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Children's work as a window into the energetic, reproductive, and cognitive trade-offs of human life history: A comment on Lancy

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No theory of human evolution can hope to succeed without confronting the puzzle of our extended childhood. Lancy (2015) complements existing approaches with the thought-provoking argument that children function as a “reserve labor force” that can be activated in emergencies of various kinds. Lancy makes a compelling case that, as a rule, juveniles do not contribute to their full capacity to the family economy. He concludes by speculating that early recruitment into work may be part of an alternative life history trajectory associated with a shortened middle childhood stage and accelerated maturation/reproduction.

While the hypothesis of an accelerated life history strategy is intriguing, the underlying logic is not made fully explicit in the paper. In fact, unpacking the relevant assumptions suggests a number of plausible alternative predictions. As the human equivalent of juvenility, middle childhood is defined by the combination of (a) sexual immaturity and (b) partial independence from parents for feeding and protection (Bogin and Smith 1996). Early recruitment into work may accelerate the developmental processes that permit (b) without necessarily affecting (a). By providing for family members while still sexually immature, children are subsidizing the survival, growth, and reproduction of other family members. At the same time, they may be storing energy reserves in view of their own growth and reproduction. Whether the optimal strategy is to shorten childhood and anticipate puberty or to prolong childhood while serving as “labor force” is likely to depend on a number of factors. For example, conditions of severe food scarcity in absence of other mortality threats may favor prolonged, work-intensive childhoods; in contrast, events that imply high rates of uncontrollable mortality—wars, epidemics, and so forth—should be more likely to trigger earlier reproduction (see Ellis et al. 2009). Hazardous events also reduce the expected fitness benefit of investing in other family members (who may die regardless); in conditions of high mortality, then, children may curtail juvenility while using up a larger share of their returns for their own growth and maturation.

Regardless of mortality levels, the advantages of delaying maturity must be weighted against the fact that a larger and stronger body increases an individual's effectiveness in foraging and other subsistence tasks (Gurven and Kaplan 2006). However, a larger body also consumes more energy; earlier maturation is only advantageous if the increased production more than offsets the associated increase in consumption. Whether this is the case is likely to depend on the local ecology, including the availability of low- and high-strength foraging options (Kramer 2011). Moreover, the physical changes of adolescence are energetically demanding, and are typically subsidized through provision by older family members (Reiches et al. 2009). When food is very scarce, the concentrated energetic demands of anticipated puberty may be too high to afford, even if adult levels of strength would result in a net benefit once achieved. In other words, children may end up “trapped” into a prolonged juvenility because physical maturation—even if beneficial in the long term—would divert too much energy from the immediate needs of their family.

Throughout the paper, Lancy highlights potential trade-offs that may favor low-intensity helping in children who live under benign conditions; for example, early recruitment into work may compromise future health, or limit the development of parenting and social skills. An embodied capital perspective (Kaplan et al. 2000) also suggests that intensive work early on may reduce an individual's future efficiency in performing more complex subsistence tasks.

If such efficiency trade-offs were demonstrated, the question would arise of what neural and psychological processes mediate them. While the brain has (almost) reached adult size at the beginning of juvenility, synaptogenesis and white matter development proceeds with a sustained pace throughout adolescence. The remarkable cognitive changes of middle childhood include the rapid development and differentiation of *executive functions*, a family of cognitive processes that support self-regulation (see Del Giudice 2014). Importantly, executive functions include both inhibition (crucially implicated in self-control) and flexibility (i.e., the ability to switch between alternative sets of rules and cognitive frames).

An intriguing, admittedly speculative possibility is that a childhood of “all work and no play” may specifically compromise the development of cognitive and behavioral flexibility, with negative consequences on performance in complex tasks that require improvisation and creativity. This would be consistent with theories of play as self-initiated “training for the unexpected” (Špinka, Newberry, and Bekoff 2001). Normally, executive functions show a pattern of strong positive correlations with one another (Miyake and Friedman 2012). However, it is possible that, under severe conditions, early recruitment into work may elicit a partial trade-off between inhibitory self-control and flexibility. In total, the perspective on childhood offered by Lancy (2015) is especially valuable in that it stimulates novel and fascinating questions, and opens a unique window into the energetic, reproductive, and cognitive trade-offs that shape the human life history.

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