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Darwin for Psychologists: What we can learn from the discussions of evolution biologists

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This article is based on a lecture Greta Sykes gave on social, emotional and behavioural development for the Doctorate Trainee Educational Psychologists at the Institute of Education, London.

Abstract

From their first revelations in the last century until now Darwin's theories continue to evoke strong feelings and debate. In this essay the recent developments in evolutionary biology and biophysics are discussed against the background of the apparent constants of intelligence and genetics. The notion of 'selfish genes' and its economic context is probed in the light of theories about inclusive fitness, group-related adaptation and self-regulation. The disappointing results of the Human Genome Project in terms of numbers of genes has led researchers to continue to seek answers outside the sphere of genes to a better understanding of human nature and nurture. These new findings are important for psychologists. In particular, the essay points out how recent explorations in these related sciences can lead to psychological strategies that can help practitioners support their clients in the field of health and education.

Key words: Inclusive fitness, group-related adaptation, multi-level selection, intelligence, genes, self-organisation

INTRODUCTION

Some *history*

The journey that Darwin made to the Galapagos Islands has now become a tourist trip. "Tailor-made Holidays" are offering family adventures. Back in 1879 Darwin's discovery of mutation and adaptation as tools of evolution shocked the world deeply. His work was immediately condemned by the church and many other bodies. Issues around evolution are still in the eye of current political and intellectual storms. In the US the story of the bible and God"s creation of the earth in seven days is still vehemently defended in some communities. Last year a film on television illustrated that a group of young people who were invited on a trip exploring various ancient aspects of nature were unimpressed by the displays they had seen. They decided the trip would not influence their fundamentalist beliefs even though they were shown a range of mammalian skulls a hundred thousand years old

and the links to present day humans, ancient foot prints of long extinct animals as well as their carbon dating.

Darwin"s findings dethroned humans. The thought that we are supposed to be mere animals similar to other animals was unbearable to many, not just the church. After explicitly declaring that „Selfish genes" rule the universe Richard Dawkins pointed out in „The Blind Watchmaker" (1986):

> "there is no watchmaker in nature just blind forces of physics... natural selection, the unconscious, automatic...process... has no purpose in mind." Mutations and adaptations take place without the organism having any control over either, it is alleged. (p14)

Genes in the economic context of the time

Darwin recognised that one of the determining features of life for all species would be whether adaptation is based on self-interest or group interest. Context, a Bronfenbrenner (1983) axiom, is naturally also a determinant in this. At the time Social Darwinist theorists such as Herbert Spencer (1860) enthusiastically appropriated the theory of the survival of the fittest. It became a powerful and suitable motto in the context of a rising bourgeoisie with an emphasis on individual enterprise. Biologists and sociologists refined the theory of self-interest based on genes. The notion of individual endowment, genius and intelligence became trump cards in research endeavours. Sir Cyril Burt, who we rightly celebrate as the first educational psychologist, nevertheless needs to be mentioned also in terms of his late work which Tommy Mackay labels as having „an obligatory question mark" in relation to his work on intelligence (Educational & Child Psychology, 2013).

The continued solidity of the belief in genes and intelligence is well suited to an economic context that refuses to let go of inequality, and instead forces through a deepening of class structures and deprivation. Genes and intelligence, not unlike inheritance, are viewed as immutable entities in a deterministic universe. Only a few months ago our Prime Minister David Cameron uttered in a radio broadcast that „intelligence was after all genetic". Such views are easily maintained while the focus is on individual attributes rather than the environment. The result is unequal access to education and the lottery of postcode choices of school places for children. One look at current data on children"s achievement and well-being proves that the government"s education reforms are designed to be palliative rather than effective measures for change. That is not to say that teachers, parents and supportive agencies, such as the educational psychology services, are not doing their best to ameliorate the situation brought about by lack of staff, resources and spaces.

The Human Genome Project

The static view of a fixed Newtonian billiard ball universe of genes and intelligence was challenged when the Human Genome Project results came out. Phillip Cohen, Andy Coghlan and Michael Le Page wrote in „Genes that count" (New Scientist, 2001).

> "The finding of our small number of genes "deals a heavy blow to genetic determinism, the idea that many aspects of a person"s life are controlled by their genes... humans have just twice the number of genes of a fruit fly..." (p32).

Since then much laboratory money has been spent to search for genes that express a particular behaviour, such as Attention Deficit Hyperactivity Disorder, intelligence or race, but the number of genes is just too small to be able to account for such complex phenomena. Behind such projects lies the desire to find a simple answer to the complexity of living beings, and, in particular one that can be turned into financial rewards. Bob Holmes (2013) refers to the largest epidemiological study ever done He cites T. Colin Campbell from Cornell University in Ithaca, New York and colleagues in Oxford and China. They found that genetic disposition is insignificant compared with what you eat and what you don"t eat.

Selfish genes or group selection

Although it might seem a little distant from EP work to talk about the details of how we have evolved, it is nevertheless vital to pursue an interest into the different arguments so that we can further refine our case for preventative action - our key interest. Group selection was considered by Darwin and developed in the 1960s by William D. Hamilton who developed the theory of inclusive fitness, only to be quickly rejected when George C. Williams published his book „Adaptation and natural selection" (1996) saying "group-related adaptations do not exist."

David Sloan Wilson (2011) says:

> "Today...there is near universal agreement among those familiar with the subject that the wholesale rejection of group selection was mistaken and that the so-called alternatives are nothing of the sort." (p 41)

However, Wilson adds:

> “Many people who do not directly study the subject, including many biologists, have got the impression that group selection was conclusively disproved...As a result there is widespread confusion.” (p 42).

Recent research has shown that today‟s individuals are tomorrow‟s group – we evolved from single cells which gradually formed multi-cell organisms.

> “The harmony and coordination associated with the word „organism can exist at any level, and individuals can lose these properties when selection takes place within them, such as when cancers evolve (p 42).

Ecological niches

“Nature, red in tooth and claw” goes the saying, but this perspective of life on earth misses the bigger picture. Altieri, (quoted by Coughlan et al, 2007) a marine biologist, found in his experiments at the sea shore in Rhode Island that chord grass, mussels, barnacles and algae all thrived better when they were all present. They form a kind of loose organism in which each member creature cooperates with the other.

Genes and education

It was in 2007 that the human genome was finally unravelled with its disappointing result of a small number of genes. Researchers who were keen to find the genes expected to make up human intelligence did find six that could be shown to have an association with intelligence. Together they account for only 1% of the variation in intelligence between individuals (Andy Coughlan, 2007). Yet the government hold on to their claim of the power of genes, implicitly arguing that each child's attainment is genetically pre-determined. Mary Midgley (2011) finds that our clinging to the competitive, selfish and hawkish (survival of the fittest) notions is not just a matter of imagery and metaphor, but goes to the heart of today‟s thinking. She refers to a number of biologists, such as Steven Rose, Brian Goodwin and Simon C. Morris who talk about the evolution of living creatures as indicated by their ability to self-organise. It is a way of being able to view evolution as intelligent and constructive, rather than a gamble driven by random forces. If a non-competitive image is required, she cites Denis Nobel, systems biologists, who suggest that natural development, not being a car, needs no single driver to direct it. Midgley refers to Peter Corning, director of the Institute for the Study of Complex Systems in Friday Harbor, Washington. He suggests that organisms can guide their own evolution and that this ability has a crucial role in the evolution of life on earth.

Over their lifetime living things make all sorts of adjustments to their pheno-typical existence in order to cope with their living conditions. They grow differently based on how they use their bodies. They turn certain genes on and others off, they learn new behaviours. None of these changes count as evolution, but they can shape the way natural selection acts on genes and thereby influence the course of evolution. Richard Palmer from the University of Alberta in Edmonton, Canada asks "do genes follow where phenotypes wander". Palmer quoted by Holmes (2013) states:

> “Mutation is random, but development is not. Changes that happen to the phenotype that emerge from developmental processes are very often beneficial to the organism” (p 35)

David Sloan Wilson (2011) speaks of multi-level selection and points out that “the suppression of within-group selection is the hallmark of a major transition". He says:

> “Accepting multi-level selection has profound implications. It means we can no longer regard the individual as a privileged level of the biological hierarchy” (p 44).

Laland, cited by Bob Holmes (2013) comments that there are two processes, natural selection,

> “but also this process of niche construction whereby organisms can modify environmental states, often in ways that are beneficial to the organism.... the most sophisticated niche construction being human culture.” (p 36)

Implications for Educational Psychologists (EPs)

What are the implication for us as EPs of these theoretical deliberations? Humans offer an excellent example of multi-level selection and niche construction. The invention of farming 10,000 years ago is a good example of how humans shaped themselves through their own cultural development, thus acting on their genome and thereby self-regulating and influencing their own development. Individuality also appears to play a minor role in recent research into big data from cell phones, social media and credit cards. Alex Pentland (NS,2014) calls himself a social physicist. He searched big data and found that “the largest single factor driving adoption of new behaviour was the behaviour of peers.”

All these points confirm the vital role Bronfenbrenner‟s (1983) eco-systemic perspective has which EPs already base much of our work on and which forms the basis of

the Doctorate in Professional Education, Child and Adolescent Psychology at the Institute of Education. The key role of social learning has been shown by Peter Blatchford"s 2013 research into classroom assistant"s support for children with special educational needs (SEN). He illustrated that the removal from the collective of the class environment hindered a majority of children with SEN from making progress. The research further emphases the important role interviewing children and young people has. Finding out what their views are of their learning development and learner identity can help them understand how they can become self-efficacious, be able to envisage and make choices and take charge of their own learning. Using personal construct psychology and cognitive behaviour therapy are further strategies that EPs can employ to assist young people towards greater independence. Learning and copying the behaviour of peers helps them find their way in a complex society. However, if the main attributes of the social world are experienced as mean and spiteful this can have devastating effects. With all the specialist knowledge Trainee EPs learn in their three years studies they are in a good position to be mindful and alert to the needs of children and young people.

Learning to become and stay flexible in behaviour and development can help an individual adapt successfully to a variety of environments. As EPs we are familiar with a concept that is similar to self-regulation, namely self-efficacy. Self-efficacy could become an even more powerful tool among the strategies EPs use when working with families, once it is underpinned with the knowledge that it is related to the purposeful endeavours of individuals and groups to live harmoniously in their given environment.

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