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Research Dialogue

Evolutionary psychology and consumer behavior: A constructive critique

Joel B. Cohen [a,*], H. Russell Bernard [b]

[a] Warrington College of Business, University of Florida, Gainesville, FL 32611, USA
[b] Department of Anthropology, University of Florida, Gainesville, FL 32611, USA

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Abstract

We examine the theoretical basis for the evolutionary narrative common to the target papers by Saad (this issue) and by Griskevicius and Kenrick (this issue) and identify areas of controversy that have sparked debate about evolutionary psychology [EP] among biologists and behavioral ecologists. The two main areas of disagreement are over (1) the role of genetic adaptations resulting from natural selection in ancient times compared to other forces leading to current behavior; and (2) the likelihood that evolution resulted in a set of highly specialized mental modules or information-processing circuits thought to be instrumental in determining present-day behavior. We review the EP research discussed by the authors of the target papers as a means of evaluating the evidence in support of the theory and of suggesting future directions of research.

Keywords: Evolutionary psychology; Inheritance; Modularity; Biology and culture; Behavioral ecology

Introduction

The two target papers, by Griskevicius and Kenrick [GK] and by Saad [S] highlight the advantages of viewing consumer behavior through the lens of evolutionary psychology [EP]. In what follows, we identify some issues and controversies inherent in the EP perspective and possible future directions.

An evolutionary approach to behavior

Prior to the evolutionary synthesis of the 1940s (Huxley, 2010, 1942) scant attention was paid to the evolution of human behavior, which was still a matter of some controversy. In *Descent of Man, and Selection in Relation to Sex* Darwin (1874) had made clear that his theory of natural selection was just as applicable to the evolution of human thought and human behavior as it was to the evolution of gills and lungs, wings and tails in nonhuman animals. He wrote: "A tribe including many members who, from possessing in a high degree the spirit of patriotism, fidelity, obedience, courage, and sympathy were always ready to aid one another, and to sacrifice themselves for the common good, would be victorious over most other tribes; and this would be natural selection" (Darwin, 1874, p. 132). Resistance to these ideas continued to be strong (see Richerson & Boyd, 2001 for a review). Wilson's (1975) synthesis of prevailing views appeared to settle many issues: genes (segments of DNA that code for a protein) were understood as the primary agent of human evolution by incorporating variance produced by sexual reproduction over time as well as more abrupt mutation (primarily from DNA replication failures and exposure to environmental factors). There is, however, continuing controversy over the extent to which genetic adaptations, most dating from Pleistocene hunter-gatherer times (discussed further below), are primarily responsible for many of the heritable behaviors and predispositions studied by EP and other behavioral and social scientists. There are many examples of plasticity in pre-existing genetic and developmental capacities that allow for substantial variations in visual processing, bodily structure, language comprehension, and so forth and which argue against a gene-dominant view of such inheritance (West-Eberhard, 2003). In what has been termed a

* Corresponding author.
E-mail address: joel.cohen@warrington.ufl.edu (J.B. Cohen).

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"paradigm shift," the science of genetics now sees DNA as dynamic (rather than largely static) and "subject to a wide array of rearrangements, insertions, and deletions" (Charney, 2012, p. 331).

Evolution and inheritance

Emerging trends in evolutionary science suggest that human inheritance involves a complex interaction between genetic, epigenetic and learned information, all of which respond to features of the physical and social environment that we have increasingly helped to construct (Bolhuis, Brown, Richardson, & Laland, 2011). We begin with the idea that natural selection operates on phenotypes (because they interact directly with the environment) rather than on the underlying genetic material — DNA. Though genes remain central, recent work on inheritance has cast a broader net to identify factors pivotal to phenotype development (see Jablonka & Lamb, 2007). Epigenetic processes (in which the transmission of phenotypic variations across generations does not stem directly from DNA/genetic differences) have garnered increasing attention, and have been said to represent "a new frontier in the study of mammalian behavior" with particular implications for the human brain (Charney, 2012, p. 332).

We first discuss the cellular epigenetic process. The complex biochemical system that regulates DNA expression enables the inheritance of traits with no changes to the DNA sequence (Charney, 2012). A large number of recent studies have been reported by the Encyclopedia of DNA Elements Encode Project Consortium (2012), including the initial analysis of 1640 data sets examining the entire human genome. Among the key findings is that over 80% of the genome is involved in such biochemical functions and that a roughly equal proportion of these lie outside protein-coding genes. This research supports an increasing role for other cellular influences, particularly in regulating the extent and timing of gene expression/repression and modulation. For example, while earlier research on cancer and other diseases focused almost entirely on protein-coding genes, it now appears that cellular regulatory processes play an essential role.

Embryonic interactions between mother and embryo, such as through hormonal variations induced by environmental factors or bodily states represent a second category of developmental epigenetic processes. Embryonic influences on phenotype variation are well known. In species where multiple offspring in the uterine environment can have a severely biased sex-ratio, for example, a testosterone-rich environment often induces a similar hormonal and behavioral state in daughters. This can be perpetuated across multiple generations. Inherited food preferences in rabbits have been shown to result from information transmitted via the mother's milk and feces during gestation, possibly leading the young to make less risky food choices when on their own. Heijmans et al. (2008), in a well-controlled study, found that even a short famine (the Dutch Hunger Winter in 1944–45) produced epigenetic changes in human DNA that have persisted for six decades as a result of prenatal exposure. They describe the process as superimposing on the DNA sequence, a "layer of epigenetic information that is heritable" (p. 17046).

An extreme focus on early (e.g., Pleistocene) genetic adaptations may also be unwarranted. Environmental pressures over a period of time alter living patterns, including shared mate phenotype preferences for advantageous features (e.g., body type, contraindications for certain illnesses) resulting in opportunities for adaptive genetic change: "If conditions persist, natural selection will favor the most well-adjusted phenotypes and the genes underlying them — the genes whose effects lead to a more reliable, faster, developmental adjustment, or the ones with fewer undesirable side-effects" (Jablonka & Lamb, 2007, p. 362). In short, because the genome is a good deal more responsive to the environment than many had thought, both cellular and embryonic epigenetic influences on phenotype development can bring about subsequent genetic change (Gluckman & Hanson, 2005). Importantly, then, genetic adaptations useful in ancient times, may have a less significant role today — a topic to which we return later.

Socially mediated information transmission affects survivability and reproductive fitness and hence is a second major non-genetic input to natural selection of successful phenotypes. It is a particularly powerful engine for inheritance of preferences and behaviors across a wide range of activities (e.g., food and habitat, predation and defense, mating and parenting), especially in conjunction with evolved capacities for symbolic communication (Gluckman, Hanson, & Beedle, 2007; Richerson & Boyd, 2005). Even in species lacking such capacities, there are many examples of sophisticated information transmission. A classic example would be blackbirds exposed either to the mobbing behavior of a familiar predator or to the same mobbing behavior of a novel, harmless animal (Curio, Ernst, & Vieth, 1978). The latter blackbirds not only continued to mob the non-predator but, of evolutionary significance, also could induce similar behavior in other naïve blackbirds, demonstrating the ability to learn and behave in a way that would protect their young even when there was no survival threat from an actual predator. While there is clearly a genetic adaptation for mobbing, the specific behavior toward a harmless animal reflects socially mediated learning. Similarly, though a genetic adaptation enables migratory birds to navigate, their actual behavior can vary with changes in their environment. In one set of studies, lack of exposure to celestial cues prior to the time of migration or exposure to artificial night skies and a different reference star produced no migratory behavior in the first instance and perfect navigation but oriented to the wrong northern star pole in the second (Emlen, 1970).

One important implication for human behavior is that genetic influences affect underlying potentialities and constraints (i.e., the ability to carry out some action) to a much greater degree than they affect the specific content of a thought or action. There is less reliance on exclusively parent–offspring interactions in the ability of socially mediated information transmission to affect inheritance, though unlike genetic influences it cannot skip generations. Its effects can be intensified considerably when a prior generation creates an ecological niche (e.g., a dam constructed by beavers, human habitats, and societal infrastructure), and subsequent generations teach their offspring patterns of

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