

Social class through the evolutionary lens

Daniel Nettle looks to an unexpected source for answers

One of the most striking things about humans is that they behave in different ways in different places. You don't need to travel to an exotic location to see this: just stroll through different districts of your nearest city. You'll see vast differences in behaviour over the space of just a couple of miles. You might think that this flexibility undermines the case for explaining human behaviour in evolutionary terms, but in fact the opposite is true. It's natural selection that gave us (and other animals too) the ability to vary our behaviour in response to local context, and natural selection can help explain the ways we deploy that ability. This means that the social sciences and evolutionary biology have a lot more in common than we usually imagine.

Differences in behaviour between members of different social classes in Britain are very substantial, and have failed to diminish despite decades of increase in the standard of living. Why should these differences persist, and why do they take the form that they do?

There are many approaches one might take to this problem, but I find a Darwinian one helpful. This might come as a surprise to some readers. Evolutionary theory is not the place most social scientists would think of looking to in order to address questions about social differences in behaviour in contemporary societies. This is because offering an evolutionary explanation is often misunderstood as claiming that the behavioural difference in question is somehow genetically determined, or that the social conditions relevant to understanding behaviour are those which faced our Pleistocene ancestors, not those we currently experience. These ideas would rule evolutionary models irrelevant to current social class differences, since the urban poor live in conditions that are novel to the last few hundred years, and since class differences in behaviour are clearly caused by different social environments, not genetic polymorphisms.

However, neither genetic determination nor a disregard of current social conditions is a necessary feature of evolutionary explanations of behaviour. The central premise of behavioural ecology, for example, is that animals possess behavioural flexibility, and use this to do as well as they can in terms of reproductive success given the ecological context in

which they find themselves (Krebs & Davies, 1997). Thus, individuals of the same species can behave in dramatically different ways if the pattern of opportunities and dangers that they face varies (Hill & Dunbar, 2002). Genes are causally involved in this behavioural flexibility only at a remove. That is, genetic evolution has created flexible cognitive mechanisms, coupled with deep motivational patterns, which animals deploy strategically given the circumstances under which they have to live.

There is an interesting echo here of the structure versus agency debate in social science (Giddens, 1984). Are patterns of behaviour determined by the choices of individuals, or by the overall structure of society? The synthetic position, that individuals deploy agency but have to do so given the constraints that the social structure imposes on them, is very similar in essence to the basic ideas of behavioural ecology, which say that individual organisms make – at some level – decisions about what to do, but those decisions are conditioned by the ecological context in which they live.

Thus, an evolutionary approach to social class differences would begin by assuming that individuals of different socio-economic positions (SEP) experience different ecologies. By examining the features of these ecologies, we can make predictions about what behavioural differences we should expect to see as people seek to preserve their fundamental interests given their local context.

Life-history theory

Life-history theory is the branch of evolutionary theory that deals with how an individual should allocate energies to different functions – growing, learning, mating, reproducing, self-care – over time (Schaffer, 1983). The optimal balance between these competing activities will depend critically on the local ecological regime. One of the most fundamental features of any ecology is the rate of

questions

Is explaining something in evolutionary terms at odds with explaining it in terms of the social environment? If so, why? Does the fact that humans are affected by social context make them different in kind to animals of other species?

resources

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mortality and morbidity, which acts as a kind of master parameter affecting optimal behaviour. These rates are so important because they dictate the time horizon. A female who delays reproduction may be able to improve her condition by so doing, but this will be maladaptive if she dies or is incapacitated before she gets a chance to reproduce; so delaying reproduction is not favoured in harsh environments. Similarly, where mortality is low, a female may do well by having a small number of offspring and investing a great deal of care in each one, but in a high-mortality world, such a strategy would have a high chance of leaving her with no offspring at all surviving to adulthood.

Thus, the general pattern, across a large number of mammalian species, is that the higher the local mortality, the 'faster' the life-history strategy individuals follow (Promislow & Harvey, 1990). 'Faster' in this context means, for females, earlier onset of reproduction – and hence, early cessation of personal growth – larger numbers of offspring, shorter gestation, and shorter lactation. For males, it means earlier and increased mating effort (which includes male–male antagonistic competition) at the expense of paternal investment and self-care. As well as differences in life history between species, there is flexibility within a species. Between-species differences and within-species flexibility have different origins – fixed genetic differences in the one case, and developmental plasticity in the other – but both can be seen as adaptive responses to ecological context.

Reasoning from evolutionary first principles, then, we could predict that if humans lived in two ecologies, one of

which had a low rate of mortality and morbidity, and one of which had a higher rate, then the individuals experiencing the harsher regime would tend to favour earlier reproduction, smaller adult size, larger families with reduced investment in each child, shorter lactation, reduced paternal involvement with children, and greater rates of antagonism amongst young men. Many of these differences are empirically confirmed at the between-population level amongst humans. For example, one recent theory surrounding pygmies is that they are essentially groups facing extreme levels of mortality, who have adapted by early reproduction and

the striking differences in behaviour within a developed post-industrial society as well?

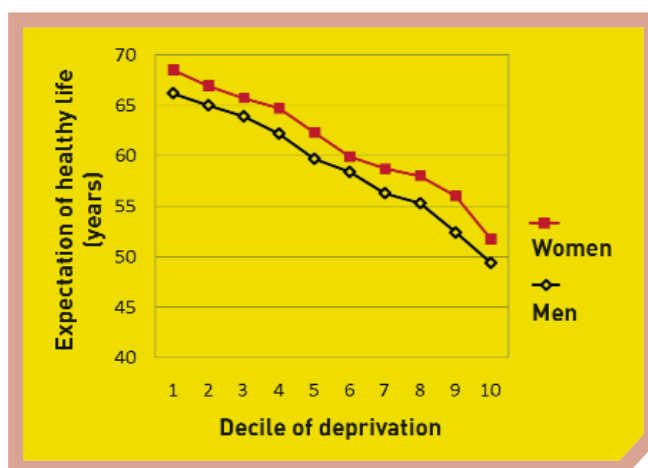
Dying young and living fast

The first thing to establish is whether different socio-economic groups in Britain actually experience different mortality-morbidity regimes. The answer is a resounding yes. Madhavi Bajekal (2005), head of the government's Morbidity and Healthcare team, used 'expectation of healthy life', the length of time a person can expect to be alive and in good health, as a single index of morbidity and mortality. A deprivation score was then

created for each electoral ward, based on the proportion of the residents in semi-skilled or unskilled jobs, unemployment, car ownership, and residential overcrowding. The results (left) showed that people in the most deprived wards of Britain can expect barely 50 years of healthy life, almost two decades less than those in the most affluent areas.

The reader may object at this point that some of these differences in mortality are a consequence of class differences in behaviour, and cannot therefore be used to explain class differences in behaviour. This is true to some extent. Lower SEP is associated with reduced compliance with health advice (Pill et al., 1995), more smoking (Jarvis et al., 2003), poorer diet

(Panagiotakos et al., 2008) and more violence (Shaw et al., 2005), amongst other things. However, even allowing for these behavioural differences, there is a residuum of increased hazard in the most deprived areas, which stems from more dangerous jobs, the quality of the built environment, less safe vehicles and appliances, pollution, and other environmental factors. Thus, however



The expectation of healthy life at birth (years), by decile of electoral ward social deprivation (1 = least deprived 10 per cent of wards; 10 = most deprived 10 per cent of wards). Data from Bajekal (2005).

hence short adult stature (Migliano et al., 2007). Across a set of small-scale subsistence societies, every 10 per cent decline in the infant survival rate decreases mothers' age at first birth by a year (Walker et al., 2006). Across the world's countries, life expectancy is a strong predictor of women's age at first reproduction (Low et al., 2008). Could such a simple principle as this help explain

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people in deprived areas behave, they will be exposed to a somewhat harsher ecology than people in more affluent neighbourhoods. Indeed, evolutionary theory actually explains why people living in the most deprived conditions, the very people who seem to have most need to look after their health, have the least incentive to do so.

To understand this, it is important to distinguish between extrinsic and intrinsic mortality. Extrinsic mortality is mortality whose likelihood is relatively unaffected by behaviour. For example, there might be lead fumes in the air of your neighbourhood, and there is not a great deal that you can do to avoid exposure. Intrinsic mortality is mortality that is a consequence of the individual's decisions, for example to ignore medical advice or

is not that long? Survey evidence shows that Britons living in more deprived conditions have lower subjective expectation of life, less interest in their health or in the future, and an increased belief in the role of chance in determining health (Wardle & Steptoe, 2003). These might be quite accurate assessments of the circumstances under which they live, and could certainly explain socio-economic differences in health behaviours.

Low-SEP behaviour as an adaptive behavioural syndrome

As we have seen, many important behaviours and outcomes show social gradients in Britain. Epidemiologists are good at describing these gradients, and governments are good at 'being concerned' about them, because of their consequences for public health. However, each of the inequalities tends to be treated piecemeal, as if they were unrelated to all of the others, and they are generally conceptualised as the consequence of ignorance or error. For example, the UK government's attempts to reduce the teenage pregnancy rate are mainly centred around educating young people about reproduction and contraception. However, such programmes appear to be ineffective (Henderson et al., 2007), as it is not clear that ignorance about reproduction is the cause (Arai, 2003). Younger women in low-SEP areas have lower target ages for reproduction (Jewell et al., 2000), and the correspondence between target age of reproduction and actual behaviour is fairly good (Nettle et al., 2009). As Arai (2003, p.212) puts it, 'policymakers find it hard to believe that young women, often in the least auspicious circumstances, might actually want to be mothers'.

An integrative life-history approach, inspired by behavioural ecology, would instead work with the following premises. First, the different behaviours associated with poverty are not independent. They constitute coherent parts of a way of trying

to live. In the animal literature, such suites of different but adaptively coordinated behaviours are known as behavioural syndromes (Sih et al., 2004). Secondly, from an evolutionary point of view, these behaviours may not be mistakes, but adaptive responses to prevailing ecological conditions. For example, the greater anxiety in low-SEP communities reflects the adaptive function of anxiety mechanisms, which is to detect threats; and these environments actually are more dangerous. Shortened breast-feeding may reflect a priority to cease investment in already-born offspring early in order to reproduce again soon.

Calling these behaviours adaptive does not mean they are desirable. They are not (although the social stigma attached to teenage pregnancy in Britain is out of proportion to the harm, if any, that it causes; Geronimus et al., 1994; Shaw et al., 2006). Maximising reproductive success and being socially desirable are two quite different things, and the one cannot be derived from the other. But it does mean that we can use the tools of evolutionary theory to predict exactly how indicators such as the age at reproduction will respond to changes in fundamental ecological parameters, such as the rate of mortality (Geronimus et al., 1999; Low et al., 2008). It also means that we don't have to view the poor as stupid, ignorant, damaged, or temperamentally different from anyone else. They are just human beings, doing as human beings do, which is to make the best of the hand they are dealt, and we can build principled accounts of why they do so in the way that they do.

Poverty, poverty, poverty

Sociologists are often critical of public health research, which focuses on individual health issues without regard to the profound structural inequalities under which people live. The view from behavioural ecology is very similar, and this is no bad thing, since Darwinian approaches have more in common with



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Young mothers training class in Tower Hamlets

not eat well. The choice to reduce intrinsic mortality by taking care of one's health can be seen as a kind of investment; it takes some effort, and one has to forgo current utility, but there is a payoff down the line. However, as rate of extrinsic mortality goes up, the return on investment in looking after oneself goes down (Robson & Kaplan, 2003). This is intuitively clear: who would spend much money on regularly servicing a car in an environment where most cars were stolen each year anyway? Similarly, why engage with looking after one's health for the very long term when whatever you do, the long term

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traditional social science than is sometimes claimed (Nettle, 2009). But the Darwinian angle adds value, in two ways.

First, behavioural ecology brings to bear a sophisticated armamentarium of theoretical modelling and empirical knowledge of other species, which may be usefully combined with social science data. For example, Grainger and Dunbar (in press) use an evolutionary simulation technique to show that, in order to achieve equal life-time reproductive success given their known rates of mortality and morbidity, British women in the unskilled social classes need to begin their reproduction at least half a decade earlier than women in the professional social classes, which is exactly what they do.

Second, there are times where evolutionary theory makes a prediction that runs opposite to our pre-theoretical intuitions, but turns out to be right. Intuitively, we might think that increasing the wealth of families in developing countries would only exacerbate those countries' population explosions, but in fact we know the opposite is true. Intuitively, we might think that low birthweight or early-life stress would slow down girls' reproductive development. In

fact, it speeds it up (Adair, 2001; Ellis, 2004). Evolutionary models successfully predict these dynamics.

The behavioural ecological view may also have implications for public policy. We should not be surprised that social gradients in diet, breast-feeding or teenage pregnancy have failed to diminish, since the underlying inequality of our society has not diminished either. The lesson of behavioural ecology is that if you want to change an organism's behaviour, you need to change its environment, which means that actually reducing poverty in the most deprived areas of Britain is likely to be far more influential than superficial education or awareness-raising schemes (see Lynch et al., 2000 for a similar argument). For example, a fluke increase in income in a poor US community (from royalties from a casino that happened to be built on their land) led to an unanticipated reduction in conduct disorders amongst young people (Costello et al., 2003). It is hard to identify a deliberately designed intervention that has had such effects. How quickly relief of poverty will affect behaviour will depend, though, on the nature of the psychological mechanisms by which the environment 'gets under the skin'. Accordingly,

behavioural responses to relief of poverty may follow quickly or may take a generation or more to work through. This is an area that researchers are beginning to address.

These are important issues for the well-being of the population – issues where ultimate evolutionary models can play a role in enriching the explanatory depth and predictive power of social theories. However, we can only make progress if we can finally banish the misapprehension that 'evolved' means the opposite of 'learnt', or that 'evolutionary causes' are the opposite of 'social causes'. To achieve this, social scientists need to learn much more about evolutionary theory, and evolutionists learn much more about social science, because the two are not opposed endeavours. Evolutionary thinking in the human sciences is nothing more or less than the holistic, integrative understanding that we, like other animals, respond to our social and developmental environment in non-arbitrary ways.

I Daniel Nettle

is Reader in the Centre for Behaviour and Evolution, Newcastle University
daniel.nettle@newcastle.ac.uk