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Evolutionary developmental psychology: Contributions from comparative research with nonhuman primates ☆

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Abstract

Evolutionary developmental psychology is a discipline that has the potential to integrate conceptual approaches to the study of behavioral development derived from psychology and biology as well as empirical data from humans and animals. Comparative research with animals, and especially with nonhuman primates, can provide evidence of adaptation in human psychological and behavioral traits by highlighting possible analogies (i.e., similar function, but independent evolution) or homologies (i.e., inheritance from a common ancestor) between human traits and similar traits present in animals. Data from nonhuman primates have played a crucial role in our understanding of infant attachment to the caregiver as a developmental adaptation for survival. Primate and human data are also consistent in suggesting that female interest in infants during the juvenile years may be a developmental adaptation for reproduction that facilitates the acquisition of maternal skills prior to the onset of reproduction.

Keywords: Evolution; Development; Behavior; Comparative research; Nonhuman primates

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There are two conceptually different views of organisms' development. In one view, development is a linear process of maturation whose endpoint is the adult individual; young and immature individuals are viewed as incomplete or miniaturized versions of the adult. Students of development who embrace this view typically emphasize continuities across stages of development, and the causal connections between earlier stages of development and subsequent ones. For example, they study adults retrospectively to identify developmental precursors of their traits, or they study young individuals prospectively to assess whether their early characteristics can predict their subsequent phenotype (see Kagan, 1996). This view often assumes that there is a normative development and that deviations from the norm are pathological.

In the other view, development is seen as a series of successive stages, each with its own problems requiring a specific solution, and without any endpoint to be reached. Individuals of different ages are seen as occupying different social and ecological niches and exhibiting adaptations to them similar to those of adult individuals living in different environments (e.g., Oppenheim, 1981). These developmental (or ontogenetic) adaptations may disappear and be replaced by new ones as the individual moves from one niche to the next. Students of development who embrace this view emphasize discontinuities across stages of development and the functional significance of particular developmental phenotypes rather than their causal connections with preceding or subsequent ones. They appreciate that variants of a particular phenotype may have meaningful functional significance, that is, be adaptive, instead of identifying one developmental pathway as normative and the others as pathological deviations from the norm. In other words, they appreciate the notion that alternative developmental pathways and the potential to express them may evolve as conditional life-history strategies (Stearns, 1992), that is, adaptive responses to the particular environments in which the individuals are situated.

These two views of development represent the opposite ends of a continuum. Generally speaking, developmental psychologists tend to be closer to the view of development as a process of maturation whereas evolutionary biologists tend to favor the view of development as a succession of age-specific adaptations. Evolutionary developmental psychology (EDP) is a discipline that has the potential to integrate psychological and biological approaches to the study of development and bridge the gap between different conceptual views of development. Researchers who follow the perspective of EDP have an appreciation for the view of development as maturation and for causal relationships between different stages of development but are conceptually driven by the notions that organisms display age-specific developmental adaptations and that natural selection may favor alternative life-history strategies (Bjorklund & Pellegrini, 2002; Geary & Bjorklund, 2000).

Developmental adaptations can arise as the result of selective pressures concerning survival or reproduction. Survival is a problem that is faced by any organism at any stage of its life span. Because threats to survival can take different forms for organisms of different ages, it is likely that organisms evolve multiple age-specific adaptations for survival during their life span. Therefore, the view that developing organisms may exhibit successive age-specific adaptations and that earlier adaptations may disappear and be replaced by new ones applies well to adaptations for survival. For example, young mammals are nutritionally dependent on other individuals, and especially on females who can breastfeed them, whereas adult mammals are not. Survival problems for young mammals involve finding females with milk who are willing to breastfeed them whereas survival problems for older mammals involve finding food and competing with others for access to it. These different problems are likely to select for very different sets of adaptations, which will be expressed at different points in the life span.