

## Nature vs Nurture in Educational Settings.

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Nature without learning is like a blind man; Learning without nature, like a maimed one; practice without both, incomplete (Plutarch).

Perhaps the oldest and most controversial issue within developmental psychology is that of “nature versus nurture” influences in human development. In his discussion of justice as an aspect of human character, Plato (in the *Republic*), referred to the issue in terms of *physics* and *trophe* (nature and nurture). The nature/nurture question is known in other ways; as nativism versus cultural relativism; genetics versus social constraints; maturation versus learning. All perspectives ask the fundamental question, to what extent are we products of our genetic constitution or our social environment?

The **environmentalistic determinism** argument, that we are determined largely by our environment, was significantly influenced by the work of John Locke. In his work, *An Essay Concerning Human Understanding*, Locke strongly rejected the prominent view of innate principles,

. . . primary notions, characters as it were stamped on the mind of man; which the soul receives in its very first being, and brings into the world with it (Locke quoted in Cleverly & Phillips, 1986:16).

Locke argued that we learn “from *Experience*. In that all our knowledge is founded; and from that it ultimately derives itself” (Cleverly & Phillips, 1986:16). Locke is best known for his *tabula rasa* analogy. At birth the mind is likened to a blank tablet with no innate ideas. Its contents are etched by the experiences on a child as he or she matures. However, according to Yolton (1971), misconceptions have arisen over Locke’s image of the mind as a blank slate at birth. Locke refers to an image of a blank piece of paper void of characters. However, this was not intended to imply the mind starts from scratch, but rather posed an alternative to the innatism debate that

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argues we are at birth filled with ideas and truths. Locke did acknowledge natural tendencies such as the inclination to seek happiness and avoid pain.

Claude Adrien Helvetius was influenced by Locke's environmentalism. After investigating the sources of human inequality, Helvetius concluded that education resulted from inequalities of understanding and achievement rather than an "unequal perfection of their organs" (Cleverly & Phillips, 1986:18), in those of lower achievement. As a result of this thinking, and the conjecture that a system needed devising that could make the most of every being physically, morally and intellectually, the doctrine of the environmentalists became a belief in the redeeming power of education. This was a heartening philosophy for educationalists, and a positive way in which to view education.

However, I do think the idea of perfection needs to be qualified to some degree. Traditionally, the goal has been for children to excel in subjects such as mathematics and science. Achievement in these areas would make for perfect children, an idea that does not underpin the philosophy of modern teaching. Throughout the twentieth century there has been an increasing awareness of different types of intelligence, and a movement away from the purely academic disciplines. I see the aim of education as having shifted from traditional views where education fulfilled the wishes of parents and reflected the narrow goals of society. The focus shifted to a child centred pedagogy in New Zealand education.

One of the earliest behaviourist theorists, John Watson, argued that people are made, not born. Dismissing the relevance of heredity, he claimed the confidence to bring up a well-formed baby born of thieves, prostitutes, and murderers.

Give me a dozen healthy infants, well formed, and my own special 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-doctor, lawyer, artist, merchant-chief, and yes, beggarman and thief (Watson, 1930:104, in Weiten, 1992:8).

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Freud's psychoanalytic theories developed from within the environmentalist tradition of the modern period. He argued that adult personality results from the culmination of childhood experiences.

While many of the above theories centre around personality and mental ability, studies have shown that the nature/nurture debate is relevant to areas that may appear nature or biologically determined. A case study by clinical neurologist Oliver Sacks (quoted in Lykken, 1999), illustrates the significance of nurture to functions that many take for granted as being entirely biologically determined. Sacks examined a patient who following a childhood illness, developed cataracts. Over years the retinas became damaged to such a degree the removal of the cataracts seemed futile. This man was functionally blind at the age of fifty when the decision was made to remove the cataracts. After surgery the patient reported having blurred vision and was unable to identify what he was seeing. He was unable to distinguish a face until he could touch it and recognise the facial expressions. The patient had become mentally blind lacking a perception of depth or proximity. This case illustrates that even our visual perception is significantly reliant upon nurture.

The Swiss philosopher, Jean Jacques Rousseau, considered the nature determinants in terms of goodness and evil as influencing human development. Believing that children are born innately good, he advocated that freedom for children would right all the wrong in the world. In his famous work, *Emile*, Rousseau wrote; "God makes all things good; men meddles with them and they become evil" (Cleverly & Phillips, 1986:34). Rousseau claimed that the only restraint children should experience is that which comes from within, and that education should follow nature (Cleverly & Phillips, 1986:36).

A major proponent of the importance of heredity was Sir Francis Galton, who theorised that personality and ability depend almost entirely on our genetic make-up. With the publication of his book, *Hereditary Genius* (1869), the biological view was strengthened and followed particularly by those studying intelligence. Galton used the word "genius" to denote an exceptionally high, inborn, ability. (Microsoft Encarta, 1998). After studying family trees of "well bred" upper class families, Galton

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concluded that success runs in families because great intelligence is passed from one generation to the next through genetics (Weiten, 1992). Notably however, he discounted other factors impacting on these families' up-bringing, and the consequential advantages of these factors. The families were financially well off and had access to high quality schooling. Had Galton investigated the schooling of lower class children, he may have found that, for many of them, school was not a financially viable option.

Galton's work led to the development of the eugenics movement, based upon the doctrine that both physical and mental features are heritable traits. Eugenics refers to "scientific" endeavors to control reproduction in order to improve hereditary characteristics in the human population. Galton's encouragement of mating between intellectually superior people was seen as an expression of class prejudice, which is not surprising in light of his "disdain for the lower classes" (Weiten, 1992:307). Paradoxically, it has been claimed that some misinterpreted his thoughts, and that he was not intent on creating an aristocratic elite, but rather a population consisting entirely of superior men and women (Microsoft Encarta 98). Galton's failure to consider the connection between wealth and schooling and the subsequent advantages of a wealthy upbringing was a major inadequacy in his work. Galton's research into intelligence measurement, although unsuccessful, paved the way for the work of French psychologist Alfred Binet.

Supporters of genetic determination have used Darwin's evolutionary theory by claiming that humans have an innate knowledge of the world required for survival. According to Darwin, certain traits that advantage a species' survival come to be selected over time and are passed down through generations. Galton attempted to adapt Darwin's theory to theorising human development. Indeed, after reading Galton's *Hereditary Genius*, Darwin wrote, "You have made a convert of an opponent in one sense for I have always maintained that, excepting fools, men did not differ much in intellect, only in zeal and hard work" (Microsoft Encarta 98). However, neither Galton nor later social Darwinists, were able to make a convincing case for all the human attributes, qualities and behaviors, such as justice, truthfulness and fairness

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that cannot be explained from an evolutionary stance. There is much in human behavior that may not prove beneficial to the individual.

In 1969 the *Harvard Educational Review* published an article by Professor Arthur Jensen, asking the question; "How can we boost IQ and scholastic achievement?" The content of this article sparked a huge outcry, and resulted in Jensen needing a bodyguard. Jensen set out to discover why the programmes intended to remedy the educational gap between advantaged and disadvantaged children had generally failed. After pondering whether it was the environment of the child or his/her genetic make-up that had the greatest influence, he concluded that it was largely the genes of the child that determined intelligence, and that large environmental changes had negligible effect (Cleverly & Phillips, 1986). Jensen followed this up by investigating the variation between different ethnic groups in the U.S.A. Consequently, Jensen surmised that discrepancies in the average performance of the disadvantaged cannot be entirely attributed to discrimination or inequalities within the classroom. Considering, however, that an intelligence test is a measure of prior educational achievement, it would seem more appropriate to argue that poor performance was *largely* due to lack of educational equality. In a critique of Jensen's conclusion, Tobias (quoted in Halsey, 1977:265), wrote; "A more accurate understanding of the contribution of heredity to intelligence will be possible when social conditions for all races are equal and when this situation has existed for several generations."

Jensen, controversially, discounted what were considered to be the two main constituents of the environmentalist model; the average children concept, and the social deprivation hypothesis. The average children concept asserts that apart from the few children born with significant neurological defects, most children are similar in their biological development and capabilities. Influences in the home environment and stimulation from parents result in either success or failure of children at school.

If all children could be treated more alike early enough, . . . they could all learn from the teacher's instruction at about the same pace and would all achieve at much the same level (Cleverly & Phillips, 1986:15).

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To discard this theory had huge implications for environmentalist and educationalists, who put faith in the environment as the significant influencing factor. Indeed, if it was the environment, which could be monitored and moulded, parents and teachers could significantly raise educational standards and make education more standardised. Similarly, if it were possible to educate children in a more uniform way and at the same pace and level, controversial practices such as streaming, and ability grouping within the classroom, could be abolished.

Advocates of the deprivation hypothesis determine that children from lower socio-economic families and racial minorities do poorly in the school environment as a consequence of socio-economic factors. Disregarding the effect of culturally and socially biased education could have significant negative effects for teachers who may continue to educate children in a narrow ethnocentric way. I believe that to ignore the bias evident in educational settings around the world is to turn your back on the essence of your role as a teacher. Thankfully, Jensen's view has not formed the basis for educational practices. Teachers in New Zealand are aware that their personal pedagogy is also a critical factor in ensuring the success of students from a huge array of cultural backgrounds.

The psychologist and biological geneticist, David Lykken, argues that people tend to disagree with the nature model for fear it requires accepting other social evils namely biological determinism, social darwinism and racism. I think our society is less in danger of the type of thinking seen in the eugenics movement because our values have altered. Where once we may have desired a genetically perfect population, all alike in nature and ability, we now value diversity and change.

In attempting to present the argument of "which one" (genes vs environment), as essentially a "chicken and egg" debate, consider the following example: a young child touches something very hot and feels intense pain. Perhaps it is the first time the child has felt pain. Is this experience the result of nature or nurture? One the side of nature, this child has specific neurotransmitters that transmit messages to the spinal cord which are then sent to the brain. From an evolutionary perspective, these messages of pain protect humans from danger and injury. However, from the nurture side of the

debate, pain results from experience, the child felt pain through interaction with a particular object. Hence, without the genetic information the child would have felt no pain, but without the *experience* he would not have felt pain, so is pain a result of genetics or environment? Hence the argument can be seen as rather circular in nature.

Modern psychology, and other disciplines have progressed from examining the question of which one. Social anthropologists perceive such extreme views as “failing to grasp what is distinctively human and how human behavior and cultural traditions have evolved” (Keesing, 1975:28). Psychologists, also, are generally in agreement today that personality, intelligence and susceptibility to certain disorders are shaped by both the environment and genetics and the debate that has historically been framed as an all or none issue, is now examined with respect to the relative influence of each one. Within this interactionist view, however, there are still differing opinions. The first of these asserts that heredity provides us with boundaries within which our environment determines where we develop. Heredity determines what we can do, and environment what we do (Montagu, 1959 in Thomas, 1996:32). The name given to the upper and lower limits provided by genetics is *reaction range* (Weiten, 1992). A prominent proponent of this theory is Sandra Scarr who gives the example of a child with genes programmed for medium/tall. If that child grows up in a poor environment, he or she may be shorter than average. This debate can be discussed with reference to intelligence. According to the reaction range model, children raised in a nurturing high quality environment will reach near the top of their potential IQ range. The opposite would be true for the child with the same genes but a deprived upbringing. While I agree with this theory to a degree, I believe that the range that is implied within this doctrine is too narrow, and does not allow for more significant environmental or psychological factors. Certain occurrences in life, such as the death of a significant other at a young age, can have a profoundly debilitating effect on a child which could significantly influence development and take it outside said boundaries of the *reaction range*.

To counter the “standard” notion of this theory, another interactionist view pioneered by Anastasi (1985), offers the example of a child suffering phenylketonuria. No environmental factor will impact on this child’s mental state. In contrast, the

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appalling case of “Genie” illustrates how dramatic an effect the environment can have on a child, regardless of genetic programming. The case, presented in Giddens (1986), tells of a young girl locked in her bedroom for over ten years, the majority which she spent tied up. When Genie was finally discovered and hospitalised she could not stand erect, run, eat properly, or speak. Genie’s inherited capabilities had no bearing on what her environment produced.

Within the *reaction range* hypothesis it is assumed that boundaries differ for different traits. Eye colour allows little room for the influence of environmental factors such as nutrition. However with complex abilities such as abstract reasoning, the scope for the environmental impact is wide. Anatasi (1985) examined the influence of heredity in light of the direct or indirect nature of genetics. Giving the example of the power of social stereotypes, I do not feel she has offered anything to counter the *reaction range* hypothesis. If a child grows up “intelligent” because she wore glasses and had brown hair rather than blonde, hence was treated as intelligent, Scarr would likely argue she would still be only as intelligent as her genes allowed.

The implications for the debate over genes or environment are serious, especially in respect to education and intelligence. Measuring intelligence is a highly controversial issue even in modern society. The fact that people measure children’s intelligence quotient infers that intelligence is a fixed variable and that genetically their intelligence is predetermined. The children labelled as less intelligent may well remain at the same relative ability level for the rest of their lives for they have become self fulfilling. They may never be pushed or extended because they are thought to be “thick”, and nothing can be done to improve their ability. What people seldom realise when they dismiss children as slow or useless based on their intelligence scores, is they are fundamentally advocating an entirely nature point of view. I believe that most people who become teachers must at least to a certain degree advocate the importance of nurture, as their job would be virtually useless if they believed their teaching would benefit only the more able students.

I feel strongly that teachers must believe in the power and strength of the value of a nurturing environment. While I am not disregarding the highly significant contribution the genetic composition of humans, I think we must believe our children are capable



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of all things and not write them off, categorise them, or dismiss them. As teachers we will encounter issues and theories of practice that we have difficulty accepting. One such dilemma for me is ability grouping in the classroom. How do we, as teachers, group children so their personal needs are being met, without permanently allocating them to that level of ability for the rest of their lives? It is my concern that children placed in lower groups will never be pushed to achieve the same as those at the higher levels, and the belief that they are at the “bottom of the class” may become self fulfilling. A study by Rist (1970), examined this phenomenon with respect to homogeneous grouping. It was concluded that teachers “treated the groups so differently, that the lowest group never had a chance to improve” (Vernon, 1979:26).

While many teachers would say they don't have IQ scores of their children, how different is that from obtaining their school records from previous teachers? This is important, I acknowledge, as there is relevant information to be gained from these reports. However, many teachers would admit to prejudging their children on their marks and comments made over the previous year. This may result in premature homogeneous grouping and pigeonholing. “Once children are fixed in a slower track, it becomes increasingly difficult to promote them to a faster one” (Vernon, 1976:32).

The effects of teachers' judgments demonstrate the way in which environment can significantly influence children's achievement, and indicate we should be mindful of the stereotypes we hold us as teachers. Many teachers have higher expectations of well spoken students, those who are dressed neatly, and those from the middle class. It may well happen that teachers stimulate those children more, and that “the children tend to live up to what the teachers expect of them” (Vernon, 1979:26).

Culture is another important component in the nature/nurture debate that is relevant to the classroom. Many tests or measures of children taken over the years may be culturally biased. Discussing and justifying intelligence tests in the education system, Anastasi, in *Psychological Testing* (1988), confidently states that IQ tests are effective predictors of performance in other areas of life. I wonder how she can possibly know what the “other areas of life” are for many different cultures. An illustration of the inappropriate questions contained in such tests is the question regarding a polo game. Many children from different cultures and socio-economic backgrounds would never

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have encountered this game. Hence the score cannot be relevant, unless knowledge of such events is a valid measure of intelligence. Teachers must make their classrooms a rich environment in that all children can thrive and grow. Many psychologists reject the notion that it is neglect in early childhood or genetic differences that result in intellectual inferiority. They accuse advocates of remedial education programmes of trying to train lower class children in the skills and values of the middle class. “Backwardness is being ascribed to genetic and environmental deficits in the child and his or her family rather than to society and the educational system underlying the social class hierarchy”(Vernon, 1979:161).

The debate over genes versus the environment is far from over, and the implications for those in the domain of education remain significant. As teachers, I think the importance of environment is something we value and incorporate into our classroom practices everyday. Indeed, if we do not believe in the environment as a vital influencing factor, we cannot value the contribution we make to every child who walks through our classroom door. While I do not disregard the important role genetics plays in our constitution, we cannot afford to underestimate the power we have as educators in a country such as New Zealand to empower the children we are responsible for. Every child should be seen as having unlimited potential, and placing any limit on their educational possibilities is an abuse of our power.

### **Bionote**

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