

# Psychological and neural correlates of the emergence of morality in toddlers

Markus Paulus<sup>1</sup>

Department Psychology, Ludwig-Maximilians-Universität München, 80802 Munich, Germany

Humans are a remarkable species. Not only do they display prosocial behavior to an extent that is unseen in other species, but these tendencies are also shaped by moral norms that prescribe what we ought and ought not to do. It is a central characteristic of moral norms that they are of an impersonal nature and apply likewise to the self and other. Thus, humans also evaluate their conspecifics' behaviors on basis of moral standards and punish or reward them based on these moral judgments.

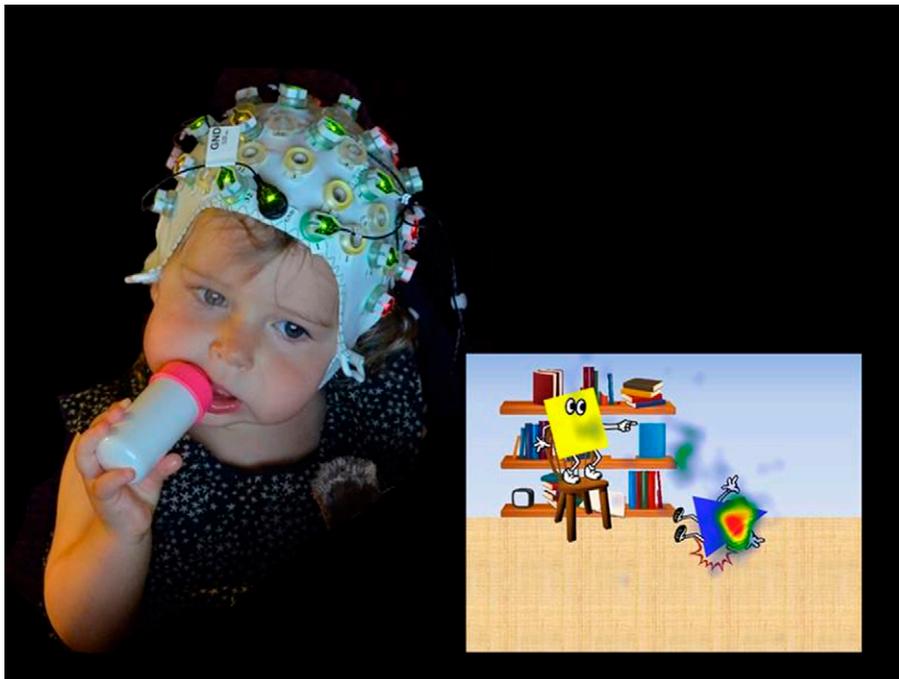
Consequently, scientists across a variety of disciplines have been interested in the psychological basis and the ontogeny of human moral thought and action. Classic psychological research has mostly focused on the ontogeny of verbal moral reasoning during childhood and adolescence (1). However, in the past years wide attention has been received

by influential research, which suggests that already preverbal infants differentiate between pro- and antisocial others and evaluate their behaviors in moral terms (2). These findings lend support to the proposal that humans possess an innate moral core (3, 4). However, others have doubted these interpretations (5), leading to an intense debate on the ontogenetic origins of human morality. Contributing to this debate, in PNAS Cowell and Decety (6) present an empirical investigation of the psychological processes involved in 1- to 2-y-old children's perception of prosocial and antisocial others. This work is of immense interest to the field because it not only relies on behavioral measures, but also employs state-of-the-art eye-tracking and electrophysiological examinations and includes measures of children's temperament, as well as their

parents' social-cognitive functioning and justice sensitivity. This is the first attempt that allows for a comprehensive assessment of the neurocognitive as well as social basis of the precursors of human morality in young children.

In Cowell and Decety's study (6), 1- to 2-y-old children observed video clips of agents performing either prosocial or antisocial actions directed toward another agent (4, 7) (Fig. 1). Simultaneously, the authors (6) measured children's looking behavior and assessed their electrophysiological correlates, including event-related potentials (7) and hemispheric activation asymmetries as markers for the basic approach-avoidance system (8). Thereafter, children had the opportunity to grasp one of the two agents (measuring their social preferences) and, in another task, to share valuable items with another person. Parental measures were assessed by means of questionnaires.

Although it is central to note that the Cowell and Decety study (6) does not replicate the previous finding that young children already selectively approach a helping over a hindering other (4), participants differentiated between both situations on a perceptual and neural level. The electrophysiological measures allowed assessment of the extent to which fast and automatic attentional processes contribute to children's perception of pro and antisocial others (7). This approach addresses the question of whether young children's differentiation between good and bad behavior is based on a cognitively advanced evaluation of these behaviors or whether earlier and faster processes are at the basis of this phenomenon. Remarkably, electrophysiological evidence suggested the latter: young children's differentiation was associated with EEG markers that are indicative of these earlier processes, not cognitively controlled ones. These findings speak directly to the theoretical debate on the basis of human moral and prosocial thought (3–5, 9),



**Fig. 1.** The picture demonstrates a participant watching one of the video clips while, simultaneously, the electrophysiological activity and the child's looking behavior were recorded. The little picture (Lower Right) displays a screenshot of one of the video clips. The heat map represents the child's looking preference. Image courtesy of Jean Decety (University of Chicago, Chicago).

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<sup>1</sup>Email: markus.paulus@lmu.de.

and help us to interpret previous work (2–4). One interpretation could be that differential reactions by infants toward pro- and antisocial others are based on rather domain-general basic processes rather than a specific moral capacity.

Another noteworthy finding concerns the relation between parents' injustice sensitivity and the magnitude of the electrophysiological indicator of children's differentiation between pro- and antisocial others. The higher the parents' sensitivity toward injustice, the greater the children's differentiation between both agents. In addition, parents' perspective-taking abilities were related to children's propensity to share with another person. The findings of Cowell and Decety speak for an impact of social factors on the earliest phases of moral development and highlight the malleability of emerging social evaluations.

However, the precise psychological mechanisms underlying the relation between parental values and toddlers' prosocial action and social evaluations remain unclear. This finding calls for further empirical clarification: How exactly do parental values affect their toddlers' perception of the social world? Given the children's age, it seems unlikely that explicit instructions or verbal discourse about justice are at the bottom of this relation. Is it possible that a shared, potentially partly inherited, sensitivity is the third variable that could explain this correlation? Do parents with a higher justice sensitivity treat their children differently, which in turn could give rise to their emerging differentiation between pro- and antisocial others? These are exciting possibilities that need to be explored by future empirical work.

Further evidence for a causal impact of parents' values on young children's social evaluations would have important implications for current approaches to moral education and early character development. Whereas previous research has primarily focused on the preschool and school years (10), Cowell and Decety (6) direct our attention to earlier phases in development. If parents' values have such an impact, can we use this knowledge to support moral development?

In sum, this study (6) enables a more nuanced view and reinterpretation of previous work on young children's perception of pro- and antisocial others. It provides evidence for a hitherto unknown interaction between

biological and social factors in young children's emerging social sensitivity. It is also highly valuable, paving the way for further research. Two directions for further research shall be shortly highlighted.

If we conclude that children's differentiation of good and bad actions is not based on a cognitive appraisal of these behaviors,

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where do these simple evaluations come from? Is it that through their own experience in engaging in prosocial behaviors (9) infants develop expectations about others' future behavior? Or is it that their perception of the neutral other triggers a simple contagious process (11) that leads them to treat pro- and antisocial agents in a manner as if they would have acted toward the child herself? The current finding (6) offers thus a number of exciting possibilities.

Similarly, given that toddlers' differentiation seems to rest on rather simple processes, what are the developmental mechanisms that transform them into more cognitively controlled processes that are present by the preschool period (7)? Furthermore, how do

they relate to the moral reasoning capacities that develop over early and middle childhood (12, 13)?

It should be noted that research on human morality cannot be judged from a neutral point of view—a view from nowhere—as we are all continuously engaged in moral considerations and debates (14). Any research on moral behavior presupposes thus a particular view on what we judge to be moral or not moral. The basis of this differentiation, that is, the justifications of norms, can only be understood from the perspective of someone who participates in a moral debate (15). Consequently, we need to be careful to not confuse normative questions about the validity of norms with empirical signatures of moral judgments and social evaluations, as the latter can only be empirically assessed when one presupposes a particular normative view on what is actually good or bad. In the present case of perceiving clearly antisocial and violent behaviors (6), such a judgment seems common-sense. Nevertheless, it would be good to keep in mind the normative presuppositions we are making when examining moral judgment and moral conduct. Such a combined effort of moral neuroscience, moral philosophy, and moral psychology seems to be well equipped to raise our understanding of the ontogenetic origins of human morality to the next level (16, 17).

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