
Different interpretations of parental effects and their implications our understanding of development, heredity and evolution

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Abstract

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Abstract

The varied ways in which to view parental effects allow one to focus on different aspects of how they provide a link between development, heredity, and evolution. Parental effects (PE), through mechanisms that promote the transitions for young and adult species-typical development, provide a link between the generations. Their study enables a deeper understanding of developmental dynamics of life cycles and their role in evolution. PEs as the context-dependent transgenerational transmission of phenotypic strategies have been interpreted as developmental plasticity at the intergenerational level. They allow organisms to be as ecologically open as possible. Some PE may be predictive adaptive responses of offspring to subtle variations in parental behaviors as a forecast of the environmental conditions they will face in the future. PE as the non-genetic transfer of developmental resources shows that evolution has trusted an exogenetic system to transmit information vital to the reconstruction of the next generation's life cycle. Reliably re-occurring PEs support the faithful reconstruction of the developmental niche for successive generations, while more context-dependent PEs participate in the modification of developmental niches, and hence the creation of environmentally induced and developmentally regulated, phenotypic variation. Some PEs highlight the hereditary/evolutionary significance of aspects of experience, either through the transfer of parental experiences or the reliable provision of affordances for learning necessary for species-typical development. This paper will discuss these different interpretation of PEs and their implications for our understanding of heredity and evolution.

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