Part I

Human autonomy

1 Twins and autonomy

Who is correct? Those who believe that our family history and decisions affect our cognitive abilities, or those who cite twin studies to show that our intelligence is largely the product of our genes? This is really a debate about the limits of human autonomy.

Until kinship studies began to partition IQ differences between people in terms of what proportion was due to their genetic differences and what proportion was due to their environmental differences, most people thought of themselves as individuals whose personal life history, and personal decisions, made them unique. That did not mean that genes could be ignored. I knew very well I did not have the genes to become a Mozart or an Einstein but, just as Graham Greene said "England made me," I was convinced that my unique family history counted for what I was and that my personal decisions (to go to the University of Chicago rather than play it safe by going to the Catholic University of America) were significant.

It may be said, what could make you more uniquely yourself than your particular set of genes? But that is the problem: to lament your genes is to wish that you had been born a completely different human being. Genes cannot be personified in the image of yourself and your parents. You can love or hate your parents, be grateful or censorious about how they raised you, lament the injustice of a home in which poverty cheated you of advantages, exult in the freedom to choose your fate. The ownership of your unique past, present, and future is the essence of human autonomy.

The ownership of your genes is kismet and the categories of justice and freedom do not apply, unless you upbraid God because you were born at all.

I am not trying to create a straw man. Those who think our inherited genes overwhelm environment in the development of our cognitive abilities do not deny that family is important in many respects. They concede that parents affect whether their kids hate other races, get a criminal record, or learn to slap their own children, and indeed, they concede that family can give children a head start for cognitive abilities that counts in school and university.

The real question is whether family and personal choice have *long-term* significance for the development of *cognitive abilities* of the sort measured by IQ tests.

After all, at the age of 17 or 18, your cognitive abilities have a profound influence on your fate. By that age, some have failed to graduate from high school, and among those that have, most apply to universities whose quality does much to influence subsequent life history. These universities screen applicants for intelligence; that is, they look at your final set of grades at secondary school and how well you score on the SAT or Scholastic Aptitude Test, which is primarily a disguised IQ test. As an adult, your cognitive ability affects the peers you seek out as friends, your job performance, even whom you marry. Assume that the twin (or kinship) studies show that family effects on IQ have disappeared by ages 17–18 and therefore, genes dominate IQ. This is to say that whether you come from a bookish upper-class family or a typical working-class family is not relevant.

In *The Bell Curve*, Herrnstein and Murray (1994) note that liberals have tended to cast aspersions on the homes of ordinary people such as the working class. They have falsely assumed that those homes are so bankrupt in cognitive quality as to leave a permanent mark on the child's intellect. Note, however, the flip side of this conclusion: that working-class parents who spend so much

time and money trying to duplicate the advantages of the typical middle-class home are prey to an illusion.

The message of the twins

A host of problems surrounds the family's influence on cognitive abilities. Studies of identical twins raised apart from birth are designed to separate genetic from environmental influences on IQ. If despite being raised in separate environments, the twins grew up to have identical IQs, we would know that their identical genes were all-powerful. If they grew up to have IQs no more alike than randomly selected individuals, we would know that environment was all-powerful. These studies are a fragment of a body of kinship studies that have the same purpose: comparing identical twins with fraternal twins (genes no more alike than brother and sister) when each twin pair is raised in the same home; comparing adopted children (whose genes would be unlike their adoptive parents) with their un-adopted brothers and sisters (who share genes with their parents).

This huge body of literature yields three factors that influence IQ differences between individuals: genes, family environment (sometimes called common environment), and "chance" environment (sometimes called uncommon environment), which is uncorrelated with both genes and family. Just as being raised in different homes has an independent influence on someone's cognitive abilities, at least in childhood, so do thousands of events that affect some people rather than others: being dropped on your head, being deserted by your spouse, unemployment, a death that sends you into depression, and so forth. These studies are virtually unanimous on three points.

First, *family has little effect on whatever cognitive abilities you have after the age of 17*. While family environment is potent early on, its effects fade away to a low level by age 17 and become insignificant by maturity. As you grow up, you move outside the

family and go to school, become a member of a peer group (your close friends), find a job, and marry. You enter a current environment that swamps the lingering effects of family environment. Current environment is surprisingly self-contained: it influences one's current cognitive abilities with very little interference from past environments. Most of us assume that your early family environment leaves some sort of indelible mark on your intelligence throughout life. But the literature shows that this is simply not so.

Second, once the influence of family disappears, *the cognitive quality of your current environment tends to match your genetic quality*. This is often called a tendency toward "gene-environment co-relation." This means simply that if your genes are at the 90th percentile of the population for cognitive quality, your current environment tends to be at the 90th percentile for cognitive quality. It appears that high-IQ people seek out more enriched environments (for example, study more, join the book club, enter cognitively demanding occupations) and society tends to select high-IQ people out for more enriched environments (bright people befriend them, schools put them into an honors stream, law schools accept them). In other words, chance events aside, genes and current environment tend to match, so whatever genetic differences exist predict cognitive performance without any need to take current environment into account.

Third, as would be expected, *chance factors tend to be constant throughout life and account for about 20 percent of IQ differences*. In other words, the events of life history qualify the perfect match between genes and current environment. Being a bright person in a high-quality environment never inoculates you against good or bad luck. Even a merchant banker can find current environment debased by unemployment, a traffic accident, or the personal tragedy of a child gone astray. Eventually, I will make a case that the autonomous decisions of an individual fit into this category, and that they confer good and bad luck of a purposive kind.

The role of chance entails an important fact. The perfect match between genes and current environment holds for *groups* of people, not for every *individual*. Assume you have selected out a group of people at the 84th percentile of vocabulary performance. At age 30, the overall match between their performance and the richness of their vocabulary environment may be perfect but, thanks to chance, individual differences persist: some people will have an environment at the 84th percentile and others above or below that. Recently a friend in Auckland found that the leader of a gang had an IQ of 150: his gang certainly did not supply him with a vocabulary environment as rich as that. Presumably in his mind he had reached the pinnacle of status and will never aspire to be a university lecturer; and no profession is likely to invite him to apply for a job. He takes satisfaction in his moral superiority: he has robbed only a few people rather than the millions robbed by merchant bankers.

This does not mean that there are any lingering family effects. Whatever mismatch of genes and environment occurs at age 30 simply affects the match of *current* environment and IQ. If that mismatch was correlated with *family background*, it would show up as a persistent family influence – and it does not.

Luck and justice

What conclusions are we to draw from these findings? That is what the first half of this book is all about. *The Bell Curve* (Herrnstein and Murray, 1994) brought the results of the twin studies to a wide public and inspired a political dialogue about social justice. Most people believe that sheer bad luck should not cripple a person's life prospects. Some people do have bad luck in the genetic lottery – that is, they are born with genes that put them very low on the IQ scale. The individual is of course not to blame for this and humane ideals suggest that some kind of compensation is due. Everyone, conservative or liberal, believes that society should help them by giving them sustenance and special education.

Others with normal genes are born into families (and neighborhoods) that blight their lives. The mere fact that at maturity cognitive abilities generally match genetic promise does not mean we should do nothing to alleviate these conditions. To suffer as a child in an impoverished home is an evil in itself no matter what the eventual effects on intelligence: right and left differ only as to means – that is, how to strike a balance between the welfare state and the free market as a cure.

The mere fact that at maturity cognitive abilities generally match genetic promise does not mean neighborhood and peer group have no lasting effects on one's life. The girl who thanks to ignorance about contraception has a child at 16, the boy whose gang lands him a criminal record at the same age, they are marked for life despite their adult mental skills. Intelligence is not everything. Your childhood years can mean you start adulthood, not only with obvious strikes against you but also with attitudes (not aspiring to transcend gang leader) and emotions (race hate or racial resentment) and traits (escaping reality through drugs) that color your whole life. Upgrading schools is one method of alleviating these evils that right and left share. There is the usual difference about means: the balance between improving public schools and providing vouchers to offer more parents the choice of a private school.

However, recall that there is a special sense of injustice among those who believe that thanks to circumstances thrust upon them they have never lived life to the full. That thanks to family or neighborhood or school, they lacked the vocabulary or knowledge or understanding to go to a good university, and thereby make lifelong friends or find a spouse among those who offer less pub talk and more serious talk, or qualify for a profession worthy of their talents. I speak with some feeling here. All but one of the males in the older generation of my family suffered to some degree from alcoholism and I suspect that (as they all left school between the ages of 11 and 14) this was due to a mismatch between their promise

and the kind of education that might have enhanced their lives. Yet, I can testify that all of them were highly intelligent, perhaps as intelligent as their genes "intended"; but that was not enough.

In addition, we must not lose sight of the question of whether freedom or personal choice has consequences. If in adulthood, chance aside, genetic quality predicts cognitive quality, are individuals powerless to enhance their intelligence? Chance may put an individual above or below those grouped at his or her level of genetic performance, but chance is beyond our control. Luck is no substitute for human empowerment.

Finally, the twins pose an evidential problem. Dick Nisbett (2009) and others tend to believe that twin studies and adoption studies conflict. He cites data in which children from lower-class backgrounds who were adopted into upper-class homes profited greatly from the enhanced quality of their new families: these children gained almost 12 IQ points even though they were tested as late as age 14. Is it really plausible that family effects become nil by age 17 or soon after?

Beyond the twins

I will use a new method to supplement the findings of the twin studies for a whole range of cognitive abilities. In the light of these new findings, I will conclude the following. First, that *whatever families do to upgrade the cognitive quality of the home persists long enough to influence their children's fate at the crucial age of 17*. Second, that *whatever society does to upgrade the cognitive environment of children has the same consequences* (this of course is really a corollary of the first conclusion). Third, that genes and luck notwithstanding, *all of us, both in childhood and maturity, have the capacity to choose to significantly enhance our cognitive performance*.

To those who are ignorant of the twin literature, these conclusions will seem self-evident. And I should add that few of

those who cite the twin literature would reject them outright. But they would stress that their significance is very limited, and caution me against encouraging naïve beliefs about the potency of family environment and choice. Well, here, the degree of significance is everything. I hope to shed some light on that: nothing that will restore belief in the "perfectibility" of man, but something that will show that genes allow environment and choice far more scope than those suffering from "post-twin pessimism" may be aware.

Toward a meta-theory of intelligence

Hitherto much of my work in psychology has been an attempt to analyze the significance of *generational trends* in cognitive abilities – that is, the so-called "Flynn Effect," or massive IQ gains from one generation to another, gains that totaled over 30 IQ points in the twentieth century. This is not to imply that "intelligence" is identical with IQ. But IQ gains are a measurable "symptom" of true cognitive gains and I have tried to describe just what those gains were.

The first half of this new book is an effort to clarify a different problem, that of *individual differences* in cognitive ability – that is, the significance of the fact that within a generation some people have superior abilities to others. Having achieved what I believe to be clarity in these two core areas of intelligence, I am emboldened to put my conclusions in the context of a theory of intelligence (one which will also find a place for intelligence in the area of brain physiology).

Therefore, the second half of this book opens with a chapter that uses my new method on a test (Raven's Progressive Matrices) that has a crucial role to play in the theory of intelligence. It also argues that intelligence needs something called a "meta-theory," concepts that offer scholars advice about how to investigate intelligence. And finally, it surveys a wide range of scientific theories of intelligence to see whether they are following