Neurobiology, Moral Education and Moral Self-Authorship

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The field of moral psychology is in a state of empirical abundance with handbooks and compendiums galore. On the one hand we know more about moral functioning than ever before. We understand that humans have competing moral sentiments (Narvaez, 2008, 2009), that moral goals can be influenced by the situation (Zimbardo, 2007; Van IJzendoorn & Kranenburg, this book), and that moral personality dispositions drive moral behavior in a person by context interactions (Lapsley & Narvaez, 2004; 2009). On the other hand while moral psychology research perhaps has never been more prolific, individual moral and social functioning may be on the decline. For example, moral judgment scores appear to be decreasing longitudinally in US college students (Thoma & Bebeau, 2008), as is empathy (Konrath et al, in press) and cheating is widespread (Callahan, 2004). Youth appear to be less capacious when they reach adulthood (Bauerlein, 2008), with one of four at risk for an unproductive adulthood (Eccles & Gootman, 2002). Although psychology has provided more insights into the causes of psychopathology, depression and anxiety are more prevalent now than 50 years ago, and the USA has more people in prison than any other nation (Pew Center on the States, 2008).

How did we get to this point? Is there something fundamentally awry that is causing these poor outcomes? In my view, a critical factor in the decline of US adult morality and children's wellbeing in the USA (Heckman, 2008) is the abandonment of evolved principles of childrearing, established more than 30 million years ago (Konner, 2010). Child rearing has profound effects on brain functioning that can last a lifetime. The quality of early care shapes the functioning of multiple systems, from neurotransmitters, to immunity and stress response, to moral imagination (Narvaez, 2011b). Good early care fosters optimal (flexible, functioning) systems, but such care is rare in the USA. Poor care influences not only cognitive and physiological capacities but also expectations for community and social life. Moreover, current cultures of childrearing in most if not all Western societies emphasize left brain development, at the expense of the more holistic, contextualized, emotional intelligence inclusive of the right brain (McGilchrist, 2009; Schore, 1994).

The Neuromoral Education of Early Life

Ecological contextualism identifies how multiple social systems (e.g., family, neighborhood, parental work life, school, societal culture) influence children's development (Bronfenbrenner, 1976). Most recently, scholars are discovering how deeply biological these effects are. Co-construction of a child's capacities begins from conception, when the developing embryo reacts to the environment provided by the mother; she in turn is affected by the community support she receives during pregnancy (and afterwards) (Hrdy, 2009). The mother's expectations for the child are conveyed through stress hormones and other neurobiological mechanisms in the womb affecting how the baby's body is constructed (Gluckman & Hanson, 2005). If a mother is stressed early in pregnancy, it has detrimental effects on the child's health in multiple ways (Davis & Sandman, 2010). Maternal depression and anxiety during pregnancy are associated with a reactive stress response and with children's subsequent rates of hyperactivity, impulsivity, and emotional and behavioral problems (e.g., Lundy et al., 1999).

Neuromoral education effects also take place at birth. Mammalian babies that are separated from the mother at birth are less attuned with the mother and more socially awkward in later life (e.g., Bystrova et al., 2009). If the baby is subjected to pain, he or she reacts with a stress response that kills neurons and may form a stressed brain (Henry & Wang, 1998); the baby also may learn to associate social life with pain and react to others with rage and/or fear.

After birth, physiological as well as psychological education continues as early care shapes the functioning of all physiological systems through epigenetic and plasticity effects. For example, children who are neglected have more poorly functioning neurotransmitter, neuroendocrine, immune, and stress response systems (Lanius, Vermetten & Pain, 2010). When these are poorly functioning, the individual has less energy for prosociality. Much of who we become is established during the first years of life, including whether we are more agreeable, open, and conscientious (Kochanska, 2002). Although the brain is plastic, it becomes less so with age, so early patterns are foundational to later functioning (Lanius et al., 2010). Modern Western humans have culturally erased most of the practices of infant and child care that evolved to fixation, practices that are "expected" by human brains and bodies and whose lack has detrimental effects on development (Narvaez, Panksepp et al, 2011).

What are the characteristics of good early care? Anthropologists have identified the human version of this care, only slightly changed from catarrhine mammalian practices that emerged 30-40 million years ago (Konner, 2010), which reflect part of our ancestral human mammalian milieu (AHMM) (Narvaez & Gleason, 2011). Along with natural childbirth (no drugs) and no separation of infant from mother, these characteristics include child-directed breastfeeding 2-5 years (4 years on average), constant touch in the first years of life, prompt response to needs, fusses and cries, multiple adult caregivers, free play in nature with multi-aged mates (Hewlett & Lamb, 2005; Konner, 2010).

Lack of AHMM-consistent care has detrimental effects on children's development and adult outcomes, including on moral outcomes such as empathy, conscience, and self control (Narvaez, Gleason et al., 2011). Usually the effects of poor early care are symptomatized by poor attachment. But the consequences of poor care are much deeper than psychological constructs; they are neurobiological. Good early care fosters perhaps the highest form of intelligence, "the ability of the organism to engage in a co-regulated affective communication, where this communication becomes more and more differentiated over time" (Greenspan & Shanker, 2004, p. 183). Without good care, development is less than optimal.

Neurobiological Underpinnings of Moral Functioning

Triune ethics theory (Narvaez, 2008c, 2009b) describes the formation of moral mindsets that rely on early experience for their co-construction. Three basic brain structures emerged from human evolution and generally correspond to three moral mindsets: security, engagement and imagination. When a person uses a mindset to propel moral action, trumping other values, it is an ethic.

The *security* ethic is rooted in survival systems that are shared with all animals and are present from birth. In mammals, the extrapyramidal action nervous system (Panksepp, 1998) comes into play under perceived threat—physical or psychological. Threat cues activate the stress-response system which affects all biological systems to some degree. The security ethic emerges when a person oriented to dominance, for example, takes moral action to protect the ego either from a "bunker," (aggressive) orientation, or a "wallflower" (withdrawing or freezing)

orientation. When the environment is chronically threatening, such as during poor early care, self-protection may become the habitual mode of the personality in social situations (Eisler & Levine, 2002). For example, Caldji, Diorio, & Meaney (2003) found that the brains of infant rats subjected to stress from poor parental care are permanently altered in neurotransmitter function. Those with poor attachment or stressed emotional systems are more likely to exhibit aggression or withdrawal as a normal mode of self protection, affecting moral behavior (Hart, Shaver & Goldenberg, 2005).

The *engagement* ethic is rooted primarily in the mammalian emotion systems that lead to sociality. The higher limbic system is co-constructed with caregivers in early life (also with caring others during sensitive periods). These structures can be easily damaged by poor care or trauma and require for their development extensive experience in mutual attunement with caregivers (Schore, 2011). Patterns of experience formed in early life become implicit physiological patterns of response that frame functioning, including moral functioning. Ideally, children develop a sense of security through intersubjectively-safe and attuned nurturing (Field & Reite, 1985; Schore, 1994). The wash of oxytocin that accompanies breastfeeding and the tryptophan in breastmilk (a precursor of serotonin) facilitate bonding and prosocial feeling (e.g., Young, Lim, Gingrich, & Insel, 2001).The engagement ethic represents the dominant mode of relating found among foraging hunter-gatherer communities (the type of society in which the human genus spent 99% of its history). In such communities, the focus is on mutual enjoyment and emotional presence (facilitated by laughter, singing, dancing, cuddling). In this mode the prosocial emotions and hormones are most likely to prevail (e.g., oxytocin). This may have a large part to do with the peaceful nature of these societies (Fry, 2006).

The *imagination* ethic is rooted primarily in the most recently evolved parts of the brain, the frontal and prefrontal cortex (PFC). It enables the ability to think outside the present moment and about future possibilities. The PFC is highly influenced by early care and experiences during other sensitive periods. When early care is poor, the orbital frontal cortex, a part of the PFC, may not develop properly, leading to an underdeveloped prosocial emotionality (leading to the dominance of the security ethic). When linked with prosocial emotions, *communal imagination* orients to moral problem solving. When fueled by security ethic concerns, *vicious imagination* aims for ego dominance. When completely detached from emotion, *detached imagination* robotically act towards others without moral compunction (e.g., Nazi doctors experimenting on prisoners).

As children grow they develop moral understanding through enactive participation in social life. At first they learn sensorimotor sensibilities for justice (Lerner, 2002) from needs getting met, then from mutually co-regulated reciprocity and social exchange, all leading to a secure attachment (Kochanska, 2002). Caregivers provide scaffolding for what to attend to and perceive (e.g., ‘look at the bird,’ ‘how does your sister feel after you took her toy?’) This *enactive* learning occurs in real life situations, in which children are immersed, so moral understanding is built from experience, not detached discussions or book learning. Through guided direction while immersed, adults help structure children’s memory for moral events that children later adopt for their own self-narratives (Stipek, Recchia, & McClintick, 1992). In these ways, children develop a moral identity (Lapsley, 2008; Lapsley & Narvaez, 2006).

Formal Neuromoral Education

When schooling starts, neuromoral education expands to include relationships beyond the family. Schooling is unnatural from an evolutionary perspective for two reasons. It involves systematic coercion, which is foreign to the animal kingdom outside of humans, and it requires extensive interaction with non-kin. When schooling starts, typically coercion becomes an everyday experience for the child. In many ways, coercion shuts down imagination, spiritual growth, and self-purposing. In most schools, children are treated systematically (for institutional purposes) at odds with their own course of development. Ideally, a school allows the child to guide his or her own development. At the same time, because children outside of school are immersed, unsupervised, in endless examples of vicious and egocentric behavior (at least in the USA), it is important for educators to take on moral character developmental education *intentionally* (Narvaez & Lapsley, 2008) with approaches that honor evolutionary principles in keeping the security ethic from emerging and maintaining a culture where the engagement and imagination ethics are fostered.

Although moral character education can be controversial (Lapsley & Narvaez, 2006), the Integrative Ethical Education model (IEE; Narvaez, 2006, 2007, 2008a) takes on many of the challenges that arise when moral character development is integrated into academic instruction. IEE offers a multifaceted approach to maintaining a more apprenticeship-styled moral character education. The model can be used with any age group in any setting as it fosters moral self-authorship in group members. Here it is described as applied in a classroom setting.

At the outset, the educator should *establish a secure, caring relationship with the child*, so as to ensure a socially supportive context for learning and a mutual commitment to work together (Masten, 2003). Because humans are wired for emotional signaling and social motivation (Panksepp 1998), a caring, supportive teacher more easily fosters students' empathy and prosocial behavior as well as motivation to learn (Wentzel, 1997). Education starts with the state of the child and the mindset of the teacher. Children with poor early care will have brains that are less flexible, integrated, and attentive, represented by poor attachment but with patience and supportiveness, these children can be reached (Watson & Eckert, 2003). Deep social connections are more easily established through activities that awaken the right brain emotion centers such as music, dance, art, and laughter.

A student and teacher typically do not work in isolation but in a social context with others that primes and promotes particular behaviors (Battistich, 2008; Solomon et al., 2002). Hence, the second proposal is to *create a sustaining climate which is supportive of ethical behavior and excellence* (Narvaez, 2010). A sustaining climate takes seriously the social and work habits of students and teacher established at the beginning of the year. Relationships form the center of the classroom along with thinking and growing. A sustaining climate meets basic needs (e.g., for autonomy, belonging, competence, Deci & Ryan, 1985) which promotes peaceful coexistence. Ideally as the teacher and students get to know one another, they co-shape classroom activities in ways that delight them. The discourse is rich with prosocial imagination (how can we help one another?) so that students move beyond thinking about themselves. The educator makes sure that the classroom is emotionally warm and engaging. Feelings are acknowledged and accepted. When things go wrong, amends are made through conflict resolution, forgiveness and restitution. Leadership is shared with the students, who have a say in important decisions. With high expectations and high support, a sustaining climate cultivates mastery learning, prosocial relationships and citizenship skill development (Zins et al., 2004). Student interests drive the

activities of the classroom. A sustaining climate fosters human flourishing through positive social influences on brain and behavior, resulting in personal and group empowerment, and cultivating social, emotional and moral skills (Elias, Parker, Kash, Weissberg & O'Brien, 2008) through novice-to-expert instruction.

In naturalistic circumstances, individuals learn through guided apprenticeship (Rogoff, 1991) that mimics expertise development (Ericsson & Smith, 1991). Apprenticeship for moral character development involves *instruction for expertise development* (Narvaez, 2005; Narvaez & Lapsley, 2005). What skills do moral experts have that can be fostered (Narvaez & Rest, 1995)? They are more morally *sensitive*—noticing when moral action is needed and empathizing with those in need. They use *reasoning* skills to determine what course of action might be best and reflect on their choices. They are morally *motivated* to help others. They know the steps to take for moral *action* and persevere until it is finished. See Table 1 for representative skills for each of these components, skills that can be taught in the classroom during academic instruction (see Narvaez, 2009a; Narvaez & Bock, 2009; Narvaez & Endicott, 2009; Narvaez & Lies, 2009).[1]

Four levels of instruction can be used to move novices towards expertise. Each involves cultivating good intuitions and deliberative understanding. First, the novice must be immersed in multiple examples of the skill and watch exemplars using the skill so that a vision of the overall goal is formed. Second, the novice's attention is tuned to details and practice of subskills in the domain. Third, the novice practices several skills together as procedures. Fourth, the novice is able to perform the skill sets in multiple contexts. With guidance from a more-expert mentor, students build an embodied understanding (intuitions and explicit understanding) of a skill in context. School-based programs in social and emotional learning are documented to help students stop the rapid emotional response and think more carefully about action (e.g., Elias et al., 2008; Narvaez et al., 2004) and increase cognitive competencies in decision making (see Catalano, Hawkins & Toumbourou, 2008, for a review). Such education for reflective skills allows the individual to monitor intuitions, reexamine gut reactions and try to eliminate misconceptions.

Ultimately, moral character development is the responsibility of the individual. After infancy and parental influence, no one has greater power to build character than the individual herself. The choices an individual makes form her character. As a child develops, she determines more and more of her character. The more an attitude or behavior is practiced, the more automatic it becomes and the more likely the individual is to use it again. Educators can help students orient themselves to *self-authorship* by giving students practice in making choices and figuring out what talents and gifts to develop towards self-actualization within the community (Baxter Magolda, 2001). Expertise in any domain requires the individual to self-regulate through sophisticated metacognition (Anderson, 1989; Zimmerman, Bonner, & Kovach, 2002). Again, guided and explained practice helps develop the eventual capacity to self-regulate.

Finally, moral character is nurtured by the community in which it will be lived. The last critical piece of the Integrative Ethical Education model emphasizes the *restoration of the ecological network of relationships and communities that support the child's development*. Too often today, adults are distracted from attending to a child's unique developmental course. For optimal development, children need multiple supportive relationships from adults within and outside of the family. When goals and practices for child development and education are mutually adopted by families, neighborhoods and schools, optimal results are more likely (Lerner, Dowling & Anderson, 2003).

In brief summary, the IEE framework offers a collaborative model that can be flexibly applied in multiple settings and modified for local needs. Even when every local setting formulates a unique application, positive changes over comparison groups can be found (Narvaez et al., 2004). Overall the IEE provides a context that sustains the engagement and imagination ethics and keeps the security ethic under control.

Lifespan Moral Self-Authorship /Neuromoral Education

Once an individual has left secondary school, how does moral development proceed? Here are three ways that adults can foster their own moral development.

1. Beware truthiness in moral decision making.

Good thinking is challenging. People may get drawn to the truthiness of their intuitions or of their flawed reasoning (Narvaez, 2010b). Not only is good thinking thwarted by fixed mindsets regarding learning, but also by dogmatism, superstition, and a lack of open-mindedness and counterfactual thinking (Stanovich & West, 1997). Yet people wrestle with moral decisions, commitments, transgressions, and judgments in a complex fashion and do so on a regular basis. Moral decision making includes such things as ascertaining which personal goals and plans to set, determining what one's responsibilities are, weighing which action choice among alternatives is best, reconciling multiple considerations, evaluating the quality of moral decisions made and actions taken, as well as juggling metacognitive skills such as monitoring progress on a particular moral goal or controlling attention to complete the goal. In decision making generally, a person monitors and interprets many signals, such as emotional reactions (e.g., "my stomach is tight, I must not like x, so I won't do y"), current goals and preferences, mood and energy, environmental affordances, situational press, contextual cue quality, social influence, empathic response, logical coherence with self-image and with prior history. Moral deliberation takes into account all these aspects, involving an interplay between intuition and conscious reasoning. The agent plays "moral musical chairs" (Kohlberg, 1981), "feeling out" consequences of different decisions, skills that develop from extensive, guided practice in a particular domain (see Narvaez, 2010b for full references).

2. Select good environments for intuition development.

Cognitive science has proven Aristotle to be correct. Virtue is fostered through extensive immersion in good environments (fostering intuitions) and mentoring (fostering deliberation and assisting in the selection of environments for intuition development). One learns intuitions from the environments in which one is immersed (Hogarth, 2000). Individuals can be primed to think and feel particular ways without awareness (as advertisers are well aware). When repeated over time, these thoughts and feelings can become automatic responses to subtle cues and be established as "intuitions" (e.g., Coca-Cola is a good thirst quencher). Therefore one who desires to be virtuous must select carefully the environments in which one spends time. However, as Aristotle also pointed out, one needs a mentor until one can guide one's own virtue development. Good parenting and adult mentorship foster a keen sense of what virtue and virtue-supporting environments look like. One must consider what kinds of skills and attitudes a particular activity will foster in the self for the longterm. Are they skills and attitudes that make one a more

virtuous human being? If one does not select carefully, then one's preferences and intuitions will be formed haphazardly by others. Activities can foster one type of moral mindset or another. Environments that promote feelings of fear, anxiety and threat (e.g., violent electronic media) are prone to foster the security ethic, as the primitive parts of the brain are maintained on alert, grabbing energy from other parts of the brain (Matthews et al., 2005). Activities that foster positive social bonds (e.g., musical play) will promote feelings of social and personal wellbeing.

3. Maintain emotions and brain sets that lead to prosocial instead of antisocial behavior.

Too often modern life encourages a stress response in reaction to the novelty of encountering strangers on a daily basis. In combination with early experience that makes one stress reactive to novelty (Meaney, 2001), a chronic stress response can lead to a self-centered orientation to living: the security ethic, vicious or detached imagination. To counter this pressure to focus on the self-protection or distancing, here are three suggestions. First, the individual can intentionally cultivate a compassionate response to others. Mindfulness training can assist by the focus on sensory and perceptual input under relaxed breathing (Langer, 1999). Paying attention to the newness of a situation or encounter and savoring it (Bryant & Veroff, 2007) enlists the right brain holistic response and fosters an engagement ethic. A second approach is to practice social gratitude (Emmons & McCullough, 2002) in which appreciation of others is acknowledged and expressed. A third practice that fosters prosocial orientation and an engagement ethic, through a stimulation of the right brain, is immersion delightful social activities such as playing, dancing, art and music making, and being in nature (Siegel, 1999). Playful activity enlivens the positive emotions and promotes emotional presence, decreasing chances for depression and self-isolation (Brown & Vaughn, 2009).

Conclusion

From the beginning of life, humans are embodied creatures who are shaped by experience. The trajectory for a unique self is set in early life as the brain is being molded by relationships with caregivers. Each person's universe is different from that of another, setting up a unique personal moral grammar for the social life (Narvaez, 2011a) that moves among engagement, security, imagination from moment to moment, situation to situation.

Yet individuals have power to change themselves. Although the beginnings of the self are established by caregivers before a child can select for herself, with autonomy throughout life, individuals can shift their personalities, capacities and virtue, "growing themselves". Individuals can deliberately foster one ethic or another in themselves or others by the activities they choose. Individuals can choose activities that enhance their ego and the security ethic or they can choose activities where they let go of the ego through interaction with nature and with others, in social delight, encouraging an engagement ethic. The world is filled with the former and needs much more of the latter.

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FOOTNOTE

1 Booklets similar to these are available for free download at:
http://cee.nd.edu/curriculum/curriculum1.shtml

Table 1. Suggested Skills for Components of Moral Behavior

ETHICAL PERCEPTION AND SENSITIVITY

Reading and Expressing Emotion
Taking the Perspectives of Others
Caring by Connecting to Others
Responding to diversity
Controlling Social Bias
Interpreting situations
Communicate Well

ETHICAL REASONING AND JUDGMENT

Reasoning Generally
Developing Ethical Reasoning Skills
Understanding Ethical Problems
Using Codes and Identifying Judgment Criteria
Understand consequences
Reflecting On The Process And Outcome
Coping

ETHICAL FOCUS OR MOTIVATION

Respecting Others
Developing Conscience
Acting Responsibly
Be a community member
Finding meaning in life
Valuing Traditions and Institutions
Developing Ethical Identity And Integrity

ETHICAL ACTION

Resolving Conflicts and Problems
Assert Respectfully
Taking Initiative as a Leader
Planning to implement
Developing Courage
Developing Perseverance
Working Hard