

Work in Progress

Developing the Capacity to Connect

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Work in Progress

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Abstract

Relational/Cultural Theory describes human development as being through and towards healthy connection. But how does this actually happen? This working paper will examine how human beings develop the capacity to connect starting in their earliest childhood relationships. Emphasizing the neuroscience of human connection, the paper describes the chemical and neuronal transformation of the brain in early growth fostering relationships. It will explore how a separation/individuation culture undermines the human nervous system which is, literally, hard wired to connect and erodes our capacity to form healthy communities.

Introduction

In the years following the 9/11 terrorist attacks, politicians in the United States governed the American people in a "power over" leadership style. As terror of further attacks swept through the country, those at the top of the nation's hierarchy were celebrated acting decisively and with a sense of moral superiority. In this leadership style those in charge are immune to criticism and blind to their impact on others. However, while some were reassured by someone "more powerful" looking out for their well-being, the power over interpersonal style has contributed to the growing divide and chronic disconnections in our country. This successful capitalist society, built around the myth of meritocracy and with individuals competing to be "king of the hill", has left many relationally bankrupt.

The chronic disconnection and isolation that afflicts many in this country must be healed. As the social pendulum swung to the extreme and the abuse of power became more flagrant, those who felt alienated searched for communities, joining together to speak out against the divisions. Because of this, our country and perhaps the world has never been in a better place to hear the message of hope and healing that relational-cultural theory is offering (Jordan et al. 1991).

Along with the rhetoric of fear and the calls for self reliance there are rumblings from both the margins and the center speaking the language of community and connection. Though not everyone is talking the language of RCT as it is described by the Jean Baker Miller Training Institute (Jordan et al. 1991), many are searching for ways to exist in mutual, respectful connection with others in the shrinking world. It is urgent that those who believe we must live in harmony and balance in the world join the building chorus of strong, clear voices supporting connection.

Science

Science is becoming an active voice in support of the idea that human beings grow, develop, and thrive in healthy connection. The science available at the beginning of the 1900's, when many models of human development were being formulated, was based on Newtonian physics which described the world as being built of many distinct, bounded, measurable entities (Jordan, 2001). Because scientists believed that true science was objective and unbiased, fact, truth and reality became dependent on what could be seen and measured.

Jordan (2001) writes, "...since its inception, psychology has sought to establish itself as a "hard" science according to the model of Newtonian physics; it has focused its analysis on the individual, the intrapsychic, and proposed movement toward separation as the path of development". Human behaviors which could be objectively measured are considered real, subjective feelings, less real. Behavior and action have value, feelings have little value. However, in the last couple of decades, neuroimaging techniques have been used to measure the previously unmeasurable, broadening and deepening our understanding of the human mind. There are now many references in the scientific literature to the biology of emotions and feelings, behavior and even relationships (Bartels & Zeki, 2000; Calder et al, 2003; Carr et al. 2003; Phan et al. 2002).

The interplay between the brain and body, feelings and thoughts, individuals and relationships and communities and all of nature is of one of life's greatest mysteries. While each new study or finding is a piece of a growing, fascinating puzzle, how each puzzle piece is seen will have a huge impact on what the final puzzle looks like. Most researchers are looking at this new information through a more traditional model of human development that believes the goal is to create individuals with strong, independent internal worlds that are maximally resilient to life's many challenges.

This paper is an attempt to filter these same findings through the lens of RCT, which posits that human development occurs through and toward healthy human connection (Jordan et al. 1991). Using RCT as the lens in viewing the research findings fundamentally changes the final puzzle we are building.

It is time to directly question the separation-individuation model of development. The remainder

of the paper will present "scientific proof" that we are connected beings and that assuming the goals of human development to be separation and individuation is not only grossly inaccurate but, as we are witnessing today, destructively misleading.

Zest

If ever there was a word almost uniquely "relational", it is zest. Jean Baker Miller coined the term many years ago to describe the energy one feels in a "growth fostering relationship" (Miller and Stiver, 1997) From zest the four other "good things" flow – clarity, an increase ability to act, an increase in self worth, and the desire for more connection. (Miller and Stiver 1997).

When in a mutual, growth fostering relationship, the zest is obvious – a sudden surge of energy, a jolt of euphoria, a release of tension, an ease in the connection, a feeling you are just where you would like to be in the moment, present and grounded in the connection. But what is zest?

Is it a biological substrate, a simple chemical reaction, a jolt of dopamine that temporarily shifts ones reality for the better? Is zest a single, universal joining entity, part of the Zero Point Field of invisible energy that connects everything described by Lynne McTaggart (2008) in "The Field"? Is the zest that occurs between two close friends the same as the zest between a parent and child? What about the zest of a romantic relationship? Is the feeling of zest between a man and a woman different then between two men or two women? Can someone with a history of severe relational violation feel the same sense of zest as someone who was raised in a supportive, non-abusive environment where safe connection is assumed? Can someone from supportive environment ever feel the extremes of connection that a trauma survivor feels when she is finally able to feel safe in a human connection. These rather simple questions illustrate how complicated connection is psychodynamically, physiologically and spiritually.

SPOT Theory

In 2004, Eisenberger and Leiberan wrote a provocative and illuminating article, "Why it hurts to be left out?" This seminal piece of research supports the belief that connection is central not only to a person's sense of well-being, but also to his/her over-all health. The article describes an elegantly simple experiment designed to explore the brain patterns of people who are socially rejected. A subject

was recruited to play computer toss with two other participants. As the game progressed, the participant being studied was gradually thrown fewer and fewer computer balls... essentially being pushed out of the game.

As the player is being left out of the game, functional brain imaging was performed to see what areas of the brain were activated by social rejection. Interestingly, Eisenberger and Leiberman found that as the research subject was excluded from the game, his/her anterior cingulate cortex (ACC) fired. The ACC was already known to register the distress of physical pain (Eisenberger and Leiberman (2004). From this observation, they created Social Pain Overlap Theory (SPOT theory for short) which suggests social connections are so essential to the health and well-being of humans that they share a neurological pathway with physical pain. The human body and mind do not differentiate between physical pain and social rejection or isolation in terms of the amount of stress placed on the body. Perhaps this is the ultimate mind, body relationship connection. This theory is supported by other research showing individuals with more social support experience less cancer pain (Zaza & Baine, 2002); less back pain (Hoogendoorn et al. 2000) and less chest pain following cardiac surgery (King et al 1993; Kulik & Mahler, 1989). A recent study also showed that individuals with a friend or supportive stranger had less pain to a cold-pressor task than when alone (Brown et al. 2003). Also, opiate drugs, which reduce physical pain, decrease social distress vocalizations from baby animals when separated by their social group or caretaker. (Nelson & Panskepp, 1998; Panskepp, 1998; Panskepp et al. 1978; Panskepp et al, 1978). SPOT theory directly contradicts the long held western belief that humans are born dependent and the goal of socialization is to help them become separate, autonomous individuals. As Louis Cozolino (2006) says, "those who are nurtured best, survive best".

The Connected Brain

How does a human being develop and nurture this precious capacity to connect? How can we foster the development of growth fostering connection to create healthier and more resilient families, communities and organizations? Let's begin by exploring the human brain and central nervous system.

Human beings have the largest brain for its size of any animal on this planet. Why? Because of connections. In primates as the social system

expands and increases in complexity, the neocortex or outer layer of the brain, becomes larger (Dunbar, 1992). Humans, with the most complex social systems of all animals, have the largest neocortex. (Dunbar, 2003). The human brain is profoundly vulnerable to the environment and to early relationships in its first stages of development. When connected with an early caretaker who is responsive, the human brain develops toward close, differentiated relationships. When early caretaking relationships are abusive or unresponsive or if the environment is chaotic and stressful the human brain shapes itself to protect the person from future destructive relationships and physical harm (Tiecher et al. 2002). How does this change happen?

At birth, the area of the neocortex most responsible for attachment behaviors, the orbitofrontal cortex (OBFC) is an immature area of neurons (Steklis and King, 1985),. It has great potential to develop toward intense, complex connections, but it take a growth fostering relationship from the moment of birth to shape the brain to fulfill its enormous potential (Luria, 1980; Pandya & Barnes, 1987).

The orbitofrontal cortex is called the "association cortex" because of its location between the frontal cortex and the deeper brain structures, the limbic and subcortical areas. The frontal cortex receives information about the external world (i.e. the mother's face, smell, touch) and "associates" it (through the orbitofrontal cortex) with information from internal information sources such as the limbic system (the affect center) and the subcortical areas (particularly the autonomic nervous system). The information from these internal sources is related to both affect and somatic, visceral sensations (Schore, 2003). The OBFC is rich with dopamine, opioid and serotonin receptors. All three of these neurotransmitters systems are strongly involved in attachment and pleasure (Steklis and King, 1985; Raleigh and Brammer, 1993). Relationally speaking, the orbitofrontal cortex connects the external world with the internal world and makes specific associations of pleasure or pain to a specific person. It is through these connections that a person can regulate his/her autonomic responses to social stimuli. For example, it is the connection from the orbitofrontal cortex to the somatic, visceral centers that causes a person to get butterflies in his stomach before a big date or work presentation.

The development of the orbitofrontal cortex is a fascinating and complex process. Before the age of 3 years, the human brain is dominated by the right cortex (Chiron, 1997). As the brain matures

and develops, the left, more logical part of the brain, becomes prominent. In adults the right cortex remains the key area of the brain guiding our connections. It is associated with empathic cognition as well as the ability to perceive the emotional states of others (Ahern et al. 1991; Borod et al. 1986; Dimberg & Peterson, 2000; Dopson et al, 1984; Henry et al, 1984; Shapiro et al. 1997; Sutton & Davidson 1997; Keenan et al. 2000; Plateket et al. 2004; Best & Queen, 1989; Russ et al. 1994; Van Lancker, 1991; Hugdahl et al. 1989; Johnson & Hugdahl, 1991; Mandal & Ambady, 2004; Moscovitch & Olds, 1982; Ricciardelle et al, 2002; Watanabe et al. 2002; Katanoda et al. 2000; Patalet et al. 2004). The right side of the brain plays an important role in many aspects of the emotional world including processing, expressing and regulating emotional information (Schoore 2003). The right cortex sends social signals necessary for the initiation of social interactions and affiliative behavior (Henry et al, 1984, Shapiro et al. 1997; Sutton & Davidson 1997).

The right cortex of the infant is essential for the initial, primitive attachment that then guides the development of the orbitalfrontal cortex, the major "relationship area" of the brain (Schoore, 2000). Even in adulthood, the right orbitofrontal cortex remains larger and more extensively connected to the limbic/affect system and the subcortical, visceral areas than the left orbitofrontal cortex (Shapiro, Jamner & Spencer, 1997; Stuss & Alexander, 1999). In the presence of an attentive caretaking relationship, the brain and body of an infant is washed with positive stimulating chemicals and the OBFC matures into a human connecting device.

Researchers in the field of attachment have studied the development of the orbitofrontal cortex by studying the "mother-infant gaze". This intense stare between mother and her baby or between a primary caretaker and the child begins around the second month of life when the visual tracts start myelinating (Schoore 2003) and vision becomes a major sense taking in the surrounding environment. From the outside looking in, the mother-infant gaze is beautiful in its simplicity. However, within both mother and child, this loving gaze stimulates a wealth of chemicals that literally helps shape the child's developing brain and reshape the mother's brain (Beebe & Lachman, 1988a). As the mother and child lock eyes in an intense gaze, their internal worlds become resonant, both becoming physiologically excited by the connection. At some point the child's body is maximally stimulated and he will turn away in an effort to regulate the release of chemicals flowing through his body. A responsive

mother will follow his lead and disengage eye contact until the child's system has settled down and he is ready to reengage. At that point, mother and child reconnect and the excitement starts again. These emotional and chemical crescendos within the context of a responsive relationship occur repeatedly through the first year of life and are crucial to the child's growing ability to navigate in a relational world.

In an ideal setting, the connected gaze sets off a cascade of chemical reactions in the infant which prunes the brain toward healthy social interaction. The engagement from mother causes an increase in the release of cortisol releasing factor (CRF) from the infant's hypothalamus. CRF then stimulates the release of endorphins (opioids) in the child's brain (Brown et al. 1982) which act on the "subcortical reward centers" producing a sense of well being and calmness (Bozarth & Wise, 1981). CRF also triggers the infant's sympathetic nervous system which leads to further arousal and excitement.(Schoore 2003).

The mother-infant gaze also stimulates the release of dopamine pathways in the ventral tegmental area causing a heightened sense of energy, arousal and elation (Schoore 2003). It is important to notice that the impact of the gaze is mutual: the mother is similarly stimulated. Overall, this chemical release leaves both the mother and the baby feeling very excited and in tune with each other in the moment, but, perhaps more importantly, the heightened neurohormonal environment actually shapes the way the brain develops over time. Specifically, the chemical mix of serotonin, dopamine, opioids and norepinephrine directly effect gene regulating systems that program "structural growth of regions of the brain necessary for future socioemotional development of the child" (Schoore 2003). Said more simply, the chemicals stimulate growth of neurons in the orbitofrontal cortex, the area of the brain that controls connection and relationship.

Neuroplasticity

Research is now showing evidence of brain neuroplasticity (Doidge 2007), the central nervous system's ability to adapt, and grow in response to environmental and genetic signals. It may be that many areas of the brain including the OBFC retains plasticity and that the quality of relationships continue to have a major impact on the OBFC and therefore on the perceived quality of all future relationships. I am reminded of one of the "5 Good Things" in a growth fostering relationship that Jean Baker Miller described

years ago. Dr. Miller said "... good connection leads to a desire for more good connection" (Miller & Stiver 1997).. This is not simply a psychodynamic concept. A healthy connection may quite literally rewire the brain to yearn for more healthy connections.

The bottom line is this, because a child's brain is still developing when he is born, it is imperative for both the individual infant and for the developing human community, that each infant start life in a growth fostering relationship; one that will shape his brain towards future healthy relationships. Think of the biological uphill battle that exists when whole families, communities and even nations are formed amidst interpersonal violence. Disconnection can breed chronic disconnections.

Relational Images

"The relational images each person creates becomes the key inner concepts we use to order our experience, they determine our expectations about what will occur in relationships, and they guide our actions. They are the inner pictures we devise of what's happened to us, they become the framework by which we determine who we are, what we do and how we can do and how worthwhile we are..." (Miller and Stiver, 1997)

I have just described the development of the OBFC during the first year of life. Alan Schore (2003) states that "during this year, if the infant is in a positive, responsive caretaking relationship the infant has developed the expectation of being matched by and being able to match the other. The recurring stimulation of opioids, dopamine, serotonin and the sympathetic nervous system leads the OBFC to develop in a way that "imprints neuronally for positive relationship" (Schore 2003). I would suggest that this imprint held by the OBFC is the beginning of relational images as described by Miller and Stiver (1997). Understanding that a relational image is a neuronal, structural entity in the brain rather than an abstract psychodynamic concept can help us all understand the resilience of these images (particularly when they are negative) against our best reframes and interpretations. It also calls into question the concept of "resistance" in therapy and the wisdom of "pushing through the resistance." Jean Baker Miller's idea of "honoring the strategies of disconnection" (Miller & Stiver, 1997) is a more effective and realistic way of working with these "resistant neuronal pathways". Ironically, by honoring the physiology of a deep relational wound and the resultant disconnection, the person begins to develop a new relational template

that includes respect, patience and understanding. Over time, with relentless empathy, respect and honoring in the therapy relationship, a new neuronal pathway may take shape and become the primary relational template.

Jill is a 30 year old married, caucasian mother of two I have treated for post-traumatic stress disorder. Her extensive childhood sexual abuse history included trips to her father's office on weekends with her sister. In this secluded environment she was forced to sit and wait her "turn" to be abused. In our therapy sessions she routinely arrived five to ten minutes after the session was scheduled. Many traditional psychotherapies would have confronted Jill about this pattern of "resistance" to treatment and pushed her to come to session on time. It was clear to me that Jill was at her maximum capacity for vulnerability simply coming to the meetings, so rather than pushing her further, I noticed this pattern aloud (and was greatly curious about it) but did not try to force her to come on time. As the therapy progressed, she became more verbal about the memories of sitting and waiting for the abuse, feeling paralyzed and terrified. Clearly, her brain and body were protecting her. Sitting and waiting outside my office activated old neural pathways of the terrible relational violation. On the few occasions when she was waiting for me, she would enter therapy severely agitated and terrified. By honoring her need to control how she entered this relationship we were able to by-pass a neural circuit that repeatedly hijacked her into her most disconnected place. Less time spent on this traumatic pathway meant more time spent building the new pathway representing our relationship, built around the concepts of respect and empathy.

Socialization and the Development of Inauthenticity

After the bliss of year one with all of the staring and cuddling, the surges of dopamine and endorphin, serotonin and norepinephrine, life goes south very quickly, even in the best "growth-fostering relationships". In American culture the second year of life is when "socialization" begins. In most cases socialization is done through shame. In fact, Alan Shore (2003) states that shame has been called the "primary social emotion". Considering shame to be the primary neuroplastic shaper of our children is deeply disturbing. If science is showing us that our brains are literally being shaped in these early years

of life by the quality of our relationships, might it be wiser to reinforce a child's ability to be compassionate and empathic rather than humiliated or disconnected?

Might socializing with shame activate the pain pathways in the anterior cingulate cortex that Eisenberger and Leiberhan have reported?

Shame, as an emotion, appears in a toddler between the ages of 14 and 16 months (Schore, 1991). One study noted that at 10 months of age ninety percent of maternal behavior consisted of play, affection and care giving. By 13-17 months, the mother sets a limit on the child every 9 minutes. (Schore 2003)

Shore (2003) describes this process of socialization – after the first year of intense acceptance and responsiveness, the child trusts that the caregiver will respond in a way that leads to the rush of sympathetic discharge. The child has developed the expectation that human relationship leads to the surge of exciting chemicals.

Now imagine this same child “programmed for connection” met with an unresponsive or even critical mother, a mother who is no longer sharing the joy and positive feelings of the child. This child is dropped into a sudden disconnection. On a physiological and chemical level there is a shift from the hyperaroused/positive sympathetic nervous system activation to a hypoaroused parasympathetic state (Scherer, 1986). Studies suggest there is a decrease in activity of the ventral tegmental –limbic forebrain midbrain circuit which controls pleasure. At the same time, the child becomes emotionally and physically inhibited by activation of the inhibitory pathways of the lateral tegmental limbic-forebrain-midbrain circuit (Robbins & Everett, 1982). This sudden disconnection stimulates the stress response system producing corticosteroids (cortisol) which feeds back and decreases both endorphin and CRF production (CRF stimulates the SNS – with less CRF there is less SNS stimulation). Overall, these periods of shame and disconnection leave a child with less pleasure and excitement and even a slowing heart rate. The child becomes inhibited and avoids attention as if wanting to be “unseen” (Powles, 1992). Might this be the beginning of inauthentic relational styles as described by relational/cultural founding scholars. (Jordan et al. 1991).

Relational Resilience

Growth fostering relationships are not relationships that are in constant connection. The physiological/psychological process of disconnection happens all the time even in our best relationships. Resilience, the relational skill we most want to develop

in children, is the ability to move as a dyad back and forth from the positive affect to the negative affect and back to the positive (Demos, 1991).

In the early formative years of childhood it is the primary caregivers' job to help the child maintain a balance of positive and negative relational experiences so that the orbitalfrontal part of the brain develops the capacity for resilience. When the child experiences moderate levels of arousal or stimulation she tends to develop the capacity for more focused attention and more positive affect (Gaensbauer & Mrazek, 1981). On the other hand, if there have been ongoing extremes in stimulation the child may be marked with more negative affective experiences and more distraction in brain functioning (Schore, 2003).

Studies of mother and child interactions reveal that when a mother is more withdrawn from the child, when she averts the child's gaze and withdraws from physical contact, the child develops an insecure relational style characterized by minimal distress at mother's departure and minimal happiness upon her return. The child appears to be dominated by parasympathetic tone and has limited emotional responsiveness (Weston, 1982; Joseph, 1992; Schore, 2003; Main & Stadtman, 1981). On the other hand, when the mother is chronically intrusive and overstimulating, not allowing the child to avert eye contact, the child learns that relating is unpredictable and out of her control. This child is dominated by sympathetic tone and may be hypervigilant to mother's face with high separation distress and difficulty being comforted when the mother returns (Tronick, 1982; Field, 1985; King, 1985; Schore 2003).

On a cellular and neurotransmitter level, when early relationships are not growth fostering/ not responsive the infant is stressed out. This stress and the accompanying high levels of corticosteroids literally lead to neuronal cell death in the affective centers of the limbic system with resultant permanent changes in opioids, dopamine, norepinephrine and serotonin receptors (Kathol, Jaeckle, Lopez & Meller, 1989; DeKosky, Nonneman & Scheff, 1982; Benes, 1994; Lewis, Gluck, Beauchamp, Keresztury, & Mailman, 1990; Martin, Spicer, Lewis, Gluck, & Cork, 1991; Rosenblum et al. 1994; van der Kolk 1987.). With fewer receptors, the infant either loses the ability or fails to develop the capacity to move fluidly from positive to negative experiences. The child becomes stuck in negative relational images. The orbitofrontal cortex remains immature and as Schore (2003) has commented, this unresponsiveness leads to an imprint in the orbitofrontal system of “self-in-relation-to a dysregulating other”. This relational image can follow

one throughout life, tainting all future connections.

Returning to SPOT theory, if a person's early developmental environment is riddled with abandonment and rejection or even if it is excessively focused on separating or "standing on your own two feet" as is the American way, then there is the potential that the person will feel perpetually "left out".. This may be the tragic corollary to our hyper- independent culture – that people, in their desire to fulfill the American dream of making it on their own are set up to live with chronic stimulation of the anterior cingulate area of the brain. They will be in chronic pain.

The consequences of our hyper- individualized culture are alarming. However, the world of neuroscience is also giving us reason to hope. The brain, once thought to be incapable of change has been discovered to be extremely plastic (Doidge, 2007). Human beings are built to adapt and change and the very capacity that allows us to be so shaped by our environment early on, allows us to reshape and relearn at any point in life. Neurons follow simple rules for change – "use it or lose it" and "neurons that fire together wire together". This means that if there are neurological connections that are not serving you well, if they are starved or not used, those connections will eventually lessen and disappear. Like wise, with enough repetition and intention new pathways can be created (Schwartz & Begley, 2002). Additionally, neurons firing repeatedly in one area will recruit neurons around it to make wider, stronger neural pathways.

On a societal level the implication of neuroplasticity is profound. Not only can individuals change at any age, but societies can develop the capacity to be in growth fostering relationships at any point. It is possible to rework relational images. Even the most "independent individuals and cultures" can heal and find their way back to the human community if they can recognize the destructive nature of isolation. We must use this information as the basis of a revolution. To honor the centrality of relationship is an important first step in walking the pathway to health, harmony and a truly integrated world community.

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