Spotlight on the Frontal Lobe

by
Ewing Coleman Green
EDD 8261 CRN 50019
The Frontal Lobe as CEO of the Brain

Nova Southeastern University
July 7, 2013
Spotlight on the Frontal Lobe

This paper discusses how the role of an effective leader mirrors the role of the brain’s frontal lobe. Goldberg (2009) reported that, “This book is about leadership. The frontal lobes are to the brain what a conductor is to an orchestra, a general is to an army, the chief executive officer is to a corporation” (p. 4). Therefore, this paper links elements of effective leadership to frontal lobe functioning and also addresses gender differences and school improvement. The paper is organized into eight sections including introduction, leadership, frontal lobe functioning, frontal lobe functioning of genders, parallels between leadership and frontal lobe functioning, implications of gender differences on policy making, schools and the frontal lobe, and conclusion.

Introduction

Continuing his argument that frontal lobe functioning is analogous to a conductor, general, or CEO, Goldberg (2009) stated that the frontal lobes are “the seat of intentionality, foresight and planning” (p. 22). As such, the frontal lobes can be considered the leader of neurological functioning, maintaining an awareness of both internal conditions and external stimuli in order to survive and meet goals, similar to how a corporate CEO maintains vigilance of organizational processes and the competitive landscape in order to remain a viable enterprise. The frontal lobes, then, mirror the role of an effective leader.

Leadership

There is ample literature focused on aspects of leadership. Collins (2001) argued that outstanding achievement requires disciplined people, disciplined thought, and disciplined action. Clawson (2012) reported that “leadership is the result of a confluence” (p. 13) of factors that manage energy, including the leader, others, tasks, and organizational structure. Likewise,
Northouse (2012) suggested that leadership involves a complex array of interpersonal interactions focused by common vision, and Kouzes and Posner (2007) argued that in order to achieve extraordinary results leaders must inspire a shared vision and empower others to challenge organizational processes. Finally, Senge (1990) stated that leaders in learning organizations inspire shared vision, improve collective mental models, continuously seek personal mastery, and build team capacity.

Similarly, Northouse (2012) stated that, “leadership is a process whereby an individual influences a group of individuals to achieve a common goal” (p. 6). Rost (1991) argued that, “leadership is a process of collaboration that occurs between leaders and followers” (as cited in Northouse, 2012, p. 5). Kouzes and Posner (2007) stated that, “leadership is not about position or title, “not about organizational power or authority,” “not about celebrity or wealth,” “not about the family you were born into,” “not about being a CEO, president, general, or prime minister,” and “definitely not about being a hero;” rather, “leadership is about relationships, about credibility, and about what you do” (p. 338). Clawson (2012) stated, “in the end, leadership is about results, about outcomes” (p. 16). Finally, in a lengthier definition, Bhatti, Maitlo, Shaikh, Hashmi and Shaikh (2012) stated:

Leadership is a social influence process in which the leader seeks the voluntary participation of subordinates in an effort to reach organization goals, a process whereby one person exerts social influence over other members of the group, a process of influencing the activities of an individual or a group of individuals in an effort towards goal achievement in given situations, and a relational concept involving both the influencing agent and the person being influenced. (p. 192)

Furthermore, leadership involves advancing an organization made up of individuals from some present condition to a desired future state, suggesting conscious choice and progress. In order to move forward, it could be argued that learning takes place both at the individual and organizational levels. Sylwester (2004) stated that “learning involves the development of new or
more robust neuronal pathways and synaptic connections and the appropriate distribution of neurotransmitters” (p. 93). By extension, perhaps it could be argued that organizations learn when new capabilities are developed and stored in the form of individuals.

Drawing an analogy between leadership and athletic success on a personal level, Loehr and Schwartz (2001) reported that testing their ideal performance state (IPS) hypotheses on thousands of executives revealed dramatically improved work performance, and enhanced health and happiness. Their findings suggested that “the best long-term performers tap into positive energy at all levels of the performance pyramid” (p. 122). The authors found that achieving and maintaining IPS depends upon effective energy management. Specifically, they reported that it is not the presence of stress that diminishes performance; rather, it is the “absence of disciplined recovery” (p. 122) in the form of rituals that promote oscillation between states of energy expenditure and recovery. In doing so, Loehr and Schwartz (2001) argued, executives emulate athletic training, focusing on managing inner states within their control as opposed to reacting to external conditions. The authors stated, “If executives are to perform at high levels over the long haul, they have to train in the same systematic, multi-level way that world-class athletes do” (p. 127). Their argument about the importance of energy management was later echoed by Clawson (2012) whose opening sentence stated, “leadership is about managing energy, first in yourself and then in those around you” (p. 3).

**Frontal Lobe Functioning**

The frontal lobes in the brains of human beings take on a variety of leadership tasks. Sylwester (2004) reported that the frontal lobes of humans “allow us to move from the purely reactive behavior of most animals to being principally proactive—capable of continuously anticipating and preparing for potential novel and familiar challenges” (p. 69). In addition, he
stated, “The prefrontal cortex is directly interconnected to every distinct functional unit of the brain, and so it coordinates and integrates most brain functions.” Prior to Goldberg (2009)’s CEO analogy, Sylwester (2004) stated, “The prefrontal areas are thus the functional equivalent of a corporate CEO or symphony conductor who coordinates and integrates the activities of many individuals” (pp. 69-70). Likewise, Balog (2006) reported, “Not surprisingly for a major executive center, the frontal lobes must reorganize to meet new demands, and they do so at more than one level in the years leading up to adulthood” (p. 35) and the frontal lobe “is associated with higher cognitive processes, such as decision-making, reasoning, and planning” (p. 102).

Goldberg (2009) argued that the frontal lobe is “the one part of the brain that makes individuals who they are and defines their identity; that encapsulates their drives, ambition, personality, and essence.” He stated that, “The frontal lobes are the most uniquely human of all the brain structures, and they play a critical role in the success or failure of any human endeavor,” “the frontal lobes “are linked to intentionality, purposefulness, and complex decision making” (p. 4), and, therefore the frontal lobes “are the brain’s command post” (p. 5).

Suggesting that the frontal lobes and leadership have an intimate relationship, Goldberg (2009) stated that the frontal lobe “plays the central role in forming goals and objectives and then in devising plans of action required to attain those goals” (p. 22), the frontal lobe “selects the cognitive skills required to implement the plans, coordinate these skills, and applies them in a correct order” (pp. 22-23), and the frontal lobe is “ responsible for evaluating our actions as success or failure relative to our intentions” (p. 23).

Furthermore, Goldberg (2009) argued that the cognitive powers of goal setting, planning, dreaming, determining aspirations, and ambitions all depend on the frontal lobe and that the metacognitive nature of these powers requires an overarching organization, for which the frontal
lobe serve is responsible. He stated that the frontal lobes are connected with virtually every functional unit of the brain and this unique connectivity places the frontal lobes in a position to coordinate and integrate the work of all brain structures. Goldberg (2009) compared the frontal lobes to the Internet where “search engines do not contain the exact knowledge necessary to solve the problem at hand” (p. 281) but, just as the frontal lobes in human brain do, “they have an aerial view of the system, enabling them to find the specific locations within the Net where this knowledge is held” (p. 281). Furthermore, he reported that the frontal lobes also have a direct role in working memory since they control “temporal organization of behavior and in controlling the proper sequence in which various mental operations are enacted” (p. 94). Finally, he stated that frontal lobe “is the only part of the brain where the inputs from within the organism converge with the inputs from the outside world” (p. 99).

Relative to the evolutionary development of the frontal lobes, Goldberg (2009) reported that they “underwent an explosive expansion at the late stage of evolution” as evidenced by the “emergence of language and the rapid ascent of executive functions” (p. 31). He stated that Gall’s phrenology work in the early eighteenth century studied “bumps on the surface of the skull and related them to mental abilities and personality traits” (p. 37) and that modern fMRI “allows us observe directly the patterns of physiological activity in the different parts of the brain as subjects are engaged in various cognitive tasks” (p. 42). This paradigmatic shift in analysis directly informed modern understanding of cortex functioning.

**Frontal Lobe Functioning of Genders**

According to Sylwester (2004), although most people view the genders as polar opposites, he stated that, “It thus appears that individuals are either clearly male or female, or else exist (for whatever biological or cultural reason) somewhere along an androgynous
continuum between the two pure gender strains” (p. 72). From a biological standpoint, the two genders have differing reproductive roles and thus “although the hormones testosterone, estrogen, oxytocin, and vasopressin are present in everyone, females typically have more estrogen and oxytocin, and males more testosterone and vasopressin” (p. 72). Structurally and behaviorally, males and females are much more similar than different, but the differences manifest in important ways. Sylwester (2004) reported that the corpus callosum that connects the two hemispheres is slightly larger in females, females tend to have a more dominant left hemisphere and males a more dominant right hemisphere, males seem to have a slight edge in systematizing and females in empathizing, females seem to have an edge on factual recall and males on conceptual recall, males seem to depend more on geometric cues and females on landmarks, and the typical male stress response is a fight/flight aggressive response whereas in females it is often a tend/befriend nurturing response. Therefore, given that there are anatomical differences and the notion of gender lies on a continuum, rendering stereotypes inaccurate, there are general male and female tendencies in effect.

In addition, Goldberg (2009) reported his work on adaptive decision making styles and found that males are more context-dependent and females more context-independent. The implications, he argued, inform how males and females tend to react to novel and chaotic situations. Males, he stated, operating more from a context-dependent perspective, do not have a default response option, and “will attempt to capture the unique properties of the situation at hand right away even though the available information may be woefully insufficient,” resulting in comparatively erratic behaviors when confronting new situations (p. 128). Goldberg (2009) suggested that while a balanced decision making strategy is probably optimal, in highly unstable environments a context-dependent (male-like) approach is preferable. This has important
implications in modern society with increasing pace of change. He also reported that “it has been known for some time that structural, biochemical, and functional differences between the hemispheres are greater in males than in females” and that this is true of the frontal lobes as well (p. 124). He reported that certain neurological diseases are more prevalent in males than in females, such as schizophrenia, Tourette’s syndrome, and attention deficit hyperactivity disorder, and that all of these diseases are associated with the frontal lobes. In addition, Goldberg (2009) reported that “left-right (hemisphere) differences are better articulated than in the female brain” but “in the female brain the front-back differences are better articulated than in the male brain” (p. 135). In summary, he suggested that this all paints “a rather elegant, equitable picture of two complementary neuroanatomical connection emphases in males and females which may account for some of the fundamental cognitive differences between the two sexes” (p. 135).

**Parallels Between Leadership and Frontal Lobe Functioning**

Goldberg (2009) stated that “Leaders send others into action” (p. 20), and this is what the frontal lobes do in the human brain. Ample evidence has been discussed in the sections above, including intentionality, purposefulness, complex decision making, forming goals and objectives, devising plans of action required to attain those goals, coordination, and evaluation of actions as success or failure relative to intentions.

One model particularly helpful to understanding frontal lobe leadership responsibility is the distributed nature of brain functioning put forth by Goldberg (2009). He argued that the field of cognitive neuroscience is increasingly embracing a “gradiental” model of brain functioning, as opposed to a modular one, which views the brain as “massively parallel and interconnected” (p. 59). This model embraces the notion that the brain behaves as a neural network and has emergent
properties due to brain plasticity. This dynamic, flexible view of brain functioning, overseen by the CEO, the frontal lobe, makes a strong case for its role as leader.

**Implications of Gender Differences on Policy Making**

Considering the arguments made above relative to leadership, frontal lobe functioning, and gender differences, it could be inferred that engaging males and females equally may produce optimal results relative to policy making. For example, if Goldberg’s (2009) adaptive decision making styles are correct, that males are more context-dependent and females more context-independent, then it could be argued that both styles add significant value in a dynamic, fast-changing world, where the strengths of both left- and right- dominant hemispheric functioning can be employed. Likewise, following Goldberg’s (2009) statement above about an elegant, equitable, complementary neuroanatomical connection emphases in males and females, perhaps the human species would benefit from more fully embracing the perspectives of both genders. Done so in a respectful, collaborative fashion just might serve the species well going forward.

**Schools and the Frontal Lobe**

DuFour and Marzano (2011) reported that educational systems have developed a tradition of failed reform efforts. They argued that school improvement must focus on people and process improvement, thereby creating the conditions for implementing successful change. These conditions include effective leadership, aligned support systems, appropriate professional development engagements, and measurement feedback systems. DuFour and Marzano (2011) reported that leadership is fundamentally about a process of influencing people to achieve desired results. They argued that modern leadership in education involves vision and organizational alignment against deliverable objectives, and that professional learning
Communities are a powerful structure to empower teacher teams leading to superior student learning outcomes. Relative to senior school leadership, DuFour and Marzano (2011) stated it is vital to focus on initiatives most crucial to mission implementation and avoid initiative fatigue, where central leadership has the tendency to simultaneously implement excessive initiatives and lack coherence among them.

In addition, there are myriad ways to help organizations move forward including frequent collaboration on mission and analysis of progress, analyzing current mental maps using contrast enhancement (Black & Gregersen, 2008, pp. 51-52), aligning performance appraisal processes with organizational goals, embedding professional development within key organizational initiatives, and assessing the effectiveness of change (Black & Gregersen, 2008, pp. 138-141). Similarly, Gray and Streshly (2010) reported that highly successful school leaders “demonstrate a strong ability to build relationships” (p. 3) and that, “Although the ability to build relationships was not identified specifically in Collins’ research of successful CEOs, it surfaced prominently during the conversations we had with the school principals in our study and is supported in Fullan’s (2008) Six Secrets of Change” (p. 5).

Schools are charged with the formal education of our youth. As such, our educational institutions must become more aware of the advancements in the understanding of neurological functioning, and at designing and implementing learning engagements that will result in maximizing human potential. The frontal lobe, as CEO of the brain and as the sole interface of internal and external inputs, must be effectively deployed if schools are to move forward in an effective, optimal fashion.
Conclusion

There are clear parallels between neurological frontal lobe functioning and elements of human leadership. The frontal lobe is the brain’s command center, just as responsible humans are in charge of their decisions and behaviors. Leaders can more consistently demonstrate the high level thinking characteristic of the frontal lobe by being more purposeful about goals, building relationships, and engaging productively with others. In addition, given that males and females exhibit complementary strengths, it is important to consistently involve, at all levels, both genders in the work of improving organizations. For as Goldberg (2009) stated, the frontal lobe is what makes us distinctly human.
References


