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## Management and the Brain Sciences: An Uneasy Alliance?

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### **Abstract:**

*Some 240 years ago, American revolutionary pamphleteer Thomas Paine (2008) depicted the angst of his era with the words, "These are the times to try men's souls." Today, countless managers also find themselves beset with a whole host of vexing issues that regularly try their mental and emotive spirits. Many of these matters are further complicated by the managers' own ill-fated efforts to cope with the rapidly fluctuating economic, social, political, and technological terrain.*

*Success in such a mutable landscape seems to favor those managers who can quickly diagnose, interpret, and act on emerging opportunities and deal with incipient threats. Taken together, all of these demands serve to lay great strain on a manager's cognitive, physical and emotional capacity. Additionally, much of their formal business education has ill-prepared managers to survive and thrive within such a confusing, topsy-turvy topography.*

*Modern brain science has the potential to offer a degree of relief to beleaguered managers. It has recently engaged in a comprehensive, lengthy, and costly effort to better understand how human brains and minds work. A small subset of researchers and practitioners has begun to focus on the linkages between management's issues and the research findings from the brain sciences. This paper will attempt to describe the current state of the relevant research, identify five relevant findings from an analysis of discovered patterns in the research, discuss each of the findings, consider limitations, offer some conclusions, and extend some recommendations for the future.*

**Keywords:** Management, brain sciences, neuroscience, neuroleadership, neuromarketing

### **1. Introduction**

For many managers nowadays, organizational life is exemplified by an ongoing skirmish with challenging human, economic, and technical issues large and small. Compounding the situational difficulty, is the need to deal with an overweening environment distinguished by multifaceted complexity, reduced resource availability, and ever-growing ambiguity. Fear, uncertainty, and doubt are constant companions. It is as if the formerly stable ground beneath the managers' feet is breaking up and disappearing leaving behind nothing but dust and chasms. Perhaps little in their education as managers has prepared them for the tumultuous, unstable and puzzling world in which they now live and work.

Counting on past experience as a reliable guide to current behavior can be an undertaking fraught with danger as quickening social and technological change blurs the rules of competition, cooperation, and engagement. Within numerous fields and organizations, the future is no longer considered to be a semi-predictable and logical extension of the past. As alliances and relationships shift, one-time competitors may become joint venture partners, customers can become business buyers, and former suppliers may morph into direct competitors. Already large international organizations merge and acquire in an attempt to become even more dominant through increased size and reach. And, tomorrow it might all change again.

Additionally, disruptive innovation (Dyer, Gregson, and Christensen, 2011) can swiftly alter a once stable business landscape. Aided by hastening technology, agile new competitors may arise un-noticed from outside traditional organizational boundaries. Abetted by crowd sourcing and financing on the Internet, individuals and small groups can quickly scale-up to challenge well-established firms. Rather than taking decades to reach large size and competitive ascendancy, small, nimble startups can become billion dollar enterprises in a short, few-years, time.

In stark contrast to management, within the brain sciences this is period of great optimism and enthusiasm. The Brain Sciences are considered to be composed of disciplines under the broad rubric of the biobehavioral and cognitive sciences. Representative sub-disciplines include: psychology, neuropsychology, neuroscience, behavioral biology, cognitive science, artificial intelligence, and some aspects of philosophy.

Of late, the brain sciences have received a lot of public attention and some notoriety. Large scale government and private sector funding is currently supporting long-term exploration of brain organization and function. For example, the era of the 1990s was declared as the "decade of the brain" by the U. S. Library of Congress and the National Institute of Health. In 2013, U.S. president Obama began the half-billion-dollar White House BRAIN initiative. This public-private partnership intends "Brain Research through Advancing Innovative Neuroethologies."

Additionally, in 2013, under the auspices of the European Union, the 1.9 billion Euro “Blue Brain Project” was introduced. This research venture focuses on creating an organically accurate model of mammalian and human brains within a computer. Thus, internationally, research scientists are cooperating on an unprecedented scale to uncover new discoveries about how the brain works and the interconnections of its parts. Neuroscience has become a big enterprise.

As a spinoff from basic brain research, scientists have begun to use some of its new tools, like fMRI or functional magnetic resonance imaging machines, facial analysis software, and PET or Positron Emission Tomography to explore possible business applications. These machines allow non-intrusive access to working brains and create reproducible images of participants responding to commercially-related questions and problems. One consequence of these developments is the creation of whole new business-related disciplines such as: behavioral economics, neuromarketing, and neuroleadership that are now being actively pursued.

Behavioral economics (Ariely, 2009) combines psychology and economics and is focused on uncovering the actual processes by which individuals and organizations make decisions ranging from the mundane to the momentous. Neuromarketing (Georges, Bayle-Touroulou & Badoc, 2014) grew out of exploring the technical possibilities arising from neuroscience applications in medicine and how they might be applied to understanding and influencing consumer behavior. Neuroleadership attempts to apply the findings of neuroscience research toward improving theory and practice within the field of leadership.

## 2. Background

Living and working in the midst of such confused and unsettling conditions has become a day-to-day facet of organizational life. Bombarded by high volumes of information, intrusive communication requests from various stakeholders, the vagaries of multigenerational workforces, and lofty performance targets, managers may respond defensively by becoming more reactive and less proactive. Additionally, while trying to balance their personal and work lives, managers may find precious little time to think about themselves and their own development. In fact, time and attention have undoubtedly become among the most prized and scarce of management commodities.

As a consequence of attempting to meet their numerous pressing tactical, operational and strategic responsibilities, managers may react with coping behavior.

Coping usually requires the use of non-preferred ways of behaving and forces managers out of their usual psychological, emotional, and physiological comfort zones. Coping depletes energy resources and adds additional stress to already harried lives. Kirton (2003) suggests that the more extensive and lengthy the coping period the more likely the long term damage to mental and physical health.

On the positive side recent advances in the brain sciences, particularly in neuroscience and positive psychology, offer strategies and techniques to assist managers with surviving and thriving in their chaotic worlds. Examples of such procedures include: mindfulness meditation, neuroscience-based executive coaching, direct application of neuroleadership models, use of heuristics for decision-making, and stress-reduction techniques.

## 3. Objectives

- To examine the current relationship between management and the brain sciences.
- To identify linkages between management and the brain sciences that may be helpful to managers accomplishing their work.

## 4. Literature Review

Recent professional literature in both the brain sciences and management was examined. Historically, the literature on management is voluminous. No attempt was made to trace the historical development of management thought and practice over time. The research focus is on identifying more contemporary works, with an emphasis on the literature less than five years old. Priority was given to accounts that showed an interest in psychological influences on management practice.

In terms of quantity and quality of material, it was determined that professional books addressing the connection between management and the brain sciences continues to grow. With reference to specifically applying the latest insights from neuroscience to the world of work, representative examples include: Brann (2015a), Garms (2014), Howard (2014), (Meshanko, 2013), (Lawson, Anderson & Rudinger, 2013), and Markus (2003). More business-oriented linkages can be found with Garten (2002), Larsen (2006), Hickman (1990), and Bessinger and Suojanen (1983). Neuroleadership as field of connective study has also come into prominence with principal exemplars such as: Swart, Chilsholm and Brown (2015), Ghadire, Habermacher and Peters (2011), Kryder (2011), Henson and Rossouw (2013), Rock and Ringleb (2013), and Dickmann and Stanford-Blair (2002).

## 5. Methodology

The principal research methodology is a review of the current literature connecting the brain sciences and management.

## 6. Findings

- Managerial decision-making and problem solving have a significant and, often unrecognized, unconscious component
- Unexamined managerial beliefs tend to filter and bias perception of events, or what you believe determines what you see.
- Cognitive capacity limitations contribute to stress and poor decisions.
- Brain dominance preferences have a significant impact on managerial behavior
- Neuroscience-based coaching offers a promising vehicle for integrating management and brain science

## 7. Discussion

### 7.1. Unconscious Decision-Making

Technological advances have allowed neuroscientists to peer into the brain in near real time as it makes decisions. One surprising result has been the finding that many managerial decisions appear to be determined by unconscious processes, this fact has been established by looking at which brain areas are active and which are not when making different types of decisions and comparing individuals to others making similar choices.

Psychologist Daniel Kahneman won a Nobel Prize in 2002 for ground breaking research that directly challenged the prevailing rational approach to judgment and decision making. Kahneman (2011) postulates that the brain employs two different types of systems for making decisions. The first, System 1, is primarily unconscious and is intuitive, fast, and emotionally driven. System 2, on the other hand, is consciously controlled and is deliberative, slow, and logical. Managers use both systems but seem mostly unaware of the extent of the influence of System 1 on their overall decision-making.

### 7.2. Unexamined Beliefs

Psychologist and cultural researcher Richard Nisbett (2003) has noted, "Moreover, the different social realities might produce very different patterns of literally seeing the world." Psychology professor Carol Dweck has spent a career researching why some individuals reach outstanding achievement and others appear to have wasted their potential. Dweck (2015) indicates that the answer may be in unexamined beliefs. She proposes two differing mindsets or strongly-held beliefs that account for the difference. The "Growth Mindset" assumes ability is not a fixed quantity but can be enhanced through personal effort, learning, and profiting from mistakes. The "Fixed Mindset" believes ability is an immutable quantity determined at birth. Typically, the growth mindset leads to expanded development and competence and the fixed mindset leads to frustration and a reluctance to risk.

Similarly, Neuropsychologist Ian Robertson (2012) proposes that the experience of success actually changes the chemistry of the brain. Calling it the "winner effect" Robertson believes that success makes you smarter, more focused, more confident, and more aggressive. In his view, the apparent downside is that winning can become physically addictive. Robertson implicates the brain chemicals testosterone and dopamine as the primary determinants of the brain changes.

### 7.3. Cognitive Capacity Limits

The frequency, intensity, and context of competing messages from multiple sources and channels continually vie for a limited amount of managerial memory space and attention focus. Neuroleadership founder David Rock likens the brain's prefrontal cortex, which holds the mind's content at any one point, to a theatrical stage. According to Rock (2009), the theatre's actors represent information that is held in attention. Since the brain's stage area is restricted, some memory researchers think it might be as diminutive as being able to hold only four to nine items at time, only a small number of actors can be on it simultaneously. These actors represent information from the inner world of the mind as well as sensory information concerning the external world. So, in Rock's analogy, what managers' wind up paying attention to is the result of an ongoing internal competition for presence on the tiny mental structural platform.

Attempting to interpret the intentions of the actors on the stage the brain's built-in danger detector, the amygdala, a structure in the mid-brain, relays threat and alarm signals to other parts of the body. Stress results from attempting to pay continuous attention to the constantly changing cast of characters on the stage. The amygdala stimulates another brain structure called the hypothalamus which, in turn, excites the pituitary gland. The consequence is a cascade of a specific class of stress-related brain chemicals called glucocorticoids, which induce fight, flight or freeze responses in all parts of the body-mind.

This finely tuned stress response by the nervous system, honed by evolution to protect our species, has evolved to use the same brain pathways to respond to social threats as well as physical ones (Sapolsky, 2004). Thus, a brain mechanism developed to keep us from the life-threatening harm posed by a sabre tooth tiger can now be engaged when a manager faces an angry boss or is forced to fire a valued subordinate.

Acknowledging the limits of human thought and information processing capacity, Nobel Prize Winning Psychologist and Economist Herbert Simon introduced the concept of "bounded rationality." Relating to decision-making, Simon (Hindle, 2008) proposed that factors such as: the obtainable information, the available time, the difficulty of the problem, and the processing limits of the brain act to limit or constrain managerial rationality. Additionally, Simon introduced the idea that managers tend to make "satisficing" types of decisions that serve to satisfy minimum solution criteria as opposed to "optimizing" type of decisions that target obtaining a more ideal outcome.

### 7.4. Dominance and Behavior

Hemispheric dominance within the human brain has received a great deal of attention from brain scientists. Instrumentation to determine areas of brain preference is well established. Different brain areas have been associated with different capabilities such as analytical reasoning, sequential planning, emotional intuition, and the ability to synthesize. Herrmann and Herrmann-Nedhi have linked several of these capabilities with business success. The Herrmanns' (2015) have also established a very large data base that can correlate managerial demographics and behavioral preferences with dominance patterns.

Carla Hannaford (1997) offers specific information on how knowing your dominant eye, ear, brain, hand and foot can improve learning and shape the way thinking and acting occur. Additionally, Jennifer Lee (2014) (2011) has utilized insights derived from

hemispheric dominance to assist managers in creating non-traditional business building and planning processes. These methods utilize creative visual and spatial mapping capabilities inherent in the right hemisphere of the brain.

### 8. Neuroscience-based Coaching

One of the newest areas for connecting the brain sciences with management is in the field of executive and organizational coaching. Coaching has traditionally been used within organizations to provide either corrective or developmental assistance to management. Coaching is typically an individual, confidential, one-to-one, service. Assistance is provided by a knowledgeable coach that emphasizes challenging and supporting a designated client in reaching his or her goals. Brann (2015b) and Rock & Page (2009) describe how coaches, conversant with principles derived from brain science, are able to employ methods that build on the natural plasticity of the brain as well as examining the role of brain chemicals and brain structures in affecting client behavior.

### 9. Conclusion

Business professor and management authority Jeffrey Pfeffer (2015) has suggested that much of the conventional wisdom about managers is based more on hope than reality, more on wishes than data, and more on beliefs than science. Developments in brain science provide a window of opportunity to significantly improve management practice. International management expert Philip Harris (2013) has noted in reference to effective managers that, "They follow the results of neuroscientists on brain matters, especially with reference to robotics and artificial intelligence." Harris further notes that future brain-based devices are likely to influence the work environment via simulated neural systems.

Also, the recent advances in the brain sciences have served to open new avenues of innovative thinking for beleaguered managers. Some of these advances include: compensating for evolutionary biases (Beilock, 2010), use of simple heuristics in decision making (Dobelli, 2013), mind mapping (Taylor, 2014), and relaxation techniques derived from interpersonal neurobiology (Siegel, 2010). By moving beyond traditional ways of coping, such as working longer and harder, managers may be better served by self-testing and experimenting with new options that reduce confusion and better preserve limited brain energy.

### 10. Limitations

One significant limitation is the translation and interpretation problem. Both brain science and management have their own goals, languages and sub dialects that makes cross-discipline communication difficult. Understanding research results across disciplines can be problematic at best. Additionally, the explosion of professional literature in the brain sciences permitted only a small, select, fractional sample from which to analyze patterns and trends in the field. By way of illustration, on December 10, 2015, Google Scholar reported over 2.7 million results related to a query search for the term "brain sciences."

### 11. Recommendations

Although currently rather few in number, using individuals who are discipline-hybrids or those who have had professional training in both the brain sciences and management could help span the communications gap. Examples include graduates of Business Psychology programs and management consultants with backgrounds in the behavioral sciences. An additional option, would be to utilize the services of general science writers who write for popular magazines, blogs, and other publications. The jobs of such writers requires them to keep abreast of the latest findings in a variety of science and technology areas. The nature of their work is such that they translate complex scientific concepts into language suitable for and of interest to the general public.

Bridging the "gap" between management and the brain sciences can be perceived as both a danger and an opportunity. The danger is in overextending the often tentative findings from brain science research into premature practical guidelines for managers. The opportunity is to improve management performance in ways consistent with how the brain actually works. Based on the current evidence, it appears that the uneasy alliance between management and the brain sciences still has a way yet to run before any final resolution is in sight.

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