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# The evolution of empathy through parental care

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## Abstract

The evolutionary approach to pro-social behavior and cooperation is widening its focus to include questions about proximate mechanisms. Empathy seems a good option in this context. A promising hypothesis presents it as a multiple-layered process, ultimately grounded in a perception-action mechanism (Preston & de Waal, 2002; Preston, 2006). This mechanism was transformed in evolution until it was capable of naturally producing helping behaviors with something like pro-social motivation. In this paper I shall attempt a hypothesis about how part of this transformation took place.

The PA mechanism probably evolved to control a very basic form of imitation, known in animal learning theory as "contagion" (Thorpe 1963): when A (the subject) sees B (the object) perform a given behavior, A performs that behavior as well. Contagion occurs usually in relation to behaviors that are species typical or instinctive. Through contagion, animals that live in groups "respond with" others, similarly and quickly, to a given affordance.

But those behaviors are still far from pro-social behaviors. How did a mechanism that explains contagion evolve into something capable of producing pro-social behavior? The most probable context for the evolution of pro-social behavior with a mechanism involving pro-social motivation is parental care. Is there any evidence of a perception action mechanism in parental care? I review empirical evidence regarding facial expressions and their role in primate communication in general, and between mother and infant in particular. There is also some initial evidence that mirror neurons control mother-infant exchanges through facial expressions.

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