

Performativity and Plasticity: Storying “Self” Bi-directionally in the Embodied Brain Ecosystem

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Abstract This article uses the narrative theory of “storying” to examine neuroplasticity within the neurobiological processes of the embodied brain ecosystem, noting one’s performative and transformative capacity to “story” oneself bi-directionally through the use of the neuromotor processes in practices of wellness. Bi-directional storying emphasizes the often overlooked physiological and unconscious (“bottom-up,” starting in the central and peripheral nervous systems) quality of constructing self in addition to the cognitive and conscious (“top-down,” starting the command center of the prefrontal cortex) processes. Such storying occurs as persons engage in regular practices of wellness – particularly through attunement, movement, and physical activity. The research suggests that such practices have the potential to induce neuroplasticity and impact one’s sense of self; relationality with self, others, and God; and one’s ability to care for self and others. Additionally, this article names the direct correlation between the care of self and the care of other, proposing that one’s capacity for empathy, compassion, and connection in (inter)relationships is directly tied to one’s own attunement and connection with the various aspects of one’s embodied self – (intra)relationship.

Key Words Neuroplasticity, holistic storying, neurobiological and neuromotor processes, intra/inter-connected relationality, embodied brain ecosystem, wellness

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"The idea that activity might change the heart or muscles is seldom questioned. The possibility that behavior could change the structure and function of the brain is seldom considered"
(Kolb, 1995, p.5).

Introduction: The embodied brain ecosystem and neuroplasticity

Neuroscience is a relatively new conversation partner for pastoral theologians and caregivers; however, in its short tenure it is one that is quickly and powerfully re/shaping our constructions of self-identity and relationality by providing new lenses and new layers of understanding. No longer is it realistic nor possible to compartmentalize the various aspects of human personhood; rather, we now realize the complexity and interdependence of them – each informing, forming, and reforming the others in an ongoing and dynamic process of construction. Furthermore, through the neuroscience literature we now realize that self-identity and meaning are constructed via one’s whole embodied being as one “stories” oneself cognitively and physiologically. In other words, how we construct and continually reconstruct our identities and our lives is the product of a holistic interconnected and dynamic flow of information within our *embodied brain ecosystem*.

In using this term – embodied brain ecosystem² – I highlight that the brain functions like a complex and dynamic system rather than a personal computer with direct causal relationships. Input does not always lead to predictable or predetermined output. Rather, the brain is largely composed of maps, neural networks, and vast communication systems of perception, sensation, attention, cognition, coconsciousness, functionality (memory, movement, emotion, language, and relationality), and identity constructions (Ratey, 2001). As such, the brain works with whole

² This term is an expansion of psychiatrist, John Ratey’s (Harvard School of Medicine), argument for the neuroscience community to revise its understandings of the brain. Ratey writes, “The sooner we replace our mechanistic model of the brain with an ecologically centered, systems-based view, the better off we will be, for such a model better accounts for much of human experience (Ratey, 2001, p.4).

concepts and whole images examining them for similarities, differences, or relationships between them (Ratey, 2001). Additionally, and most significantly for this essay, in using this term I highlight that the brain is literally located throughout the body via the central and peripheral nervous systems (Siegel, 2010). Consequently, all of the brain's functions are actually mediated in and through the human body. In other words, we perceive, think, feel, construct meaning, and know ourselves, others, and God as, and only as, embodied beings. Therefore, as we experience, reflect on and make sense of that experience cognitively, linguistically, bodily, and relationally, our brains grow new neurons and new neural connections, providing greater capacity and ability for connection and dynamic integration. Neuroscientists refer to this dynamic capacity for life-long growth and change as *neuroplasticity*.³

More precisely, neuroplasticity is the term used to describe the brain's malleability, or "plastic" quality because, as described above, it changes (in structure and function) every second of every day as a result of our experiences – thoughts, emotions, actions, and so on (Ratey, 2001; LeDoux, 2002; Howard, 2006; Siegel, 2010). Neuroplasticity is the science that encourages persons to incorporate brain fitness exercises into their daily lives such as Sudoku and crossword puzzles to stave off illnesses such as dementia, Alzheimer's disease, and other brain diseases (see "The Nun Study" Snowdon, 2001; 2003). This research is based on the finding that though genes or biological makeup is important, it is not deterministic and that we do have the ability to shape our brains in life-giving ways through repetitive practices and experiences. Brain function and behavior mutually inform one another in a two-way process. In other words, "dynamic changes

³ Evidence for neuroplasticity has been observed in persons who have suffered brain injury and those who specialize in a particular skill. This is because as one learns, studies and uses repetition the wiring and firing patterns of this particular skill in the brain are strengthened and made more efficient. For example, brains scans of London taxi drivers revealed a larger hippocampus in the temporal lobe than London bus drivers; and the hippocampus is important in forming and assessing complex (and spatial) memories. Likewise, the areas in the prefrontal cortex, those affecting the motor control of the left hand, light up in brain scans of violin players (Ratey & Hagerman, 2008; Le Doux, 2002; Howard, 2006); and structural changes (plasticity) are seen in the left inferior parietal cortex of people who are bilingual (Mechelli et al., 2004).

in the brain most likely reflect a concomitant change in behavior, cognition, or emotion” (Barth, 2001). In short, neuroplasticity describes how every thought and experience in one’s life alters the brain’s architecture and function; thus, impacting one’s sense of self and one’s relation to the world. What this means for a pastoral theology and pastoral/spiritual care and counseling is that regular practices (behavior) have the potential to change the structure and function of the brain to be more aware, receptive, and empathic in caregiving situations.

In this essay, I bring the concepts of neuroplasticity, neuromotor learning and training, and narrative theory into conversation with pastoral theology to illustrate how the embodied brain ecosystem model offers an expansion of our theories and practices of pastoral caregiving and offers exciting possibilities for rethinking the scope of our practice. In so doing, my hope is that we continue to expand our repertoire of practices of pastoral/spiritual caregiving – with self and with others – and that we note the direct correlation between the care of self and the capacity to care for others.

Before I turn to examining the embodied brain ecosystem and bi-directional storying, it is helpful to name the particular vantage point in which I engage this conversation, as it is somewhat unique in the field of pastoral theology, care and counseling. I say this because part of what informs my work (in addition to my seminary and pastoral theological education, and my clinical training and experience) is my previous experience as a certified personal trainer and fitness professional for the American Council on Exercise (ACE) for ten years prior to completing my doctoral work. What I found in working with persons to improve their “physical” health and well-being was that time and again my clients would share how much the physical activity and exercise impacted their “whole” sense of self, confidence, and overall well-being. In such cases, clients entered the initial assessment filled with negative images of themselves and

their abilities. Their current story was essentialized and “problem saturated” with self-critical messages. However, as we worked together – particularly as persons learned, challenged, and changed their physiologies through weight loss, increased musculature, improved cardiovascular capacities and flexibility, and reduced stress and tension – the previous problem-saturated understandings of self were reauthored into stories and identities of self-confidence, self-accomplishment, and self-love. I would literally watch them perform themselves into a new identity through regular, life-giving practices and experiences. At the time I did not realize what I do now – that these clients were storying themselves bi-directionally, physiologically through neurobiological process of neuroplasticity, and cognitively through self-reflective capacities – and it had profound effects on their sense of identity, relationality, and well-being.

In the following exploration, I will first provide a brief overview of narrative theory in general and then explain why I think an expansion is helpful in naming the neurobiological processes of storying self. After having established bi-directional storying within the embodied brain ecosystem as a helpful model for pastoral theologians and caregivers, I will close with a section on the potential implications of this model for our theories and practices of pastoral and spiritual care and counseling.

“Storying” bi-directionally: (“bottom-up” and “top-down”)

Human beings are meaning seekers and makers. As we encounter ourselves, others, and the world, we make sense of our experience by weaving together events into a coherent narrative – a story (Espton & White, 1990). Narrative theory is a product of the “linguistic turn” and “poststructuralist” or “social constructionist” movements of the postmodern era. The theory is based on the work of Gregory Bateson, Kenneth Gergen, and French philosophers, such as

Foucault, Derrida and Jean-Francois Lyotard. These thinkers saw through the hidden biases and assumptions of dominant discourses and sought to expose the myths of objectivity and name the partiality and situatedness of all knowledge. Thus, narrative theory, as its name indicates, is built on the metaphor of “storying” or “authoring.” It is a theory that asserts persons make sense or make meaning in their lives through the stories they tell and the stories that are told about/around them (see White 2000; 2007). And these stories shape and construct the realities and identities persons live into. Narrative therapists and authors Jill Freedman and Gene Combs state:

We think that people’s experience of the meaning of their lives and relationships changes through changes in their life narratives. As their narratives change, what they do and what they perceive change as well. (1996, p.38)

Moreover, such stories and identities are multilayered and infinitely rich in possibilities for new meanings and discoveries. No single descriptor can capture the entirety of the lived experience of such diverse persons in this world. Objective reality has given way to epistemological understandings that are located in particularity, difference, and hybridity. Therefore, in the narrative approach one comes to see the limitations of power laden hegemonic discourses and how to see previously unseen aspects of experience and local knowledge.

From a neurological perspective one’s storying capacity occurs via the brain’s structure and functionality. Pastoral theologian and author of numerous works on the intersections of neuroscience and pastoral theology, David Hogue, touches on this as he describes the “storying” capacity of human beings as mediated by two key brain functions: memory and imagination. Hogue writes:

We are our memories; the events of life that we recall give us a sense of personal identity and movement through time. *For better or worse, we are shaped and transformed by our*

experiences through the synaptic patterns with which our brains record those experiences. As we recall the stories that have brought us to any given moment in time, we are both rediscovering and proclaiming who we are. (Hogue, 2003, p.4, italics mine)

Hogue's description is enlightening and helpful; yet, it appears that often the embodied quality of these processes remain overlooked. We assume that all of this processing occurs in the "grey cabbage" in our skulls (Ratey, 2001). Therefore, I would like to highlight the two-way process of storying and emphasize the bottom-up physiological quality of "storying" to this process that tends to be overlooked. In other words, persons story themselves physiologically and unconsciously ("bottom-up," starting in the central and peripheral nervous system), as well as cognitively and consciously ("top-down," starting the "command center" of the prefrontal cortex). As such, the way that persons "thicken" or "strengthen" a physiological narrative is through neuroplasticity – motor learning and motor training, which is a part of procedural memory.

Storying "bottom-up": Motor learning and training induced plasticity

Movement in human beings is a complex, finely regulated, process of coordinated neural signals and recruitment of muscle fibers via the "neuromotor system" (McArdle, Katch & Katch, 1999). The neuromotor system, more commonly called the central nervous system, is really made up of two parts: the central nervous system and the peripheral nervous system (or autonomic nervous system). The central nervous system includes the brain and spinal cord; and the peripheral nervous system includes the nerves that exert their influence beyond the cranial nerves and spinal cord throughout the body – where the brain truly becomes "embodied" (McArdle, Katch & Katch, 1999). Together the central nervous system and peripheral nervous system provide the

“bottom-up” somatic information – voluntary and involuntary – that make movement possible and meaningful.

Movement is such a typical part of our daily lives that it often goes unnoticed; however, it is certainly not a simple process. A basic task like tapping one’s index finger (a common task asked in neuroimaging studies) requires the processing of motor information to flow through the sensorimotor divisions of the basal ganglia and thalamus, such as the primary (M1), supplementary (SMA), premotor (PMC), and cingulate (CMA) motor areas; as well as the cerebellum and its motor associated structures – the somatosensory motor cortex and ventral PMC (Doyon et al., 2009). Following this, the hippocampus stores the movement in the memory. Over time, and through repetition, a particular movement becomes easier and easier, to the point that it is eventually completed with almost no conscious effort. The way this occurs is through motor learning or motor training.

Motor learning and motor training are forms of movement based memory that induce neuroplasticity in the embodied brain. Motor learning “relates to the acquisition of a new skill and is therefore associated with attentional demands and the building of new motor plans and commands” while motor training “relates to the repetition of a learned motor skill, for example, in order to fine-tune or improve this skill” (Bezzola et al., 2012, p.189). While slightly different, both motor learning and motor training are vital aspects of “consolidation” in motor memory – moving from fragile short term memory to more stable long-term memory (Brashers-Krug, Shadmehr, & Bizzi, 1996, p.252). Eventually, a consolidated motor memory becomes “automatized” or “when actions are carried out effortlessly with little attentional resources needed for their successful completion” (Doyon et al., 2009, p.62).

Another way to think about the automatization process is that the movement, the procedural memory, becomes embodied. In fitness circles this is often referred to as “muscle memory” and is used to describe increases in performance (strength, efficiency, endurance, or expertise). For instance, the first time one attempts a lay-up in basketball, performs the bench press, or runs a mile, his or her embodied brain will not be as skilled in this particular activity. Through practice and repetition, one becomes more skilled as the memory of this particular movement is processed and stored, and is thus able to increase his or her ability and capacity for that particular skill. After repeated practice and training, one becomes so efficient and skilled, the movement or activity occurs nearly unconsciously and the level of performance increases dramatically. In neuroscientific terms, the embodied brain has “automatized” the neuromotor process of this particular skill or activity and moved it from an initial fragile memory to a long-term embedded/embodied memory. The result: neuroplasticity – the brain changes and grows new neural connections. In other words, the embodied brain needs to adapt and change in response to the motor learning process in order to meet new requirements (Bazzola et al., 2012, p.189).

Research has shown that anatomically motor learning and motor training (in both experts and novices) leads to increased grey matter volume, changes in white matter architecture, and neural wiring adaptation (Schlaug et al., 1995; Gaser & Schlaug, 2003; Imfeld et al., 2009; Bezzola et al., 2012). Motor learning and motor training have been shown to induce neuroplasticity in both “expert populations” such as highly trained musicians and athletes, and “novice” populations (see Bezzola, et al., 2012). In fact, neuroplasticity occurred in novice golfers even while they only mentally rehearsed a slow motion golf swing without actually moving their arms and bodies. This led the study’s authors to conclude that even low-to-

moderate intensity leisure activities might be valid intervention types to induce structural and functional neuroplasticity (Bezzola et al., 2012). This study also illustrated that motor learning and training induced neuroplasticity is not strictly task specific; rather, “an active lifestyle, comprising regular physical activity, delays the clinical onset of dementia;” and cardiovascular fitness in the elderly is related to good cognitive abilities – particularly in the executive control processes (Bezzola et al., 2012, p.194). Moreover, research has shown that similar practices of wellness (such as an active lifestyle, cardiovascular fitness, resistance training, movement, and so on) help regulate the key neurotransmitters serotonin, dopamine, and norepinephrine (which are vital in one’s thoughts, mood, and emotions); help regulate cortisol (the key chemical is the stress response); and increase the proteins which build the growth factors in the brain (BDNF, VEGF, and IGF-1) (Evans & Burghardt, 2008). All of which lead to changes in brain structure and functionality and one’s sense of identity – particularly through thought, mood, and emotion.

The neuromotor processes of e-motion

The processes described above do not merely alter brain structure and function, but impact thought, mood, and emotion. For centuries we have thought of human beings as being above the animals because of our ability to think and reason; whereas, animals simply act instinctually. Action and movement were thought to be lower brain functions, while cognition was a higher brain function (Ratey, 2001). However, some neuroscientists are clarifying that movement is fundamental to the very existence of *any* brain (Ratey, 2001; Seigel, 2010). Previously, it was commonly thought that the “motor brain” does not do anything but react to incoming stimuli and instruct motor functions. The cerebellum, which coordinates physical movement, also coordinates the movement of thoughts, thus illustrating that the old view of isolation and

particularization of brain function no longer applies. Rather, the “ecosystem” is constantly communicating across brain regions and many functions of the brain share the same parts of systems (Ratey, 2001). Another way to say this is that mind and body movements are so inextricably connected and the correlation between our movement and our emotions are so intertwined that one leading neuroscientist believes the word emotion should really be thought of as a physical expression, as *e-motion*, because the root of the word literally means “to move” (Ratey, 2001, p.163). In neuroscientific terms this means that feedback between the layers of the brain is bidirectional (both “bottom-up” and “top-down”); if you activate a lower level, you will be priming an upper level, and if you activate a higher level, you will be priming a lower level. So smiling, or exercising and training your body can improve your mood (p.164). Furthermore, research suggests that our brains produce and secrete the very chemical compounds that pharmaceutical companies produce artificially in antidepressants when we participate in aerobic exercise⁴ (Howard, 2006; Ratey & Hagerman, 2008). What this means for pastoral theologians and pastoral/spiritual caregivers is that there is tremendous potential within the embodied brain ecosystem to alter and regulate emotion, mood, and even constructions of self through practices of physical activity and exercise and their ability to reshape the brain through neuroplasticity. Therefore, I propose that we pastoral and spiritual caregivers consider the potential implications for how bi-directional storying might inform our practices of caregiving in conjunction with other treatment modalities and medication (when necessary).

⁴ The chemicals are dopamine, norepinephrine, endorphins, serotonin, and “gamma aminobutyric acid” (GABA) (Howard, 2006). The pharmaceutical companies call them “selective serotonin reuptake inhibitors” (SSRIs) and use them to treat depression, anxiety disorders, and personality disorders (Howard, 2006).

Potential implications for pastoral theology and pastoral/spiritual care and counseling

Having established the importance of embodied, two-way processes in storying self identity and relationality I will turn to highlighting the potential implications for pastoral theology and pastoral/spiritual care and counseling. There are three implications I would like to highlight in how this research shapes our constructions of identity, relationality, potentiality in plasticity, and practices of pastoral and spiritual caregiving. I have organized these implications into three areas: (1) Multilayered, Embodied Ontology, (2) Performative and Transformative Capacity, and (3) Intra/Inter-Connected Relationality.

Multilayered, embodied ontology

Neuroscience challenges and expands our theologies of embodiment as it illustrates and asserts a profoundly complex and embodied being. Everything about us – our thoughts, emotions, sensations, intuitions, actions, and even our spiritualities – is mediated through a complex, interconnected neural wiring and firing communication system. Furthermore, neuroscientists now know that meaning, identity, and the ability to relate are all constructed in/through/with our physical embodiment (Siegel, 2010). In short, we live and move and have our being, as, and only as, embodied creatures.

I realize that as I make the case for expanding embodiment there is a danger to reduce and essentialize persons, minimizing and overlooking important systemic factors (culture, race, class, gender, sexual orientation, and so on). However, while highlighting embodiment as normative, I also hope to attend to embodiment in ways that actually raise critical awareness of difference and particularity, and the need to attend to whole persons contextually. For instance, if the soul/spirit is actually embodied, rather than disembodied, and identity, relationality, meaning,

faith, and wholeness/wellness are mediated only through the embodied processes, then issues of justice in the here-and-now take on new meaning and theological importance. In other words, the questions of who has access to healthful nutritional choices and recreational resources; and who has access to adequate medical care and who does not; and whether or not our social policies favor certain forms of embodiment and ignore or devalue others are all deeply theological questions. Consequently, I am not simply interested in the reality of embodiment; rather, I am urging us to consider the particular quality of our embodiment and the way in which we enact our embodiment as human persons.

More specifically, I am interested in naming the multilayered and complex quality of our embodied being, and our call to relational justice. There are many aspects to our embodied identity: the brain; the nerves running throughout our central and peripheral nervous systems; the body of organs, bones, and physical characteristics; the mind; and the spirit/soul – all of which come together in a dynamic and complex integration of neurobiological and self-reflective properties. Given this complexity, no single descriptor of the human person will suffice; rather, each particular person combines the various aspects for a unique constellation of identity in her or his context. Each aspect is but one account, one layer, of the multiplicity of our lives and identities, which we inhabit and enact at various points. Thus, one's identity cannot be constructed flatly, but is situated within the web of human relations in the system/social structures (Miller-McLemore, 1993; 2004). As a result, our pastoral theologies of embodiment should attend to contextuality and particularity and work to deconstruct systems and power structures that devalue certain forms of embodiment and/or use one's embodiment to do harm to others. In short, a pastoral theology that takes embodiment seriously reveals how we are called to care for the whole person systemically and contextually, and that includes liberation from

systems and structures of oppression. Consequently, we pastoral and spiritual caregivers are challenged to enlarge the vision of our role to include advocacy in the public domain and to enlarge our constructions of “spiritual” wholeness/wellness to include the everyday realities of the here-and-now.

Additionally, expanding a pastoral theology of embodiment is important because it deconstructs the lingering dualistic residue in Christian theological anthropologies and reconstructs a holistic, embodied being as the human person. In so doing, it empowers persons to reclaim the “goodness” of the entire being and trust the wisdom of the body; to attune to one’s embodiment. As such, expanding embodiment avoids the danger of self-alienation, opens possibilities for “other” ways of knowing, and identifies new ways of experiencing oneself and God. Often our “intuitions,” “sensations,” and “gut senses” are the seat of profound spiritual experience. If we continue to ignore the embodied quality to our being, we risk limiting our ability to connect with self, others, and particularly with God.

Performative and transformative capacity

The second important area of implication is the performative and transformative capacity of persons. Human persons are creative, active, and agentic authors who construct meaning and identity performatively, which, transforms the self. In narrative theory this process is known as “storying.” In this essay, I extended our storying capacities to include the entirety of our embodied being. We story ourselves bi-directionally – linguistically and consciously, and physiologically and unconsciously. James L. Griffith, professor of psychiatry at the University of Mississippi School of Medicine and Melissa Elliot Griffith, director of the Family Therapy Program at the University of Mississippi School of Medicine, touch on this in their work on

“mind-body problems” using narrative theory and ethological pharmacology.⁵ In their text, *The Body Speaks* (1994), they describe how problem saturated self-narratives are intimately connected to somatic symptoms and hold a person in a double bind that silences both verbal expression and expressions of the body (p.113). In other words, self-narratives like “I am bulimic,” or “I’m a depressive type person” are literally located and felt within the body in what the Griffiths call “emotional postures” of somatic symptoms. Within the Griffiths’ theory, their task is “a search for counter-practices, effective antidotes that disable a destructive story’s bind on the body” (p.118). These counter-practices “are new habits, rituals, and lifestyles that obstruct participation in a destructive story” (p.118). In turn, counter-practices of wellness produce “emotional reposturing” in life-giving, rather than destructive ways.

The Griffiths touch on physiological authorship; however, their approach while acknowledging that the constructive capacity flows in both directions – “language is a complex form of gesturing, a way of touching the body from a distance. Language can reconfigure the physiological state of the body and vice versa” (p.184) – focuses on the pharmacological way of changing physiology. In other words, while acknowledging that “changing physiology can create new possibilities for change through language,” the initial source of the physiological change is medication (p.188). For example, in treating a careseeker with panic attacks, a medication to “turn down the sensitivity of the brain’s systems for monitoring threat” such as Xanax, causes alterations in the noradrenergic and GABA systems, which would create a new “emotional posture” (p.188). The process is correct, yet I fear that in this approach we are overlooking the power of the physiological to “write (with) the body” (Graham, 1999, addition mine). By this I mean that the neurobiological research reveals that we can actually do the very same thing that

⁵ The Griffiths describe ethological pharmacology as “the planned effort to bias the occurrence of particular classes of social behavior, such as increasing assertiveness or diminishing irritability, by resetting these brain systems with medications” (1994, p.184).

the psychotropic medications do through regular practices of wellness such as physical activity and exercise via the neuromotor processes. We change the structure and function of the brain through our experiences and practices. This, of course, does not discount the usefulness and appropriateness of medications in some circumstances, but does help to expand our thinking about and the scope of our authorship and construction of self.

Recent studies in the neuroscience literature reflect motor trained induced neuroplasticity as well. They show how physical activity and exercise are vital components to not only treating, but preventing depression and anxiety (Evans & Burghardt, 2008; Ratey & Hagerman, 2008). In fact, some neuroscientists claim that exercise is the single most powerful tool we have to optimize our brain function (Ratey & Hagerman, 2008; Arden, 2010). There are a few reasons for this. The most basic one is that physical activity increases the volume of blood (i.e. fuel and nutrients) that gets to the brain. With more oxygenated blood available, the brain does not run out of fuel and it can perform its multitude of functions quickly and efficiently. Additionally, physical activity and exercise secrete powerful neurotransmitters (dopamine, norepinephrine and serotonin) and neuropeptides (proteins) which regulate brain activity, control stress and anxiety, improve mood and self-esteem, and build the cellular circuitry in the brain (Ratey, 2001; Howard, 2006). Aerobic exercise has been shown to reduce anxiety and some of the symptoms of PTSD, as well as increase self-esteem (Arden, 2010, pp.120-121; Clinebell, 1991).

Research also indicates that physical activity that incorporates learning complex movements like dance, sports, and martial arts can sharpen memory and increase the capacity to master new information (Ratey, 2001, p.360; Ratey & Hagerman, 2008). Add to this that there is mounting evidence that movement is crucial to every other brain function, including: memory, emotion, language, and learning, and we see how vital movement is our lives (Ratey, 2001). In

fact, the parietal and frontal cortex (regions of the brain which are known for movement) also play a significant role in activity related to planning, calculating, and forming intentions. And the cerebellum, which coordinates physical movement, also coordinates the movement of thoughts (Ratey, 2001, p.148). Clearly movement and physical activity highlight the interconnection and two-way flow (top-down and bottom-up) of the embodied brain.

There are two meaningful aspects of the performative and transformative capacities of persons for pastoral theology and pastoral/spiritual care and counseling. The first is the spiritual quality to performative rituals and practices of wellness, and the second is the potentiality and hopefulness of neuroplasticity.

First, every act of faith whether clinical, liturgical, kerygmatic, prophetic, inter-personal, or intra-personal is embodied and performed (Hogue, 2003; Graham, 1999). Pastoral theologian David Hogue clarifies that, “until we go through the prescribed symbolic actions of the ritual, we have no experience of the ritual or of the grace it makes available to us” (2003, p.133). The point is that our regular and habitual practices have a transformative quality and that engaging in the wellness practices described here has the potential to rewire our brains and reshape our sense of self, how we relate to others, and how we relate to God.

The late professor emeritus and founder of the Institute for Religion and Wholeness at Claremont School of Theology, Howard Clinebell, illustrates the spiritual and transformative quality of what I call practices of wellness. In his text, *Well Being*, Clinebell (1991) observed, “It’s obvious that we can ignore the fact that we are embodied selves only at a high cost to our physical wholeness. What’s not so self-evident is that neglect of bodily self-care usually has deleterious impact on our mental and spiritual wholeness as well (Clinebell, 1991, p.76). In addition to increased mood, self-esteem, sense of control and ability to relax, the “most

intriguing finding” Clinebell names is that “those who work out regularly are more open to spiritual experiences than nonexercisers” (p.82).

Additionally, my own research conducted with pastors and pastoral/spiritual caregivers who participated in a six week “pastoral wellness program” revealed a newfound sense of connection to and calling from God as part of a lifestyle with regular practices of wellness including: attunement, nourishment, physical activity and movement, rest and renewal, and relationships (Roozeboom, 2013). This “spiritual” reconnection was in conjunction with: increases in attunement with self; improved nourishment; increased movement and physical activity; increased hours of sleep each night and increased time of Sabbath taking, and fewer hours worked each week; and improvement in key inter-relationships (Roozeboom, 2013, pp.118-135).

From a Christian theological perspective movement is built into the very fabric of our understandings of God, of life, of worship, of healing, and of wholeness/wellness. In the creation narratives of Scripture we read of a God who hovers over the waters of the deep, creates from dust, breathes life into being, and walks with us in the garden. Likewise, practices of faith and worship for the faithful are often expressed through movement and actions, and as described previously the performative capacity of these expressions of life and faith, actually “re-author” and transform one’s sense of self and connectedness to self, others, and God. Yet, ironically our approaches to providing care as pastoral and spiritual caregivers often overlook the physicality and transformative quality of movement.

The second important aspect of the performative and transformative capacity is potentiality and hopefulness. If every moment and every experience changes the structure and function of the brain (and thus meaning making processes and one’s sense of self and

relationality), then one is no longer “stuck” in any particular place of pain or suffering. No matter the circumstances, there remains a certain measure of hopefulness that embraces the “paradigm of plasticity” and one’s agentic and performative ability to reauthor his or her identity in life giving ways through intentional practices of wellness. My Christian expression of faith, names this hope-filled capacity for transformation as part of, and in partnership with, God’s liberative love, sanctifying power, and grace in our lives. Accordingly, we co-participate with the Spirit of God in our lives and transformation occurs through a blend of personal agency and God’s grace working in concert.

Knowing the importance of the performative and transformative capacity of human persons should inform our clinical practice in pastoral/spiritual care and counseling. For instance, incorporating training for a local 5k, 10k or half marathon into the treatment with someone struggling with depression may be a powerful supplement to the work “in session.” Likewise, the utilization of mindful awareness practices such as body scans, progressive relaxation, mental rehearsal, and grounding in session could aid the healing process in those who have experienced trauma. One might also consider incorporating focused, attentive rhythmic movements such as Tai Chi and yoga, or walking meditation into treatment to assist a client’s ability to self-soothe and regulate in the face of anxiety and stress. Ultimately, embracing our performative and transformative capacity challenges our theories and practices of pastoral/spiritual caregiving to expand our repertoires to include “preventive” approaches in addition to “restorative” ones. In other words, encouraging regular practices of attunement and physical activity regardless of symptomology has the potential to increase one’s threshold for and creative capacity to navigate difficult circumstances and regulate mood and emotion.

Intra/inter-connected relationality

The third and final area that is helpful to reflect on is how new insights from neuroscience inform our understandings of intra/inter-connected relationality. Both neuroscientific and theological literature claim that human persons are essentially and inherently relational. However, we must also ask what is the particular quality of this relationality? I propose an answer to this question through an understanding of human persons as intra/inter-relational. In using this term, I emphasize not only the two elements of relation – with self (intra-relationality) and with others (inter-relationality) – but their enduring connection. The ability to embody and enact just ways of inter-relational connectedness (loving and caring for our neighbor) is directly tied to our capacity for intra-relational connection (loving and caring for ourselves).⁶ This connectedness flows in both directions – we come to know ourselves better as we are known in relationships and vice versa.

Intra-relationality: Self-reflectivity, reconnection, and regulation in self-care

Attunement is the term that neuroscientists use to describe one's ability to relate and "tune in" – with oneself and with others. In intra-relationality attunement is a process of reflection and reconnection with ourselves wherein we "check-in" with the various aspects of our embodied selves – our bodily sensations, our mental images, our emotional state, our thoughts, and so on (Siegel, 2010). The key component in attunement with self is self-reflexivity. A self-reflective capacity trains us to be able to be aware of awareness itself and pay attention to our own intentionality (Siegel, 2010, p.86).

⁶ Feminist theologian Beverly W. Harrison noted a similar concept in her work on the importance of inter-connection, naming the role and power of one's own internal experience in the work of loving others in just ways. (See *The power of anger in the work of love: Christian ethics for women and other strangers*, 1981).

Within self-reflexivity are key components of reflection, reconnection, and regulation. One of the most profound areas of self-reflexivity is the unconscious sympathetic processes of escalation which occur during the fight-flight-freeze response. The process is commonly referred to as the stress response or HPA (Hypothalamic-Pituitary-Adrenal) Axis response. In this process, the neurochemical, cortisol, is released to prepare us for action – and sometimes for survival. This nearly instantaneous process is absolutely necessary for life and wellness. However, if our embodied brain remains on high alert chronically, cortisol becomes toxic. Thus, the counter-process – the parasympathetic process of de-escalation – is also vital. This is the process wherein our brain secretes GABA (gamma aminobutyric acid) and other chemicals to counteract cortisol. The ability to be aware of each process and utilize self-reflective practices of wellness to self-soothe is known as regulation. Essentially, attunement with self is how we regulate and dynamically integrate the myriad of experiences and information that our embodied brain ecosystem constantly produces, which assists our de-escalation process and self-soothing.

Attunement with self is not only important for self-soothing, it is vital because it prepares us to connect with and attune to others (Siegel, 2010). In other words, our awareness of and ability to connect with another person's internal world of meaning depends on how well we know our own (Siegel, 2010, p. 62). The key to this process is the insular cortex, a part of the brain called the "middle prefrontal cortex" which is folded deeply within the cerebral cortex (Siegel, 2006; 2010). The insular cortex is known to be influential in many aspects of consciousness, but most specifically in emotional states and bodily states, such as the heartbeat, blood pressure, and sensation of pain (Critchley et. al., 2004; Lamb et. al., 2006; Baliki et. al., 2009). In light of this, the insular cortex is considered by some neuroscientists to be the superhighway of information flow between the mirror neurons, limbic region, brain stem, and the

central nervous system (Siegel, 2010). The insular cortex is described in this way because it is the region of the brain responsible for what some scientists call “emotional contagion,” or why we can resonate emotionally and physiologically with others – our respiration, blood pressure, and heart rate can actually rise and fall in sync with other’s around us (Siegel, 2010, pp. 61-62). This is why and how we feel heaviness and sadness when sitting with someone who has suffered a loss, or why we smile and feel happy when another person smiles at us. Meaning, in short, is that inter-relationality is interwoven into the very fabric of intra-relationality and visa versa. Consequently, our own capacity to provide effective care for/with others is directly tied to our capacity to regulate, attune, and care for ourselves. Neuroscientifically, this is known as the mirror neural processes.

Inter-relationality: Mirror neurons and empathy

One of the more recent developments within neuroscience is the study of the social or inter-relational brain. Social neuroscience developed as a sub-field within neuroscience as researchers began to draw on cognitive and social psychology, development neurobiology, and physical anthropology in their efforts to study the processes and structures the brain employs in human relational processes (Insel & Fernald, 2004); as well as how the social context shapes the development, function, and structure of the brain (Cacioppo et al., 2007; Hogue, 2010).

Given the scope of this essay I cannot go into depth here (see Hogue, 2010 for a more in-depth examination of the mirror neural processes), but want to briefly describe how mirror neurons are brain cells that “re-create” the experience and emotions of others that we observe within ourselves (Iacoboni, 2008, p.5, Hogue, 2010). It is as if we are trying on the other’s experience or “mirroring” his or her internal state, activity, and response within our experience.

As social creatures, this mirroring capacity is vital to our ability to relate to others and the world around us. Recent research with persons on the autism spectrum illustrates what happens when the mirror neural system does not function adequately. Impairment in the ability to perceive and connect with the emotional expressions and states of others has been tied to diminished mirror neural activation (Dapretto et al., 2006; Siegel, 2006). Additionally, research in developmental and attachment theory illustrates the importance of the mirror neural system in developing secure attachments (Schoore, 1994). In short, intra/inter-relatedness names how our ethical capacity to see and connect with others depends on the attuning and mirroring processes of our middle prefrontal cortex. Without both processes functioning well, our capacity for meaningful empathic encounters is limited.

In my previous research (Roozeboom, 2013) one participant in the pastoral wellness program noted the importance of this connection in his experience. This participant had “one of those days” where the demands and deadlines exceeded his capacity and became overwhelming. He tried as best he could to prioritize and balance all of the items which needed his attention (and did so fairly well while at the church). However, once he got home he could not keep it together as all the pressures were adding up, and he “blew up” at his daughter for no apparent reason. The neuroscientific way to describe this is that this participant’s brain was dis-regulated and he “lost his mind,” or at least his ability to regulate his experience and thought processes and behavioral response. The result: pain and damage to a valuable relationship in his life. Fortunately, he was able to repair this relationship with his daughter, but in chronic, repetitive episodes of dis-regulation such is not always the case. In short, there is strong evidence that the capacity to care for others (love one’s neighbor) is directly tied to one’s capacity for his or herself.

The clinical implications of intra/inter-relationality are fairly direct: our ability and commitment to love and care for our “self” (or lack-there-of) will have a significant impact on our capacity to provide effective, empathic pastoral/spiritual care and counseling for/with others. I propose that regular practices of wellness – particularly attunement, physical activity, and movement – are crucial in maintaining and increasing this capacity.

Some cautions to consider

Before concluding this essay, I need to note a few particularly important cautions in what I am presenting. First, I am not promoting the type of physical activity and lifestyle that becomes destructive in its own right – a form of idolatry, addiction, and obsession. Like many aspects of human living, exercise and training one’s body has a threshold of diminishing returns, and when taken to extremes such activities can become life draining rather than life giving. Narcissism, eating disorders, body image distortions, objectifying the body, and other “illusions” of well-being are the result of such extremes (Toombs, 2006). Therefore, I am promoting a dynamically integrative and balanced approach to wellness, not an extreme form of self-focus.

The second caution is that life-giving practices of wellness must always be contextualized and attentive to one’s physical abilities and particularities – and this includes finitude, limitation, and vulnerability. Being “well” does not always mean without symptoms or difficulties (Kornfeld, 1988). For example, my two siblings suffer from a chronic, muscle degenerative disease called Muscular Dystrophy. Consequently, it is physically impossible for them to perform practices that more able-bodied persons can. Thus, there are limitations to what is possible through physical activity. However, for those persons who cannot move their bodies as freely, the mindful awareness exercises of attunement, body scans, and meditative prayer are

alternative practices which have been shown to increase one's connectedness with self, others, and God. Additionally, as described previously, the mental rehearsal of movement has been shown to induce neuroplasticity as well.

Third, we must remember that no matter which particular lens we use to view the human person, there will always be a certain amount of mystery to persons. Neuroscience continues to expand the ability to map the brain's activity in various experiences; however, even as new discoveries expand understandings, most neuroscientists readily admit that there are many things we simply do not know – and likely will never know. While some neuroscientists allow room for this mystery and even refer to that which is beyond empirical verification as “religious” or “spiritual” experience (see d'Aquili & Newberg, 1999, 2000; Beauregard, 2007; Bergemann et al., 2011), for others, the quest to map all realms of experience neurologically remains compelling. In contrast, those of us in theological circles tend to be much more comfortable with the unknown and embrace the mystery of persons as part of the larger mystery of God as “Other.” In either scenario, the point is that there are realms of human experience that we simply cannot quantify empirically; yet, these moments are profoundly meaningful in self-construction and understanding. Therefore, I consider what I present here illustrative and not exhaustive, and I anticipate further transformations in our understandings, or ways of looking at identity and relationality, as the conversation between neuroscience and pastoral theology continues to deepen.

Conclusion

In this essay I explored the neurobiological processes of motor learning and motor training as part of a two-way, dynamic process of storying self bi-directionally in the embodied brain

ecosystem. Furthermore, I noted how paying particular attention to the embodied quality of these processes invites us to expand our thinking about identity and relationality, as well as our practices of pastoral and spiritual caregiving – paying particular attention to treatment modalities that invite attunement and physical activity with the embodied self. Through such practices I propose that we have the capacity to transform and reauthor our sense of identity and relationality through neuroplasticity. Additionally, and perhaps more importantly, I propose that such practices are for vital for the caregiver and not just the careseeker, and that our capacity to love and care for/with our neighbor is directly tied to our capacity and performance of caring for ourselves.

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