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## Abandoning the ‘theoretical apartheid’ between nature and nurture: human infants hold the key

In *Anthropology and the Cognitive Challenge*, Bloch tells the intertwining tales of two protagonists – psychology and anthropology (Bloch 2012). With a keen eye for historical and intellectual trends, he identifies political and intellectual tensions that have hampered both fields. Arguing convincingly for abandoning the old ‘theoretical apartheid’ between nature and culture (in anthropology), which runs parallel to the pernicious theoretical tension between innateness and learning (in psychology), he also calls for relaxing disciplinary boundaries, maintaining that advances in the psychological sciences will enrich, rather than threaten, advances in anthropology and related social sciences.

Of course, our innate endowments and capacity for experience-based learning are both essential. These twin engines of development influence one another dynamically, in ways that often go unnoticed, in a process often dubbed ‘experiential canalization’. Viewed from this perspective, our earliest endowments are shaped by the cascading influences of early experience, which in turn promote certain developmental outcomes (the acquisition of specific abilities, behavioural responses or even gene responses) over others (Blair and Raver 2012; Gottlieb 1997).

Research with human infants holds some of the appeal of the ‘exotic’ that has so often captivated the imaginations and research agendas of social scientists. But infancy work offers considerably more promise for identifying our earliest, most ‘primitive’ capacities and for tracing how these are shaped by experience. If we begin early enough, infancy research permits us to identify the core initial capacities that guide learning in all humans, even before the contexts in which we live begin to shape the very phenomena that we see as worthy of attention and inquiry (Medin and Bang 2014). If we consider the environment carefully enough, infancy research permits us to witness the earliest imprints of experience and to trace how experience shapes opportunities for subsequent learning.

Two uniquely human features – our altricial status at birth and our unparalleled capacity for learning – contribute jointly to our ability to acquire language and create culture. Because human infants are considerably less mature at birth than other species’ young, their very survival requires prolonged proximity to caregivers. Moreover, human infants’ neurological and behavioural plasticity ensures an exquisite sensitivity to early experience. This, coupled with their close interactions with elders and their own innate capacities, set the stage for the acquisition of language and transmission of culture, our species’ most powerful conduits for the transmission of knowledge.

To illustrate this dynamic interchange between human infants' innate endowments and sensitivity to experience-based learning, I take infants' precocious links between human language and core cognitive capacities as a case-in-point.

For decades, we have known that at birth, infants prefer human vocalisations over a host of other sounds (Vouloumanos and Werker 2007). More recently, we documented that infants not only prefer speech, but that listening to it supports core cognitive processes, including the ability to form object categories (Ferry *et al.* 2010; Fulkerson and Waxman 2007; Vouloumanos and Waxman 2014). Perhaps more surprisingly, this precocious link to object categories, evident as early as 3 months in human infants, is initially not restricted to human vocalisations alone. At 3 months, non-human primate vocalisations (blue-eyed Madagascar lemur: *Eulemur macaco flavifrons*) also promote object categorisation, mirroring exactly the advantageous effects of human speech. By 6 months, lemur vocalisations no longer exert this language-like effect: infants have tuned the link to categorisation specifically to human language (Ferry *et al.* 2013). Thus, a link between language and object categories, evident as early as 3 months in human infants, derives from a broader structural template that initially encompasses vocalisations of both human and non-human primates, but is quickly tuned to human vocalisations.

This rapid specialisation, fascinating in its own right, underscores several additional points. First, it illustrates clearly the crucial role of early experience: Merely exposing infants to lemur vocalisations at or before 6-months effectively reinstates their developmentally prior link to object categorisation (Perszyk and Waxman 2015). Second, this work also illuminates the powerful constraints imposed by infants' early endowments or structure: Exposure elevates infants' response only for signals that were once part of their initially broad template. For signals outside this initial template, infants take a different route to establish links to cognition: Only if such signals (e.g. tone sequences) are embedded within a social communicative exchange will infants endow them with communicative status, and only then will they exert the advantageous effect of human language on categorisation (Ferguson and Waxman 2014). Third, it reveals that well before infants produce their first words, listening to human language promotes core cognitive capacities, including object categorisation as well as rule-learning, identification of communicative partners, and emerging expectations about how we transmit information between us (Vouloumanos and Waxman 2014). Thus, what begins as an innate preference for listening to human speech sets in motion a developmental cascade that promotes not only language acquisition but also the core cognitive and social capacities that are signatures of our human species.

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