2 The Neurobiology of Moral Sensitivity: Evolution, Epigenetics, and Early Experience

Darcia Narvaez

INTRODUCTION

The challenge of shifting baselines plagues scholars across the sciences. A scholar's assumptions about the nature of the world she studies are often dominated by what she herself has experienced. For example, in oceanography, where the notion of "shifting baselines" arose, scientists assumed that the state of the oceans (including the diversity and number of animal life in the sea) during their lifetimes was an appropriate baseline to use for gauging normality and change. But this assumption made them miss the drastic decreases in sea life one observes when examining oceans over generations and long spans of time.[1] We can apply this notion of shifting baselines to other domains. For example, in the U.S. at present, the air is cleaner compared to 1960 and forest cover is better compared to 1900, but neither is better compared to 1500. The baseline one selects for comparison makes all the difference.

The notion of "shifting baselines" crosses over into other areas of scholarship beyond the sciences anytime scholars generalize what is salient to them. For example, Thomas Hobbes, immersed in a civil war, generalized the violent conditions around him to humanity generally.[2] He used the salience of callous violence and greed within his "state of nature"—the condition of ungoverned humans—and thereby argued for the necessity of a social contract to control human nature. Much of the Western world still subscribes to his generalization of humans as selfish and competitive when they take up neo-Darwinian and neo-Hobbesian evolutionary perspectives, each of which emphasize ego-driven human nature controlled by selfish genes.[3] The unfortunate result of a poorly selected baseline is that one is easily persuaded that the way things are now are "normal"—whether number of butterflies, birds, or amount of human aggression.

As discussed further below, Hobbes was quite wrong about how humans behaved before societal structures evolved and quite wrong about nature in general, which is deeply mutualistic and symbiotic on every level of analysis.[4] When scholars study human morality, they must also understand the baselines for human development and the parameters for optimal development. If not, they will understand morality too narrowly, even taking misdeveloped or overstressed humans as a baseline for normality, as Hobbes did. Although the widespread individualistic egoism seen today represents a form of moral functioning, in light of evolutionary and development baselines, it is better characterized as arrested development.[5]

When we apply the notion of shifting baselines to moral development, we must find an appropriate baseline for the typical or "normal" development of human moral capacities in general, including capacities for moral sensitivity. To select baselines for human morality and human nature, one must understand humanity's evolutionary story. First, it is important to recall that humans are mammals—social mammals—and so we must understand that mammalian nature and how to nurture its moral potential. Second, we must understand that humans have a set of propensities and capacities available at birth, which are significantly shaped peri- and postnatally by the caregiving environment. Third, we must understand that children have basic evolved needs as part of their animal, mammalian and human nature, which when not met sets a child up for atypical development in light of evolution.[6]

In this chapter, I propose that whereas evolution has designed humanity to develop a Darwinian "moral sense,"[7] early experience—in very deep neurobiological ways—influences the *type* of moral orientation one learns to favor. We might see more emphasis on ingroup, hierarchy, and purity today[8] but these are hardly apparent in humanity's evolved contexts[9] and rather are cultivated by early experiences that promote self-protective orientations. Although humans evolved to be prepared for a broad communal morality, the roots of a "moral sense" must be cultivated carefully during sensitive periods such as the first few years of life. Caregiving environments that match up with human evolved needs shape dispositions for humanity's fullest moral functioning. When evolved caregiving practices are violated, it influences the trajectory of moral development, affecting moral intuitions, sensitivity to situations, and capacities for deliberation. We touch on all these topics. But first, we need a better understanding of humanity's evolutionary story and baselines for human morality.

The Baseline: Our Evolutionary History

We often hear in popular media that humans are selfish and aggressive by nature.[10] But the baselines used for these assumptions are either murky, inadequate, or wrong: murky because the data are misunderstood or poorly described; inadequate because only one type of violence is examined; and wrong because misleading data are incorrectly grouped together.[11] Furthermore, looking at humans within our current historical and cultural period as a measure of normality is like looking at oceans today—each are decimated by reckless human behavior that compounded over generations.

To find a baseline for optimal morality, we must examine common environmental, social, and biological circumstances across the full scope of our evolutionary history. Ethologists have noted that for 99% of human history, humans lived in immediate-return (no storage of foods, no domestication of animals or crop cultivation), small-band hunter-gatherer (SBHG) societies.[12] Some of these societies still exist and are highly communal, with individuals cooperating in hunting, gathering, and child raising.[13] They are fiercely egalitarian (maintained through the social control of teasing) and they are non-coercive (even of children), allowing individuals high autonomy.[14] They display a common culture and adult personality of generosity, sharing, and peaceableness.[15] All over the world, such SBHG societies display a similar range of social, open, and non-domineering personalities. They do not exhibit anxiety or aggressiveness as a matter of course.

Prior to the spread of agriculture, SBHG societies were universal. Even after the development and spread of agriculture (with the resultant increase in group size, hierarchical shifts in social structure, and increasingly segregated division of labor and skills), SBHG societies continued to exist side by side with settled agricultural communities, which indicates that such small-band societies have a stable social structure.[16] Given that humans lived within SBHG societies for the vast majority of human history, the social and child-rearing conditions I describe below appear to have been the norm for the vast majority of human history. Of course, we cannot return to this lifestyle, but these practices, and our recent scientific examination of them, provide us with a comparative baseline to examine our current moral capacities and functioning in light of the full span of human evolution and development. But to understand the development of moral sensitivity, we first need a better understanding of human moral evolution. Darwin provided us with a place to begin.

Darwin and the Moral Sense

Human morality emerges from characteristics shared with evolutionarily prior creatures, providing inheritances that were formed before humans appeared. For example, empathic sensibilities have been documented in non-human animals that behave altruistically toward peers.[17] Indeed, Darwin traced human morality through the tree of life. He proposed that humans inherited a "moral sense," which arose from the sexual, parental, and social instincts that evolved in mammals generally—but especially in humans—giving rise to such things as the golden rule. This inherited moral sense contributes to human evolution, beyond the role of natural selection.[18] Darwin even toyed with the idea that the moral sense was the main driver of human evolution.[19] Darwin described the evolution of the moral sense, which is not a single capacity, but a suite of evolved capacities that underlie morality:

> "In the first place, the social instincts lead an animal to take *pleasure* in the society of its fellows, to feel a certain amount of *sympathy* for them, and to perform various services for them.…Secondly, as soon as the mental faculties had become highly developed, images of all past actions and motives would be incessantly passing through the brain of each individual. Out of a comparison of past and present, the feeling of dissatisfaction, or even misery, which invariably results from any unsatisfied instinct, would arise. Third, after the power of language had been acquired, and the wishes of the community could be expressed, the *common opinion of how each member ought to act for the public good* would naturally become the guide to action…Lastly, *habit* in the individual could ultimately play a very important part in guiding the conduct of each member, for the social instinct together with sympathy, is, like any other instinct, greatly strengthened by habit, and so consequently would be *obedient to the wishes and judgment of the community*."[20]

Although these capacities may be innate, the components of the moral sense require particular experiences for them to develop well. Many, if not all, of these characteristics of Darwin's moral sense are highly influenced by post-natal experience, suggesting that what often looks like a purely genetic outcome is more reliant on evolved consistent care during their foundation (that is, epigenetic and plastic). Humans might be genetically predisposed to exhibit these components, but experience shapes their manifestation.[21]

Given the consistency of the social environment and the natural pressure on survival throughout much of human history, to call something part of our human nature means that it was selected for and is beneficial to survival for the individuals within our species. The phrase "human nature" is generally understood as short-hand for the claim that some trait or capacity is not only typical of the members of our species, but also part of their normal development.[22] But of course, typical or normal development of an individual only occurs when the social and environmental conditions exist within which the species evolved. Thus we can say that with a species-typical environment the outcome is species-typical. But, without those conditions, typical development cannot occur, so the outcome is species-*atypical*.

In thinking about our human nature and the evolved moral sense, there are several things to keep in mind. First, humans continue to be social mammals—and have not evolved away from being so. One feature of every mammal's life is the early nest: an evolved set of intensive nurturing practices for the young. In fact, the early nest is one of many evolved inheritances outside of genes (i.e., "extra-genetic") based on what worked for ancestors to outcompete rivals genetically over generations within a context of biodiversity.[23] Nesting practices evolved to match up with the maturational schedule and basic needs of the offspring in order to optimize development. Social mammals emerged more than 30 million years ago, characterized by

particular intensive parenting practices. Over the course of human evolution, parenting practices intensified further.[24]

Second, humans are dynamic systems whose early experiences influence trajectories for the life ahead. Much of brain and body system development occurs after birth through biosocial construction—that is, social experience shapes biology. Although humans have a set of propensities and capacities built in at birth, those capacities are shaped by social environmental conditions and experiences in interaction with maturational schedule. Caregivers actually co-construct the child's brain and body systems during their rapid development after birth, influencing basic neurophysiological functioning for a lifetime.[25]

Third, children have basic evolved needs that include animal needs for nourishment and warmth, mammalian needs for affection and play, and human needs for belonging and meaning making.[26] If basic inherited needs are not met, then the developmental trajectory for an organism, which evolved over countless generations, is thwarted.

These three considerations—the interactions between nurturing practices, rapid post-birth development, and evolved needs—represent the conditions that brought about the human nest or Evolved Developmental Niche (EDN). Because the early environment affects the trajectory and subsequent development of moral capacities, we must examine some of the key features of this human "nest" to understand the development of moral sensitivity.

The Human Evolved Developmental Niche: The Human "Nest"

Anthropologists have identified what my colleagues and I call the human Evolved Developmental Niche (EDN).[27] The EDN represents the type of early caregiving environment that emerged initially with social mammals over 30 million years ago and which was intensified through human evolution. For 30-40 million years of social mammalian history—and 99% of human genus history—selection forces were consistent, so we can describe the EDN as a species-typical early environment for the development of the very malleable, immature human. The EDN represents a key inheritance that evolved to address young children's animal, mammalian, and human basic needs. It is comprised of specific types of responsive care and social environment that shape children's psychobiosocial development. Caregiver practices tailor the neurobiology of the majority of neurobiological (brain and body) functioning; that is, the way caregivers treat a baby co-develops the systems of the body, including immunity, neurotransmitters, and endocrine systems.[28] Although immaturity at birth is characteristic for other primates too, human babies are particularly immature relative to other primates.[29] Based on the evidence from small-band hunter-gatherer studies and reports, I propose that the EDN provides a "cultural commons" for the development of human nature, and that such similar common cultural features offer a window into the development of moral sensitivity.

Now let's consider some of the characteristic caregiving practices of the early caregiving environment, keeping in mind details about small-band hunter-gatherer (SBHG) societies: (1) soothing perinatal experience, (2) breastfeeding, (3) positive touch, (4) responsiveness, (5) play, and (6) positive social climate. First, there are no hospitals in such societies, so the birthing process is natural with no interference with timing (induced births), no imposed pain, no drugging of the mother (and hence, the baby), and no separation of mother and newborn (which undermines bonding and breastfeeding).[30] In such societies, the *birthing process and perinatal experiences are soothing*. In the days just prior to labor, the mother may be restless and spend time "nest building.[31] The mother is attentive to body signals[32] and has the wisdom of elder women to guide

her.[33] The hunter-gather mother typically is thin and fit and the baby is not large, so normal labor is not onerous.[34]

Second, infants are *nursed frequently* (2-3 times/hour initially). A neonate's stomach is tiny and rapid brain/body development requires frequent ingestion of what breast milk provides. Nursing typically lasts for 2-5 years, sometimes longer, with an average weaning age of age 4 (often when the next child arrives). At times, breastfeeding is shared with other mothers.[35] Breast milk provides thousands of ingredients to establish a healthy brain and body, including systems underlying intelligence and immunity.[36]

Third, given their extended immaturity and immobility, children experience a high degree of handling, carrying, and touch. Such attentive, *positive touch* facilitates responsive and social interaction. Touch keeps a baby calm and growing, fostering good functioning of important brain structures such as oxytocin receptors.[37] In the first years of life, children are held or kept near others constantly. There is little forced separation from a set of responsive caregivers who are typically adults. In some SBHG societies, about half the time adults other than the mother are holding the child.[38] There is next to no negative touch (e.g., punishment), which is known to have detrimental effects on child development.[39] Positive touch facilitates and negative touch undermines self-regulatory and social capacities like empathy in young children and adults.[40]

Within the EDN, babies are always in the company of caregivers, who are extremely responsive and attentive to the communications, reactions, and needs of the baby.[41] The fourth feature, *caregiver responsiveness*, yields little distress for baby and properly sets up multiple systems, including tuning up the vagus nerve which is critical for well-functioning digestion, cardiac, respiratory, stress, immune, and emotion systems.[42] In SBHG societies, baby fusses are attended to immediately (minimizing crying) and their desires met without resistance.[43]

Fifth, the constant company of others allows the child to learn in the way young mammals learn best—through *self-directed social play*. Playfulness is fragile, in that it is absent when there is fear, anger, or pain; consequently, it can be a good measure of the quality or state of a relationship, as young mammals play whenever they feel safe and well.[44] Play is fundamental to mammalian growth, enhancing physiological, neurological, and social development. Children's free play, especially rough-and-tumble play, leads to better outcomes such as good mental health and social skills.[45] Even though they have limited physical control, babies are ready to play from birth and eagerly create play routines with caregivers.[46] In fact, infants are able to play jokes on their parents by 9 months of age.[47] In SBHG societies, children spend most of their time playing with multi-aged playmates, both kin and non-kin.

Sixth, there is a *positive social climate* fostered by social support from caregivers, peers, and community members. Young children are frequently cared for by close community members other than mothers (fathers and grandmothers, in particular), which also promotes greater maternal responsiveness.[48] Shared nursing also occurs, which is related to greater social openness later, and as the child grows older, he will rely on additional provisioning (food) from other older members of the community.[49] A culture of high social support and social embeddedness develops positive emotions and fosters trust, loyalty, and caring beyond the mother-child dyad.

These characteristic practices yield several key relational outcomes, which are vital for moral sensitivity development: (1) bonding, (2) self-regulation, (3) tuning of emotion systems, and (4) prosocial autonomy. First, extensive (years) of infant-initiated breastfeeding, touch and responsiveness facilitate *secure mother-child bonding*, which yields trust and procedural social memory for that relationship that is applied to other relationships. Human infants, like other apes, develop strong attachments to caregivers which grounds lifetime brain function as well as social

and moral behavior.[50] Under evolved conditions, the mother demonstrates a caregiving attachment system that aligns with the infant's attachment system, providing a mechanism by which the rudimentary nervous system of the infant can be co-constructed by the caregiver. Not letting a baby become distressed during rapid brain growth facilitates appropriate thresholds and parameters for the stress response system and engagement of the autonomic (sympathetic and parasympathetic) nervous system.[51] For example, parents with strong caregiver attachment systems feel pain when their infant cries and will do what they can to prevent it (an infant's cry is physiologically irritating to adults).[52] Among SBHG, adults respond quickly to babies when they start to show discomfort and minimize crying. Keeping a baby calm during rapid development of brain regulatory systems ensures that she develops well, and sustained positive interactions promote brain development on all levels (neurochemical, circuitry, integration).[53]

Second, caregiver responsiveness builds *internal regulation* capacities in the young child. Because children cannot self-regulate their biological systems at birth, caregivers must act as facilitators of self-regulation development.[54] T. Lewis and colleagues point out that the mammalian nervous system cannot self-assemble but requires the caregiver's "hidden" regulation of infant development across sensory systems (e.g., olfactory, tactile).[55] Indeed, mammalian maternal touch can lower an infant's heart rate during a distressing experience, which trains the infant's systems for adaptive responding to stress.[56] As an "external psychobiological regulator," the caregiver helps shift external into internal regulation, increasing the complexity of maturing brain systems as they learn to adaptively regulate interactions between the baby's self and the social environment.[57] Behavior regulation (e.g., impulse control), emotion regulation (e.g., anger management), and the development of attachment to the parent typically go hand in hand.[58] Fundamental for the social life, self-regulation is a biosocial construction and is critical for both physiological and social functioning.[59]

Third, part of regulation development involves the *tuning (or training) of emotion systems* to provide good information for adaptive behavior. This occurs through caregiver intersubjective communication and attunement, along with responsiveness and touch. The ability to regulate and employ emotions well—that is, capacities for emotional intelligence, such as the ability to recognize, regulate, and express emotions effectively—is necessary for social relations as emotion systems guide thinking and perception.[60] Emotion regulation develops through experiences with caregiver intersubjective attunement and affect-mirroring (using physical, vocal, and facial expressions to reflect and respond to the child's feelings in a reassuring manner).

Fourth, the positive social climate and high degree of social support shape the development of *prosocial autonomy*. Over the course of development, children experience several "autonomy surges": the first emerges in early life (called "terrible twos" in North America) and another in early adolescence. In SBHG societies, autonomy surges are shaped by prosocial guidance from adults and older children in the community. For example, if a toddler runs at another with a stick, the others laugh and make a game of it, rather than scolding or punishing understanding that the young child is not yet fully human.[61] There is no coercion in the group, even of children, unless someone hurts another. In such societies, an individual's autonomy is curbed by the gentle guidance of older community members who help children develop a communal orientation where an individual's autonomy is integrated with shared values and interests of the larger group. In adolescence, children are guided in expanding sense of self to their place on the earth and in interaction with both human and non-human entities. This prosocial climate establishes prosocial behaviors, interactions, relationships, and values. The individual's

life course is movement *with* others (including non-humans), not *against* them.[62] In these circumstances, egalitarianism and trust gets deeply wired into early procedural memory.[63]

The characteristic caregiving practices of the EDN shape children's psychobiosocial development and yield key relational outcomes. The infant's inborn propensities interact with caregiver relationships during this early developmental period to establish parameters for autonomy, self-regulation, and all basic emotion systems. Robert Emde and colleagues postulate that by age 3 children develop an "affective core," which are five consolidated "motives" built into the species by evolution that serve as a biologically prepared platform for early moral development.[64] The affective core includes *activity* (tendency for exploration and mastery), *self-regulation* (propensity to regulate physiology and behavior), *social fittedness* (propensity to initiate, maintain, and terminate interactions and establish behavioral synchrony), *affective monitoring* (tendency to track pleasurable experiences and use affect to guide parental care), and *cognitive assimilation* (tendency to seek out novel experience to make it familiar). But the operation, activation, and consolidation of the "affective core" require a sensitive, responsive infant-caregiver relationship. In this view, self and morality develop before the capacity for reflective self-awareness. By age three, a well-raised child has internalized preferences about acceptable behavior, displays moral affect, engages in prosocial behavior, regulates conflict between personal needs and social obligations, and is governed by internal standards (at least some of the time).

The EDN represents a key inheritance, or a "cultural commons," that evolved to address young children's animal, mammalian, and human basic needs. It is comprised of specific types of responsive care and social environment that shape children's psychobiosocial development to yield a developed "human nature." This human nature includes a moral sense, but to understand it in greater detail, we must examine its component roots.

Empathic Effectivity Roots

Within the EDN, children's relationships are guided by displayed affection, reciprocity, and the development of shared purposes and interests. As a young child engages successfully in social relationships with caregivers, multi-age peers, and members of the broader social support network, she builds a sense of social effectiveness or effectivity. Effectivity includes both the sense of personal effectiveness (self-efficacy) and the expertise to successfully carry out the action.[65] The effectivity fostered in the child by EDN-consistent caregiving facilitates the development of not only Emde's affective core but what I call *empathic effectivity roots* (EER). Empathic effectivity roots are buried in the layers and functions of neuronal networks established by the way that the infant is treated in early life and comprise socioemotional procedural intelligence, which matches with Polanyi's notion of tacit knowledge: understandings and actionable knowhow held often without awareness or verbalizable explanation.[66] We can think of the development of such tacit knowledge as the "roots"—the beginnings—of social procedural knowledge.

Recall Darwin's list of components that contribute to humanity's moral sense: pleasure, sympathy, concern for common opinion, habit development, and graceful conformity or social fittedness.[67] As a rough parallel, the EER include capacities for secure and trusting attachment, self-regulation (also in Emde's list), trained and well-functioning emotion systems, and communally oriented autonomy. These capacities provide the building blocks which guide social relations and whose interrelated practice fosters the effective enaction of moral sensitivity: (1) emotional presence, (2) synchrony and reciprocity, (3) perspective taking, and (4) empathy. These

roots, or building blocks, represent basic socioemotional procedural knowledge constructed initially in the first years of life that form the foundations for lifelong actionable moral sensitivity—a knowhow for relating to others, contributing to what Darwin calls "the moral sense."

First, *emotional presence* refers to the capacity to be fully emotionally present (not preoccupied) and responsive, which is a sign of good mental health. The child begins to develop this capacity when she is not ignored or emotionally shut down, but experiences responses from caregivers even when she is upset. When she indicates open expectation of social connection (e.g., by smiling or reaching up), a caregiver responds, mirroring relational interest, and there is a reciprocal connection promoting "limbic resonance," a co-coordination of emotion systems.[68] This type of social attentiveness from caregivers is the manner in which the child practices and builds the capacity for mirrored, appropriate emotional responses herself. Like any expertise, it is built from guided, immersed experience.

Second, *synchronous, reciprocal intersubjectivity* refers to the ongoing negotiation of purpose, interest and companionship within the relationship by means of an interpersonal dance. This relies on a sense of reverence for the unique expression of being in the other. A reverent hospitality allows the relationship to develop as it will, without "controlling it." Again, the child learns from experience with caregivers. Thus, the EDN immersion in reciprocal intersubjectivity itself fosters capacities for the same that the child applies in social life. Nervous systems coordinate and synchronize themselves, mirroring one another's inner states.[69] This rich, positive social experience with mother and others results for the child in capacities for intersubjectivity (self-to-other communion), mutual responsiveness and reciprocity, as well as dyadic meaning making and repair.[70] The child learns to reconnect after a period non-synchrony, building a sense of social capacity.[71] The child has learned how to deploy her learned capacities, understanding that social relations involve emotional signaling (knowing about) and knows how to signal properly, coordinating verbal and nonverbal communications in the dyad (knowing how).

Third, *perspective taking* is the imagination of another's viewpoint and motivations. The caregiver-child relationship is the biosocial motivating context for the initial stages of this capacity. Caregiver affect-mirroring is a modified, less intense reflection of the child's feeling (not the mother's) that allows the child to start to develop representations of mental states, and interaction with caregivers provides children with experience of social situations and motivations. In well-functioning adults, maturation and experience lead to moral imagination capacities that are able to extend outside the present moment to imagine multiple possibilities and to mentally rehearse potential outcomes of actions. But these later capacities are built on the early present-moment capacities and are grounded in real-life social experience.

Fourth, *empathy* represents the ability to *feel with* or to match another's feeling. It is a social or other-regarding emotion (unlike personal distress, which is a non-social, self-regarding emotion that actually must be regulated for empathy to occur). Babies demonstrate empathic mirroring capacities from the first days of life (i.e., crying when another baby cries) and in early life practice empathy with empathic caregivers who also help the child learn to regulate personal distress. Sympathy builds on empathy but includes a cognitive concern *for* the other, which requires taking the perspective of another.[72] Empathy emerges from the mammalian CARE emotion system[73] and matures with cognitive development, specifically, with perspective taking.

These empathic effectivity roots represent basic socioemotional procedural knowledge that forms the foundation for a moral sense. But these inherited roots or propensities are shaped by the environment, social interactions, and personal practice: such early experiences yield either species

typical or species a-typical development. To understand the difference, we first turn to species typical development.

Species-Typical Development: Engagement Orientation

Although humans are evolutionarily prepared for the development of the moral sense, it is best cultivated by the EDN, constructed in early experience, and developed over the course of life through lived relationships with others. Establishing trust (or mistrust) of those in one's web of relationships is a primary outcome of the first months of life.[74] After that, it is hard to revise the procedural knowledge learned implicitly upon which the social life depends. Infants signal with body and facial gestures and only break into crying if earlier signals are ignored. When parents are responsive to early signals, the child learns that her body is a reliable source of information and the world will provide what is needed. Good care during the early sensitive period facilitates strong linkages from executive functions in the prefrontal cortex to self-preservational systems in evolutionarily older parts of the brain so that the individual can control more primitive systems. In addition, the right hemisphere has many systems that govern self-regulation for the rest of life. For example, the vagus nerve (10^{th} cranial nerve) whose function is related to all body systems and linked to compassionate morality is largely controlled by the right hemisphere.[75] Warm, responsive care that teaches the baby to rapidly calm down or keep calm while the nerve function is being established, leads to better vagal nerve functioning. A well-functioning body and brain, which supports self-regulatory processes on multiple levels, create the building blocks for a host of capacities that govern our lives. When self-regulatory and emotion systems underlying prosociality are working as designed, it indicates that early experience was responsive.

Early experience, actions, habits, and interactions with caregivers form moral trajectories by shaping the development of early capacities, or empathetic effectivity roots. These empathic effectivity roots are motivational and dispositional orientations, which are massive sets of schemas. When a young child experiences ongoing intersubjectivity and her needs are met, social effectivity leads to instinctive cooperation with others and the development of prosocial autonomy. In fact, she builds a personal narrative for herself-in-the-world as an effective, cherished community member. This becomes a self-guiding orientation for life, based on the early learning of an intuitive dance in relationships with others, maintaining a broad "circle of attachments."[76]

Among SBHG (and other indigenous cultures that provide the EDN), such attachment and relational attunement is both a deeply embedded *practice* and a *value*. Elsewhere, I describe such relational attunement as an "engagement ethic" or orientation.[77] An engagement orientation means that the capacities I have described pervade the mind, intuition, and practice of the individual as actionable knowhow. One's engagement orientation alters the development and subsequent functioning of moral sensitivity for several reasons. First, it requires us to have enough self-control to not get too distressed in face of another's need or closeness. Second, it involves a relational commitment in the present moment and being relationally attuned, in an egalitarian manner. There is a sense of fellow feeling, rather than emotional distance or coercive interaction. Third, one's social procedural knowledge influences one's worldview and habits of interaction with others.

Consequently, moral sensitivity is not a single (or specific) biological capacity, but expertise in sociomoral relations that emerges from a host of more rudimentary capacities and lived experience beginning in early life. Moral sensitivity relies on embodied capacities that emerge from the cultivation of inherited seeds of capacity by nurturing caregivers in early

childhood.[78] Learning moral sensitivity differs from schoolbook learning in that it does not emphasize thinking and intellect applied to hypothetical problems, but requires situationally-sensitive actionable knowhow for everyday life.[79] As such, moral sensitivity is not just a matter of empathic response, but of interpretation, understanding the motives of another, and knowing how to act effectively. Much like the practical wisdom of social skills, moral sensitivity requires actionable learning in that it takes immersion, guidance, and extensive practice to move from novice to expert.[80] Most of this knowledge is learned and held implicitly. Of course, we all continue to build social expertise throughout life with people from different backgrounds and in new contexts. As a consequence, moral sensitivity requires practice in active caring for others—a lifelong learning activity, because every situation and individual is a unique case.

Species A-Typical Development: Protectionist Orientation

When a child is not provided with the key features of the evolved developmental niche during development, it undermines species-typical moral development and crucial capacities for engaging with others morally and socially. Without appropriate care in early life (which I call "undercare"), mammals can grow up with erratic physiological systems that are easily thrown into disarray when unpredictable things happen. In extreme cases of undercare, mammals slip toward physiological chaos as the brains of the young do not self-assemble—the prosocial neural networks are not developed. Instead, they must rely on basic survival systems that can lead, in severe cases, to functionally dangerous individuals who are only able to think of their own (unmet) needs.[81] Even in non-extreme cases, defensive survival systems are more easily activated and enhanced[82] because the controlling linkages from the prefrontal cortex on schedule to mature at that time may not develop properly.[83] The orbitofrontal system, whose function is developing in early life, connects directly to the autonomic system and, when properly functioning, regulates its two subsystems (sympathetic and parasympathetic). When a child experiences regular stress, these primitive systems are frequently activated, undermining development of their controls and sense of trust.[84] If undercare occurs too intensely, for too long, or during critical developmental periods, a child may develop one or more poorly functioning systems, leading to deterioration in health, intelligence, sociability, or morality—which may not be manifest for years.

Let's examine what happens to the stress response system and the automatic (sympathetic and parasympathetic) nervous system when a baby is routinely left to cry.[85] When a baby gets uncomfortable (e.g., from hunger, the need for movement or touch), the baby will indicate this through grimaces and wiggling. If this signaling does not bring relief, the child will start to make noise. When small noises fail to bring relief, the child begins to mobilize stronger signals. The stress response is engaged and moves from initial alarm to panic as the *sympathetic* system mobilizes the body for action ("fight or flight"). Anger surges and the baby screams. Perhaps the caregiver shows up at this point. When this occurs routinely, trust is undermined and a rageful personality fostered: anger was effective and an *anxious* insecure attachment develops. In contrast, when help is not forthcoming even with raging, the *parasympathetic* system will be activated. This system preserves energy and life through slowing or shutting down systems ("freeze or faint"). When this system is activated, the baby quiets down into despair. The caregiver showing up after this has promoted distrust of relationships and emotion: emotions are ineffective for communication and an *avoidant* insecure attachment develops. If the caregiver is inconsistent and unreliably present, the baby resides in anxiety, which becomes chronic and is apparent in an anxious insecure attachment.[86] When there is a pattern of this type of undercare, the child's stress response will become hyperactive and can be easily inappropriately triggered

from unfamiliar experience. The stress response physiologically takes over attention and energy,[87] and directs the maturational schedule.

This undercare promotes insecurity: the child learns not to trust others, seeks security elsewhere (e.g., achievement, dominance, or hoarding resources), and distrust becomes an everyday filter or "the expectation that others will hurt, abuse, humiliate, cheat, lie, manipulate, or take advantage."[88] In these cases, the individual may become threat-reactive. Threats will be frequently perceived, provoking the strong stress response, undermining higher order thought and prosocial emotions.[89] Distrust sets up a self-protective or a "protectionist" orientation (called "safety" or "security" ethic elsewhere[90]) that relies on the survival systems present at birth: mammalian emotions systems of fear, rage, and panic. When the stress response becomes habitual early on and these primitive survival systems dominate action, the individual is oriented to threat and dominance, habitual suspicion of others, and insensitivity to the needs or communications of others (apart from threat, dominance, and suspicion).

Protectionism undermines the development of empathic effectivity roots (such as practice in reciprocal intersubjectivity), affecting imagination and sensitivity.[91] When raised in a non EDN-consistent environment, one is generally less imaginative, gracious, aware, and perceptive due to excessive energy, focus, and growth on mechanisms for survival, control, or withdrawal.[92] Attention is preoccupied with self-protective routines and ideologies. When one is anxious, depressed, distracted, or nursing a sense of injustice, one is less morally sensitive. When a child does not feel embedded in a close, prosocial community, or is (mis)guided by vicious adults who encourage aggression and selfishness (or foster it through punishment or disrespect), self-aggrandizing energies will be let loose on the world, without sensitivity to their destructive power towards relationships, peoples, or species. With practice in this alternative universe of self-development, self-protective filters can be evoked so quickly that the person is unaware of the narrowed perception of the social landscape. In these cases, moral decisions and actions are taken with self-protection foremost in mind. Such habitual self-protective procedural memory alters subsequent experience, action, and interaction with others.

With a protectionist orientation, the individual compulsively moves to a hierarchical moral relation (one-up or one-down) for self-protection, often based in procedural memory from early life (e.g., power struggles to get needs met). The two subtypes of a safety mindset that operate "in the moment" reflect this hierarchical orientation. One is anger-based and aggressive (Combative or Bunker Safety) where one feels enough strength and power to take action against the threat (one-up). In fact, with a dispositional combative safety mindset, one feels less than adequate unless one is dominant; hence, the "bulldoggedness" of some personalities in the face of challenge. This externalizing, or pushing away of others with hostility or aggression, can become habitual in social situations as a learned form of self-regulation. The other safety subtype is fear-based appeasement (Compliant or Wallflower Safety). In a dissociated state (detachment from the immediate situation), the individual is cut off from external and internal stimuli. In this case, one feels paralyzed or too weak to take action and so withdraws physically and/or emotionally. Energy is internalized towards anxiety and depression. This, too, can become habitual in social situations as a way to cope in a perceived hostile environment.[93] In both cases, the primitive systems are rigid and so the individual will demonstrate inflexibility and a reliance on routines and precedent—unable to be emotionally present to others and relationally attuned; instead he will categorize others and react to them as members of a category.

If a child does not receive intensive social support during sensitive periods when brain and body systems are established (i.e., the evolved developmental niche or EDN), the foundations for

health, wellbeing, and social and moral life—the empathic effectivity roots—are rent, torn asunder, with varying degrees of misalignment dependent on the timing, duration and intensity of toxic early stress.[94] The child develops a stress-reactive physiology, sensitized to personal distress, with relative inflexibility, which can persist and become habitual in a protectionist orientation and actions, altering neurobiological development and function. By acting from such a protectionist orientation, the individual alters subsequent experience, action, and interaction with others, thereby altering the very social conditions that foster the development of moral sensitivity.

Implications and Conclusions

Recall how baselines often shift without awareness unless one steps back to examine the "big picture." The reason to take the broad view of human evolution is that comparative baselines have become unclear. Child raising contexts have slipped so far from our evolved developmental nest—with generations of effects—that we have difficulty recognizing the suboptimality of human beings today and are tempted to think that unregulated, selfish, aggressive individuals exhibit "normal" human nature. But such behaviors, particularly those that emerge from a "protectionist" orientation, result from conditions of undercare (failing to provide the EDN) and fit with the Hobbesian received view of human nature: that humans are violent, self-interested, and must be governed and controlled by hierarchies for social order. These views may ring true because of how a person was raised: under conditions of undercare with increased stress reactivity, immersed in interactions with those using protectionist orientations, and developed skills for detachment and withdrawal as well as dominant aggression and vicious imagination. Given this early learning environment and experience, such selfish, aggressive, and avoidant behaviors will be expected—and then promoted—by the behavior of those who believe they are "normal" (e.g., parents). If everyone around one has similar limitations, such limitations look normal—until one looks at the big picture and sees the shifting baselines. The received view of human nature is veridical only under conditions where human needs are thwarted. Humanity's inherited capacities that grow within the EDN—relational engagement and its abstracting counterpart, communal imagination—then look like Pollyanna visions far from reality. But these capacities are only far from current reality because societies have moved their childrearing baselines in directions that undermine human development and have limited their imaginations to match.

What happens when a society contains many species-atypical human beings? As adults, they will build societies that perpetuate the same undercare and, unsurprisingly, rationalize it. Most births in the U.S. are traumatic,[95] and undercare for multiple generations may epigenetically shape the brain over generations for a focus on social harm and threat.[96] The natural flow of childhood established over hosts of generations has been radically shifted. Distrust has been climbing since the 1950s,[97] which is about the time of a significant downturn in childrearing.[98] Babies are isolated and left to cry as if this yields no harm; unfortunately, it creates toxic stress.[99] The social separation that is forced on infants and children in settled, particularly Western, societies[100] influence perceptions, attention, and social capacities, creating insecure attachment, poor emotive development, and distance from intimacy and intimate relationships. The effects go "all the way up" from early childhood, stretching into formative pre-teen and teen years, and extending into early adulthood, where parents then transfer these norms, orientations, and practices to the next generation through their parenting. Developmental experiences snowball across generations where low-nurturing parents create children who become even less nurturing as parents.

In today's modern industrialized world, so many untoward and haphazard experiences occur during sensitive periods for brain/body development that individuals have a wider range of psychopathologies than in environments that support and provide the EDN.[101] Children spend a great deal of time alone at home with screens, buying food from local convenience stores when hungry, while parents are either working or entertaining themselves away from home. So it should be no surprise that avoidant attachment has increased significantly and empathy has decreased among American college students.[102] EDN-deprived people are set on a trajectory to grow into emotionally illiterate people consumed by self-aggrandizement and narcissism, who are morally detached from others (exemplified by video-recording attacks).[103] Secure attachment and corresponding emotional intelligence are decreasing,[104] and such socio-emotional illiteracy leads to self-protectionism where social encounters are win-lose (all or nothing) or zero tolerance, making it difficult to cooperate across perceived divisions (which appear everywhere to those with socio-emotional impairments). Thus, in the process of dysregulating layers of regulatory and socio-emotional systems, caregiving inconsistent with the EDN detaches moral emotions from their species-typical moorings in empathetic effectivity roots. As a result, a protectionist orientation is cultivated instead of humanity's moral potential.

Humans evolved the capacity for Darwin's "moral sense" but do not necessarily develop it well in every culture. Individuals who suffer from undercare are not only more limited socially and morally within their own interactions, but they also alter the developmental conditions for their children, grandchildren, and children in subsequent generations. In fact, cultural heritage, along with personal experience fostering incorrect intuitions, may have the largest impact on the ill-being that is so common among human beings today. Because many institutions, policies, and expectations within current U.S. society undermine community support, parent-child bonding, and parental responsivity (the EDN for children), the U.S. is the epitome of a culture that undermines humanity's moral heritages and instead promotes self-centered morality leading to adults with limited capabilities for moral sensitivity.[105] For example, in the U.S. there is a noted loss of the ability to listen to alternative perspectives.[106] This does not mean that individuals are not social (that is hardwired for survival as social mammals), but that sociality is becoming misshaped as social "de-skilling" spirals downward over generations.

Cultures with chronic and widespread undercare for children are impairing the development of moral sensitivity. In these cultures, there is often an emphasis on intellect—a discount of emotion—which stems from adults' own childhoods: again, a shifting comparative baseline and a shift of what is valued and promoted as "normal." Adult emotions and social understandings become skewed towards detachment. For some time, the emphasis on cognition (intellect, reasoning) in most Western scholarship has led to (or is a result of) a blindness toward emotion leading to the neglect or misunderstanding of affect (emotion, feeling) and its vital role in moral functioning throughout evolution. We know now that emotions must be well educated or human functioning is malformed, at least in terms of human potential.

Fortunately, human culture, interpersonal relationships, orientations, and actions are malleable. These can shift based on the choices individuals and communities make, starting with how human brain/minds are raised. Young children who receive more EDN-consistent care are more likely to demonstrate empathy, self-regulation, and conscience in early childhood, as well as orientations to engagement and less self-protective focus in social relations.[107] Adults who report childhoods with more EDN-consistent care also demonstrate better mental health, empathy, and perspective taking as well as an engagement orientation.[108] A change in cultural practices of childrearing can help us return to conditions for development that not only provide conditions for

the growth and flourishing of our empathetic effectivity roots, but also promote the long-term development of moral sensitivity.

Endnotes

[1] Daniel Pauly, "Anecdotes and the shifting baseline syndrome of fisheries," *Trends in Ecology and Evolution* 10 (1995): 430.
[2] (Thomas Hobbes, In *Leviathan, Revised Edition* edited by A.P. Martinich and Brian Battiste. Peterborough, ON: Broadview Press, 2010), 24.
[3] For examples, see Richard Dawkins, *The Selfish Gene: 30th Anniversary Edition* (Oxford: Oxford University Press, 2006); Mary Midgley, *The Solitary Self: Darwin and the Selfish Gene* (Durham: Acumen, 2010); Marshall Sahlins, *The Western Illusion of Human Nature* (Chicago: Prickly Pear Paradigm Press, 2008).
[4] For example, see Lynn Margulis, *Symbiotic Planet: A New Look at Evolution* (Amherst: Sciencewriters, 1998); Kenneth Weiss and Anne Buchannan, *The Mermaid's Tale: Four Billion Years of Cooperation in the Making of Living Things* (Cambridge: Harvard University Press, 2009).
[5] Paul Shepard, *Nature and Madness* (Athens: University of Georgia Press, 1982).
[6] Darcia Narvaez, *Neurobiology and the Development of Human Morality: Evolution, Culture and Wisdom* (New York: W.W. Norton, 2014). Much of what follows is a condensed argument from Narvaez (2014), so for more information about the neurobiological and psychological research, see the full-length monograph.
[7] Charles Darwin, *The descent of man* (Princeton, NJ: Princeton University Press, 1871/1981).
[8] See Graham, J., Haidt, J., Koleva, S., Motyl, M., Iyer, R., Wojcik, S., & Ditto, P. H. "Moral Foundations Theory: The pragmatic validity of moral pluralism," *Advances in Experimental Social Psychology* 47 (2013): 55-130.
[9] See Douglas Fry & Patrik Söderberg, "Lethal aggression in mobile forager bands and implications for the origins of war," *Science* 341 (2013): 270-273.
[10] For example, See Steven Pinker, *The Better Angels of Our Nature* (New York: Viking, 2011).
[11] For reviews, see Douglas Fry, ed. (2013) *War, peace and human nature: The convergence of evolutionary and cultural views* (New York: Oxford University Press, 2013).
[12] Melvin Konner, *The Evolution of Childhood* (Cambridge: Belknap Press, 2010).
[13] Sarah Hrdy, *Mothers and Others: The Evolutionary Origins of Mutual Understanding* (Cambridge: Belknap Press, 2009); Richard Lee and Richard Daly (eds.), *The Cambridge Encyclopedia of Hunters and Gatherers* (New York: Cambridge University Press, 2004).
[14] Christopher Boehm, *Hierarchy in the Forest: The Evolution of Egalitarian Behavior* (Cambridge: Harvard University Press, 1999).
[15] Douglas Fry, *The Human Potential for Peace: An Anthropological Challenge to Assumptions about War and Violence* (New York, NY: Oxford University Press, 2006).
[16] Tim Ingold, "On the social relations of the hunter-gatherer band," In *The Cambridge Encyclopedia of Hunters and Gatherers*, edited by Richard B. Lee and Richard Daly, 399-410 (New York, NY: Cambridge University Press, 1999)...
[17] Inbal Ben-Ami Bartal, Jean Decety, and Peggy Mason "Empathy and pro-social behavior in rats" *Science 334*(6061),2011: 1427-1430.; Frans de Waal, *Good-natured: The Origins of Right and Wrong in Humans and Other Animals* (Cambridge, MA: Harvard University Press, 1996).
[18] Darwin, 1871; Howard Gruber, *Darwin on Man: A Psychological Study of Scientific Creativity* (Chicago, IL: University of Chicago Press, 1974). d, pt. 1.
[19] Loye, D. *Darwin's Lost Theory of Love* (New York: Writer's Press, 2000)
[20] Loye. 2000, 128-129 [emphasis added]
[21] d
[22] Because of human malleability based on experience, there is some dispute about whether there is a "human nature" or not. For examples, see Edouard Machery "A plea for human nature," *Philosophical Psychology* 21 (3), 2008:321-329 Jesse Prinz, *Beyond Human Nature* (NY, NY: W.W. Norton, 2012). d.
[23] Gilbert Gottlieb, *Synthesizing Nature and Nurture: Prenatal Roots of Instinctive Behavior* (Hillsdale, NJ: Erlbaum, 1997).
[24] Colwyn Trevathan, "Innate moral feelings, moral laws and cooperative cultural practice" In *Free Will, Emotions and Moral Actions* edited by Ariberto Acerbi, Jose Angel Lombo, and Juan Jose Sanguineti, 385–420. (Rome, Italy: Pontificia Universita della Santa Croce, 2011).

[25] Narvaez, D., Panksepp, J., Schore, A.N., and Gleason, T. (eds.) (2013) *Evolution, Early Experience and Human Development: From Research to Practice and Policy* (New York, NY: Oxford University Press, 2013).
[26] Narvaez, 2014
[27] Barry Hewlett and Michael Lamb, *Hunter-Gatherer Childhoods: Evolutionary, Developmental and Cultural Perspectives* (New Brunswick, NJ: Aldine, 2005).
[28] Narvaez, 2014
[29] For several months postnatally, human babies share characteristics of *fetuses* rather than infants of other primates (Trevathan, 2011). d
[30] Humans have changed the mammalian heritage of following the natural rhythms of the mother and infant, replacing them with psychological interference (e.g., anticipation of pain, causing fear and contraction of muscles instead of relaxation). Specifically, since World War II, most children have been born in hospitals (See Neal Devitt "The transition from home to hospital birth in the United States, 1930-1960" *Birth and the Family Journal, 4* (2) 1977: 47-58.) Medicalized childbirth is documented to interfere with mother-child bonding, breastfeeding success, and child self-regulation (See Narvaez et al., *Evolution, Early Experience and Human Development*, 2013; Bystrova, K., Ivanova, V., Edhborg, M., Matthiesen, A.S., Ransjö-Arvidson, A.B., Mukhamedrakhimov, R., Uvnäs-Moberg, K., Widström, A.M. (2009) Early contact versus separation: effects on mother-infant interaction one year later. *Birth, 36*(2), 2009: 97-109). Procedures were established that are primarily convenient for the doctor (lying down, scheduled inducements and c-sections).
[31] Trevathan, 2011
[32] There is evidence to suggest that under normal conditions, the baby initiates labor by releasing oxytocin to the mother (Peter J. Hogarth *Biology of Reproduction*, NY, NY: John Wiley and Sons, 1978). Natural oxytocin and epinephrine are released by the mother during unimpeded labor, suppressing pain, coordinating uterine contractions, and supporting emotional bonding through hormone releases that facilitate memory and social reward (See Lévy, F., Kendrick, K.M., Goode, J.A., Guevara-Guzman, R., & Keverne, E.B. "Oxytocin and vasopressin release in the olfactory bulb of parturient ewes: changes with maternal experience and effects on acetylcholine, gamma-aminobutyric acid, glutamate and noradrenaline release," *Brain Research, 669* (2) 1995:197-206.)
[33] One of the best studied practices is that of a doula or guide (not a midwife) who stays with the woman through the entire process (Campbell, D.A., Lake, M.A., Falk, M., & Backstrand, J,R, "A Randomized Control Trial of Continuous Support in Labor by a Lay Doula," *Journal of Obstetric, Gynecologic, & Neonatal Nursing, 35*(4), 2006: 456–464; Marshall H. Klaus and J.H. Kennel *Maternal-Infant Bonding: The Impact of Early Separation or Loss on Family Development* [St. Louis, MO: C.V. Mosby, 1976]; Trevathan, 2011).
[34] Trevathan, 2011
[35] Hrdy, 2009
[36] Armond S. Goldman, Randall.M. Goldblum, and Lars A. Hanson "Anti-inflammatory systems in human milk," *Advances in Experimental Medicine and Biology* 262, 1990: 69-76; Nathavitharana, K.A., Catty, D., & Mcneish, A.S. IgA antibodies in human milk: epidemiological markers of previous infections?" *Archives of Disease in Childhood 71*, 1994: F192-F197; M. Walker, 1993.
[37] Caldji, C., Tannenbaum, B. Sharma, S., Francis, D, Plotsky, P.M., & Meaney, M.J. (1998) Maternal care during infancy regulates the development of neural systems mediating the expression of fearfulness in the rat. *Proceedings of the National Academy of Sciences USA 95*(9), 1998: 5335-5340; Champagne, F.A., Weaver, I.C.G., Diorio, J., Dymov, S., Szyf, M., & Meaney, M.J. "Maternal care associated with methylation of the estrogen receptor-a1b promoter and estrogen receptor-alpha expression in the medial preoptic area of female offspring." *Endocrinology 147*(6), 2006: 2909-2915; Seymour Levine "The ontogeny of the hypothalamic-pituitary-adrenal axis: The influence of maternal factors," *Annals of the New York Academy of Sciences 746*, 1994: 275-288.
[38] Hewlett & Lamb, 2005
[39] Elizabeth T. Gershoff, "Spanking and child development: We know enough now to stop hitting our children," *Child Development Perspectives 7* (3), 2013:133-137.
[40] Narvaez, D., Wang, L., Cheng, A., Gleason, T., Lefever, J.B. (under review) *The Importance of Touch for Early Moral Development*.
[41] Babies are typically carried skin-to-skin nearly constantly, making it easy for the caregiver to pick up the baby's signals. This goes so far as to tell when the carried child needs to eliminate waste—the caregivers learn to recognize the signals and then hold the baby away. Current practices of elimination communication (going "sans diaper") mimic this practice.

[42] Gösta Alfven "Plasma oxytocin in children with recurrent abdominal pain," *Journal of Pediatric Gastroenterology and Nutrition, 38*(5), 2004: 513–517; Susan D. Calkins and Ashley Hill "Caregiver influences on emerging emotion regulation: Biological and environmental transactions in early development," In *Handbook of Emotion Regulation edited by* J. J. Gross, 229–248, New York, NY: Guilford Press, 2007; Donzella, B., Gunnar, M. R., Krueger, W. K., & Alwin, J. "Cortisol and vagal tone responses to competitive challenge in preschoolers: Associations with temperament," *Development Psychobiology 37* (4), 2000: 209–220; Nancy Eisenberg, N., & Natalie D. Eggum, "Empathic responding: Sympathy and personal distress" In *Cooperation: The Political Psychology of Effective Human Interaction* edited by Brandon Sullivan, B., Mark Snyder, and John L.Sullivan, 71-83; Malden, MA: Blackwell Publishing, 2008; David W. Haley and Kathy Stansbury "Infant stress and parent responsiveness: Regulation of physiology and behavior during still-face and reunion," *Child Development, 74* (5), 2003: 1534–1546; Jarrett, M. E., Burr, B. L., Cain, K. C., Hertig, V., Weisman, P., & Heitkemper, M. M. d

[43] Hewlett & Lamb, 2005

[44] Jaak Panksepp, J., & Lucy Biven *The Archaeology of Mind: Neuroevolutionary Origins of Human Emotions* (New York, NY: Norton, 2012).

[45] Sergio Pellis and Vivian Pellis *The Playful Brain: Venturing to the Limits of Neuroscience* (Oxford, England: Oneworld, 2009); Vasudevi Reddy *How Infants Know Minds* (Cambridge, MA: Harvard University Press, 2008); ColwnTrevarthen "Stepping away from the mirror: Pride and shame in adventures of companionship—Reflections on the nature and emotional needs of infant intersubjectivity," In *Attachment and Bonding: A New Synthesis* edited by Carter, C. S., Ahnert, L., Grossmann, K. E., Hrdy, S. B., Lamb, M. E., Porges, S. W. & Sachser, N., 55–84 (Cambridge, MA: MIT Press, 2005).

[46] Trevarthen, 2005

[47] Reddy, 2008

[48] Hrdy, 2009

[49] Gilda Morelli, Paula Ivey Henry, and Steffen Foerster, "Relationships and Resource Uncertainty: Cooperative Development of Efe Hunter-Gatherer Infants and Toddlers," In Darcia Narvaez, Kristin Valentino, Agustin Fuentes, James McKenna, & Peter Gray, *Ancestral Landscapes in Human Evolution: Culture, Childrearing and Social Wellbeing*, 69-103 (New York, NY: Oxford University Press, 2014).

[50] James J. Gross, (Ed.) *Handbook of Emotion Regulation*. (New York, NY: Guilford, 2007)

[51] Narvaez, 2014

[52] Trevathan, 2011

[53] Allan N. Schore *Affect Dysregulation & Disorders of the Self* (New York, NY: Norton, 2003).

[54] Ashley Montagu *Anthropology and human nature* (New York, NY: MacMillan, 1957); Allan N. Schore "The experience-dependent maturation of a regulatory system in the orbital prefrontal cortex and the origin of developmental psychopathology," *Developmental Psychopathology* 8, 1996: 59–87.

[55] Thomas Lewis, Fari Amini and Richard Lannon *A General Theory of Love* (New York, NY: Vintage, 2000).

[56] Calkins & Hill, 2007

[57] Allan N. Schore, "The effects of early relational trauma on right brain development, affect regulation, and infant mental health," *Infant Mental Health Journal* 22, 201–269, 2001: 202.

[58] Janice A. Egeland "Bipolarity: The iceberg of affective disorders?" *Comprehensive Psychiatry* 24 (4), 1983:337–344; L. Allan Sroufe *Emotional Development: The Organization of Emotional Life in the Early Years* (New York, NY: Cambridge University Press, 1996).

[59] For example, self-regulation can be impaired by separation from mother at birth or by unmitigated early distress; Bystrova et al., 2006; Stephen W. Porges. *The Polyvagal Theory: Neurophysiological Foundations of Emotions, Attachment, Communication, Self-Regulation*. (New York, NY: Norton, 2011).

[60] Marc A. Brackett and John D. Mayer "Convergent, discriminant, and incremental validity of competing measures of emotional intelligence" *Personality and Social Psychology Bulletin* 29, 2003:1147–1158.

[61] Sahlins, 2008

[62] Among SBHG there is no ingroup/outgroup orientation of any strength, unless they were mistreated by outsiders (See Douglas P. Fry and Geneviéve Souillac "The relevance of nomadic forager studies to Moral Foundations Theory: Moral education and global ethics in the twenty-first century" *Journal of Moral Education* 42 (3), 2013:346-359). Instead, they are known to be fiercely egalitarian with fluid group boundaries, treating non-group members without fear or aggression (Boehm, 1999; Fry, 2006).

[63] Narvaez, 2014

[64] Robert N. Emde, Zeynep Biringen, Robert Clyman, and David Oppenheim "The moral self of infancy: Affective core and procedural knowledge" *Developmental Review* 11, 1991:251–270.
[65] Aristotle's 'power' of virtue; John Haldane (2014) Personal communication
[66] Michael Polanyi *Personal Knowledge: Towards a Post-Critical Philosophy* (Chicago: University of Chicago Press, 1958).
[67] Aristotle included 'social fittedness' in his list of virtues as well (See Martha C. Nussbaum "Non-relative virtues: An Aristotelian approach" In *Midwest Studies in Philosophy: Vol. XIII: Ethical Theory: Character and Virtue* edited by Peter A. French, Theodore R. Uehling, and Howard K. Wettstein,, 32–53 (Notre Dame, IN: University of Notre Dame Press, 1988)
[68] T. Lewis et al., 2000
[69] Lewis et al., 2000
[70] Edward Tronick and Marjorie Beeghly "Infants' meaning-making and the development of mental health problems" *American Psychologist* 66 (2), 2011:107–119.
[71] Edward Tronick *The Neurobehavioral and Social-Emotional Development of Infants and Children*. (New York: W.W. Norton, 2007).
[72] Nancy Eisenberg "Emotion, regulation, and moral development," *Annual Review of Psychology* 51, 2000: 665–697.
[73] Jaak Panksepp *Affective Neuroscience: The Foundations of Human and Animal Emotions* (New York: Oxford University Press, 1998).
[74] Erik H. Erikson *Childhood and Society* (New York, NY: Norton, 1950).
[75] Porges, 2011
[76] Darcia Narvaez "The ethics of neurobiological narratives," *Poetics Today* 32(1), 2011: 81-106.
[77] Darcia Narvaez "Triune ethics: The neurobiological roots of our multiple moralities," *New Ideas in Psychology* 26, 2008: 95–119; Narvaez 2014
[78] Grazyna Kochanska, "Mutually responsive orientation between mothers and their young children: A context for the early development of conscience" *Current Directions in Psychological Science* 11 (6), 2002: 191-195.
[79] Francisco Varela *Ethical know-how: Action, wisdom, and cognition* (Stanford, CA: Stanford University Press, 1999).
[80] see Karl A. Ericsson and Jacqui Smith *Toward a General Theory of Expertise* [New York, NY: Cambridge University Press, 1991].
[81] T. Lewis et al., 2000, p. 218
[82] Perry et al., 1995
[83] Allan N. Schore *Affect Regulation and the Repair of the Self* (New York, NY: Norton, 2003).
[84] For example, too much unmitigated distress in early life can leave one's hypothalamic-pituitary-adrenal-gland axis (HPA) sensitized, resulting in a system that never settles down (see Lupien, S. J., Mcewen, B. S., Gunnar, M. R., & Heim, C. "Effects of stress throughout the lifespan on the brain, behaviour and cognition" *Nature Reviews Neuroscience 10* (6), 2009:434–445).
[85] See James P. Henry & Shirley Wang "Effects of early stress on adult affiliative behavior" *Psychoneuroendocrinology* 23 (8),1998: 863–875. doi:10.1016/S0306-4530(98)00058-4
[86] See Jan Karrass and Tedra Walden."Effects of nurturing and non-nurturing caregiving on child social initiatives: An experimental investigation of emotion as a mediator of social behavior" *Social Development* 14 (4), 2005:685–700; Spangler, G., and Klaus E. Grossmann."Biobehavioral organization in securely and insecurely attached infants" *Child Development* 64, 1993:1439–1450.)
[87] Robert Sapolsky *Why Zebras Don't Get Ulcers, 3rd ed.* (New York, NY: Holt, 2004).
[88] Jeffrey E. Young, Janet S.Klosko, and Marjorie E. Weisshar *Schema Therapy: A Practitioner's Guide* (New York, NY: Guilford, 2006), 211
[89] Narvaez, 2014
[90] Narvaez, 2008, 2014
[91] Darcia Narvaez, Lijuan Wang and Ying Cheng (under review) "Evolved Developmental Niche History: The effects of early experience on adult health and morality"
[92] Although there may be brain plasticity after initial groundwork is laid in early life, flexibility to change brain architecture may require extensive therapy to recondition the mind/brain (e.g., re-parenting, mindfulness meditation) in order to let go of social anxiety and detachment and to learn how to be emotionally present.

[93] Dispositionally, a person can favor one or the other type of safety ethic, or flip between them depending on the situation (a bully in one moment but a doormat in the next). We can see the safety ethic in operation with an authoritarian personality that claims dominance around low-status people but exhibits submissive behaviors around a higher-status person (See Adorno, T. W., Frenkel-Brunswik, E., Levinson, D. J., & Sanford, R. N. *The Authoritarian Personality*. Oxford, UK: Harpers, 1950). The flipping to imbalance (cacostasis), one-up or one-down, indicates a lack of nuanced social self-regulation.
[94] Narvaez, 2014
[95] Wagner, 2009
[96] Meaney, 2010
[97] Robert Putnam, *Bowling Alone: The Collapse and Revival of American Community* (New York, NY: Simon & Schuster, 2001).
[98] Parallel with the advent of television after World War II, multiple changes to childrearing occurred: most births were medicalized (Devitt, 1977): anesthetizing mothers and using forceps, separating mother and baby for days after birth; most male babies were circumcised and most babies received formula. Since the 1970s families have been increasingly overstressed with two parents required to work to maintain an expected standard of living, leaving more and more babies in the care of under resourced day cares. Currently, outdoor play is curtailed by parents and recess is absent or under adult control in many primary schools. Touch is discouraged even in primary schools. So there are many contributing causes to the decrease in child and adult trust and wellbeing in the latter half of the 20th century.
[99] Shonkoff, J. P. Garner, A. S., 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. "The lifelong effects of early childhood adversity and toxic stress" *Pediatrics* 129, 2012: e232.
[100] In the U.S., there have been considerable changes in child birthing and rearing practices, many over the course of the 20th century, which may have a causal relation to "the hedonism of the 1960s, the narcissism of the 1970s, the materialism of the 1980s, and the apathy of the 1990s" (Christopher Peterson and Martin Seligman *Character Strengths and Virtues* [New York, NY: Oxford University Press, 2004], p. 5).
[101] Most societies today no longer provide the EDN, and—what is worse—advocate *against* EDN practices in the pursuit of profit by pushing infant formula, advocating sleep training, and baby isolation in all sorts of equipment.
[102] Konrath et al., 2011; Konrath, Chopik, Hsing & O'Brien, 2014
[103] Twenge & Campbell, 2006
[104] Daniel Goleman *Social Intelligence: The New Science of Human Relationships*. (New York, NY: Arrow, 1995)

[106] Susan Jaccoby *The American Age of Unreason* (New York, NY: Vintage, 2008).
[107] Narvaez, D., Gleason, T., Wang, L., Brooks, J., Lefever, J., Cheng, A., & Centers for the Prevention of Child Neglect "The Evolved Development Niche: Longitudinal effects of caregiving practices on early childhood psychosocial development" *Early Childhood Research Quarterly 28* (4), 2013:759–773; Narvaez, D., Wang, L., Gleason, T., Cheng, A., Lefever, J., & Deng, L. "The evolved developmental niche and sociomoral outcomes in Chinese three-year-olds" *European Journal of Developmental Psychology 10* (2), 2013:106–127.
[108] Narvaez, Wang, Cheng, Gleason & Lefever, 2014; Narvaez, Wang, Lawrence & Cheng, 2014