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## Are adaptations necessarily genetic?

Steven J. Scher, *Eastern Illinois University*



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## **Are Adaptations Necessarily Genetic?**

Steven J. Scher

Buss, Haselton, Shackelford, Bleske, and Wakefield (1998) are to be commended for clarifying concepts from evolutionary science and detailing the utility of these concepts for psychology. Rather than contribute to the emotion-laden arguments that have accompanied much of the development of evolutionary psychology, Buss et al.'s contribution helps psychologists apply ideas from evolutionary biology to the study of mind and behavior.

However, Buss et al. (1998) erred when they wrote that "there must be genes for an adaptation because such genes are required for the passage of the adaptation from parents to offspring" (p. 535). It is incorrect to say that genes are the only way behavioral or psychological features can be passed from parents to children. Decades of research have demonstrated that children are likely to have the same religion, political affiliation, and socioeconomic status as their parents. Surely Buss et al. don't believe that there are genes for these characteristics. Nonetheless, these features have passed from parents to offspring.

Buss and his colleagues might argue that the examples given above are not adaptations because they don't solve an adaptive problem or don't have the design features that characterize adaptations. However, there is nothing inherent in these features that precludes them from being adaptations, unless one simply defines an adaptation as being passed down by genes. There is no a priori reason why these features are any less likely to be adaptations than, for example, the tendency to be a short-term or long-term strategist in mating ( Buss & Schmitt, 1993) or to solve problems of social deception ( Cosmides, 1989).

Buss et al. (1998) defined an adaptation as an "inherited and reliably developing characteristic that came into existence as a feature of a species through natural selection because it helped to directly or indirectly facilitate reproduction during the period of its evolution" (p. 535). However, the degree to which a feature facilitates reproduction—its inclusive fitness—"is not a property of an individual organism but rather a property of its actions or effects" ( Buss et al., 1998, p. 534). The effects of a phenotype determine whether those effects will be selected. How those phenotypic effects arise is irrelevant to the selection process.

Phenotypic psychological mechanisms surely arise through a complicated process. The role of genes is likely to be rather far away and indirect. Certainly, our current understanding of the relationship between mind and body limits our ability to understand how genes—which code for physical structure—contribute to psychological development. Although the physical body can be measured in terms of the parameters of the physical world (e.g., mass, volume, velocity), these parameters do not apply to the mental world ( Williams, 1985). Until parameters that apply in

both domains can be identified, it will be difficult to understand how genes affect behavior.

In the meantime, it is entirely possible to imagine adaptations that are “reliably developing characteristic[s]” ( Buss et al., 1998, p. 535), not because specific genes have been developed for their assembly, but because a cultural transmission system has selected cultural products that facilitate reproduction. Take, for example, human mate selection. Buss (e.g., 1989) has convincingly demonstrated a set of sex differences that appear in many cultures. However, nothing in the data Buss has collected (or in the hypotheses he has generated) relates to a genetic basis for these differences. If the tendency of men to put a greater emphasis on physical attractiveness, for example, solved an adaptive problem for men, and if the emphasis on physical attractiveness by men could be acquired from one’s parents through some form of social learning (a fact that seems not only possible, but likely), then men who acquired this tendency would have more children, and this tendency would therefore spread throughout society. (This example obviously needs more elaboration. However, it is included here only as a means of illustrating the conceptual points being made.)

Determining whether genetic or cultural selection (or some combination of these) contributed to the evolution of a psychological adaptation requires a careful specification of a proposed natural history of the feature—a point that Buss et al. (1998) appropriately made the focus of their article. This point is even more important given the position I advocate. The steps the feature has passed through and the functions served at each of those stages should be described. The natural history should include a consideration of what means of transmission and what ontogenetic factors have affected and continue to affect its development.

This natural history will generate evolutionary hypotheses, and “all evolutionary hypotheses . . . should be formulated in a precise enough manner to produce empirical predictions that can then be subjected to testing and potential falsification” ( Buss et al., 1998, pp. 544–545). If one wants to comment on what means of selection led to the evolution of the adaptation, then these hypotheses should include predictions that would differ depending on whether there was genetic or cultural selection ( Scher, 1997). If research confirms hypotheses that uniquely depend on there being “genes for” a particular feature, then the genetic nature of the feature would be supported. If such differential hypotheses cannot be generated, then one cannot address which method of selection was involved.

This does not mean that one cannot fruitfully continue to study the adaptation without determining which means of selection was involved. A theory will be valuable to the extent that it leads to more hypotheses and the collection of further data. Buss et al. (1998) cited a variety of studies that have been generated by adaptationist thinking, attesting to the strength of evolutionary psychology as a paradigm. However, few of these studies had anything to say about the genetics of the mechanisms studied, let alone compared genetic and cultural selection models.

Buss et al. (1998) made a valuable contribution to thinking about evolutionary psychology. However, their insistence that adaptations are by necessity genetic is in error. It is not valuable to omit viable mechanisms for the development of psychological features from study by definition. I encourage Buss et al.—and all psychological scientists—to be even more “pluralistic about the conceptual tools of evolutionary psychology” (p. 545).

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