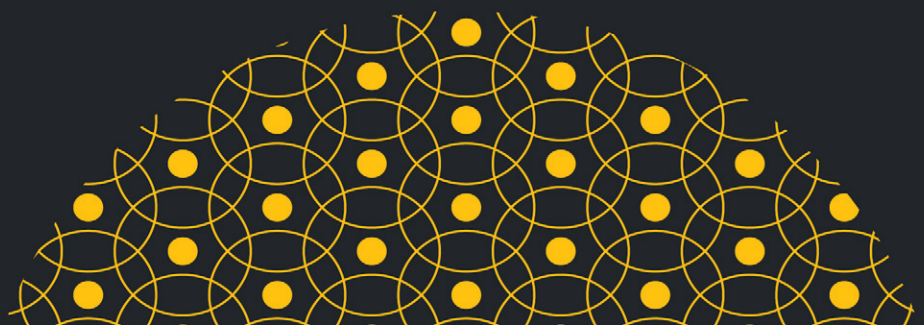
EMERALD POINTS

LEADERS' DECISION MAKING AND NEUROSCIENCE

What Are You thinking?

YINYING WANG



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What Are You thinking?

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INTRODUCTION: LEADERS' BRAIN AS A DECISION-MAKING ORGAN

What exactly is leadership? At its core, leadership is about motivating a group of people to achieve shared goals. To understand leadership, we need to answer a fundamental question: Why do people behave the way they do? Traditionally, leadership has been studied through a behavioral lens – an examination of leaders' behaviors. Yet, this behavioral approach invites a further query: Where does behavior come from? Behavior, both leaders' behavior and how people respond to it, is an outward manifestation of a decision made in the human brain. Think of leadership as a tree, where visible branches and stems represent observable behaviors. Still, there is a substantial part that remains invisible – the root system, which is like intricate mental processes that underpin decision-making. Much like a tree that draws its strength from its roots, the quality of a leader's decisions is heavily reliant on their underlying mental processes.

If you are seeking to make high-quality decisions, this is the book for you. Decision-making refers to the mental processes, conscious or unconscious, of choosing a course of action from a set of options. With remarkable strides in neuroscience in recent decades, we now have a better grasp of the workings of the human brain and nervous system. This book takes you on a journey to unravel the hidden layers of decision-making as seen through the lens of neuroscience. Following an introduction in the current chapter, Chapter 2 guides you through the life course of power – how a desire for power assists you in making decisions that help you rise to power but also, once in power, undermines the quality of decisions that can lead to your downfall. Chapter 3 dispels the misconception that emotions are adversaries of sound judgment. Instead, we explore how emotions can serve as valuable compasses to guide your decision-making. Moving to Chapter 4, we will learn about the workings

of the dopaminergic system and how to harness it to make decisions that effectively motivate people. Next, Chapter 5 sheds light on how attention influences your decisions, and Chapter 6 explores the impact of memory on decision-making. Chapter 7 centers on the neuroscience underpinning trust, the glue that binds social relationships together. In Chapter 8, we discuss the powerful role of human faces, brimming with social and emotional cues, in shaping your decisions. Chapter 9 probes into where your personality comes from and its sway over your decision-making processes. Chapter 10 ventures into intuitive decision-making and gut feelings. Chapter 11 uncovers how mental shortcuts can lead to decision errors. And Chapter 12 is about brain-to-brain synchronization in collective decisions. The concluding chapter offers guidance on how to take care of our brains to make better decisions. The aim of this book is to equip leaders and those aspiring to lead with neuroscience insights and tools to make high-quality decisions. By the end of this book, you will find that exploring neuroscience and leaders' decision-making is one of the most rewarding decisions you will ever make. Are you ready to start this journey?

OUR BRAIN'S MOST IMPORTANT JOB

At the beginning of the journey, it is crucial to understand the fundamental role of the human brain. This understanding lays the foundation for the rest of the book, as we learn why our brains operate the way they do and how they influence our decision-making processes. First and foremost, what is our brain's most important job? While thinking, feeling, imagining, and creating are all important functions, they ultimately serve a grander purpose. The primary mission of our brains, and indeed all brains across species, is survival, ensuring that we pass on our genes to the next generation. We may choose not to have offspring, but that is a strategic decision rather than the primary mission of our brains.

Our brains oversee approximately 86 billion neurons, which are the nerve cells that form the foundational infrastructure of our nervous system. Collectively, they perform a vast array of operations, including supervising over 600 muscles for precise movement coordination, regulating dozens of hormone productions, powering the circulation of around 2,000 gallons of blood daily, and enabling our thoughts, creativity, and learning abilities.

Yet, despite their crucial role, our brains operate within a rather stringent energy budget. To survive, our brains have to optimize energy efficiency. This

is like how leaders, who have finite resources, maximize efficiency within their organizations while facing constraints such as budget, time, and personnel. Picture it as a small department within your organization, constituting only 2% of the total organizational structure but consuming 20% of the resources (Raichle & Gusnard, 2002). Similarly, our brains account for 2% of our body weight but require approximately 20% of the blood supplied by a vast network of 600 kilometers of blood vessels (Kuzawa et al., 2014). Those blood vessels, including arteries, veins, and capillaries, ensure the delivery of vital resources such as oxygen and glucose to neurons, which are essential for their survival (Gailliot et al., 2007; Özugur et al., 2020). Our brains receive approximately 750–1,000 milliliters (0.75–1 liter) of blood per minute to support complex brain functions.

Due to its high metabolic cost, the brain is highly sensitive to the energy supply carried by the blood. When oxygen is lost for as little as 5 minutes, the death of neurons becomes almost irreversible (Magistretti & Allaman, 2015). If blood flow is not restored promptly, it can lead to brain death. In situations where the blood supply is limited, the brain takes top priority for its survival. For example, when we are under stress, our body's stress response is activated, causing physiological changes such as increased heart rate, rapid breathing, and elevated levels of stress hormones like cortisol to increase blood flow to our brains. Even if other organs need blood, our body attempts to supply the brain with a constant flow of blood. Saying yes to something means saying no to something else, and resources are allocated accordingly.

To optimize energy use, our brains, which are essential organs for decision-making, operate as energy-efficient prediction organs. How our brains make decisions is similar to how leaders make decisions, because a significant part of what leaders do is make decisions under uncertainty, which necessitates predictions. In our brains, to reduce uncertainty, the brain constantly processes sensory data such as images, sounds, and language and makes predictions based on past experiences to minimize the need for intense computational processing and conserve energy. When something unexpected arises, our brains have a stronger response (Heilbron et al., 2022). This is because unexpected events signal a prediction error, indicating that our brains' prediction model is inaccurate. To correct the prediction error, our brains have to update their prediction model, which requires additional computational resources and, hence, more energy. Imagine if we could travel back in time and change our past experiences – the changes would influence our brain's predictions, potentially leading to different decisions and behaviors. We do have the power to influence our future predictions. By learning new ideas, learning from people who disagree with us, and engaging in new activities, we can

influence our brain's future predictions. This adaptability allows us to change our behaviors and perspectives over time.

A BRIEF TOUR OF THE HUMAN BRAIN

After understanding the most important job of our brains, let us take a brief tour of this decision-making organ. Consider our brains as a thriving metropolitan city with a mission to survive and thrive. In this brain city, approximately 86 billion neurons serve as diverse residents. Their job is to receive, evaluate, and transmit information to the next neuron. Each neuron, similar to city residents, has a specialized role. Some neurons are charged with processing sensory information, enabling us to perceive the world through sight, hearing, taste, smell, and touch. Other neurons are responsible for motor control, coordinating muscle movements, and facilitating actions. They function as the city's workforce, driving the execution of various tasks and activities. While each neuron plays its role as an individual resident, it is their collective effort and communication that give rise to the remarkable capabilities of processing information, generating thoughts and emotions, and carrying out intricate cognitive functions.

The communication between neurons is constant. Neurons communicate via electrical impulses and chemical signals known as neurotransmitters. Among more than 100 neurotransmitters in human brains, several of them are closely related to leadership: oxytocin is associated with trust (Kosfeld et al., 2005), dopamine is associated with motivation and obtaining a leadership position (Li et al., 2012, 2015) and serotonin is associated with human reactions to being treated unfairly (Crockett, 2009). The neurotransmitters are like couriers of the brain city. They navigate through intricate brain networks and cross synapses – the junctions between neurons – just as couriers navigate intersections within the city. They deliver vital messages and signals from one neuron to the next. Much like couriers carrying different types of packages from one place to another, different neurotransmitters carry specific signals or messages between neurons. For example, dopamine acts as a courier for reward and motivation signals, serotonin acts as a courier for mood regulation and glutamate acts as a courier for excitatory signals important for learning and memory. The neurotransmitters relay information related to sensory perception, memory formation, emotion regulation, and decision-making. Fueling these activities, as mentioned earlier, is a vast network of blood

vessels that supply the energy-intense brain with necessary resources like glucose and oxygen.

Due to the brain's high energy demands, while accuracy in decision-making is essential, survival often takes precedence over absolute precision in the brain city. It recognizes the need for quick responses to potential dangers, much like a city's emergency services prioritize rapid action during crises. This prioritization of speed and efficiency over absolute accuracy enables the brain to make fast decisions, even if they are not always perfectly accurate. In the following chapters, we will revisit the brain's principle of energy optimization and its influence on our decision-making processes.

HUMAN BRAINS IN ORGANIZATIONS

In neuroscience, structure and function are inextricably linked. Brain regions are connected both structurally through neuroanatomical wiring and functionally through shared responsibilities. This interconnectedness means that one brain region supports numerous functions, and one function engages multiple brain regions (Gazzaniga et al., 2014). The same mechanism applies to organizations. The structure and function of the human brain bear many similarities to organizational structure and function. Brain regions can be likened to teams or departments within an organization, each with specialized functions and responsibilities. Different brain regions collaborate to process and interpret sensory information, perform specific tasks, and coordinate overall brain function, much like how different teams within an organization work together to achieve a shared goal. Neurotransmitters facilitate communication between neurons, allowing for the exchange of information and coordination of actions, resembling communication channels within an organization, such as face-to-face conversations, phone calls, and emails. Neurotransmitters also regulate and modulate neuronal activity, ensuring optimal brain function. Similarly, effective communication and information exchange are essential for smooth organizational functioning, impacting members' motivation, trust, and overall effectiveness.

Brain systems are akin to cross-functional teams in an organization. Just as different brain systems (e.g., attentional, memory, and emotional systems) work together to perform complex tasks and achieve overall brain functions, cross-functional teams bring together members from different departments or functional areas to work together on a specific project, leveraging their unique skills and expertise to achieve a shared goal. In the same way that our brains

optimize energy to make decisions, leaders must optimize their resources – both human and material – to make the best decisions for their organizations. Different brain systems interact with one another, which then takes a winner-takes-all approach to generate a decision and sends motor commands to muscles to execute that decision (Gandhi & Katnani, 2011). This is why, despite numerous brain systems at work, we feel unified when making decisions. The brain operates as a unified entity, with all the systems working together as a whole.

Moreover, neurons do not function as simple on/off switches in a fixed wiring diagram. Instead, neurons respond in a continuous manner, adjusting their activity based on the intensity and pattern of incoming signals or stimulation. This adaptability of neuronal activity is at the core of brain plasticity, which refers to the brain's remarkable ability to reorganize its structure and modify its function in response to experiences, learning, and environmental changes. Similar to how individual neurons can modify their connections and adapt their activity, organizations also exhibit a similar level of plasticity in their structure and function. Much like the strength and efficacy of synaptic connections can be enhanced or weakened through experience, organizations can undergo structural changes that shape their operations and performance. In response to evolving external conditions (e.g., market changes, mergers, and acquisitions) or internal strategic shifts (e.g., adopting new technologies into operations), organizations experience changes in their functional teams. Through the process of restructuring or realigning, the teams adapt their roles and responsibilities to better align with organizational goals. This organizational restructuring can lead to improved specialization, more effective resource allocation, and newly established communication pathways, resembling the modifications in brain regions and their connectivity. With a foundational understanding of the similarities between our brains and organizations, we are now ready to explore the life course of power in leaders' decision-making.

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THE LIFE COURSE OF POWER IN LEADERS' DECISION-MAKING

In social life, power is ubiquitous. It refers to having discretion and the means to asymmetrically exert influence over others' thoughts, decisions, and behaviors (Sturm & Antonakis, 2015). For leaders, such as a department head, power can be exercised through resource allocation, like budget and personnel, to influence subordinates' behaviors. The department head can reward employees who follow her directives with promotions, bonuses, or favorable assignments while punishing those who do not comply by demoting them or withholding resources. At times, the department head may adopt bullying tactics to exercise power, including intimidating, manipulating, belittling, and threatening employees who do not bow to her will. Bullies in the workplace, like bullies in other social settings, often target those who are perceived as weaker or more vulnerable because it is easier for bullies to exert control and influence.

Beyond the power derived from positions of authority, power can also be exercised through influencing tactics such as charm, ridicule, social exclusion, guilt-tripping, and spreading rumors. In parent–child relationships, children can make parents feel powerless, even though parents control critical resources for their children, including food, safety, emotional nourishment, and making most decisions on their behalf (Bugental & Lewis, 1999). Children can throw tantrums, pit parents against each other (e.g., telling mom that dad said "I can do it"), give parents silent treatment, and make parents feel guilty for resisting their child's demands (often through phrases like "If you love me, you would. . ."). Similarly, many workplace bullies do not hold positions of power, but they use similar influencing tactics to manipulate others' feelings, thoughts, and behaviors.

Power plays a critical role in leadership, a process wherein leaders influence others' behaviors to achieve a shared goal. Power can be used for the greater good, as exemplified by Abraham Lincoln's use of his presidential power to issue the Emancipation Proclamation. Power can also be used to enforce unyielding obedience, leading to power abuse, as demonstrated by authoritarians who use power to establish a repressive regime and suppress opposition. One can argue that an essential aspect of leadership is how to acquire power and decide when, where, to whom, and how it should be exercised. In this chapter, we embark on a journey through the life course of power and its influence on leaders' decision-making.

RISE TO POWER: UNVEILING THE DRIVING FORCES

What factors contribute to an individual's rise to power? A frequently examined trait is implicit power motive, also known as need for power or *n* Power. It is an innate, *unconscious* desire to influence others and control situations (Winter, 1973). This basic human need for control and influence is rooted in our evolutionary history, where having power and control often meant survival (Lammers et al., 2016). Not everyone has the same level of desire for power. You have probably encountered people with a voracious appetite for power – those who have an intense need for power, revel in the pursuit of control and dominance, believe themselves superior in intellect, and feel entitled to make decisions on others' behalf. People with a high power motive are driven by a need for social status and prestige, and they seek to attain positions of authority in order to gain control over others. Typically, they are confident, assertive, and ambitious. They often have decreased awareness of constraints, are willing to take risks, and feel invincible (Anderson & Galinsky, 2006; Whitson et al., 2013). They vie for leadership roles, compete for status and recognition, or exert influence over others in social settings.

The power motive is shaped by multiple factors in our neurobiology, one of which is the brain's dopaminergic reward system (Schultheiss & Schiepe-Tiska, 2013). This system governs our responses to rewards, fueling our pleasure-seeking behaviors and playing an integral role in reward-motivated behavior. The dopaminergic system starts in the ventral tegmental area (VTA), a region rich in dopamine neurons that produce the neurotransmitter dopamine (Chinta & Andersen, 2005). The VTA sends signals to the ventral striatum when activated by pleasure-associated stimuli, such