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Book Review

Matt Ridley. 2003. *Nature via Nurture: Genes, Experience, and What Makes Us Human*. Harper Collins, New York. 336 pp. $26.95.

Nature via Nurture (NvN) is a wide-ranging introduction to the pervasive role of genes in human and animal behavior. It is written for a general audience, with some attendant heavy-handed literary devices (e.g., 'Prolog: Twelve Hairy Men'), but, because of its extraordinary broad, insightful, and technically accurate coverage of scholarly literature, it has much to offer college students and even specialists. As we might expect from the author of *The Red Queen* and *The Origins of Virtue*, the book has a strong evolutionary emphasis. Ridley is anxious to show us the importance of genetic ideas for evolution (e.g., a single gene, ASPM, appears to control overall brain size in a simple way, p. 37). I find the book's integration of genetics and evolution very appealing.

The title suggested to me that the book would focus on behavioral genetics, which presents a relatively refined, quantitative, version of the 'nature-nurture controversy,' permitting phenotypic variation to be decomposed into multiple genetic and environmental components. This requires a lot of not-too-plausible assumptions, including, usually, lack of genotype-environment interaction. *NvN* presents some studies that are critical of this assumption (e.g., Eric Turkheimer's on IQ, p. 90), but there is much less emphasis on this topic than I anticipated, and there is even an explicit statement (p. 80) that G-E interaction is not always important. More generally, *NvN* is respectful of behavioral genetics, to the point of freely citing standard heritability and environmentality statistics without any discussion of the assumptions under which they were derived. Not everyone is pleased with this approach (see Laland, 2003), but instructors using *NvN* as supplemental reading can easily fill in what Ridley omits.

NvN is more concerned with crude 'one-or-the-other' versions of the nature-nurture debate than he is with the behavioral genetics version. Moreover, he is more concerned with species-general traits and species differences (e.g., Tom Insel's amazing work on genetic control of pair bonding in voles [pp. 42–46], than with individual differences. In this respect, the orientation is more that of evolutionary psychology than that of behavioral genetics, though, to his credit, Ridley considers both kinds of problems. He gives the nice example (p. 76) of ten human fingers to illustrate that full genetic determination is fully consistent with zero heritability.

Nature via Nurture has two distinct themes, and I think the book might have been improved by emphasizing the distinction. One is that the environment influences gene expression during development, thus influencing the way the body and brain are built. The genome is the same in a fingernail cell as in a muscle cell, but fingernail cells and muscle cells develop differently. Similarly, the distinctive neurological connections corresponding to fluent speech in one's native language are laid down during language acquisition in the early years. This theme is a backdrop to traditional (i.e., non-molecular) behavioral genetics courses, even though such courses do not have much to say about the details of neurodevelopment.

A second theme, greatly emphasized in *NvN*, is that genes modulate environmental influences in mature organisms, and, more generally, 'run the body.' The second theme, unlike the first, is somewhat neglected in traditional behavioral genetics courses. I think reading assignments from *NvN* would be a good way to expand coverage of this theme.

I should mention a small exception to the book's very high level of technical accuracy. *NvN* claims (p. 78) that twins raised together, seeking distinct niches, are less similar than twins reared apart. Students find this very intuitive, but I am afraid that the evidence does not support it. It is a major finding of behavioral genetics that twin correlations for many traits are nearly the same for twins reared apart and twins reared together (environmental similarities don't produce behavioral similarities). But I don't know of any examples where the correlation is significantly *smaller* for twins reared together.

I have so far discussed possible use of *NvN* as a source of supplementary reading in behavioral genetics courses, but I think it might also add a useful dimension to courses in evolutionary psychology and human behavioral ecology. These courses tend to adopt a principled indifference to genetics under the umbrella of the phenotypic gambit, one aspect of which is that genetic 'constraints' may not be very relevant to human evolution (see Laland and Brown, 2002, p. 136). This viewpoint pervades the human behavioral evolutionary disciplines, with the exception of gene-culture coevolutionary theory. There is not much use complaining about the phenotypic gambit as a research strategy, since, in a great many cases, there is no present alternative. But one ought not to let one's courses convey the impression that genetics can be safely ignored by psychology and anthropology students. If that impression is not effectively countered in lectures, supplementary reading assignments from *NvN* would have the desired effect.

One can usefully add some evolution to one's behavioral genetics course, or some genetics to one's evolutionary psychology course, but there is much to be said for giving genetics and evolution roughly equal coverage within the same course, which is what I have been doing for many years in a course entitled 'Genetics, Evolution, and Behavior' at the University of Pennsylvania. The first half semester treats behavioral genetics, and the second treats evolution of psychological mechanisms from a genetic point of view; so it is fair to say that the whole course is genetically oriented. *NvN* chapters 1–4 and 6–7 supplement the behavioral genetics part of the course. These chapters cover instinct, behavioral genetics, schizophrenia, effects of early environment, and the role of genes in learning. Students submit e-mail essays on these readings, and the readings are discussed in brief seminar sessions separate from the lectures. The lectures treat hard-core traditional behavioral genetics, emphasizing the many very restrictive assumptions of classical models (e.g. no genotype-environment interaction). Norman (2002) gives a very condensed version of some of my behavioral genetics lectures.

The second, evolutionary, half semester uses Chapters 3–6 of Laland's and Brown's (2002) *Sense and Nonsense* as the main reading. These chapters treat human sociobiology, human behavioral ecology, evolutionary psychology, and memetics. I also assign Richerson & Boyd (2001) for gene-culture coevolution, and Eisenberg (2001), which treats a phenomenon, adoption, that sits uncomfortably alongside the standard evolutionary psychology account of male sexual jealousy, based on loss of fitness when resources are expended on another man's child.

The lectures in the second half semester develop classical large population one-locus selection theory assuming random mating, and attempt to illustrate psychological issues within this narrow framework. Thus, for example, one see that, under these and other stringent assumptions, evolutionary dynamics is simpler to describe at the level of gene fitnesses and gene frequencies than at the level of genotypic fitnesses and genotype frequencies, thus providing a quantitative foundation for a 'gene's eye view.' However, one notes that genic fitnesses are frequency dependent, as is their ordering in the case of overdominance, so some of the alleged simplicity of this view is illusory. The evolutionary dynamics of kin selection is treated by simply replacing classical fitnesses by inclusive fitnesses. This high-handed approach permits students to see that superior inclusive fitness, usually diagnosed by W. D. Hamilton's cost-benefit analysis (see Laland and Brown, 2002, p. 77), does not ensure superior asymptotic frequency in certain cases where the genotype underlying the fittest phenotype is heterozygotic. Similarly, an evolutionarily stable strategy in simple (implicitly haploid) evolutionary games would not be dynamically stable if its underlying genotype were diploid and heterozygotic. Such examples motivate a critical (but respectful) discussion of the phenotypic gambit.

As in the first half-semester, the readings and lectures are separate instructional streams. Laland and Brown (2002) and Richerson and Boyd (2001) complement the lectures with an attractive survey of different approaches to the evolution of behavior and psychological mechanisms. Student seem to find the breadth of the reading in both half-semesters a welcome respite from the methodological focus of the lectures.

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M. FRANK NORMAN
University of Pennsylvania, USA
(norman@psych.upenn.edu)