



## BOOK REVIEW

### HUMAN DEVELOPMENT AND THE EXTENDED MIND: REVIEW OF BECOMING HUMAN: THE ONTOGENESIS, METAPHYSICS, AND EXPRESSION OF HUMAN EMOTIONALITY BY JENNIFER GREENWOOD

One of the most exciting developments in contemporary philosophy of mind has been a turn toward types of minds that have, until very recently, been considered inaccessible to philosophical analysis (eg, animal minds and infant human minds). The driving force behind this reappraisal has been an increasing awareness and engagement with the work of scientists in a number of areas including ethology, animal behaviour studies, psychology, and developmental studies. Jennifer Greenwood's *Becoming Human: The Ontogenesis, Metaphysics, and Expression of Human Emotionality* is an innovative exploration of the empirical literature on human development and its implications for the extended mind debate. Greenwood argues that an examination of the emotional and linguistic development of children, especially the unique relationship between mothers and infants, supports transcranialism. Transcranialists, as opposed to intracranialists, argue for the extended mind hypothesis which is that cognitive processes extend outside of the brain and into the world. While intracranialists can agree with transcranialists that the interaction between cognitive processes and social and physical environments is important for understanding the mind, the transcranialist takes a further step to argue that some of these cognitive aids are constitutively integrated with cognition. Greenwood argues for a transcranialist interpretation of emotional development which then provides the foundation for linguistic development, including metaphorical language.

The heart of Greenwood's book is a philosophical analysis of the empirical literature on the development of emotion and language. While these two topics get separate chapters, Greenwood thinks they develop "concurrently through the same developmental mechanisms..."<sup>1(p212)</sup> Greenwood argues that infants and mothers are both genetically preadapted to engage in a unique social relationship.<sup>1(p85)</sup> Human infants are born "the most neurologically immature of mammalian neonates"<sup>1(p85)</sup> which actually aids positive feedback loops generated by mother-infant interaction.<sup>1(p87)</sup> This interaction is crucially defined by the infant's motor-mimicry abilities, which allow infants to replicate the facial expressions of caregivers, developing "contingencies between expression and feeling".<sup>1(p88)</sup>

Emotions are a kind of first intentional reaching into the world, which point to causes of pleasure or agitation—for the infant, but for the caregiver as well, who may find herself urgently trying to decrypt the intentionality of emotional states to sooth a crying baby. Emotions, according to Greenwood, are "ostensive expressive", in other words, "communicative devices" whose evolutionary role is to develop and sustain interpersonal and intrapersonal regulation.<sup>1(p23)</sup> Other philosophical understandings of emotion have missed this functional role because they only focus on fully developed adult emotions.

In one of her most interesting claims, Greenwood argues that infants inhabit tight worlds, which limit the amount and complexity of the information they receive, and this very simplicity is at the root of developing more sophisticated cognitive abilities.<sup>1(p5)</sup> For example, syntactically constrained "baby talk" exaggerates certain speech patterns that help lay the basis for language development.<sup>1(p136)</sup> Language only emerges from the stage setting provided by the tight world that caregivers provide children. Language, like emotions, develops as a form of ostention from simpler forms of communication, such as pointing.<sup>1(p120)</sup> Greenwood takes the interdependency of interactions between mothers and infants, and their crucial role in the cognitive development of infants to be decisive in the argument against intracranialism. She argues for the transcranial position of "deep functional integration" in which the "internal and external components of the [cognitive] system function synchronically as a whole ..."<sup>1(p58)</sup> Emotional and linguistic development is only possible on the basis of the feedback loops and tight world that characterizes the functional integration of mother and infant cognitive processes.

In the final two chapters, Greenwood uses Ruth Millikan's accounts of function and biosemantics to interpret some of the empirical claims made earlier. She argues that linguistic signs evolutionarily emerge from a "ratcheting" process that relies on reading the intentional behaviour of others.<sup>1(p160)</sup> In particular, Greenwood emphasizes the role of imitation in understanding behaviour—arguing that "human emotional ontogeny mirrors human emotional evolution".<sup>1(p51)</sup> She supports her claim for the integrated roles of emotion and language as ostensive vehicles by noting that language is a form of perception that tracks "objects and events of salience to us".<sup>1(p170)</sup> This analysis is then extended to metaphorical talk and other forms of "loose" communication. Greenwood argues for a relevance-theoretic approach to loose talk that emphasizes both inference and context. Relevance, here, is defined as "a property of inputs to cognitive processes that makes them worth processing".<sup>1(p188)</sup> The upshot of this approach is a "slack" between speaker and sentence meaning.<sup>1(p188)</sup> Greenwood again appeals to tight worlds, positing that the tighter the world, the

looser communication can be—at its tightest, verbal communication is hardly required.<sup>1(p18)</sup> In her conclusion, Greenwood advocates a multi-disciplinary approach for understanding human development in a transcranialist framework.<sup>1(p206)</sup> While her own work is an impressive example of philosophy taking up this multidisciplinary challenge, she sees her book only as a programmatic starting point, citing the development of morality as a potential area for further research.<sup>1(p207)</sup>

While the integration of empirical results and philosophical theorizing in *Becoming Human* is exciting, Greenwood's presentation of work in developmental psychology and evolutionary biology would benefit from a more critical stance. For example, she interprets the pauses in suckling and subsequent "jiggling" by the mother to encourage the reuptake of suckling activity as the developmental foundation of conversation.<sup>1(p114)</sup> She argues for this conclusion by noting that jiggling does not actually encourage "the resumption of suckling" and therefore has "no nutritional value" implying that "it was selected for another function".<sup>1(p114)</sup> It therefore follows that "pause-jiggle sequences are clearly minimally intentional (they are produced for consumption or use by another device) and thus coevolved to establish turn taking".<sup>1(p114)</sup> While this is probably Greenwood's most explicit example of strong adaptationism—these assumptions underlie much of her analysis of mother-infant interaction. It is not clear at all why one should consider the pause-jiggle sequence to be a directly selected for effect, because it could be an exaptation or even the behavioural equivalent of junk DNA. Turn taking in conversation could have developed independently from any of the many other turn taking behaviours infants are involved in, learned through watching adults converse, or could be an entirely innate capacity. Stating that the pause-jiggle sequence coevolved as a learning process for turn taking is a big claim and needs more evidence than simply pointing out that suckling and conversation both involve an interactive form of pausing. The problem with this claim is not that it is necessarily false but that it presumes that because one behavioural trait developmentally precedes another the former plays a causal role in the existence of the latter. Evolutionary arguments require more substantial evidence than temporal precedence and behavioural similarity; otherwise, they risk simply being a developmental just-so story.

A further problem with Greenwood's approach to empirical data is that it is not always apparent that her philosophical conclusions immediately follow. Greenwood will often point to empirical results as refuting intracranialism, but it is not clear why an intracranialist could not propose an alternative interpretation. For example, she argues that intracranialists cannot explain "synchronized coaction between caregivers and neonates",<sup>1(p92)</sup> referring to evidence provided by slow-motion cameras that show that child and mother often move "simultaneously toward the point of mutual contact" when a child passes a toy to her mother.<sup>1(p134)</sup> But an intracranialist does not need to deny the

importance of cognition being embedded in its environment and context—feedback loops, subtle body language that is consciously or subconsciously picked up on, knowledge of behaviour from previous interactions could all be used to provide an alternative interpretation of the evidence. These possibilities are even more apparent considering Greenwood's discussion of the tight world that infants and mothers inhabit. The array of possible actions is minimized while those actions themselves are simplified to make their structures more apparent and mimicable. It seems entirely possible that, over the course of previous iterative interactions, the mother and her infant could become tuned to each other without ever having to presume that cognition is extended. Greenwood could argue that transcranialism provides a simpler interpretation, or argue for the superiority of transcranialism on some other theoretical grounds, but she takes the empirical evidence to be sufficient for refuting intracranialism. Lacking further argument, it is not clear why an intracranialist interpretation should not be given equal epistemic weight.

Despite these criticisms, *Becoming Human* is an ambitious and exciting attempt to synthesize a formidable array of disciplines and insights. While a more critical perspective on the material she draws from would have helped strengthen Greenwood's argument, *Becoming Human* is still an impressive example of empirically informed philosophy. Greenwood's argument that understanding childhood development is essential for understanding the nature of emotions, language, and the mind is original and potentially ground-breaking. Unfortunately, given Greenwood's hope to establish a project that extends into the fields she is citing, her writing is philosophically technical and will likely be opaque to those who do not have at least some previous engagement with the extended mind debate. That is not to say that the writing in *Becoming Human* is unnecessarily difficult because the questions she addresses are technical and complicated. Graduate students and scholars in the philosophy of mind should find much to value in *Becoming Human*. Even if they have similar difficulties accepting some of Greenwood's conclusions, the presentation of the empirical and philosophical literature is clear and provides an extensive tour through the study of human development that will likely inspire future explorations.

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## REFERENCE

1. Greenwood J. *Becoming Human: The Ontogenesis, Metaphysics, and Expression of Human Emotionality*. Cambridge, MA: MIT Press; 2015.