable of abstract thinking tend to be able to see the nuances in situations and relationships. They better understand not only the simple but also the complex. They see the interconnections between their attitudes and behaviors and the consequences

that flow from their beliefs and behaviors. More important, they can understand how their behaviors and attitudes affect and influence others. Criminals, research tells us, tend to be concrete in their thinking—that is, they view the world in simplistic ways, often much like that of a young child (Ellis & Walsh, 2003). They are strongly influenced by the here and now, they do not tend to make effective generalizations from one situation to the next, and they tend to be very literal in their understanding of life events.

Criticism of the IQ → Crime Relationship

Although much of the research shows that there is a modest to strong relationship between intelligence and antisocial behavior, some researchers dispute the validity of this relationship. Critics argue that the empirical association between intelligence and criminal behavior may be accounted for by other factors. They highlight three general criticisms: (1) that differences in police detection ultimately account for the IQ → crime relationship; (2) that an individual's race and/or class may account for the relationship; and (3) that the relationship is in the opposite direction, namely, that it is antisocial behavior that leads to lower intelligence. We now examine each of these arguments in greater detail.

First, the *differential detection hypothesis* states, in essence, that criminals with lower intelligence are more likely to be detected by the police for their unlawful actions compared with criminals with higher intelligence. In other words, individuals with higher intelligence may be committing crimes at the same rate as individuals with lower intelligence, but only the less intelligent ones are getting caught by the police. For that reason, it is argued that studies that show a relationship between intelligence and criminal behavior are invalid because the more intelligent criminals are able to avoid being detected by the police.

Research does not support this criticism. Several studies have compared mean IQ scores of delinquents detected by the police and delinquents not detected by the police, primarily through the use of self-reported questionnaires (e.g., Ellis & Walsh, 2003). These studies have found no **[p. 97 ↓]** significant differences in IQ levels between individuals caught by the police and those not captured by the police. In all the studies, delinquents, arrested or not, scored significantly lower on intelligence compared

with nondelinquents. Overall, converging evidence rejects the differential detection hypothesis.

The second counterhypothesis against the intelligence → crime relationship stems from a traditional sociological perspective. Sociologists are not usually concerned with explaining individual differences in behavior, because they believe that people who are exposed to the same environment will respond in a similar way. Thus, it is not surprising that many sociologists discount the relationship between intelligence and criminal behavior in favor of a *race and/or class hypothesis*. Most sociologists view IQ test scores as a proxy for race and class and not a true measure of intelligence. Higher scores on intelligence tests, they argue, reflect how well an individual has assimilated and internalized white, middle-class values instead of a valid assessment of intellectual ability.

To assess the validity of this argument, researchers include measures of race, class, and intelligence in their analyses to determine whether intelligence remains related to crime after controlling for these other factors. These studies have shown that the relationship between intelligence and crime remains even after the influence of race and class has been accounted for (Ellis & Walsh, 2003). Moreover, in every assessment of intelligence, African Americans score lower than whites or Asians. Across thousands of studies, the IQ for African Americans averages 85, whereas whites average 102 and Asians average 105. No study that has examined racial differences in IQ has been able to account for these differences.

The third argument that questions the relationship between intelligence and criminal behavior focuses on the chronological order of these two factors. Whereas the relationship between intelligence and crime assumes that individuals with lower intelligence are more likely to engage in criminal activity, critics argue that this relationship may in fact be temporally reversed. Instead of intelligence influencing criminal behavior, they maintain, it may be that criminal behavior affects an individual's level of intelligence. There are two main hypotheses related to this perspective. The first is called the *temporal order hypothesis:* Some scholars hypothesize that a delinquent lifestyle can result in lower intellectual functioning. For example, an individual can suffer from head injuries as a result of physical violence, or he or she can experience the erosion of cognitive abilities through prolonged substance abuse. In essence, it is the

individual's criminal lifestyle that is to blame for his or her limited intellectual abilities, not the other way around.

The problem with this argument, however, is that ample evidence has shown that intelligence is established well before the onset of serious delinquency. In any case, a suitable way for researchers to examine this argument is by sampling younger children in an attempt to decrease the possibility that they have already experienced the negative consequences of drug abuse and violence. These studies, along with those that demonstrate that intelligence is established early in life, cast suspicion on the delinquent lifestyle interpretation of the intelligence → crime relationship.

The second argument stemming from the temporal order hypothesis states that delinquents are simply not motivated to do well on intelligence tests; specifically, antisocial adolescents may lack motivation for or interest in completing an intelligence test. Therefore, although it appears that criminals are scoring lower on intelligence tests, the lower scores are in fact the result of their lack of motivation to complete the test instead of a true reflection of their intellectual abilities. To address this issue, researchers have used a variety of methods to control for levels of motivation. Indeed, when controlling for these motivational issues, the relationship between intelligence and crime remains.

Indirect Relationships

Research has consistently shown that delinquents score, on average, 8 percentage points lower on IQ tests than nondelinquents. As a result, criminologists began investigating the mechanisms by which intelligence influences criminal behavior. Little evidence emerged, however, to suggest that the relationship between intelligence and delinquency was purely direct. For that reason, criminologists shifted their attention toward examining the possible indirect effects relating intelligence to criminal behavior. Studies have revealed that school performance is an important mediating factor (Ellis & Walsh, 2003). Individuals with lower intelligence are more likely to struggle in their academic endeavors, which may then increase their likelihood of delinquent involvement. After school performance emerged as an important factor in explaining the intelligence → crime relationship, the next step was to determine the specific

mechanism by which school performance exerts its effects on delinquency. Research soon revealed that an individual's attitude toward school was a substantive predictor of school performance (Ellis & Walsh, 2003). Simply put, intelligence predicts school performance, which affects an individual's attitude toward school, which then influences delinquent involvement; specifically, adequate school performance is frequently associated with a good attitude about school, and poor school performance frequently results in a poor attitude.

Many criminologists attempt to explain the indirect relationship between intelligence and crime from a *social bond* perspective. The core premise of social bond theory states that individuals are born with the innate ability to commit crime; therefore, people need to be stopped from acting on these innate and selfish antisocial desires. The **[p. 98 ↓]** inhibition to commit crime is accomplished when an individual forms a strong bond to society. There are four social bonds that tie individuals to society: (1) attachment, (2) commitment, (3) involvement, and (4) belief.

Of these four bonds, two—commitment to school and attachment to school—are especially relevant in explaining the indirect relationship between intelligence and crime. *Attachment* is the degree to which an individual has close bonds with other individuals (e.g., teachers). This bond is believed to help restrain the adolescent from committing crimes. In theory, a student with a strong attachment to a teacher will try to avoid causing disappointment and will thus steer clear from acting out delinquently. However, when an individual's intellectual ability interferes with his or her ability to succeed in school, his or her frustration level may increase and subsequently weaken his or her attachment to school officials.

Commitment refers to an individual's level of dedication to prosocial activities, such as school. For example, an adolescent who is heavily involved in school will have more to lose by committing crime, not to mention simply less time to think about and commit crimes, compared with an individual who is not as committed to his or her education. However, if an individual's intellectual ability is limited, then success in school may suffer, and the student may be less likely to maintain a strong commitment to his or her education.

Intelligence and Interventions

We stated earlier that no known social intervention has successfully increased IQ scores over the life course. Programs designed to increase IQ and thus reduce crime and violence are likely to fail. Even so, this should not be taken as evidence that cognitive interventions in general are likely to fail. Indeed, quite the opposite is true: Programs that reduce criminal involvement and violence are more likely to use principles of cognitive therapy and behavioral modeling.

IQ appears to be immutable after childhood, but individuals, even those with low IQs, can be instructed to recognize criminal thinking patterns and to alter those patterns. Evidence indicates that IQ is not as important as the way individuals reason, the moral values they hold, or even their level of impulsivity. Because of this, interventions that occur early or later in the life span can be effective in reducing delinquency and crime even if they do not increase one's IQ.

One effective early intervention program is the Perry Preschool Project, which offers children from lower socioeconomic status with IQ scores in the range of 60 to 88 the opportunity to receive 2 years of intensive preschool education. The results obtained from this project revealed that children who received these 2 years of preschool had fewer arrests and were more likely to be employed during adolescence (vs. youth with the same IQ and who did not attend preschool; Ellis & Walsh, 2003). Although IQ was impacted by the program, educational achievement was and remained the most important factor related to future delinquency.

One of the goals of the U.S. correctional system is to keep criminals from returning to prison once they have been released. Many rehabilitative programs have been implemented to help achieve this goal. Research has consistently indicated that the most effective programs for incarcerated individuals are those that target and change thinking styles and that use behavioral modification techniques (Ellis & Walsh, 2003). These programs are effective in part because they target known, changeable individual factors and they do so at a level the offender can understand. Cognitive behavioral programs attempt to change what offenders think, and they try to alter the behavior of offenders through positive and negative reinforcements.

It is also instructive that psychodynamic treatment modalities have not been proven effective with the criminal population. Scholars believe that psychodynamic programs are mismatched to the average offender's IQ level. Psychodynamic treatment is effective for individuals with average to above-average IQs, but it is not effective for below-average-IQ individuals.

Although it is important to focus on particular risk factors that place an individual at a higher likelihood of recommitting crimes, such as cognitive styles, other characteristics specific to the individual should also be considered. These characteristics, often referred to as *responsivity factors*, need to be identified because they have the potential to interfere with an individual's ability to succeed in a treatment program. There are several responsivity factors to consider, such as personality disorders; attention deficit disorder; child care problems; transportation needs; and, most important to this discussion, intelligence.

An offender's intelligence level should be considered before he or she is placed into a correctional treatment program. For example, very-low-functioning offenders will have a difficult time succeeding in treatment programs that require written homework or abstract thinking. Placing intellectually limited offenders into rehabilitation programs that require at least an average intelligence may waste resources and increase the likelihood of the person failing the program or returning to prison.

Conclusion

The relationship between intelligence and crime remains a fiercely debated topic. Despite recent advancements through revised intelligence tests and sophisticated brain imaging techniques, there remain numerous theoretical deficiencies regarding the mechanisms underlying the intelligence → crime relationship. Needless to say, these shortcomings need to be examined more thoroughly, and **[p. 99 ↓]** new hypotheses must emerge, before the role of intelligence in criminal behavior can be fully explained. True understanding may eventually emerge with the unification of several perspectives from various disciplines; therefore, one cannot forget that intelligence may just be one small piece of a larger puzzle in which numerous variables taken together can best explain the cognitive makeup of today's modern criminal.

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