Biology is destiny

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Background

Traditionally, human nature was thought of as predetermined and divinely ordained. The differences between men and women were attributed to God's design as were the differences between "superior" and "inferior" races. From the mid to late 1800s following the scientific discoveries of the role of inheritance and natural selection by Mendel and Darwin, human characteristics came to be seen as products of evolution – “nature”. However the late nineteenth century also saw the rise of theories that human nature, intelligence and behaviour are primarily determined by social environment – “nurture”.

In the mid-20th century both schools of thought got a bad name. The "nature" hypothesis (hereafter Nature Theory) became tarnished by association with the Nazis who pursued an agenda based on claimed innate superiority of one race over others. The “nurture” hypothesis (hereafter Nurture Theory), on the other hand, was taken up by Communists who saw human identity as something to be manipulated and shaped by social structures – with effects that were arguably equally disastrous. Yet the nature vs nurture debate continues to rage as scientists fight over how much of who we are is shaped by genes and how much by the environment.

The Nature Theory has received a boost in recent years from advances in genetic research. Newspaper and television reports often feature reports that scientists have uncovered evidence for the genetic basis of psychological characteristics and patterns of behaviour, such as violence and criminality, or sexual orientation and gender roles and behaviour. James Watson (co-discoverer of the structure of DNA and former head of the Human Genome Project) has said, "We used to think that our fate was in our stars. Now we know, in large part, that our fate is in our genes."

The Nature Theory - Heredity

Scientists have known for years that traits such as eye and hair colour are determined by specific genes. The Nature Theory takes things a step further to say that more abstract traits such as intelligence, personality, aggression, and sexual orientation are also encoded in an individual's DNA. Evidence for the theory comes from two main sources: evolutionary biology and genetic research.

For

- Evolutionary theory
- Mating strategies are hardwired by evolution
- The "Cinderella effect"
- The "gay gene"
- The "monogamy gene"
- The "criminal gene"
- The "IQ gene"
- Twins studies
- Understanding genetic causality is socially beneficial

Against

- Evolutionary psychology is based on dubious reasoning
- The mating strategy hypothesis is flawed
- The Cinderella hypothesis is flawed
- The gay gene hypothesis is flawed
- The monogamy gene hypothesis is flawed
- The criminal gene hypothesis is flawed
- The IQ gene hypothesis is flawed
- The Nature hypothesis is an excuse for anti-social behaviour
- The Nature hypothesis justifies repressive laws
- The Nature hypothesis justifies inaction on social reform
- The Nature hypothesis justifies repressive social hierarchies
- Human beings have free will

Evolutionary theory

In his book *Sociobiology*, the Harvard entomologist EO

Evolutionary psychology is based on dubious reasoning

Wilson argued that certain forms of human behaviour are universal, and that the best explanation for this is that they are the result of natural selection and hence are coded in our genes. He postulated genes for a wide variety of traits, including entrepreneurship, creativity, spite, conformity ("Human beings are absurdly easy to indoctrinate – they seek it"), xenophobia, and homosexuality.

Mating strategies are hardwired by evolution

In *The Evolution of Desire*, evolutionary psychologist David Buss argues that each gender has its own set of mating strategies that have remained unchanged since the dawn of time, and work to guarantee the survival of the species. Because a single sexual dalliance can lead to pregnancy, women have evolved to be highly selective about mates, and to demand characteristics in a mate that make them more likely to stick around and provide for their offspring. They therefore prefer men who are industrious and ambitious, dependable, stable, intelligent, physically powerful, healthy, and faithful. The evolutionary goal of men, on the other hand, is to leave behind as many offspring as possible. Men have a greater desire for sexual variety, for a larger number of sex partners and they prefer young, attractive women due to an evolved desire for mates who can provide them with robust offspring. Because they are expected to invest resources in their own offspring, men prefer wives with less premarital sexual experience – a strong predictor of infidelity. For similar reasons men are wired to have a strong jealous reaction to sexual infidelity, while women react to emotional infidelity.

The "Cinderella effect"

Many researchers have observed that parents abuse their stepchildren at significantly higher rates than they do their own, genetic children. In one study, evolutionary psychologists Martin Daly and Margo Wilson analysed child abuse reports held by the American Humane Association and found that "a child under three years of age who lived with one genetic parent and one stepparent in the United States in 1976 was about seven times more likely...to become a validated child-abuse case than one who dwelt with two genetic parents." Records in Great Britain revealed that children were beaten by stepfathers at a rate of 100 times more than by genetic fathers. Their findings demonstrated that children residing with stepparents had a higher risk of abuse even when socio-economic factors were considered. The reason, they suggested, is that evolution selects nurturing behaviour that is directed toward genetic, rather than non-genetic, children.

The "gay gene"

A 1993 report published in the journal *Science* by Dean Hamer, linked DNA markers on the X chromosome – inherited from the mother – to male sexual orientation. In 2005 a report in *Human Genetics* by Hamer and others claimed that several genetic regions in the human genome might influence homosexuality. The fi ndings showed that identical stretches of DNA on three chromosomes were shared by about 60% of gay brothers in the study, compared to the figure of about 50% which is normally expected by chance. Recent studies have found notable differences between the physiology of gay people and non-gay people. For example: gay men have similar brains to those of straight women and gay women to those of straight men; gay and non-gay people emit different armpit

The claim that supposed human universals have a genetic basis is flawed since there might easily be non-genetic explanations. It is hard to imagine any human trait for which a plausible scenario for its selective (therefore genetically determined) advantage could not be invented. The real problem is that there is absolutely no evidence. No one has ever measured in any human population the actual reproductive advantage or disadvantage of any human behaviour. More generally, there has been tremendous cultural evolution in the past few thousand years that cannot be explained in biological terms because there simply hasn't been enough time for natural selection to operate.

The mating strategy hypothesis is flawed

David Buller, the author of *Adapting Minds: Evolutionary Psychology and the Persistant Quest for Human Nature*, has challenged David Buss's findings about evolutionary mating strategies. First the evidence indicates that behavioural differences are much more widespread in sexually reproducing populations than the idea of a universal human nature would require. Evolutionary biological research on male mating strategies has tended to focus on older males who re-enter the mating market after divorce and tend to prefer younger females, neglecting over half of older males who remain mated to older women.

The Cinderella hypothesis is flawed

David Buller also casts doubt on the reality of the "Cinderella effect". Data from the US Third National Incidence Study of Child Abuse and Neglect (NIS3) for example, shows that single parent genetic fathers are 1.7 times more likely than stepfathers to physically abuse their children. Moreover a Colorado study showed that child fatalities caused by abuse at the hands of non-genetic relatives were "1.37 times more likely to be recorded as the result of maltreatment on death certificates" than were those for genetic parents. This bias in reporting, Buller argues, accounts for much of the "Cinderella effect" that appears to be present in the NIS-3 data. The role of evolutionary causation has been exaggerated.

The gay gene hypothesis is flawed

The gay rights campaigner Peter Tatchell acknowledges that many gay people have seized on the hypothesis to prove that "homosexuality is beyond our control" rather than a "lifestyle choice", but regards it as both scientifically and morally flawed. If gayness was primarily explainable in genetic terms, we would expect it to appear in similar forms in all cultures and all epochs. But as the anthropologists Clellan Ford and Frank Beach demonstrated in *Patterns Of Sexual Behaviour*, the nature of same sex relationships varies greatly between different societies. Young men in some tribes (the Aranda of Australia, Siwan of Egypt, Batak of Sumatra, Anga of Melanesia and others) have relationships with boys or older male warriors, usually lasting several years, often as part of manhood initiation rituals, before progressing to fully heterosexual lifestyles. Likewise history reveals huge disparities in different eras down the ages. Same-sex behaviour in Ancient Greece was very different, in both its prevalence and manifestations, from homosexuality in Confucian China, Renaissance Italy, Meiji Japan, Tudor England and late twentieth century USA. Many studies suggest social factors – moral values, social ideologies and cultural expectations, together with family patterns and parent-child interaction – are also

odours; gay men are likely to have a counter-clockwise hair whorl pattern; gay and non-gay people's brains respond differently to two human sex pheromones – and so on.

The "monogamy gene"

In 2008, scientists at the Karolinska Institute in Stockholm, claimed to have found a link between vasopressin (a hormone found in mammals that had been linked to mate stability in prairie voles in earlier studies) and pair bonding behaviour in human beings, and found that variations in a section of the gene coding for a vasopressin receptor help to determine whether men are serial commitment-phobes or devoted husbands. The researchers looked at the various forms of the gene coding in 552 Swedish people, who were all in heterosexual partnerships. They found that variation in a section of the gene called RS3 334 was linked to how men bond with their partners. Men can have none, one or two copies of the RS3 334 section, and the higher the number of copies, the worse men scored on a measure of pair bonding. Men with two copies of RS3 334 were more likely to be unmarried than men with one or none, and if they were married, they were twice as likely to have a marital crisis.

The "criminal gene"

In the 19th century, Italian criminologist Cesare Lombroso claimed that criminality was genetic. Born criminals could be identified by physical features such as sloping foreheads, jug ears, large chins, fleshy lips, and hard shifty eyes. Lombroso's work fell out of favour, but recent research has revived the idea of a connection between genes and criminal behaviour. Studies of twins have found that identical twins are more criminally similar than fraternal twins. On average, where one member of an identical pair is criminal, 51.5% of the co-twins are criminal compared to 20.6% for fraternal twins. Similarly studies of adopted children show that if a child has a criminal biological parent, but is adopted at birth into a non-criminal foster-home, that child is more likely to become criminal than an adopted child from a non-criminal biological parent. In an article in *American Sociological Review* written in 2008, Guang Guo, of the University of North Carolina-Chapel Hill, identified three genes which predict delinquency.

The "IQ gene"

In their controversial 1994 book *The Bell Curve*, social scientists Richard Hernstein and Charles Murray argued that IQ has a genetic basis and is a better predictor of many factors including financial income, job performance, unwed pregnancy, and crime than parents' socioeconomic status or education level. Low IQ people, the book says, are more likely to commit crimes because they lack foresight and cannot understand that robbing someone is wrong. Genetics, they argued, also accounts for at least some element of the enduring racial differences in intelligence.

Twins studies

Some scientists have attempted to establish the effect of genes on character by studying the lives of twins. Fraternal twins develop from two separate eggs and are no more similar genetically than any other brothers or sisters. Identical twins develop from a single fertilized egg and are 100% similar genetically. If our behaviour is shaped by our genes, then identical twins important.

The monogamy gene hypothesis is flawed

Even if there is a connection between genetics and monogamy, experience shows that serial cheaters can and do change, even if it often takes a shock. Some quit drinking and taking drugs. Some have a religious experience or narrowly escape dying. Some get caught and realise the importance of their marriage. Some fall so deeply in love with a new partner that cheating no longer holds any thrills. Something usually needs to change before most people shed one "lifestyle" for another. But people can and do change. As Katharine Hepburn says to Humphrey Bogart in *The African Queen*, "Nature, Mr. Allnutt, is something we were put on this earth to rise above."

The criminal gene hypothesis is flawed

Even if there does appear to be a genetic basis to some types of behaviour that lead to criminality, psychologists are almost unanimous in their belief that it does not mean some children are doomed to a life of crime. In a 1995 article in the journal *Nature*, Steven Rose, a brain researcher at the Open University, lambasted those who believe there is a raw genetic basis for criminality and violence. "Although only the most extreme reductionists would suggest that we should seek the origins of the Bosnian war in deficiencies in serotonin-reuptake mechanisms in Dr Karadzic's brain, and its cure by the mass prescription of Prozac, many of the arguments offered by neurogenetic determinism are not far removed from such extremes."

The IQ gene hypothesis is flawed

The biologist Stephen Jay Gould says that IQ tests are a good predictor of "success" in school, "but is such success a result of intelligence, apple polishing, or the assimilation of values that the leaders of society prefer?" The philosopher of science Hilary Putnam has argued that the notion of IQ is built on the assumption "that there are a few 'superior' people who have this one mysterious factor – 'intelligence' – and who are good at everything, and a lot of slobs who are not much good at anything." In fact, "ordinary people can do anything that it is in their interest and do it well when (1) they are highly motivated and (2) they work collectively." That motivation plays a decisive role in acquiring almost any skill is a matter of everyone's experience. The sort of people who do well in IQ tests, in other words, tend to be those at the top of the social hierarchy who are motivated (and often trained) to do so. The claims of the IQ geneticists are simply an attempt to rationalise race and class inequalities as more or less inevitable. As genuine science, they lack merit.

The Nature hypothesis is an excuse for anti-social behaviour

We all recognise instinctively that we have choices in our lives. The claim that such behaviour as infidelity or criminality is genetically determined can be used to excuse criminal acts or justify desertion of one's family. In 1995, for example, lawyers acting for Stephen Mobley, a convicted murderer awaiting execution in Georgia, attempted to get his conviction overturned on the ground that the murder was not the evil result of free will but the tragic consequence of a genetic predisposition. The appeal was unsuccessful, but it could undermine the basic principle that individuals

should be more similar than fraternal twins. Studies have found that this is more or less true. Identical twins are more alike in personality traits, interests, preferences, and even talents than fraternal twins are. Though identical twins raised by different families in different environments show more dissimilar personality traits than identical twins raised together, separated identical twins are still more alike than separated fraternal twins.

Understanding genetic causality is socially beneficial

Addiction experts say that the knowledge that roughly half the risk of alcohol addiction is associated with genes can remove a burden of guilt that otherwise serves as an obstacle to recovery. By suggesting a genetic basis for behaviour previously believed to be the result of character flaws, scientists and others say the discoveries could make for more understanding of human differences and better strategies for therapy and treatment.

have free will and consequently are legally responsible for their behaviour.

The Nature hypothesis justifies repressive laws

The idea that anti-social urges can be traced to inherited traits underpinned the pseudo science of eugenics which held that mankind could be improved by breeding out the bad. In the early 1900s US eugenicists such as Charles Davenport encouraged US states to enact laws permitting the forced sterilization of thousands of people in prisons and mental hospitals and inspired a series of viciously racial immigration laws. A quarter of a century later the Nazis used laws such as these as a model for their own policy of sterilising and exterminating the *untermenschen* ("sub-humans"). The dangers have not gone away. In 2007, Dr. James Watson, the Nobel Prize winner who co-discovered DNA, was quoted in The Sunday Telegraph as saying: "If you could find the gene which determines sexuality, and a woman decides she doesn't want a homosexual child, well, let her [abort the foetus]".

The Nature hypothesis justifies inaction on social reform

The attempt to explain important features of society as biologically determined has the goal of convincing us that inequality and injustice cannot be eliminated. It can thus serve as an excuse not to take action on unemployment, bad housing and other social problems on the ground that since the problem behaviour is "in the genes" no amount of social improvement is going to help. The educational psychologist Arthur Jensen, for example, has argued that education programmes designed to compensate for low IQs are doomed to fail. Critics argue that even if IQ and other characteristics are heritable, it does not follow that differences between groups and individuals cannot be overcome by improved educational and other opportunities.

The Nature hypothesis justifies repressive social hierarchies

EO Wilson, among others, has argued that supposed inherited biological facts make certain aspects of society, such as male domination of public life and capitalistic division of labour, all but inevitable. Against that, research shows that not every human society has exhibited the same sexual division of labour as our own. And not every human society has been capitalist or even competitive. The anthropologist Peggy Sanday conducted a survey of about 150 different societies going back as far as the sixth century BC and found a huge diversity of sex roles in these societies, showing that such roles derive not from human nature, but from specific historical and political circumstances.

Human beings have free will

Human beings are capable of free choices, argue existentialist philosophers like Soren Kierkegaard or Jean-Paul Sartre and libertarian philosophers like Robert Nozick. There is no reason to believe that every event in the world is determined by physical causes. Indeed, it is not possible to claim that anyone is morally responsible for an action unless they could have done something else in the circumstances. But if free will is possible, then it is wrong to claim either that genetics or social conditioning determine outcomes.

The Nurture Theory - Environment

For

IQ is a product of social environment

Human behaviour can be conditioned

Humans learn behaviour through environmental interaction

Nutrition and education affect intelligence

Adoption studies

Twin studies

Sense of humour is a learned trait

Against

Nurture Theories are as dangerous as Nature Theories

Conditioning theories are flawed and morally dubious

IQ results do not measure intelligence

IQ is a product of social environment

In the 1980s, a New Zealand-based political scientist, James Flynn, noticed that IQ was increasing in all countries all the time, at an average rate of about three IQ points per decade. The finding suggests that IQ must be affected by environmental factors. Some have suggested that the so-called "Flynn effect" is due to the way we are being saturated with sophisticated visual images: ads, posters, videogame and TV graphics etc – a rich visual environment that helps with puzzles of the kind that dominate IQ tests. Other research has found that environmental factors such as nutrition, schooling, parental behaviour and economic status have a significant impact on IQ scores.

Human behaviour can be conditioned

In 1920, the American psychologist John Watson demonstrated that the acquisition of a phobia could be explained by conditioning. In a controversial but famous experiment Watson used an 11 month-old baby, Albert, to prove that a person could be conditioned to be afraid of something by which he was not previously affected. Albert was put into a room and introduced to a white rat. Albert liked the rat and wanted to stroke it. Some time later, after several sessions, Watson would produce a very loud noise every time Albert reached out to touch the rat. As a result, the baby became terrified of every white and furry object in which he came in contact. A strong proponent of environmental learning, Watson said, "Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select...regardless of his talents, penchants, tendencies, abilities, vocations and race of his ancestors."

Humans learn behaviour through environmental interaction

Harvard psychologist BF Skinner's early experiments produced pigeons that could dance, do figures of eight, and play tennis. He went on to develop the theory of "operant conditioning", based on the idea that an action taken by a person or an animal often has consequences that work to reinforce or discourage the behaviour that gives rise to them. For example, if a child makes faces at the teacher in school, the laughter of the other children may serve to reinforce his behaviour. If the teacher punishes him the child may

Nurture Theories are as dangerous as Nature Theories

In 1997 Barbara Ehrenreich and Janet McIntosh, writing in *The Nation,* described extreme nurture theorists as "secular creationists" who argue that humans have no "essential" nature that has been passed down genetically over time, but are creatures entirely shaped by cultural influences. This "unique and miraculous freedom from biology", they observed, gives human beings "a status utterly different from and clearly 'above' that of all other living beings" - an ideological outlook "eerily similar to that of religious creationism...we need a notion of human nature," they argue, "for meaningful social advocacy. If there is no human nature outside social construction, then there is no basis for social criticism and no reason for protest or rebellion." That denial of nature, of course, was exactly the rationale used by repressive communist regimes who tended to regard critics as mentally unbalanced.

Conditioning theories are flawed and morally dubious

Recent reviews of Watson's "little Albert" study found little evidence either that Albert developed a rat phobia or even that animals consistently evoked his fear. Likewise virtually no psychologists accept the view, put forward by Watson and BF Skinner, that a child is a *tabula rasa* (blank slate) onto which anything can be sculpted through environmental experience. Environmental determinism is as morally questionable as evolutionary determinism since both undermine the idea that we have free will and are independent moral actors.

IQ results do not measure intelligence

Studies which claim that educational and environmental enrichment improves intelligence merely show that what is being modified is performance on an IQ test rather than intelligence per se, argues American psychologist Herman Spitz. Children in "educational enrichment" programmes often receive extensive instruction and practice in test-taking. This accounts for the well-known "fade-out" effect, whereby initial, often very high gains in IQ scores, in experimental "enriched schooling" groups, return to the level of the control group a few years after the "experiment".

avoid such antics in the future. Behaviour, in other words, is progressively shaped by our responses to the "environmental" consequences of our actions. This principle, called "successive approximation" has proven a successful teaching technique and has been adapted to teach people to overcome phobias or other disruptive behaviours. In 1971, Skinner published *Beyond Freedom and Dignity*, in which he dismissed the notion that individual freedom existed. Man's actions were nothing more than a set of behaviours that were shaped by his environment, over which he had no control.

Nutrition and education affect intelligence

A study done in Great Britain in the late 1980s showed that nutrition plays a very large role in a person's development. Adolescents aged twelve to thirteen were given vitamin and mineral supplements for eight months and were found to score higher on IQ tests than before they took the supplements and in comparison to a "control" group not given the supplements. In an American study a group of children from families with low parental IQ, low parental education and minimal financial resources were given high quality educational day care outside the home from the age of three months to the start of schooling. Even though the children returned to their home environment every day and spent holidays and weekends with their families (mostly unemployed, single mothers), there were large gains in IQ. This shows that education as a part of an individual's environment has a huge effect on that individual's intelligence and mental aptitude.

Adoption studies

Studies done in France have found that transferring an infant from a family having low socioeconomic status to an adoptive home where parents have high socioeconomic status improves childhood IQ scores by 12 to 16 points – a very substantial effect in psychological research terms. Another study found that adoptive children raised in the same house had very similar IQs, even though they were not related genetically. The study concluded that the environment they were raised in was more important than genetic factors.

Twin studies

If environment didn't play a part in determining an individual's traits and behaviour, then identical twins should, theoretically, be exactly the same in all respects, even if reared apart. But while studies show they are similar in many respects, no identical twins are ever exactly alike.

Sense of humour is a learned trait

A study in 2000 published by researchers at St Thomas's Hospital in *New Scientist* found that a sense of humour was not inherited but learned. The researchers came to this conclusion after studying 127 pairs of female twins of whom 71 pairs were identical. The twins were asked to go into separate rooms and rate a series of humorous cartoons from zero (boring/dud) to ten (extremely funny). The genetically identical twins shared no more common responses to the jokes than did the genetically different fraternal twins. The researchers concluded that between one-third and two-thirds of the variability in reaction was due to shared environmental effects such as family upbringing and that genetic factors did not

appear to contribute at all.

Conclusion

Experience of the great ideological movements of the 20th century shows that both the nature and nurture hypotheses, pushed to extremes, can have highly undesirable consequences. The Nature Theory justified the Holocaust. The Nurture Theory justified forced collectivisation. Both share a belief in determinism which undermines the principles of freedom of choice and individual moral responsibility.

These days most scientists accept that all three factors – genetic programming (nature), social and environmental influences (nurture) and individual choice – have a role to play in shaping character and behaviour. Our genes may make us more or less inclined to promiscuity or violence, yet both are affected by the culture we grow up in and can be mediated by the decisions we make as individuals.

So while it is interesting and illuminating to find out how we are affected by genetics and conditioning, it is almost pointless to try to establish which is the most potent set of determinants, since any conclusion must necessarily be highly subjective. Even now the “nature-nurture” debate tells us more about competing political and social ideologies than about the realities of human nature.