

Children's Development in Light of Evolution and Culture

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In Narvaez, D., Gray, P., McKenna, J., Fuentes, A., & Valentino, K. (2014). Children's development in light of evolution and culture. In D. Narvaez, K. Valentino, A., Fuentes, J., McKenna, & P. Gray, (Eds.), *Ancestral Landscapes in Human Evolution: Culture, Childrearing and Social Wellbeing* (pp. 3-17). New York: Oxford University Press.

Abstract

With lenses from multiple disciplines, contributors to this volume examine culture and parenting effects on child development and individual and cultural wellbeing. The contributions examine in more detail what might be considered baselines for social mammalian and human development. The volume includes examinations of specific cultures, reviews of hunter-gatherer cultures on particular topics, evolutionary views of offspring in evolution, as well as mammalian and human developmental needs. The emphasis is on caregiving and offspring, their interaction, and how family and community cultures influence and are affected by children.

Keywords: culture, childrearing, evolution

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“All child rearing is based on beliefs about what makes life manageable, safe, and fertile for the spirit” so that “even with the best, most rational, kindest advice from outside, child rearing will likely always be so” (Bruner, 2000, p. xii).

Individual humans cannot grow up alone. Like all social mammals, humans need intensive caregiving in early life to survive, thrive and disperse (Konner, 2010; Williams, 1966). As childcare takes a great deal of energy, mother-child dyads are necessarily aided by families and communities (Hrdy, 2009). Indeed, the contexts for raising children among all human societies include multiple layers of influence and support (Bronfenbrenner, 1979). Culture—socially-transmitted shared beliefs, understandings, and practices—is one of those influences.

Around the world, families and children are embedded in cultures and sub-cultures that support and encourage different approaches to childrearing. Some cultures encourage while others discourage physical closeness, based on potential psychological or physical outcomes; some consider babies to be in need of wooing into interdependence while others consider them to be in need of strict discipline to learn independence (Deloache & Gottlieb, 2000; Doi, 1981; Georgas, Berry, van de Vijver, Kağıtçıbaşı & Poortinga, 2006; Levine & Norman, 2001). Even within a particular society, the culture of child caregiving can change over time in terms of family constellation, community traditions and everyday family pragmatics. Such variations in practices may challenge universalistic models such as that of attachment theory which affixes attachment labels to particular child behaviors which are matched to particular types of parental

behavior (Bowlby, 1969, 1988; Main, 1995). But if some societies encourage psychological distance, demonstrating high levels of social detachment (avoidant attachment), can one argue, as some do, that avoidant attachment is adaptive—which is contrary to the claims of attachment theory (Levine & Norman, 2001)?

The book delves into several issues. First, it probes the question of whether or not there is an optimal range of infant/childhood care and what that might look like. The beneficial or “expectable” range of care might to some degree be inferred from the common dimensions of care in other social mammals, especially primates. We can also discern an expectable range of care from human beings living in ways consistent with our evolutionary past, to the degree that we can infer this from diverse lines of evidence. Such evidence includes paleo-ecological reconstructions and contemporary ethnographic studies elucidating a range of adaptations beginning with, nomadic foragers (also known as small-band hunter-gatherers; we use the term hunter-gatherer to represent this type of society). Mobile communities like these represent a characteristic social structure for much of human history up until to about 10-15,000 years ago when more sedentary, settled societies emerged (though hunter-gatherers have coexisted since then as well; Lee & Daly, 2005).

A second question is whether some societies have stepped out of the optimal range for childrearing (Edgerton, 1991). It can be said, for example, that children who are maltreated (i.e., neglected, abused, traumatized) exist outside the optimal range as inferred from their adult dysfunctions and/or mental disorders and addictions, all of which are clinically evident (Lanius, Vermetten & Pain, 2010). But how about those whose care does not reach the legal or clinically-relevant levels of neglect or abuse? Are there other less obvious forms of infant or child caregiving that damage them in more subtle but still significant ways? Although in the past, and to a certain extent even in the present, wide ranges in early life caregiving were considered fairly harmless, increasing evidence shows that traumatic early life experience can be toxic, with lasting effects on physiological and psychological wellbeing (Shonkoff et al., 2000; 2012).¹

Many investigators concur on the importance of having an empirically-based, diverse but solid knowledge base regarding “healthy” development, in humans and other animals, in order to understand psychopathology (e.g., Cicchetti & Roisman, 2011; Panksepp, 2001). One could always ask how will we know what is abnormal unless we have a good sense of what the range of normal is? While recognizing the obvious pitfalls and difficulties of proposing an “optimal range” for our species, given our great biological and cultural plasticity, this book intends to raise important new questions that challenge certain assumptions about the appropriateness of infant and child care practices, especially in the industrialized West. At the very least we need to start a conversation that moves toward understanding how to identify social caregiving innovations that push infants and children beyond their adaptive limits. Specifically, we hope to shed light on what the evolved, expectable contexts for mammalian and human development really are. What are optimal and suboptimal contexts for human development? What are the effects on children’s development and adult wellbeing of the wildly divergent physical and social habitats in which children grow up today, which require behavioral adjustments that were never tested in an evolutionary context?

We do not idolize ancestral forms of care, nor naively singing their collective praises without realizing that the usefulness of evolved behaviors can change through time. Nor do we dismiss the possibility that traits that may have been adaptive at earlier points in our prehistory are not necessarily compatible with present circumstances (but measuring what is adaptive or not

¹ The sister volume, *Evolution, early experience and human development*, addresses this question more directly.

is impossible to predict). Indeed, we are mindful of Stephen Jay Gould's insightful perspective that evolution is all about functional change with structural continuity. We certainly should not ignore Sarah Hrdy's whimsical but perceptive comments that "A mother today, whether in New York, Tokyo or Dacca is not just a gatherer caught in a shopping mall without her digging stick" nor the point that "continuous contact and proximity and carrying may be what infants want but it might not be what mothers want or more importantly what they can provide" (Hrdy 1999, p. 105). We take such observations seriously and know that translating the research presented in this volume into "lessons learned" to apply where we can will not be an easy endeavor. But we are also confident that having a strong, empirically-based beginning point, a baseline perspective, is the first step in understanding why infants respond and develop as they do. It will help us understand what can go wrong when estranged or biologically novel, current conditions push infants beyond their adaptive limits. To lay out a baseline perspective, we begin with our heritage, what we call here the ancestral context.

The ancestral context

Mobile hunter gatherers (hereafter, hunter gatherers) societies represent a lifestyle that many of our ancient ancestors are presumed to have followed before the advent of agriculture about 10-15,000 years ago. Although archeology and paleontology provide important information about human ancestry, including inheritances from a long line of other animals including non-human primates, studies of contemporary mobile hunter-gatherers offer glimpses into probable components of humanity's past.

Hunter-gatherers are people who gain their sustenance from hunting wild animals and gathering wild plant materials. Anthropologists commonly distinguish between two categories of hunter gatherers (Bird-David, 1994; Fry, 2006; Ingold, 1999; Kelly, 1995). One category, typified by the Kwakiutl of the American northwest coast and the Ainu of Japan, is variously referred to as *collector* societies, *delayed-return* hunter-gatherers, or *non-egalitarian* hunter-gatherers. They live in relatively permanent, relatively dense villages located near highly concentrated sources of food (commonly fish). These societies are generally organized hierarchically, much like agricultural tribal societies. The other category, which are more common and are believed to reflect a more basal pattern of social demography, are those referred to as *band* societies, *immediate-return* hunter-gatherers, or *egalitarian* hunter-gatherers. When anthropologists refer to *hunter-gatherers* or to *foragers*, unqualified, they are usually referring to this category, and that is the convention used in this chapter and elsewhere in the volume, along with the clarifying term, hunter-gatherers. The hunter-gatherers described in this volume fall between the two types as they are foragers but who do some farming and trading.

During the twentieth century, researchers visited and studied dozens of different hunter-gatherer societies, in various remote parts of the world, some of which had been very little influenced by western or industrialized contact. Examples of such societies are the *Ju/'hoansi* (also called the *!Kung*, of Africa's Kalahari Desert), *Hazda* (of Tanzanian rain forest), *Mbuti* (of Congo's Ituri Forest) *Aka* (of rain forests in Central African Republic and Congo), *Efé* (of Congo's Ituri Forest), *Batek* (of Peninsular Malaysia), *Agta* (of Luzon, Philippines), *Nayaka* (of South India), *Aché* (of Eastern Paraguay), *Parakana* (of Brazil's Amazon basin), and *Yiwara* (of the Australian Desert). There are good archaeological reasons to believe that these societies have core patterns similar to those present the predominant way that human beings (*Homo sapiens sapiens*) lived for at least 40,000 years before the development of agriculture, and possibly for

much longer (Boehm, 2008). Although these and other hunter-gatherer groups still exist, it should be noted that the cultures have changed considerably in the last few decades because of pressures from the outside world.

Although there is much variability among small-band hunter-gatherer societies, they do share some remarkable similarities. We draw these generalizations from several sources (Lee & Daly, 1999; Fry, 2006, 2013; Hewlett & Lamb, 2005; Ingold, 1999).

Characteristics shared across groups

Wherever they are found, hunter-gatherer societies display several common characteristics. They generally live in live in groups of about 20 to 50 people, counting children as well as adults. Each group shifts terrain as needed to follow the available game and edible plants, but moves can also be associated with alliance formation and social relationships between groups (Fry 2006, Gowdy, 1999). At each campsite to which they move, families build, from natural materials, small, temporary huts, the construction of which usually takes just a few hours. Because the band moves frequently, material goods beyond what a person can easily carry are burdens, so there is very little accumulation of property.

Characteristics of hunter gatherers include a companionship lifestyle that involves non-exclusive (widely shared) intimacy, characterized by sharing of company, food, residence, food and movement (Bird-David, 1994; Gibson, 1985; Ingold, 1999). Cooperation, sharing and egalitarianism are common values. To survive, individuals within the group, whether or not they are kin (and mostly they are not), cooperate intensely in hunting, gathering, caring for children, and other activities (Kim et al., 2011). They share food and material goods (50-80% on average; Hewlett, 2013), often following a general rule that nobody in the group should have more than anyone else. Although each group is an independent entity in which group members make all of the group's decisions, boundaries are fluid and there is generally a spirit of cooperation with nearby groups. Hunter-gatherers also display common childrearing practices which are shared with old world primates and social mammals generally but have unique features (e.g., alloparental care, extensive cooperation, cosleeping beyond childhood, pronounced social learning; Hewlett, 2013).

Ancestral Childrearing Practices: The Evolved Developmental Niche

The evolved developmental niche (EDN; Narvaez, Wang et al., 2013) for *young* social mammals emerged over 30 million years ago and many of the characteristics of that niche remained true for human beings (Konner, 2010). For young children, the EDN includes natural childbirth, extensive and infant-initiated breastfeeding, continuous contact and/or proximity to caregivers, responsiveness to the needs of the child, free play in nature with multiple-aged playmates, extensive support of the mother-child dyad and multiple adult caregivers (Hewlett & Lamb, 2005; Hrdy, 2009; Konner, 2005, 2010). The outcomes for the presence or absence of each of these parenting practices have only recently been studied scientifically and results indicate that not only physiological but psychological wellbeing is affected (Narvaez, Panksepp, Schore & Gleason, 2013; McKenna et al., 2007; Narvaez, Gleason et al., 2013; Narvaez, Wang et al., 2013). For example, significant effects on brain development can be observed when breastfeeding does not occur in the first months of life (Deoni et al., 2013).

Today there are extensive conflicts between human biology and culture patterns (Eaton, Shostak & Konner, 1988). For example, the emergence of the SIDS epidemic in Western industrialized societies was driven by the adoption of untested socio-cultural infant care inventions and their underlying social values: infants sleeping in rooms by themselves i.e. solitary infant sleep, not breastfeeding, and laying infants prone for sleep (to promote deep sleep) all proved to be independent risk factors for the sudden infant death syndrome leading to the deaths of possible as many as a half a million infants (Fitzgerald, 2000). There is no doubt, then that much harm can be done when evolved developmental patterns are abandoned altogether for cultural reasons without explorations of the possible functionally damaging impacts these changes could mean. Is there a core set of needs and practices whose absence impedes wellbeing? Section 1 addresses this question by focusing on several key features of mammalian parenting.

Cultures have shifted over millennia in terms of how much and what kind of support for child development is provided. On one end are the contexts that more closely follow the human developmental niche, which are found often among small-band hunter-gatherers. Though experiencing many ecological and physical hardships, some hunter-gatherer groups experience greater social wellbeing than most in modern societies (e.g., Everett, 2009). Section 2 will focus on case studies of these groups.

On the other end are modern parenting practices, most of which have diverged greatly from the evolved developmental niche for young children. The high social embeddedness, multi-aged and cooperative lifestyle of hunter-gatherer culture has been replaced, for example, in the USA with extensive social and age-related isolation and a productivity-focused lifestyle. Instead of a village of playful companionship support, many children do not experience characteristics of the EDN for very long, or worse, they are neglected or abused. Felitti and Anda (2005) suggested that child maltreatment has been experienced by the majority of adults in the USA. Indeed, on July 11, 2013, three agencies of the US government sent a letter to state child welfare agencies to alert them about the issue of childhood trauma (USDHHS, 2013). Currently, maltreatment is affecting approximately 1 million children each year (USDHHS, 2012). Including a focus on the effects of early maltreatment will give insight into the extreme cases of the childrearing context. Section 3 will focus on issues of harm and maltreatment.

This volume

Overall the interdisciplinary set of contributors to this volume addresses contexts for development, with the aim of increasing understanding of basic mammalian, and human, emotional and motivational needs in varied contexts. In chapters 2 and 3 of this volume, neurobiological research is reviewed demonstrating what happens to development when young mammals do not receive beneficial and normative parenting.

In the first section, the needs of mammalian young are addressed. In chapter 2, *The epigenetics of mammalian parenting*, Frances Champagne details research on mammalian mother-infant interactions which suggests that maternal tactile stimulation has a profound effect on infant neuroendocrine and behavioral development. Among Long-Evans rats, for example, natural variation in maternal linking/grooming (L/G) of pups, a primary forms of tactile stimulation during the postnatal period, leads to profound consequences for offspring; those who receive low compared to high levels of LG have elevated glucocorticoid levels in response to stress, increased fear reactivity and impaired learning. Moreover, low LG experienced among

female offspring is associated with reduced levels of maternal behavior and increased sexual behavior in adulthood. Focusing on epigenetic mechanisms, which are factors that can change the expression of genes without altering the DNA sequence, Champagne provides evidence to support the hypothesis that maternal touch induces long-term effects on their off-spring's brain development and behavior. For example, the experience of low LG leads to increased DNA methylation of the *Esr1* gene during postnatal development, and the persistence of this epigenetic effect into adulthood renders low-LG female offspring less sensitive to the priming effects of hormones which normally enhance maternal sensitivity. As such, reduced maternal sensitivity results in decreased LG toward the offspring reared by low-LG females, perpetuating a cycle of low maternal care. Implications of the epigenetic effects of early maternal care on child development and parenting are discussed, including their relevance for human development and evolution.

John Bowlby's delineation of the significance of maternal-infant, and infant-maternal attachment and his generic "perceptuo-motor mechanisms" that "tie" infants and mothers together are brought to life by the rich, integrative, endocrinological and psycho-biological framework used by Amanda Dettmer, Stephen Suomi and Katie Hinde. in chapter 3 entitled, *Nonhuman primate models of mental health: Early life experiences effect developmental trajectories*. Using a variety of observational, genetic, and physiological data, the authors provide multiple examples of new research that explain and interpret the underlying neuro-hormonal transactions that are affected by, and respond to, the primate infant's developmental conditions. These conditions include deficiencies that require compensatory responses such as by cortisol, which lead potentially to more fearfulness, increased inhibition, and less play, and, on the other hand, more favorable environments providing an abundance of maternal and peer-based social support that produce "confidence" and maximum resilience of individuals if stressed.

In the book's second section contributors explore how those who live in conditions comparable to patterns common in human evolutionary history care for their children. The level of access to their informants, and the detailed observations emerging out of their own important established personal commitments and connections to these communities, reflect the very best of ethnographic research and methods. The authors have immersed themselves in the practices of a particular mobile hunter-gatherer society. A focus on hunter-gatherer contexts can assist us in discerning the range of what is normal or how questions concerning what is optimal social development might be developed (in contrast to the dominant focus in science on members of Western, Educated, Industrialized, Rich and Democratic societies; Heinrich et al., 2009). Examining the details of several small band hunter gatherer societies regarding parenting, sleeping arrangements, personality, social relations and morality (and the interconnections) can offer insights into how these factors relate to one another and may influence children's development in hunter-gatherer societies.

In chapter 4, *Relationships in a world of uncertainty: qualities of social life of Efe hunter-gatherer infants*, Gilda Morelli, Paula Ivey Henry, and Steffen Foerster describe the social landscape and development of Efe infants and toddlers. The Efe are pygmy hunter-gatherers in the Ituri forest, in the northeast portion of Africa's Congo River Basin. Their world is one of uncertainty. Reliable access to nutritious foods is unpredictable, and reliable access to the same people day-to-day is not assured. Diseases can strike any time, and it is not uncommon for parents to die before their children are grown. For the Efe, survival depends on sharing and cooperation with others beyond the immediate family (a trait that seems unique to humans) that

is built on a history of trustworthy experiences. Morelli and her colleagues present narrative and empirical data showing how Efe infant relationships and trust develop in a highly variable ecology. Efe infancy is intensely social. Infants experience an active social network from birth, and prior research shows that they may be nursed by other women, not just their mothers. Infants and toddlers are in near constant physical and/or social contact with people for much of their waking time. They move from partner to partner at rates of roughly once every 3 minutes; and flexible as people move in and out of the camp. These young children are very successful at obtaining resources from other members of the forager band, as well as visitors. At all ages children experience highly positive affect and reward their partners' engagement with smiles, laughter, and bright-eyed attentiveness. With increasing growth and mobility, toddlers play a more active role in determining with whom they spend time, and their networks grow and diversify, most likely, as a result. Children are active, not passive partners in developing the trusting relationships that are essential to survival in such an uncertain world.

In chapter 5, *Batek childrearing and morality*, Kirk and Karen Endicott report on their research in the mid-1970s with the Batek people of Malaysia who largely followed a nomadic hunter-gatherer lifestyle but also traded forest products for cloth, metal goods and some food commodities. The Endicotts' description of childrearing practices through adolescence give a window into how these practices influence the personality of the adults and the culture generally. They describe socialization into non-aggression. For example like all toddlers, Batek children show signs of aggression or possessiveness but adults generally react minimally, usually gently redirecting them or using humor to relieve tension. The adults seem to have an understanding that the child will grow out of these impulses and indeed they do without punishment or admonition. Older children are scared into staying close to camp with threats, as in many cultures, that a bogey man might come if they do not comply with certain rules. In late childhood and early adolescence, children move into spending more time on sex-typed activities (gathering or hunting with the adult of the same sex). Adolescents set up their own households with each other, not under the direction of adult guidance, until they enter real marriages. Adults generally display enthusiasm, a "confident independence," a sense of responsibility to others, and a "cooperative autonomy," with no apparent personality differences between males and females.

Barry Hewlett and Jennifer Roulette's pioneering study of the social sleeping patterns and arrangements of juveniles, adolescent and teens, described in Chapter 6, *Cosleeping beyond infancy: culture, ecology, and evolutionary biology of bedsharing among Aka foragers and Ngandu Farmers of Central Africa*, amongst two well-studied farming and foraging peoples living adjacent to each other in Central Africa reminds us of just how far Western cultural ideologies have departed from our species-wide, universal practice of mothers and children cosleeping (in some form) with infants breastfeeding throughout the night but older children never sleeping alone. Indeed, throughout the world most parents would never even imagine the possibility of their infants or children sleeping outside of their company, protection and /or social reach of their alloparents defined either by kin, relationships through marriage, personal preferences and/or friendships.

In section three, broader questions about evolution, family, children and human nature are the focus. In *The Environment of Evolutionary Adaptedness, rough-and-tumble play, and the selection of restraint in human aggression*, Douglas Fry addresses the evolution of aggression restraint. Evolution has favored non-lethal aggression in intraspecific competitive interactions in many species. Intraspecific aggression that causes significant harm is rare among animals,

including humans in nomadic foraging conditions, and when it occurs it is a personal, not collective, action. Instead displays of aggression between group collectives cause little physical harm and are characterized by drama and preservation of face. Fry discusses how rough-and-tumble play may be critical for learning aggression restraint because it provides a platform for learning vital social skills such as the signaling of intentions and maintaining a playful, non-injury-inducing interaction. It provides a way to establish dominance without serious injury.

In chapter 8, Peter Gray presents a *Play theory of hunter-gatherer egalitarianism*. His thesis is that our hunter-gatherer ancestors used play, more or less deliberately, to counteract the tendency to struggle for status and dominance, which was inherited from our primate ancestors, and that this permits the high degree of cooperation and sharing that hunter-gatherer life require. He explains that play, in all mammals, requires a temporary setting aside of aggressiveness and dominance, and he reviews research suggesting a negative correlation, across primate species, between adult playfulness and steepness of dominance hierarchies. Then, for the rest of the chapter, he reviews research on contemporary hunter-gatherers showing how their social life—including their games and dances, religious practices, approach to productive work, means of enforcing social norms, and approach to children's education—is imbued with the spirit of play. The hunter-gatherer culture represents a social landscape where play and humor are valued and aggression and status seeking are devalued.

In chapter 9, *Incentives in the family I: The family firm, an evolutionary/economic theory for parent-offspring relations*, Joan Roughgarden and Zhiyuan Song challenge the received view of parent-offspring behavioral conflict with its emphasis on psychological manipulation by offspring of parents for the purpose of getting their needs met (and advancing their genetic fitness). Instead, derived from a social selection model, they emphasize honest communication of needs within the relationship, with a shifting balance of incentives in a type of family “team play.” Their cooperative theory better fits the parent-child behavioral data and the social harmony that is found in small-band hunter-gatherer societies.

In chapter 10, *Preliminary steps towards addressing the role of non-adult individuals in human evolution*, Agustin Fuentes proposes a reconsideration of children in evolutionary theory. Children are often absent, or underrepresented, in our reconstructions of human behavioral evolution. However, there are emerging indications that we can envision non-adults as having substantive impacts in the ways in which early humans interfaced with local ecologies and each other. Modern evolutionary theory provides a toolkit for conceptualizing the role of children in human evolution, especially in the context of niche construction. Through broad cooperation that includes behaviors such as alloparenting, materials collection and transport for tool making, immatures may have played a critical role, Fuentes suggests that we consider the possibility that immatures (children) are actors alongside adults in creating and shaping the social and ecological inheritance systems that enable behavioral flexibility and extended adaptation. Active participation by children may have been one of the key factors in the long-term success of the genus *Homo*.

In section four, issues of changed childrearing contexts are addressed including trauma and abuse. Chapters 11 and 12 describe the extremes for human development, when parents themselves are troubled and unresponsive. In chapter 11, *Child maltreatment and early mother-child interactions*, Kristin Valentino, Michelle Comas and Amy Nuttall provide a developmental psychopathology perspective on mother-child interactions among maltreating and nonmaltreating families from infancy through toddlerhood, addressing how a maltreating family environment affects developmental outcomes. Because child maltreatment represents an extreme deviation

from the average expected early caregiving environment, the comparison of maltreating and nonmaltreating families serves as an experiment of nature and provides critical information regarding the contribution of early caregiving to young children's development. In particular, early maltreatment is associated with attachment disorganization, decreased maternal sensitivity, and decreased maternal verbal interactions. Moreover, infants and toddlers from abusing families demonstrate persistent deficits in social initiation and autonomous behavior compared with children from neglecting and nonmaltreating families, which underscores the disruption in normative social development associated with an abusive family context. The authors conclude by providing specific examples of translational research interventions for young maltreatment children informed by basic research on mother-child interactions during early childhood.

In chapter 12, *The importance of the developmental perspective in evolutionary discussions of PTSD*, Robyn Bluhm and Ruth Lanius critique theoretical and evolutionary accounts of mental disorders, with an emphasis on posttraumatic stress disorder (PTSD). Focusing on chronic exposure to traumatic stress during early life (i.e., persistent childhood abuse), Bluhm and Lanius present data which demonstrates how early childhood trauma disrupts neural development, and they argue that several key deficits observed in patients with PTSD subsequent to early childhood trauma can be understood via these alterations to neural development and functioning. Thus, in contrast to current theoretical accounts of PTSD, which have largely ignored early life trauma, an alternative account that emphasizes the developmental context is presented.

Eugene Halton in Chapter 13, *Presymbolic interaction: Genetic dictates and protosymbolic communication*, takes a sweeping view of human evolution. Considering the development of self and the pervasive role of symbol and meaning in human evolution, he reviews the contexts of early development and hunter-gatherer practice, contrasting it with the modern world and highlighting how media and technology act as contemporary socializing agents. Social media and technology have taken such a dominating influence in socialization that they can be viewed as inversions of evolutionarily central socializing practices. In this chapter Halton lays out how contemporary techno-consumption culture mimics aspects of our behavior and perception related to evolutionary processes, yet subverts their action and outcomes.

The final chapter in the book, *Childhood environments and flourishing*, by Tracy Gleason and Darcia Narvaez, considers childhood environments and their relation to child flourishing, incorporating the insights from volume chapters. It is still unclear which biological needs are particularly essential for optimal development, although attending to 30 million years of evolved practices might be a place to start as a baseline for examination. The quality of the early caregiving context has significant ramifications for later physiological and psychological functioning. Central to this nurturing environment is the responsiveness of the primary caregiver, and provision of adequately sensitive social and emotional care associated with many positive outcomes. However, flourishing, defined as emotional, psychological, and social wellbeing, along with appropriate physiological regulation, and a sociomoral orientation towards others, might require an intense level of caregiving on the part of the community that is atypical in the USA. Attention to caregiving practices common among small-band hunter-gatherers behaviors, which are positively associated with sociomoral development, as well as to the broad social context of early development might provide important steps toward creating proactively moral, prosocial communities.

Conclusion

The interdisciplinary set of contributions provides insight into human development, broad and particular cultural customs, as well as evolutionary features of social structure in light of human evolution. The integration of eclectic methods and theories break previously existing traditional disciplinary boundaries separating anthropology, psychology, sociology and neuroscience. As a result of cooperative research efforts by scientists from different fields each discipline is in a strengthened position and finding answers to questions that a single discipline working alone even knew were important to ask.

The shifting baselines for childrearing which have occurred over generations in settled societies may have longterm effects on the psychology, anthropology and sociology of subsequent generations. Social environments consistent and inconsistent with ancestral conditions may have longterm effects on individual outcomes. The cultures of mobile hunter-gatherer societies examined here may offer a glimpse at the contexts for child flourishing. With the information provided by these scholars, we may be in a better position to understand what optimal childrearing entails and thereby be able to facilitate changes in social structures and support systems that better foster wellbeing in human development. This next step, however challenging, will require understanding that our evolutionary legacies are relevant to helping us adjust our lifestyles to provide a fit between our more conservative biology and cultures that can be at odds with one another to greater or lesser degrees. Only our imaginations are stopping us.

References

- Bird-David, N. (1994). Sociality and immediacy: or, past and present conversations on bands. *Man*, 29, 583-603.
- Boehm, C. (2008). Purposive social selection and the evolution of human altruism. *Cross-Cultural Research*, 42, 319-352.
- Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.
- Bruner, J. (2000). Foreword. In J. Deloache & A. Gottlieb, *A world of babies: Imagined childcare guides for seven societies* (pp. ix-xii). New York: Cambridge University Press.
- Cicchetti, D., & Roisman, G. I. (Eds.) (2011). *The Origins and Organization of Adaptation and Maladaptation: Minnesota Symposia on Child Psychology* (Vol. 36). New York: Wiley.
- Deloache, J. & Gottlieb, A. (2000). *A world of babies: Imagined childcare guides for seven societies*. New York: Cambridge University Press.
- Deoni, S.C.L., Dean III, D.C., Piryatinsky, I., O'Muircheartaigh, J., Waskiewicz, N., Lehman, K., Han, M., & Dirks, H. (2013). Breastfeeding and early white matter development: A cross-sectional study, *NeuroImage* (2013), <http://dx.doi.org/10.1016/j.neuroimage.2013.05.090>
- Doi, Takeo (1981). *The Anatomy of Dependence: The Key Analysis of Japanese Behavior*. English trans. John Bester (2nd ed.). Tokyo: Kodansha International.
- Eaton, S. B., Shostak, M., Konner, M. (1988). *The Paleolithic prescription*. New York, NY: Harper & Row.
- Edgerton, R.B. (1992). *Sick societies: Challenging the myth of primitive harmony*. New York: Free Press.

- Felitti, V.J. & Anda, R.F. (2005). *The Adverse Childhood Experiences (ACE) Study*. Atlanta: Centers for Disease Control and Kaiser Permanente.
- Fitzgerald (2000).
- Fry, D. P. (2006). *The human potential for peace: An anthropological challenge to assumptions about war and violence*. New York: Oxford University Press.
- Fry (Ed.), *War, Peace and Human Nature: The convergence of Evolutionary and Cultural Views*. New York: Oxford University Press.
- Georgas, J., Berry, J.W., van de Vijver, F.J.R., Kağitçibaşı, Ç., & Poortinga, Y.H. (2006). *Families across cultures: A 30-nation psychological study*. New York: Cambridge University Press.
- Gibson, T. (1985). The sharing of substance versus the sharing of activity among the Buid. *Man*, 20, 391-411.
- Gowdy, J. (1998). *Limited wants, unlimited means: A reader on hunter-gatherer economics and the environment*. Washington, D.C.: Island Press.
- Gowdy, J. (1999). Gatherer-hunters and the mythology of the market. In R. B. Lee & R. Daly (Eds.), *The Cambridge encyclopedia of hunters and gatherers* (pp. 391–398). New York: Cambridge University Press.
- Henrich, J., Heine, S. J. & Norenzayan, A. (2010) The weirdest people in the world? *Brain and Behavioral Sciences* 33,61–135.
- Hewlett, B. (2013). Personal communication.
- Hrdy, S. (2009). *Mothers and others: The evolutionary origins of mutual understanding*. Cambridge, MA: Belknap Press.
- Ingold, T. (1999). On the social relations of the hunter-gatherer band. In R. B. Lee & R. Daly (Eds.), *The Cambridge encyclopedia of hunters and gatherers* (pp. 399–410). New York: Cambridge University Press.
- Kelly, R. L. (1995). *The foraging spectrum: Diversity in hunter-gatherer lifeways*. Washington D. C.: Smithsonian Institution Press.
- Konner, M. (2005). Hunter-gatherer infancy and childhood: The !Kung and others. In B. Hewlett & M. Lamb (Eds.), *Hunter-gatherer childhoods: Evolutionary, developmental and cultural perspectives* (pp. 19-64). New Brunswick, NJ: Transaction.
- Konner, M. (2010). *The Evolution of childhood*. Cambridge, MA: Belknap Press.
- Lanius, R.A., Vermetten, E., & Pain, C. (Eds.) (2010). *The impact of early life trauma on health and disease: The hidden epidemic*. New York: Cambridge University Press.
- Lee, R. B., & Daly, R. (Eds.). (2005). *The Cambridge encyclopedia of hunters and gatherers*. New York, NY: Cambridge University Press.
- Levine, R.A., & Norman, K. (2001). The infant's acquisition of culture: Early attachment reexamined in anthropological perspective. In C.C. Moore & H. F. Matthews (Eds.), *The psychology of cultural experience* (pp. 83-104). New York: Cambridge University Press.
- Main, M. (1995). Recent studies in attachment: Overview, with selected implications for clinical work. In S. Goldberg, R. Muir, & J. Kerr (Eds.), *Attachment theory: Social, developmental and clinical perspectives* (pp. 407-474). Hillsdale, NJ: The Analytic Press.
- McKenna, J. J, Ball, H., Gettler, L.T. (2007). Mother-infant co-sleeping, breastfeeding and sudden infant death syndrome: What biological anthropology has discovered about normal infant sleep and pediatric sleep medicine. *Yearbook of Physical Anthropology*, 50,133-161.

- Narvaez, D., Panksepp, J., Schore, A., & Gleason, T. (Eds.) (2013a). *Evolution, Early Experience and Human Development: From Research to Practice and Policy*. New York: Oxford University Press.
- Narvaez, D., Panksepp, J., Schore, A., & Gleason, T. (2013b). The value of using an evolutionary framework for gauging children's well-being. *Evolution, Early Experience and Human Development: From Research to Practice and Policy* (pp. 3-30). New York: Oxford University Press.
- Narvaez, D., Wang, L., Gleason, T., Cheng, A., Lefever, J., & Deng, L. (2013). The Evolved Developmental Niche and sociomoral outcomes in Chinese three-year-olds. *European Journal of Developmental Psychology, 10*(2), 106-127.
- Panksepp, J. (2001). The long-term psychobiological consequences of infant emotions: Prescriptions for the 21st century. *Infant Mental Health Journal, 22*, 132-173.
- Shonkoff, J.P. & Phillips, D.A. (2000). *From neurons to neighborhoods: The science of early childhood development*. National Research Council, Committee on Integrating the Science of Early Childhood Development. Washington, D.C.: National Academy Press.
- Shonkoff, J.P., Garner, A.S. The Committee on Psychosocial Childhood, Adoption, and Dependent Care, and Section on Developmental and Behavioral Pediatrics, Dobbins, M.I., Earls, M.F., McGuinn, L., ... & Wood, D.L. (2012). The lifelong effects of early childhood adversity and toxic stress. *Pediatrics, 129*, e232 (originally published online December 26, 2011)
- Tomkins, S. (1965). Affect and the psychology of knowledge. In S.S. Tomkins & C.E. Izard (Eds.), *Affect, cognition, and personality*. New York: Springer.
- U.S. Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families. (2012). *Child maltreatment 2011*. Available from <http://www.acf.hhs.gov/sites/default/files/cb/cm11.pdf>
- U.S. Department of Health and Human Services (2013). Letter to state child welfare agencies. Downloaded on July 17, 2013 from : <http://www.medicaid.gov/Federal-Policy-Guidance/Downloads/SMD-13-004.pdf>
- Williams, G. C. (1966). *Adaptation and natural selection: A critique of some current evolutionary thought*. Princeton, NJ: Princeton University Press.