Validation and application of the Triune Brain and CareerQuotient™ (CQ) visual neuroscience profiling methodology and framework

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This research study validates a new approach to personality profiling and brain balance scoring based on visual neuroscience storytelling and behavioral science rather than the observational models of the past, including the OPQ-32, Myers-Briggs, Predictive Index, Culture Index, Pymetrics, Kolbe, Six Working Geniuses, StrengthsFinder, the BIG-5, DiSC, Fisher, Hogan, the Enneagram, and other profiling models. Ideally, the potential wide range of applications includes talent acquisition, employee profiling and engagement, job satisfaction and retention, team building, and professional productivity through the understanding trust factors, soft skills, leadership situations, professional strengths, introversion/extroversion, and personal attributes based on a visual neuroscientific approach. CQ is the first and only assessment system to equate these factors with measured elements for neurotransmitter and brain chemical levels and/or sensitivities. Further, the CQ assessment and C-QUIZ™ platform is the first to use neuroscientific evaluations to match profiles for top performing individuals against talent acquisition candidates to ensure optimal alignment for soft skills, trust factors, attributes, strengths, profile types, and culture fit.

Beyond talent acquisition, the CQ assessment model is in use by organizations, such as the Kollab Youth program sponsored by Wells Fargo, to support mentoring and internship programs, as well as educational program personalization. For the latter, the CQ 4STORY™ Framework offers a next generation approach to educational personalization beyond the widely accepted 4MAT framework.

CQ also has potential applications in sales and marketing to match prospects against Ideal Customer Profiles (ICPs) to facilitate Account-Based Marketing campaigns and sales prospecting initiatives. Additionally, CQ can used for a variety of other purposes such as

marketing personalization for websites where in copy and images are changed on-the-fly based on profile types. Also, for eCommerce where specific products or services are recommended to individuals based on profile types.

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We would like to express appreciation to those individuals who graciously provided research information and study participation.

Introduction

Background of the Problem

A Gallup poll conducted in 2015 (Weber, 2015) revealed that more than one million U.S. workers found that the number one reason people quit their jobs is poor leadership. In the 2013 Gallup *State of the American Workplace* study, researchers determined that only one-third of workers are engaged in their jobs, leaving more than two-thirds who are completely or partially disengaged (Gallup, 2013). The estimated cost to U.S. firms is over $500 billion each year in lost productivity and revenue.

Gallup studies (Weber, 2015) have concluded that workgroups with bad leaders are 50 percent less productive and 44 percent less profitable than well-managed teams. A Barna Group study found that two in five Americans rank their boss as "bad" and just one in five assigns only positive attributes (Barna, 2015).

Researchers from Eastern Kentucky University's Bachelor of Science in Occupational Safety program uncovered that workplace stress is costing U.S. firms $300 billion each year for health care and lost work days. They suggested that 77 percent of workers exhibit physical symptoms caused by work stress and 60 percent said they wanted a new career (Smith, 2016).

The Society for Human Resource Management (SHRM) predicted that every time an organization replaces a salaried employee, it costs between six to nine months of salary (Society, 2015). The Center for American Progress reported that for an educated executive, the cost is 213 percent of annual salary (Boushey & Glynn, 2012).

Quimet (2012), writing for *Inc.* magazine, inferred that bad bosses aren't just a concern, they're bad for business. This report disclosed that 65 percent of employees would choose a

better boss over a pay raise. Around one-third confessed to dialing back their productivity due to poor leadership. The *Inc.* study concluded that it's not what bosses do that makes them bad, it's what they don't do.

The number one thing bad bosses don't do, according to the study, is inspire their teams. They also don't improve productivity, as they accept mediocrity. Further, they don't provide a clear vision and are not good team leaders.

Bad team leaders are not limited to the United States. The Chartered Institute of Management found that almost half of all workers in Britain left at least one job solely because of a bad boss (British Broadcasting Corporation, 2009). In Australia, around two-thirds of workers who responded to a CareerOne survey rated their leaders as either "horrible" or "average" (News.com.au, 2011).

Some of the world's top neuroscientists, many of whom are associated with leading institutions such as Harvard University, have made new discoveries in the last decade about the human brain. Some of these insights may help leaders improve employee morale, productivity, and retention. For example, according to neuroscientist Dr. Paul Zak (2017), increasing oxytocin can enhance organizational trust and customer brand loyalty. Using mirror neurons can set proper examples for subordinates (Winerman, 2005), and research conducted by the London School of Business suggests that leaders employing neuroscience-based storytelling techniques can increase retention (Vermeulen, 2012).

Subsequent to the pandemic of 2020, in relation to more remote or hybrid working environments, an article titled *It's a Matter of Trust*, published in *HR Magazine*—the premier publication for human resource professionals sponsored by the Society of Human Resource Managers (SHRM)—noted the following:

In its global CEO survey, PwC reported that 55 percent of CEOs think a lack of trust is a threat to their organization's growth. SHRM research shows that when there is more trust in the workplace, employees are 23 percent more likely to offer ideas and solutions. According to the Edelman Trust Barometer (a survey of 33,000 people in 28 countries), 1 in 3 people don't trust their employer. According to Gallup research, employees who trust their employers experience 74 percent less stress and 40 percent less burnout. Also, 96 percent of engaged employees trust management compared to 46 percent of disengaged employees. Stephanie Stewart, SHRM CP, stated that "If employees feel trusted, they feel more engaged. Nobody likes to be micromanaged." Gallup studies reveal that high-trust work environments have 50 percent higher productivity and 106 percent more energy. Highly engaged workers also drive 20 percent more revenue and profits.

A post pandemic Martec Group study shows that mental health and trust have declined while stress has increased by 42 percent. Prevalent systems to deal with these issues, such as wellness and mental health programs, have obviously failed to improve these statistics. Current approaches to personality profiling, especially those used for recruitment candidate screening, have also proven to be less than optimal in ensuring high-trust, low stress, well-balanced teams and working environments.

Statement of the Problem

The research noted above suggests that neuroscience usage and education can positively enhance the effectiveness of business leaders while improving overall employee engagement, productivity, and wellness. However, it is not enough for leaders to simply employ neuroscience

and hope for the best. A proper framework and implementation plan is essential to ensure prompt results without negatively impacting moral or productivity.

The proposed research is designed to address the following question:

What components of recent neuroscientific research and what type of framework and implementation are optimal to ensure a timely and positive impact within a neuroscience-based leadership initiative that can be adapted for the modern organization with the goal of enhancing morale and productivity?

Purpose of the Study

The purpose of the proposed study is to develop a usable and simplified framework and implementation plan to utilize recent neuroscience research related to business productivity and employee engagement and wellness. This study will propose using a new approach to personality profiling based on modern neuroscience rather than the observation models of the past, including the OPQ-32, Myers-Briggs, Predictive Index, Culture Index, Pymetrics, Kolbe, Six Working Geniuses, StrengthsFinder, the BIG-5, DiSC, Fisher, Hogan, and the Enneagram profiling models. Ideally, the potential wide range of applications could enhance employee job satisfaction and improve productivity by adapting leadership skills to employees' neuroscientific profiles. Furthermore, identification of a leader's neuroscientific profile can enhance the ability to adjust the leadership style used based on the situation and the subordinate's identified profile.

Definition of Terms

For the purposes of the present study, the following definitions of terms will be used:

Neuroscience. The field of study encompassing the various scientific disciplines dealing with the structure, development, function, chemistry, pharmacology, and pathology of the nervous system.

Leadership. An act or instance of leading; guidance; direction.

Personality. The sum total of the physical, mental, emotional, and social characteristics of an individual.

the organized pattern of behavioral characteristics of the individual.

Psychology. The science of the mind or of mental states and processes.

Persuasion. The act of persuading or seeking to persuade.

Framework. Work done in, on, or with a frame.

NLP. Neurolinguistics Programming.

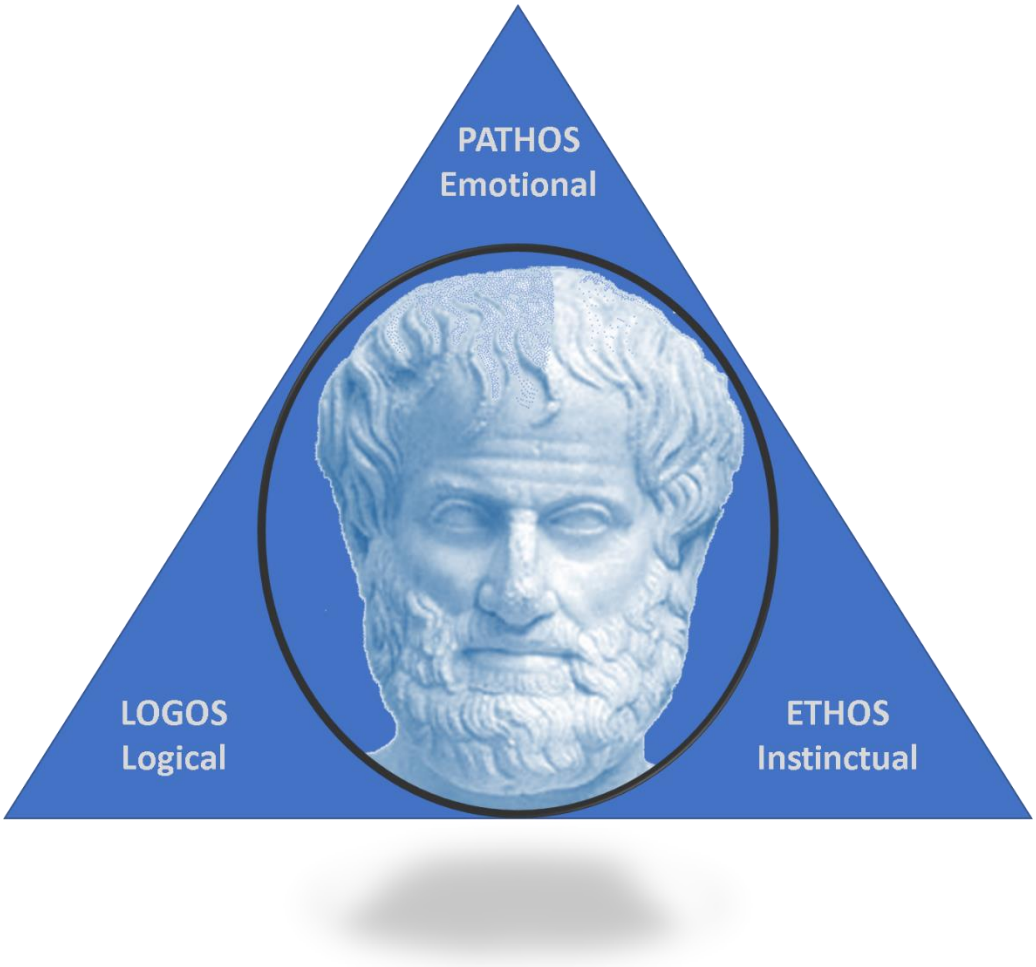
Limitations of the Study

Neuroscience is still nascent, and information related to its usage for leadership models is scarce. Few leaders, recruiters, or HR professionals have embraced neuroscience as a leadership, employee engagement, or talent assessment framework, so direct results are also scarce. Limited time and resources make it impossible to conduct an extensive research project to validate all assumptions, theories, or recommendations. Therefore, this study relies primarily on direct field studies across hundreds of individuals; currently available research, published books and articles; and provides a theoretical framework model that interviewed leaders agree may be effective for improving professional leadership results. This study also relies on volunteers to complete the CQ profile test, HIPAA-compliant Health Assessments, and the neurotransmitter urine tests. Test results have been analyzed and normalized to determine alignment between neurotransmitter and

brain chemical levels and self-identified profile types. Inaccuracies are inherent, but at a far lower rate than noted for other personality profiling tests that do not also align with brain science metrics.

CHAPTER ONE

Aristotle's Persuasion Model



(Graphic created by the author, Aristotle 384-322 BC. White photo of the bust is from Wikimedia Commons, attributed to jlorenz1)

Introduction and Overview

Aristotle developed *The Art of Rhetoric* (Aristotle, 1992) starting in 367 BC, which detailed his triangle of persuasive arguments. Today, top speakers and leaders incorporate these principles into their speeches or approaches to persuade and inspire audiences and followers. The relevance this has as related to the topic of this study, specifically regarding the neuroscience of

leadership, is in the relationship of this approach to the triune-brain neuroscience proffered originally by D. Paul D. MacLean in his book, *The Triune Brain in Evolution* (MacLean, 1990). Details about MacLean's theories are covered in detail in Chapter Three. Based solely on observational science, Aristotle's *The Art of Rhetoric* aligns with MacLean's neuroscientific theories in that both subscribe to three appeals to three separate brain or persuasive centers that are more emotional, instinctual, or logical in nature. The relevance to today's leaders is that it is apparent that Aristotle's persuasive techniques may be utilized in tandem with modern neuroscientific knowledge about the art of persuasion.

Aristotle's Seven Positive Emotions

One corner of Aristotle's triangle, which he called pathos, is defined as a "pathetic appeal." From an emotional perspective, pathos relates to feelings, suffering, pain, or calamity. Linguistic derivatives of pathos include empathy, sympathy, and apathy. The goal of the speaker or leader is to create a shared emotional bond or connection.

Top leaders use a rhetorical approach called enumeration, which is strengthened by making an emotional appeal three times in succession while using three related but different examples. The speaker or leader seeks to trigger key audience emotions that can set up subsequent calls to action, which might be to take out your wallet or approve a purchase order.

Aristotle recommended seven positive emotions, as compared to their contrasting negative emotions, to accomplish this goal:

- Calmness vs. Anger
- Friendship vs. Enmity
- Confidence vs. Fear

- Shamelessness vs. Shame
- Kindness vs. Unkindness
- Pity vs. Indignation
- Emulation vs. Envy

Historical Perspectives of Leadership Persuasion

When employed properly and passionately, with the right motives and intent, Aristotle's pathos has been used effectively to move an audience to feel what the speaker or leader feels, which in turn creates a bond similar to what one might feel for a close friend or loved one. The right emotional appeal can allow a leader or speaker to connect with an audience and lay a solid foundation for the second mode of persuasion.

When one steps onto the stage, whether in front of a team, a large audience, or a single person, Aristotle notes that they must connect emotionally, which is what he called pathos. Once this has been accomplished, the speaker then needs to build credibility and trust, which Aristotle called ethos.

Aristotle used three additional terms to define his views about ethos. *Phronesis* means good sense. He explained that when we communicate, it should be relevant, tasteful, and appeal to the good senses of the audience. *Arête* is defined as good moral character. By showing honest vulnerability, authenticity, and true heart, a speaker allows the audience to experience arête. Finally, *eunoia* refers to goodwill. The audience needs to sense that the speaker's intentions are selfless and that his or her honest goal is to be helpful by informing the audience about something important, such as a pending calamity or consequence.

The third leg of Aristotle's persuasion triangle is logos. This is where the speaker can make a logical argument supported by facts, figures, numbers, validation, case studies, evidence, and reason. There are two types of arguments that ensure the speaker is properly delivering logos: deductive and inductive.

Defining the Arguments of Persuasion

Deductive reasons, or arguments, are generally based on specific premises, delivered in small steps, that are true. If one small premise is true, then the next, which builds upon the first, must also be true, and therefore the logical conclusion must be valid. Socrates also used this approach by effectively gaining agreement for a small truth and then using that as a stepping stone for the next one. For example, a leader might say to someone (response noted in italics):

"Do you agree that the sun will come up in the east tomorrow morning?"

"Yes, of course I do."

"And that it will set in the west in the evening?"

"Yes, absolutely."

"And do so again for the next 365 days?"

"Yes, without question."

"And continue for all the years of your life?"

"Yes, for the rest of my life."

"And that someday, for all of us, we will not witness this event once we're gone?"

"Yes, sadly that is true."

"And you have no idea when that day may come, correct?"

"Yes, I have no idea when that will be."

"Therefore, it's important to ensure that the family you leave behind is taken care of, yes?"

"Yes, very important."

"Then wouldn't you agree that it's vitally important to have adequate life insurance?"

After having said "yes" seven times to small unarguable truths, it becomes almost impossible for someone to then say "no" to the final question.

Inductive reasoning, where the premises are not certain but offer strong evidence to support the truth, can also be used to invoke logos. One application of this uses reverse psychology to encourage someone to "sell themselves." As an example, someone might employ this as noted in the following conversational example (audience responses noted in italics):

"Are you working with anyone to help you solve your issues, John?"

"Yes, Linda, I contacted another vendor and they're researching answers now."

"Did they inform you of the consequences of deploying an inadequate solution that does not offer a whizzle stick umptifrats?"

"No, they didn't."

"That's very concerning, John. Without a whizzle stick umptifrats you could fry your whittle-me-rig. Even so, if you're happy with the other vendor, then you probably would not entertain a second opinion at this point. I hope I've at least been of some help and would be happy to answer any questions you might have in the future."

"Well, I haven't pulled the trigger with them yet, Linda. Tell me more about this whizzle stick umpti-whatever."

In this example, by offering a morsel of information that included strong evidence of truth, Linda used inductive reasoning to pique curiosity and then politely refused to satisfy the interest. She then used reverse psychology by stating that John might not be interested.

Like many ancient Greeks, Aristotle studied how humans act and react and are persuaded through speech and action. He obviously had no idea that, more than 2,000 years later, modern neuroscientists would not only validate his theories but discover why they work from a scientific standpoint.

Summary

Although Aristotle's *The Art of Rhetoric* (Aristotle, 1992) was postulated in 367 BC, it appears to align with the triune-brain neuroscience described by D. Paul D. MacLean in his book, *The Triune Brain in Evolution* (MacLean, 1990). Johann Wolfgang von Goethe (Wolfgang, 2018) once said, "He who cannot draw on three thousand years is living from hand to mouth." This can be interpreted as not having the ability to learn from ancient wisdom may place one at a disadvantage. As such, leaders may be at a disadvantage by not learning and utilizing Aristotle's persuasion theories to convince and motivate others to adopt their vision and follow their lead. Explored in the next chapter is the relationship of these theories to modern neuroscientific theory. Using only the available observational science of the times, Aristotle's *The Art of Rhetoric* appears to align well with MacLean's neuroscience-based theories. Both proffer that the human brain inputs and digests information from three different perspectives and in three differing ways that tend to be more emotional, instinctual, or logical. This theory, while observational and ancient, aligns perfectly with modern neuroscientific studies as noted in subsequent chapters.

CHAPTER TWO

Modern Neuroscience

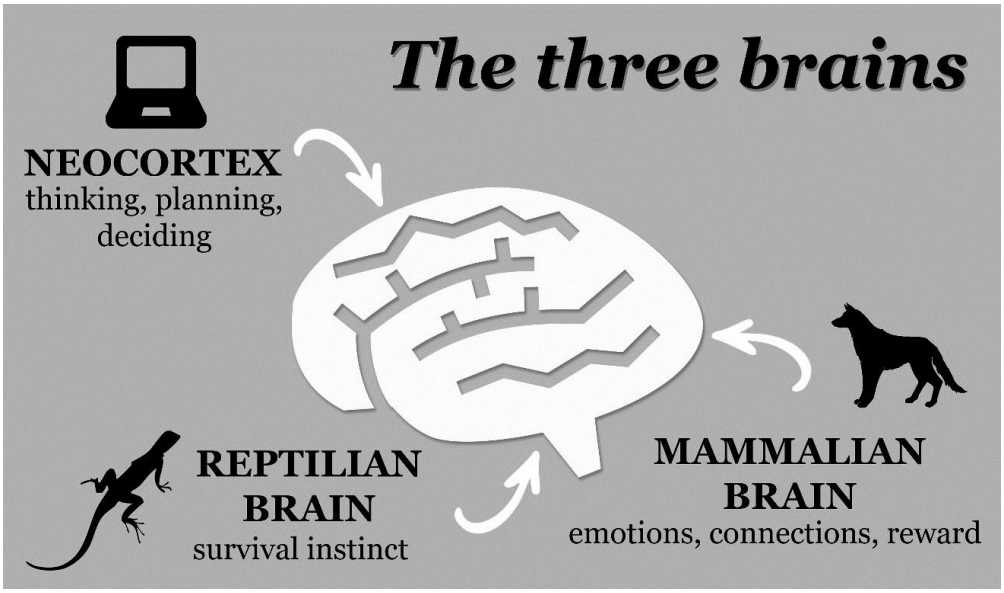
Introduction and Overview

The late Dr. Paul D. MacLean, a renowned neuroscientist, postulated that humans don't have just one brain, they have three. He shared this theory with the world in his 1990 book, *The Triune Brain in Evolution* (MacLean, 1990). The late MacLean believed that each of our three brains evolved over time and formed three layers, like the layers of a cake, one atop the other. He served as the director of the Laboratory of Brain Evolution and Behavior in Poolesville, Maryland, and commented that our three brains work like three interconnected biological computers, and they each have their own intelligence, subjectivity, and sense of time, space, and memory.

Some leading neuroscientists agree with MacLean while others do not. For example, Dr. German Garcia-Fresco is the director of the Adaptive Neuroscience Research Institute. He has a Ph.D. in molecular neurobiology from the University of North Carolina. He and his colleagues (also Ph.Ds.) published a paper titled "Neuroscience of Selling" (Fresco, 2015), wherein they refer to three brains—rational, emotional, and reptilian. Says Dr. Garcia-Fresco in an interview, "I agree that it's not exclusive, but for the most part the human brain can be divided into three areas. The neocortex is more rational, or logical, and involved with reasoning and high-order thinking. The reptilian brain is the oldest part evolutionarily. It is more instinctual and consists of the brain stem and cerebellum. The limbic system or middle brain is where we find the hippocampus and amygdala, which produce most of our emotional chemicals and neurotransmitters."

In contrast to Garcia-Fresco and other neuroscientists, Dr. Paul Zak, a neuroeconomics expert with a Ph.D. in economics, disagrees with MacLean and argues that the human brain is a more unified system that is diverse in structure, connection, and function. Those who side with McLean state that while Zak is correct, it is also true that certain areas of our brain are more involved than others with respect to emotional, instinctual, or logical thought processes and responses.

Says Dr. Garcia-Fresco in an interview, “There will always be controversy as the science is still maturing, but I think it is best to align with the science that is best supported and the least disputed.”



(Alain Lacroix, Dreamstime.com)

Defining the Elements of Neuroscience

The limbic system, or the paleomammalian brain as neurobiologists call it, is comprised of the hippocampus, hypothalamus, and the amygdala. Again, some experts disagree that this part of our brain is "more emotional," however, leading neuroscientists to state that the amygdala is a critical center for coordinating behavioral, autonomic, and endocrine responses to environmental stimuli, especially those with emotional content (Edwards, 2005).

This area of the human mind is involved with love, excitement, heart rate, blood pressure, sweat glands, appetite, sexual desires, and the desire to seek pleasure and avoid pain. Areas in the limbic system are stimulated by mild electrical currents that invoke a myriad of emotions, including love, which is influenced by a neuropeptide hormone called oxytocin that is produced in the hypothalamus. For women, oxytocin is released during labor, breastfeeding, and sex. For men, it's also released during sex, but far more so when there is a close bond, such as in a loving relationship. One study, published in the *Journal of Neuroscience*, noted that oxytocin levels are higher in lovers as compared to single individuals and remains highest during the first six months of a relationship (Hurlemann, 2010, p. 4999).

The limbic system influences someone's attention span, imprints emotionally charged memories, and determines valence—whether a person feels positive, negative, or neutral about something—and salience—whether something holds attention or stimulates creativity. The middle brain also influences value judgments, action rationalizations, and decisions about whether an idea or leadership vision is good or bad. Should someone become psychologically unhealthy, this part of the brain can invoke depression, paranoia, and addiction.

Most scientists agree with the biological fact that oxytocin is often referred to as the "love hormone" (MacGill, 2017) and has been dubbed the "hug hormone" and "bliss hormone"

due to its effects on human behavior, most especially its role in love. Oxytocin is responsible for an emotional (loving) response, and it is produced in the limbic system.

Increasing the production of oxytocin also decreases cortisol levels. This hormone controls our instinctual fight-or-flight responses, which on a short-term basis can save a life by allowing someone to respond quickly to a threat or perilous situation. However, long-term cortisol production can be detrimental to someone's health.

Dopamine is a neurotransmitter released by the hypothalamus, which is located in the limbic system. Both MacLean and non-MacLean groups agree that dopamine is involved with memory, pain/pleasure responses, behavior, cognition, learning, moods, and more (Zak, 2017). It is released during pleasurable situations, such as the anticipation of or indulgence in something exciting, interesting, and fun—like having sex, eating a juicy hamburger, going on vacation, winning a contest, or completing an important goal.

Many other brain chemicals are involved with emotions, but two of the more important ones are directly related to love and pleasure. Dopamine and oxytocin are predominantly produced in the limbic system, which is why scientists who side with MacLean (1990) believe that the limbic system is more involved with emotional responses than other areas. They also note that this part of the brain does not respond well to a communication style and messaging that is more logical and that employs more facts, figures, written copy, graphs, charts, etc. Instead, pictures, video, audio, and tactile or olfactory (smell) stimuli are usually more effective at eliciting an emotional response. Given this fact, to impact teams emotionally, leaders should limit the use of spreadsheets and instead use more pictures, sounds, and vocal timbre.

The MacLean followers believe that the instinctual areas of the brain include the stem and cerebellum and are responsible for safety responses, harm avoidance, motor balance, and

survival instincts, as well as involuntary actions such as heart rate and food digestion. The anti-MacLeaners do not completely concur, but biologically both camps agree that the vagus nerve, discussed earlier, originates from the brainstem (Zak, 2017). MacLeaners note that the brainstem is located in the reptilian brain or R-Complex (MacLean, 1990). Also, as we learned earlier, the vagus nerve is where the cortisol "antagonist" resides.

In Dr. Zak's book, *Trust Factor: The Science of Creating High Performance Companies*, he states that "trust begets oxytocin" and "high levels of [chronic] stress inhibit the release of oxytocin" (Zak, 2017, p. 300). While this chemical obviously belongs in the emotional area, it is also the antidote to cortisol-triggered instinctual fight-or-flight responses.

In an interview, Dr. Zak says, "Think of trust as the biological basis for the Golden Rule: if you treat me nice, my brain makes oxytocin, signaling that you are a person whom I want to be around, so I treat you nice in return."

The fear of pain is also an instinctual trigger. Norepinephrine is produced by the adrenal medulla, which is located in an adrenal gland atop the kidneys. Norepinephrine (noradrenaline) is released by the kidneys, but it affects a part of the brain called the locus coerules, which is located in the R-Complex brainstem. Given this fact, it's possible that both the MacLean and non-MacLean groups are correct. The instinctual adrenaline hormones are not exclusively located in the brainstem, but that part of the brain does have some dominion over the norepinephrine neurotransmitter.

While still disputed by some neuroscientists, MacLean postulated that the reptilian brain (R-Complex) is the only part that most reptiles have (MacLean, 1990). A snake, therefore, only acts out of instinctual self-preservation.

Experts call this brain area the archipallium, primitive, or "basal brain." The instinctual brain is involved in obsessive/compulsive, rigid, paranoid, and ritualistic behaviors. It is crammed full of ancestral memories and instincts and drives a person to repeat safe behaviors to ensure longevity.

The instinctual brain is always alert and never sleeps, which is why someone can be instantly awakened by a potential threat. It is motivated by fear of loss, harm, or conflict, and is involved with aggression, dominance, and repetition. Like the limbic system, the instinctual brain does not respond well to the written words, numbers, statistics or logic. It prefers sights, sounds, smells, and touch. Leaders who wish to motivate teams to follow them or follow instructions are best not to do so with a presentation or speech filled with numbers and graphs.

In summary, the "instinctual brain" governs norepinephrine, an adrenaline neurotransmitter involved in fight-or-flight responses. This part of our brain controls cortisol, which is the antistudy to oxytocin. Oxytocin release can foster more trusting and productive workers (Zak, 2017, p. 300). Limiting oxytocin and raising cortisol by using fear or other instinctual motivators may do just the opposite. Said Dr. Zak in an interview, "The science shows that fear-based management is a losing proposition because people acclimate to fear quickly. Fear-inducing leaders must ramp up threats to increase productivity, but there are only so many threats one can make."

The neocortex is the area of that brain that experts like Dr. Paul Zak call the cerebrum, cortex, neopallium, neomammalian, superior, or rational brain (Zak, 2017). The neocortex takes up two-thirds of a human's total brain mass. In animals, it's just the opposite. With other mammals, the neocortex is much smaller and has far fewer folds, which is indicative of less

development and complexity. Remove the neocortex from a rat and it will act like a rat. Remove the neocortex from a man and he'll act like a vegetable.

The cortex is divided into two parts. Although most scientists agree that there is no such thing a "right brain versus left brain," it is believed that this notion came from the fact that the left cortex controls the right side of the brain and vice versa. The non-MacLean dissenters do not agree that the neocortex reigns supreme over logical inclinations. However, ScienceDaily (2017) states that the neocortex is involved with the higher functions of the brain, including spatial reasoning, sensory perception, conscious thought, the generation of motor commands, and language processing.

Non-MacLeaners point out that the neocortex is not the exclusive host of logical thought or action (Zak, 2017) but do agree that persuading someone from a logical perspective is best achieved by using facts, figures, written words, research, graphs, etc., which will appeal more to the logical brain. Pictures, video, and audio can help reinforce concepts, but they will be more effective at stirring emotions than gaining rational agreement.

Relating Neuroscience to Modern Leadership

As discussed previously, Aristotle (1992) believed that to persuade, one needs to appeal to a person's emotional, instinctual, and logical "brains." Many neuroscientists concur that the primary chemicals, hormones, functions, etc. that trigger these three responses are created in or mostly affected by three parts of the brain.

Gerald Zaltman, a prominent neuroscientist from Harvard University, is the author or editor of over twenty books on various topics involving neuroscience. He stated that at least 95

percent of human cognition is subconscious, while high-order consciousness is only involved with about 10 percent of decision-making (Mahoney, 2003),

Dr. Zak agrees with Zaltman that more than 90 percent of decisions are ultimately made by the subconscious mind, which is usually not very logical. Therefore, a leader should not only win logical minds, but must also win emotional hearts and instinctual guts.

Zaltman patented some of his science under the term Zaltman Metaphor Elicitation Technique (ZMET). By employing ZMET, he explored unconscious behavior using emotional-response testing and metaphors to stimulate purchase scenarios. The objective was to create foundational advertising elements, such as images, for commercials. This work, combined with other discoveries made by Harvard researchers, led to a new field called *neuromarketing*, a term coined in 2002 by researcher Ale Smidts (Ariely, 2010).

The use of neuromarketing has expanded rapidly at Yahoo, eBay, CBS, Google, PepsiCo, Ford Motor Co., Hyundai, Hewlett-Packard, Frito-Lay, Coca-Cola, Proctor & Gamble, and many other companies worldwide. Neuromarketing studies, combined with neuroscience validation, shows that the logical brain (neocortex) tends to respond better to text, words, numbers, graphs, charts, and other analytical or written content. The emotional brain (limbic system) and instinctual brain (R-complex) responds best to more visual, auditory, and tactile content such as video and pictures. Therefore, content and assets, including personality and professional assessment tests that are based on text and word questions can only appeal to about 10 percent of the decision-making brain, resulting in lower accuracy. Studies show that only 30 percent of individuals complete text or word-based tests as they also result in lower attention and retention.

Summary

While neuroscientists and neuromarketers would like to believe their discoveries and concepts are groundbreaking, Aristotle obviously had a glimpse of this concept when he created his persuasion model eons ago. Also, George Ivanovitch Gurdjieff, a Russian philosopher and teacher (of Greek descent), often referred to humans as "three-brained beings" (Howell, 2012). One brain for the body (gut), one for the spirit (head), and one for the soul (heart). Plato referred to similar concepts, as did Kabbalah spiritual leaders.

Given that leaders lead people and not buildings, computers, or P&L statements, it stands to reason that an understanding of modern neuroscience and the triune brain as it relates to motivating employees, fostering a culture of trust, and increasing productivity can empower leaders to create more successful and profitable organizations.

Given the proven ineffectiveness and inaccuracies inherent in text and word-based profiling, what is needed is a groundbreaking new approach using visual neuroscience that appeals to 100 percent of the decision-making brain to improve retention and attention.

CHAPTER THREE

Current Personality Profiling Models

Introduction and Overview

The term *psychology* is derived from the Greek words *psyche*, meaning "spirit, soul, and breath," and *logia*, which means "the study of something." Psychology is the study of mental and behavioral processes—how humans interact with and react to the world around them. Ancient Greek philosophers were the founders of psychology, but the German psychologist Wilhelm Wundt set up the first "psych lab" back in 1879 (Kleinman, 2012, p. 7). Since then, the science has spurred dozens of studies and theories about what makes people "tick."

One of the most well-known psychologists in history is Sigmund Freud (Kleinman, 2012, pp. 20-31). Born in 1865, Freud spent most of his life in Vienna, where he wrote three books about dream interpretation, psychopathology, and sexuality. He is remembered most for the latter, but Freud gave the world many of its modern concepts about the human id, ego, and superego. Freud observed that humans have three brains, but lacking neuroscientific knowledge, he did not understand why.

The id refers to that unorganized portion of the personality structure related to basic animal instincts and bodily needs. The id is motivated by pain and pleasure. Naturally, people want to avoid one and seek the other. As babies, all humans are controlled almost entirely by the id, which is why some people cry every time they get hungry. Some may still do that, even as adults.

As children become adults, they learn to control id impulses lest they pee in their pants or attack the waiter at a fancy restaurant with a fork rather than wait patiently to be served. Addictions and severe temper tantrums stem from an inability to properly control id impulses.

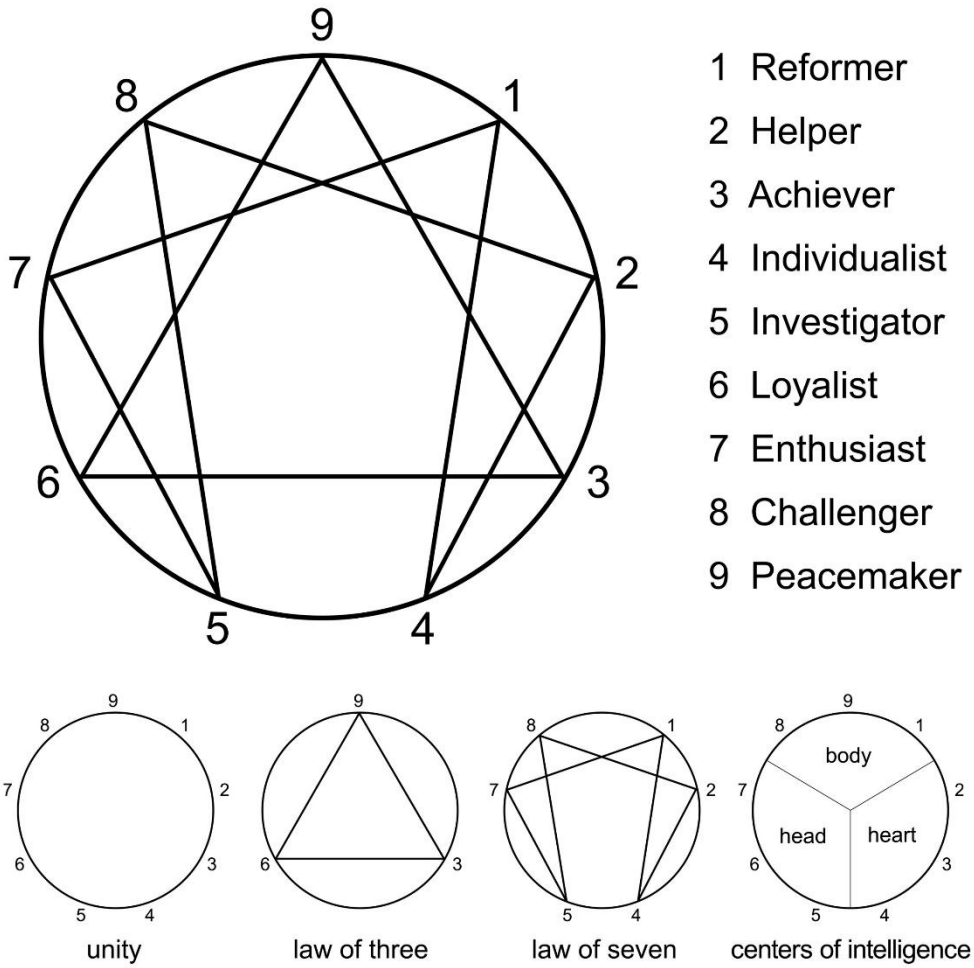
The id is the raw animal within everyone, the untamed beast, unconcerned with right, wrong, good, evil, or morality. Within the id resides the instinctual drive to survive.

Superego is the learned rules, guidelines, boundaries, etiquette, and proper communication skills, such as flushing the toilet, saying thank you, etc. Most learned these appropriate behaviors from parents, teachers, siblings, friends, and so forth. When someone did something bad, they were given pain, such as a belt whipping from dad. When they did something good, they received a dose of pleasure, like ice cream from mom. The superego learned how to behave appropriately through this process of emotional pain and pleasure learning.

The ego deals with the part of personality structure that controls the perceptive, defensive, cognitive, and executive functions. Reason and common-sense stem from the ego. A primary ego function is to mitigate between the id and ego while striking the right balance between primitive drive and modern reality. The ego logically organizes thoughts and make sense of them. Unlike the id, where raw passions reside, the ego deals with reason and common sense. When the ego is healthy, people have better control over base instincts, such as the need to lash out in anger or run from potential conflict.

Freud's conclusions intimate that the id is predominantly involved with instinctual brain functions. The ego appears to be more involved with emotional functions, and the ego is rational and pragmatic and more logical. Could it be that Freud had the same observations as the ancient Greeks? It appears that both proffered the concept that humans have three distinct brains that tend to be more emotional, instinctual, or logical.

Ancient Personality Profiling Models



(Peter Hermes Furian, Dreamstimes.com)

The Enneagram symbol is an interconnected circle made of nine points used to depict nine distinct personality types. Some people believe the ancient Greeks invented the diagram and science, but evidence of its origination can be found in four-thousand-year-old Pythagorean geometry. The Pythagoreans were an inquisitive bunch and were captivated by the deeper meaning and significance of numbers. Plato apparently studied the Enneagram theories and passed them on to his disciple Plotinus and other followers.

George Gurdjieff (Howell, 2012), a Russian teacher and follower of Freud, learned about the Enneagram in the 1920s while visiting a Sufi monastery in Afghanistan. Oscar Ichazo learned about it from Gurdjieff, and Claudio Naranjo heard about it from Ichazo. Robert Ochs and Helen Palmer researched the Enneagram by studying Naranjo's concepts, but the most famous authors on the Enneagram are Riso and Hudson of The Enneagram Institute.

Some question whether the Enneagram is accurate. The ancient Greeks invented the water mill, odometer, alarm clock, cartography, geometry, medicine, philosophy, and democracy. They excelled in the fields of astronomy, biology, and physics. Aristotle postulated that our world was round, and the Pythagoreans proposed that the earth revolved around the sun. Archimedes discovered that submerging a solid object displaces a like measure of water. The Greeks weren't infallible, but they were obviously highly observant and accurate. It is possible that the research conducted by the ancients on human personalities is bunk, but considering the advanced knowledge displayed by the ancients that used the Enneagram, this appears to be unlikely. Moreover, given recent discoveries made by modern neuroscientists, it is possible that the personality profiles outlined in the Enneagram are quite accurate.

The Development of Modern Personality Profiling Models

During the early 1900s, humanist psychologist Carl Rogers (Kleinman, 2012, pp. 115-118) proffered his "self theory." He believed that all humans are infused with a single driving motivation: to self-actualize. He defined this state as achieving the highest level of "human-beingness." Others have simplified this theory to being happy or filled with joy in every aspect of one's life—including professions.

Modern psychology views personality through the lens of an individual's emotions, behaviors, thoughts, actions, and reactions. These make people unique in relation to others and are referred to as mental models (Johnson-Laird, 2012, pp. 131-138). Although humans exhibit personality characteristics in individualized ways, there are definite commonalities. Traits remain relatively constant throughout one's life. The caveat here is whether they are acting in healthy or unhealthy ways.

In addition, individual or not, people tend to behave in similar and sometimes predictable ways when faced with certain situations or decisions. Although the study of personality is decidedly a psychological science, many experts now agree that personalities are impacted by neurological wiring and processes. Some psychologists, like Sigmund Freud (Kleinman, 2012, pp. 115-118), subscribe to the "nature" theory, believing that biology (today more commonly referred to as neuropsychology) entirely governs our personalities. Others, like Alfred Adler (Kleinman, 2012, pp. 44-47), lean toward the "nurture" theory, in which personalities are governed entirely by experiences, environment, and societal factors.

Many other experts have a leg in both camps. They point to identical twins or triplets exposed to similar environments and home situations who exhibit completely different

personalities. They claim that nature is to blame for core personality types but that different nurturing aspects can alter levels of psychological health and account for diverse individuality.

In the mid-1930s, Gordon Allport (Kleinman, 2012, pp. 176-177), a Harvard graduate, became the first psychologist in the United States to teach a class about personalities. He also created a trait theory that used more than 4,500 dictionary words to describe different traits. He divided these traits into three categories he named cardinal (individual), central (common), and secondary (conditional) traits. Years later, Raymond Cattell reduced Allport's long list to 171 traits by combining and reclassifying similarities and removing uncommon ones. Using questionnaires completed by individual subjects, he narrowed the list even further to only sixteen types that included perfectionism, dominance, apprehension, warmth, etc. Allport's observations provided some of the foundational elements used in the sixteen Myers-Briggs personality profiles.

Modern Professional Personality Profiling Models

Some psychological researchers refer to a five-factor model (Goldberg, 1992) when evaluating what they believe are five core attributes, or personality traits, displayed by individuals. Usually referred to as the "BIG 5," the qualities determined include Openness to experience, Conscientiousness, Extraversion-introversion, Agreeableness, and Neuroticism. These five form the acronym OCEAN. To determine a person's attributes, psychologists use question-based testing to measure the degree to which respondents believe they exhibit these traits.

The OCEAN model has been used to determine relationships between these attributes and personality traits for professional, academic, and social endeavors. Critics claim that the model has limitations given the small number of attributes evaluated and also that it is primarily a data-driven model that is not based on any psychological theories. Proponents argue that OCEAN can create consistent results and that psychological theories should follow and not precede a personality description. A six-factor model, called HEXACO, has been recently introduced that adds an honesty and humility factor to the OCEAN five behaviors. Neither of these models, however, are based on neuroscientific theories such as neurotransmitter or brain chemical balances.

OPQ32 is a personality "test" widely used in professional and employment circles for selection, development, team building, succession planning, and organizational change. The SHL Group, purveyors of the OPQ, completed a study in 2005 in concert with The Enneagram Institute and discovered that the nine personality types proliferated by the ancients are real and objective and stand on a par with Myers-Briggs, the Big Five, and other prominent psychological systems (Brown & Bartram, 2005).

The OPQ32, backed by hundreds of validation studies across tens of thousands of individuals, is one of the most widely used and highly regarded measures of personality in the workplace. Professors Dave Bartram and Anna Brown conducted an independent study of the Enneagram Institute interpretation made by Don Riso and Russ Hudson to see if it related to the OPQ32 and discovered a clear match (Brown & Bartram, 2005).

Bartram and Brown reviewed information from hundreds of volunteer participants from different countries. The results indicated a strong relationship between the nine Enneagram personality types and OPQ32 traits. In fact, based on a person's OPQ32 profile, someone could

predict the Enneagram type 75 percent of the time. One could do this only 11 percent of the time by guessing. The conclusion is that modern researchers have all but validated the observational science recorded by ancient researchers from as long ago as 2000 BC.

Helen Fisher's Personality Quiz has now been taken by over 14 million people in 40 countries. This quiz is one of the first to equate brain science to personalities, and was created to test the degree to which someone expresses four broad styles of thinking and behaving, each associated with one of four basic brain systems related to dopamine, serotonin, testosterone and estrogen. Fisher labels these four types as:

Explorer: those who primarily express traits linked with dopamine.

Builder: those who primarily express traits linked with serotonin.

Director: those who primarily express traits linked with testosterone.

Negotiator: those who primarily express traits linked with estrogen.

Studies show that it is not unusual to score equally on two (or sometimes three) of these temperament dimensions. Fisher initially designed the test to enable individuals to understand basic aspects related to their romantic partners, as well as attraction tendencies. The test was not designed to determine optimal profiles for employment or other professional uses, however, it has been used for this purpose by some organizations. While Fisher’s studies relate brain science to personalities, the approach still relies upon observation rather than tendencies based on neuroscience. For example, Fisher observed that individuals with certain serotonin setpoints tended to act in certain ways, rather than research how serotonin affects personality and tendencies (cause and effect versus effect and cause).

Summary

Virtually all personality profiling models have been based upon unscientific observational methods dating back thousands of years, beginning with the creation of the ancient Enneagram model. This methodology was not expanded upon until a few hundred years ago, when psychologists developed early personality profiling models, again based on observations.

More recently, respected institutions and researchers have expanded upon or streamlined historical personality profiling models to create frameworks and systems used primary for personal amusement and not for professional environments such as employment screening or jury selection. However, all these models still rely upon observational methods only—what has been observed across thousands of individuals—to create profiles that appear to be relatively correct. Modern neuroscience and research conducted by Ph.Ds. involved in this new field offer validation in some respects for these older models while providing the opportunity to create more effective frameworks based upon neuroscientific cause and effect. More importantly, as reviewed previously, virtually all current personality or professional performance assessment tests are text or word-based. They appeal to only 10 percent of the decision-making brain areas, which causes a "bad in, bad out" test result that lowers attention, retention, and accuracy.

CHAPTER FOUR

Defining a Neuroscience-Based Framework

Introduction and Overview

A paper published in the Academy of Management Perspectives in 2011 titled *Leadership and Neuroscience: Can We Revolutionize the Way That Inspirational Leaders Are Identified and Developed?* (Waldman, Balthazard, & Peterson, 2011) explores the relationship between inspirational leadership and neuroscience. The authors noted that there are a number of indicators available to interpret brain activity, including coherence, which is an often-used metric for social cognitive neuroscience research. Coherence measures interconnection between areas of the brain, and can track coordinated activity or communication between brain regions. As such, coherence can be used to examine complex behavioral concepts such as inspirational leadership behavior.

The researchers determined that this type of behavior likely requires the use of multiple brain regions such as emotional and cognitive centers (Cacioppo, Berntson, & Nusbaum, 2008; Nolte, 2002). Percentages are used to report coherence. For example, 90 percent coherence indicates a high degree of coordinate activity between two brain areas, while 10 percent indicates less coordination.

Authors have commented on the importance of using an emotional component when expressing visionary communication that appeals to the beliefs and personal values of the listener to motivate and inspire (e.g., Boal & Hooijberg, 2001; Shamir et al., 1993). An emotional appeal is important from the perspective of what a leader experiences and shares to ensure listeners also experience these emotions so they will readily follow (Barsade & Gibson,

2007; George, 2000). This theory appears to align well with the emotional appeal expressed in Aristotle's persuasion model discussed in the previous chapter.

Researchers (Boyatzis, R, 2011) have explored the relationship between activated brain regions and a leader's ability to build resonant or dissonant relationships with followers (Goleman, Boyatzis & McKee, 2002). Using an fMRI-based study, they explored which neural mechanisms were invoked in resonant and dissonant leadership relationships. Middle-aged subjects were queried about specific incidents with leaders while the researchers conducted fMRI scans. Preliminary observations indicated that the recollection of resonant experiences stimulated 14 brain regions while dissonant situations activated 6 and deactivated 11 regions.

Resonant leader experiences activated neural systems involved with attention arousal (i.e., anterior cingulate cortex), the default or social network (i.e. right inferior frontal gyrus), the mirror system (i.e., the right inferior parietal lobe), and other regions associated with approach relationships (i.e., the right putamen and bilateral insula).

For dissonant leader experiences, systems deactivated included social or default networks (i.e., the posterior cingulate cortex) and the mirror system (i.e., the left inferior frontal gyrus). Activated regions included those associated with diminishing attention (i.e., bilateral anterior cingulate cortex), and with less compassion (i.e., left posterior cingulate cortex), and negative emotions (i.e., posterior inferior frontal gyrus).

This study indicates that positive or negative situations stimulated by specific leadership styles or approaches can activate specific brain regions that could evoke a positive or negative reaction on the part of the listener or follower.

A May 9, 2015 article in *Psychology Today* states that around 20 percent of the population is likely more emotionally sensitive in nature (Bergland, 2015). The article cites

findings from University of British Columbia and Cornell University neuroscientists who discovered that human genes may influence how sensitive certain people are to emotional information.

In other words, some people may be genetically wired to be more emotional as compared to the average human being. Furthermore, Todd et al. (2015) determined that some people have a genetic variation called ADRA2b, which influences the norepinephrine neurotransmitter. ADRA2b is linked to heightened activity in certain brain areas that can trigger intense emotional sensitivity and responses.

To summarize, neuroscientists from two respected universities proffered research indicating that a percentage of the human population is genetically wired to be more emotional, which may be directly related to levels of norepinephrine. Furthermore, this research shows how the norepinephrine pathways connect directly to the hippocampus and amygdala, which are located in the limbic system.

Adam Anderson (University of British Columbia, 2015), professor of human development at Cornell University and senior author of the study, stated that emotions aren't just about how someone feels about the world, but also how a person's brain influences perception. Human genes can influence how a person visualizes negative and positive aspects in the environment.

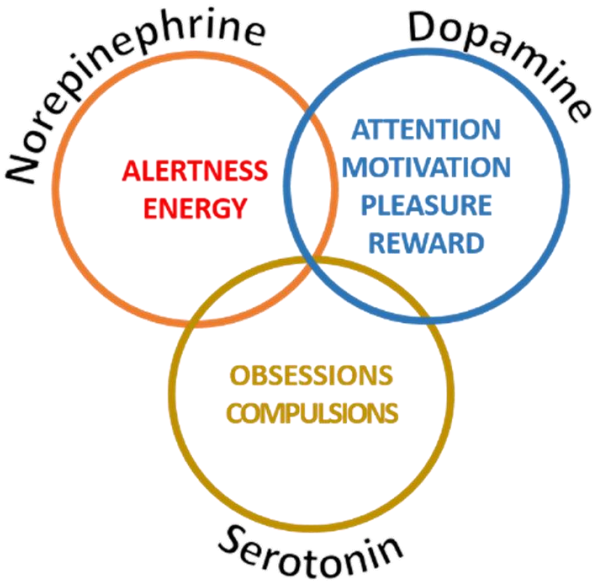
The American Psychological Association (2018) defines personality as the differences in characteristic patterns of thinking, feeling, and behaving. Based on this premise, it appears that norepinephrine influences human personalities and that the levels of this neurotransmitter are genetically predisposed.

The research study referenced above also stated that there is reciprocal activity between norepinephrine and serotonergic and dopaminergic systems, which refer to serotonin and dopamine production, respectively.

Based on this recent research, it appears that neuroscience, and more specifically the balance between three primary neurotransmitters, may be directly linked to differences in personality and behavioral profiles. If so, how do these profiles relate to the ancient Enneagram or more modern frameworks such as the OPQ-32? Also, how can human resource and corporate leaders leverage neuroscience-based profiling to create frameworks that improve talent acquisition, trust environments, morale, retention, and productivity?

As previously noted, many experts agree that neurotransmitters and chemicals modulate brain activity in predictable patterns and influence how humans act and interact with others. Three primary neurotransmitters that appear to be more involved with personalities than others are dopamine, serotonin, and norepinephrine (Thomas, 2016, pp. 173-178).

Dopamine is a basic modulator of attention, motivation, pain, and pleasure and regulates how we behave. Serotonin modulates obsession, compulsions, and psychological well-being and regulates how someone feels. Norepinephrine is involved with focused thinking, mental activity, alertness, and energy and regulates how someone thinks. Each neurotransmitter's production, or level, is either high, medium, or low. Apparent levels can also be determined by the length of a neurotransmitter's pathway in the brain. Neuron profiles are divided into three groups: logical, emotional, and instinctual.



(Illustration by authors)

Neuroscience-Based Personality Profiling

Many experts state that genetic predispositions may be factors that can cause low, medium, or high levels that can lead to certain disorders (Hariri et al., 2002, pp. 400-403). In his book, *The Edge Effect*, Dr. Eric Braverman (2004, pp. 18-26) shows how four main neurotransmitter or chemical levels in the brain can determine personality profiles. To validate this, he used a quantitative electroencephalogram (EEG) called BEAM (Brain Electrical Activity Mapping). Some skeptics question Braverman's research and even his credibility, but his studies appear thorough and match research conducted by two PhDs interviewed for this study.

Most neuroscientists and biologists concur that dopamine is an assertive "power" neurotransmitter that dominates the frontal lobe. Braverman found that those with high dopamine levels enjoy power, theories, language precision, and strategy.

GABA is found in the temporal lobe. Those with high "calming" GABA levels are more traditional and conventional, dependable and punctual, and organized and confident. GABA is an "inhibitory" neurotransmitter that can lower "excitatory" ones, most especially norepinephrine.

Norepinephrine makes a person more alert and ready for active body movement, which increases energy use. Its effect can be offset by GABA and acetylcholine, which act on most of the same organs to make someone more conducive to calmness, rest, recovery, and food digestion.

Acetylcholine is related to motor and memory functions and is produced in the parietal lobes. Braverman says that individuals with high levels are more creative, empathetic, authentic, and benevolent. As noted above, it can affect norepinephrine production. One study (Granneman, 2015) shows a direct connection from this chemical to introversion and extroversion. Introverts apparently have long acetylcholine pathways. For extroverts, it's shorter. Visualize a hose pumping water into the brain. A person will not necessarily have a higher "level" of water with a longer hose, but it will take longer to fill up the brain. This may be why introverts can handle large crowds temporarily but eventually grow weary of them, whereas with extroverts, the opposite is true.

Serotonin is in the occipital lobe and is associated with delta waves. According to Braverman, those with high serotonin are playful, adventurous, optimistic, achievement-oriented, and have a positive mental attitude.

If Braverman's research is accurate, it could prove to be groundbreaking, but does it align with the ancient Enneagram?

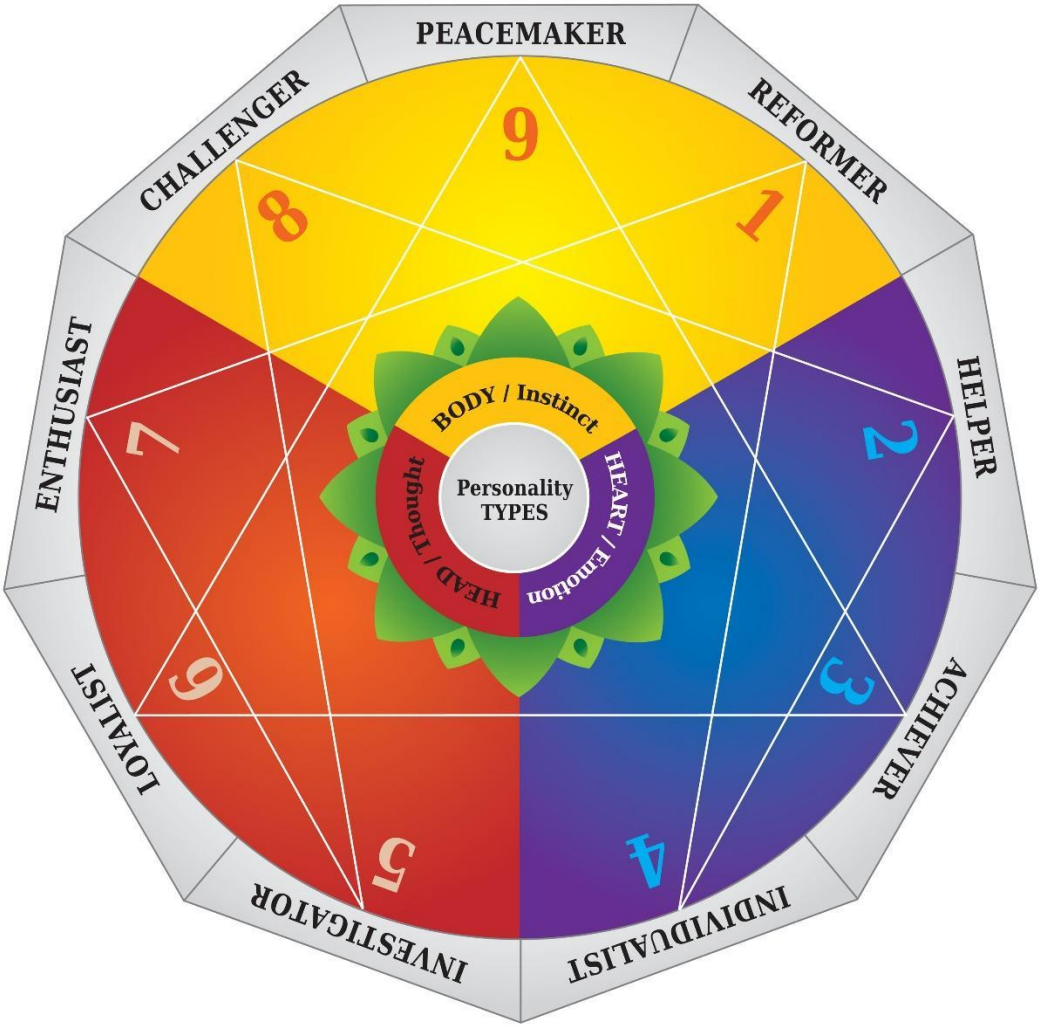
Noted earlier, Helen Fisher conducted studies to relate serotonin, dopamine, estrogen, and testosterone to personality traits. Studies show that estrogen promotes synthesis, prevents

degradation, and inhibits reuptake of serotonin. It also promotes the expression of serotonin receptors. Also, estrogen increases dopamine synthesis and decreases its degradation and reuptake. Obviously, Fisher discovered a connection between brain wiring and personality, but did not delve deeper understand how other neurotransmitters, such as norepinephrine and GABA, are more related to personalities than estrogen and testosterone.

Relating Neuroscience-Based Profiling to the Enneagram

Two renowned experts interviewed for this study, Dr. Eric S. Schulze and Dr. Tina Thomas, conducted extensive neuroscientific research studies similar to Braverman's. Dr. Thomas documented these findings in her book, *Who Do You Think You Are?: Understanding Your Personality From the Inside Out* (Thomas, 2016, pp. 18-26). These two Ph.Ds. discovered that the Enneagram's observational science can be explained by genetically determined high, medium, or low levels of dopamine, serotonin, and norepinephrine.

The ancient Enneagram's nine types are divided into three distinct groups of three personality types each. The three groups, or triads, can be defined as "head types" (more logical), "heart types" (more emotional), and "gut types" (more instinctual). Schulze and Thomas discovered that thinking group types appear to have high levels of norepinephrine activity and are generally mentally active. The instinctual types have relatively low norepinephrine activity, and the heart types have medium levels.



(Artellia, Dreamstime.com)

How does their research compare to Braverman's work? A close examination reveals that they are quite compatible:

Schulze and Thomas found that norepinephrine regulates how quickly and how often a person thinks and solves problems. Thomas reports that "people who have a high set point of norep (norepinephrine) are people whose brain 'engines' are set at a high idle. They are almost always revved up and ready to think." They also tend to speak quickly and may be perceived as

"high-strung" individuals. They may have difficulty "turning their brain off," so sleeping soundly could be a challenge. People in this category are logical "head types."

Those with low levels are referred to as the three instinctual "gut" personality types. They are more solid and steady, traditional and conventional, dependable and punctual, organized and confident, and "calm." They rarely have a problem falling asleep. Recall that GABA is calming and throttles norepinephrine, and Braverman said that those with high levels have similar attributes. High GABA and low norepinephrine are essentially equivalent, so it appears that the two viewpoints are similar.

Schulze and Thomas determined that people with medium levels of norepinephrine fall into the emotional and feeling "heart" triad. They are "intermittent thinkers" and may cycle in and out of daydreaming. These types are also more creative, caring, and empathetic. Braverman said that those with high levels of acetylcholine are creative, empathetic, authentic, and benevolent. The effects of norepinephrine are offset by acetylcholine, so it's quite possible that high levels of the latter will create medium levels of the former.

Braverman said that those with high levels of dopamine are assertive and enjoy power, precision, and strategy. Schulze and Thomas concurred. They showed high dopamine types as falling into the assertive triad and liking power, control, precise diction, and strategic goal setting. This is also in close alignment. Schulze and Thomas also noted that dopamine levels can dictate whether or not someone is more extroverted or introverted.

Schulze and Thomas showed high serotonin types as being in the "positive outlook" triad. Braverman said these individuals are playful, adventurous, and have positive orientations.

Summary

Based on the above research, it may be possible to conclude that:

1. Personality types are influenced by a small number of primary neurotransmitters and brain chemicals.
2. The levels (production) of norepinephrine and serotonin neurotransmitters are either high, medium, or low, which creates nine distinct personality types. Levels of dopamine and acetylcholine impact extroversion and introversion and create what is referred to as “wings,” meaning that someone may tend to have a few of the attributes of an adjacent personality type.
3. The nine types described by the ancient Enneagram align closely with the neurotransmitter studies done by leading researchers.
4. Recent research conducted by teams at the Academy of Management Perspectives and other renowned organizations validate that leadership communication approaches can impact emotional and logical coherence between brain centers.
5. The Enneagram aligns with validated personality profiling systems such as the OPQ32.

CHAPTER FIVE

Validation of the alignment between primary neurotransmitters and brain chemicals and personality and "brain type" profile testing

Introduction and Overview

Basis of the clinical study…

Across more than a decade of projects completed for such clients as Adobe, Avnet, Arrow, Booz Allen Hamilton, Blackberry, Cisco, HP, Logicalis, LogMeIn, Oracle, SAP, Symantec, Visa, and many others, thousands of individuals completed various versions of the CraniumQuiz™ test to create various versions of the CareerQotientAdditionally, the ENGAGE86 app extension for Google Chrome and Microsoft Edge browsers was used to analyze LinkedIn profiles and determine CraniumQuotient results. Hundreds of individuals wherein profiles were determine subsequently engaged with researchers on video or audio calls or in live meetings. Researchers queried these individuals to validate personality and other test findings. Final results indicated the following:

91.3% match with full CareerQuotient results based on subject interviews

76.7% match with RemotleyMe profiling app results based on subject interviews

Study details and validation are provided in the Index section.

The ZRT Laboratory neurotransmitter urine kit includes measurements for the following:

- NeuroAdvanced Profile – GABA, Glu, Gly, DA, Epi, NE, HIST, 5-HT, PEA, DOPAC, HVA, 5-HIAA, NMN, VMA Trp, Kyn, 3-OHkyn, Tau, Gln, His, N-MeHist, Tyra, KynAc, Xanth, Tyr & Crtn (Sample Report)
- Optional add-ons:

- Saliva Hormones add-on – E2, Pg, T, DS & C
- Urine Hormones add-on – E2, Pregnanediol, Allopregnanolone, Androstenedione, T, Epi-T, DHT, DHEA, & 5α,3α-Androstanediol
- Diurnal Cortisol add-on – Free Cortisol x 4 & Free Cortisone x 4
- Diurnal Cortisol & Melatonin add-on – Free Cortisol x 4, Free Cortisone x 4 & Melatonin (MT6s) x 4
- Diurnal Cortisol, Norepinephrine & Epinephrine add-on – Free Cortisol x 4, Free Cortisone x 4, NE x 4 & Epi x 4
- Diurnal Cortisol, Melatonin, Norepinephrine & Epinephrine add-on – Free Cortisol x 4, Free Cortisone x 4, Melatonin (MT6s) x 4, NE x 4 & Epi x 4
- Urine Toxic & Essential Elements add-on – I, Se, Br, Li, As, Cd & Hg

Base on urine tests with dozens of individuals, researchers determined the following results:

- 87.4% match for serotonin levels in individuals determined by CareerQuotient tests to be in the high serotonin category.
- 83.5% match for dopamine and acetylcholine levels in individuals determined by CareerQuotient tests to be introverted (high acetylcholine) or extroverted (high dopamine) categories.
- 89.6% match for norepinephrine levels in individuals determined by CareerQuotient tests to be in the high norepinephrine category.

Triune Brain Profiling System™

Studies and research conducted by leading experts and neuroscientists have revealed the following:

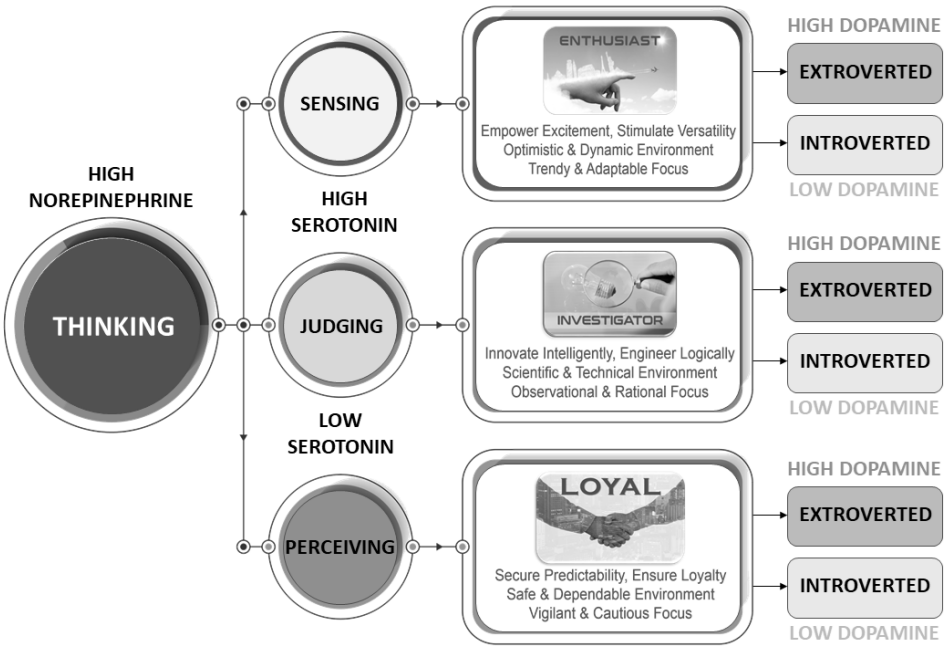
- Most personality and professional assessment tests consist of 40 to 100+ “either/or” or similar text or word-based questions
- These tests average 30 to 60 minutes in length
- Text and word-based profiling tests appeal to only 10 percent of decision-making brain areas
- Given test length and lower attention appeal, these tests have a 70 percent non-completion rate
- Due to the above issues, accuracy for these tests have been questioned by leading psychologists

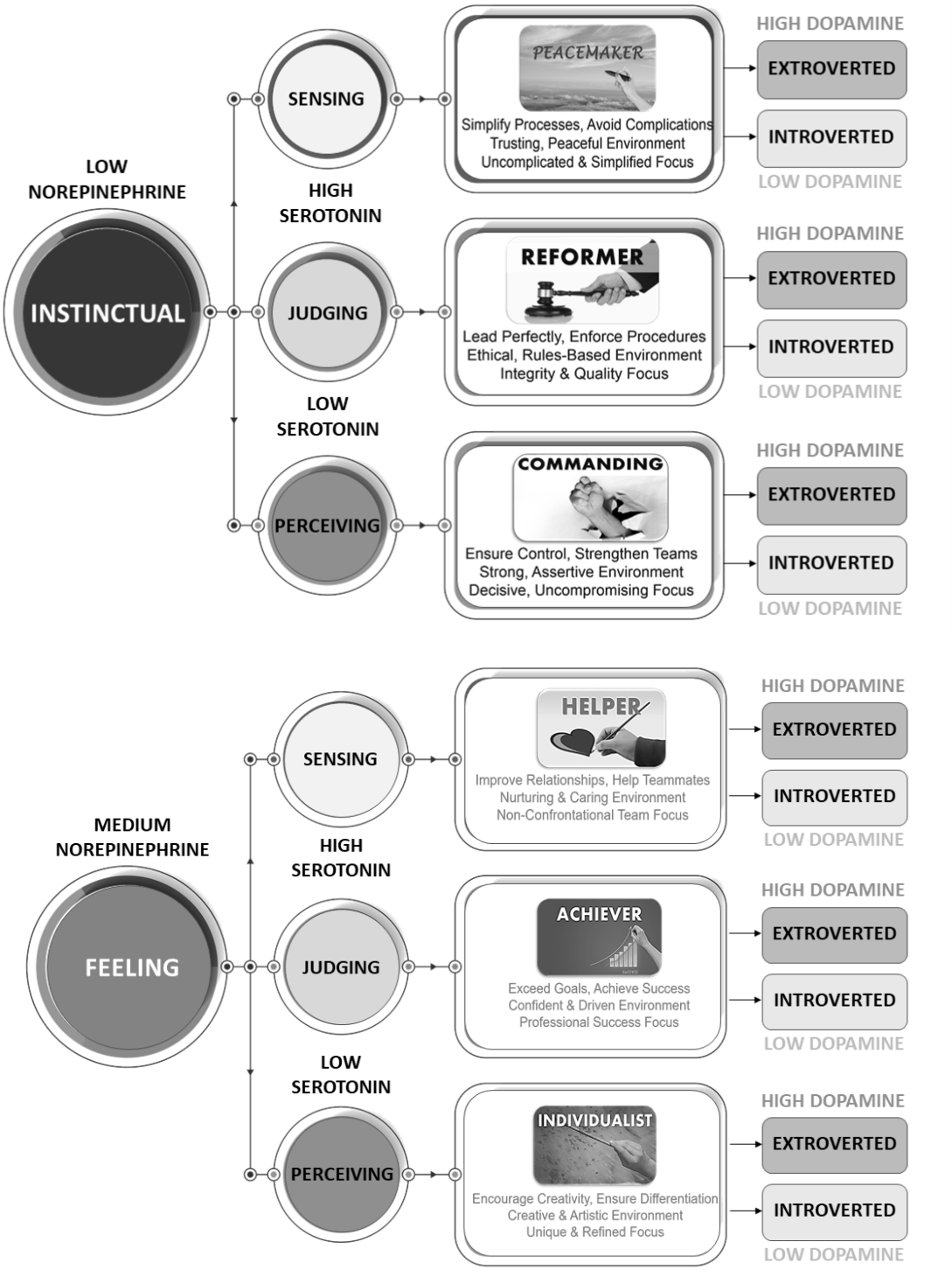
The London School of Business and other studies have validated a 1400 percent increase in retention and attention for visual storytelling content as compared to text or word-based content. Therefore, a new profiling model is needed that transcends inaccurate word and text-based tests that does for visual assessments what Zoom did for visual communications. This new model needs to equate neurotransmitter and brain chemical setpoints or sensitivities to personalities, tendencies, attributes, strengths, weaknesses, soft skills, and trust factors. Moreover, the assessment needs to be short, preferably less than 10 minutes in length, and use visual elements such as video.

The Triune Brain Profiling System is designed to accomplish this with a proven nine minute video and graphic-based assessment that uses visual elements to determine levels of dopamine, acetylcholine, serotonin, norepinephrine, oxytocin, and GABA. The system is

designed to equate visual responses to setpoints and sensitivities based on scientifically research and studies, as noted earlier, that validate effects for these neurotransmitters and brain chemicals on the brain. In turn, given the brain effects, the system shows a direct link between brain impact and personalities, tendencies, attributes, strengths, weaknesses, soft skills, and trust factors.

The below graphics illustrate how this model is designed.





As shown, high norepinephrine types have more neocortex stimulation and dominance, and are therefore more logical, analytical, and thinking types. If they also have high serotonin,

they will be more sensitive in nature. If medium, more judging, and if low, more perceiving. The model provides details for each type based on this overview. Any type with high dopamine will be more extroverted, and with high acetylcholine will be more introverted.

Those with low norepinephrine will be more instinctual, wherein the R-complex part of the brain becomes more dominant. Serotonin levels will have similar effects as for logical types. Those with medium norepinephrine will be driven more by emotional factors, and will also have similar profiles based on serotonin levels.

For all types, as validated by neuroscientific and professional development studies, oxytocin is directly related to trust factors. Individuals with low oxytocin may have difficulty trusting or functioning in a high-trust environment, and vice versa.

Assessment Legalities

Regardless of the approach implemented, human resources professionals and executives should be concerned with the legality of pre-employment tests and assessments. The Equal Employment Opportunity Commission (EEOC) outlines guidelines related to proper and improper questions that can be asked. According to leading employment law firms, it is legal for an employer to require a test or assessment prior to offering candidates employment. Any test or assessment, however, must adhere to specific professional standards that include having an appropriate intended use. Otherwise, the test or assessment could be discriminatory and may not be legal or valid. The EEOC defines discrimination mistreating someone unfairly who is in a protected class, such as:

- Race or nationality
- Sex or gender

- Sexual orientation
- Pregnancy
- Religion
- Age or disability

A pre-employment assessment asking questions about these protected areas that aren't relevant to the position (age, disabilities, etc.) may not be legal. The EEOC does not permit employers to ask such questions prior to hiring, whether during interviews or pre-employment testing. If a test assesses personality traits, aptitudes, attributes, tendencies, soft skills, trust factors, etc. without using discriminatory questions, most legal professionals agree that employers are legally held harmless.

The Triune Brain Profiling System is designed to comply with all EEOS requirements related to discrimination, and has been reviewed by a leading employment attorney to ensure compliance.

CHAPTER SIX

Creating an Effective Neuroscientific Leadership Implementation Plan

Introduction and Overview

As noted previously, many neuroscientists believe that personalities, attributes, and tendencies are related to three primary neurotransmitters that modulate brain activity in predictable patterns and influence how humans act and react to the world. Again, these neurotransmitters are norepinephrine, serotonin, and dopamine. Counter or related to these are GABA, oxytocin, and acetylcholine.

Someone's neurotransmitter chemical levels and/or sensitivities are either high, medium, or low, and if the levels are out of balance, a person can become psychologically or physically unhealthy. For example, a serotonin deficiency can cause migraine headaches, nausea, appetite issues, depression, and anxiety. Something as simple as drinking too much coffee can affect dopamine levels and make someone irritable. Conversely, as previously noted, Dr. Paul Zak and others have shown that effectively raising oxytocin levels can increase trust and therefore employee satisfaction and productivity.

A Model Implementation Plan to Improve Recruiting, Morale, and Productivity

Dr. Paul Zak (2017) conducted experiments showing the connection between raising oxytocin levels and increasing trust in work environments. He offered eight management behaviors that foster trust that are measurable and can be managed to improve employee performance:

1. Recognize Excellence—publicly reward top performers
2. Induce "Challenge Stress"—create moderate job stress via attainable goals

3. Ensure Work Autonomy—trust workers to complete projects in their own way
4. Enable Job Freedom—allow people to select the most rewarding projects
5. Share Company Information—a well-informed employee is a happier employee
6. Build Relationships—less task-orientation and more relationship-orientation
7. Encourage Wellness—facilitate personal growth along with professional growth
8. Show Vulnerability—leaders should ask for help to encourage cooperation

As noted by SHRM experts and studies completed by Gallup and leading neuroscientists, high-trust organizations result in dramatically higher productivity, energy, profits, and revenue. Also, dramatically lower stress and absenteeism. Therefore, the ability to screen and assess candidates for recruitment and talent acquisition to determine approximate levels of oxytocin—validated by experts as an accurate trust factor measurement—can ensure employees who can trust and be trusted in a high-trust environment. Also, implementing employee engagement and professional development programs to increase workplace oxytocin levels will drive the results desired.

Furthermore, such a system will provide far more accurate results for soft skill evaluations as compared to observational profiling systems such as Predictive Index, et al. SHRM studies show that 92 percent of recruiters concur that when candidates fail in a new job, it is primarily due to improper matching of soft skills with job requirements and company culture. Furthermore, ensuring proper team fit can be crucial. For example, an individual with rigid right/wrong rules-based attributes were clash with more creative non-rules-based individuals. Strong controlling types may clash with more peaceful types, and so on. Conversely, too many

individuals of the same profile type on a team could result in “group think” that may drive undesired results.

A system based on validate brain science to screen and assess individuals prior to hiring, and then ensure proper team complements and balance, and further create an environment of trust, can drive the results noted by numerous studies: 106 percent more energy, 74 percent higher productivity, 20 percent higher revenue and profit, and 76 percent less stress.

The Development of a Neuroscience-Based Leadership Priority Planner

The Seven Habits of Highly Effective People, by Steven R. Covey, popularized a matrix grid with four quadrants called the Time Management Grids. This matrix was created by President Dwight D. Eisenhower (Clear, 2014), who once said, “What is important is seldom urgent and what is urgent is seldom important.”

Eisenhower placed tasks or projects that were urgent and important in the upper left quadrant of the matrix for immediate action. Items that were not urgent or important went into the upper right quadrant for further decision. Not important but urgent items went in the lower left for delegation, and not urgent and not important items went in the lower right for deletion.

(Jaroslav Frank, Dreamstime.com)

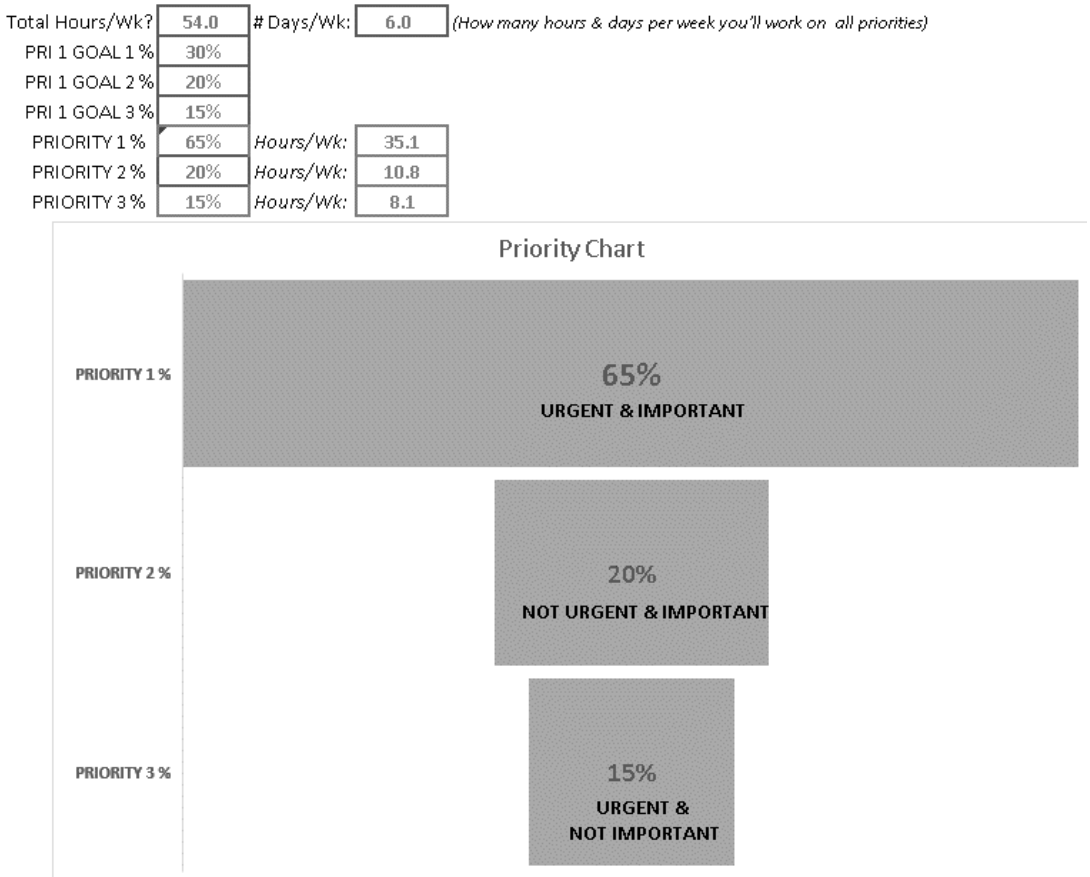
This grid provides a simplified means to keep leadership priorities straight. However, Eisenhower created this grid decades before modern neuroscientists had a more mature understanding of how the human brain works. In today's dynamic and hectic world, leaders may need a better way to simplify projects and tasks and prioritize time.

Using a more neuroscientific approach to leadership decision-making, leaders might consider using three boxes to represent priority one, two, and three goals. Goal 1 is the most important goal required to accomplish a leader's purpose, vision, or mission identified for the organization, department, or team. This is similar to Eisenhower's urgent and important grid. Goal 2 is the second most important goal to reach this objective, which is similar to the not urgent and important grid. Goal 3 is similar to the urgent and not important grid. There is no box for not urgent and not important, as it is not needed.

Leaders can then decide what percentage of team time will be devoted to each goal. Those with Lean and Six Sigma expertise often discuss the 80/20 Pareto principle, wherein 80 percent of the effects come from 20 percent of the causes. Translated for time management

purposes, 80 percent of a team's time should be spent on 20 percent of the projects or tasks—those which will gain 80 percent of the objective.

A leader might assign 60 to 65 percent of a team's time to Goal 1, around 20 percent for Goal 2, and 15 to 20 percent for Goal 3. Note that goals 1 and 2 add up to about 80 percent, which aligns with the Pareto principle.



(Illustration created by the author)

The Development of a Neuroscience-Based Leadership Decision-Making Model

Psychologists and neuroscientists are beginning to understand what happens in the human mind (mental activity) and the brain (the physical region associated with the activity) when someone is required to make a decision (Schwartz, J. & Thomson, J., 2016). Making decisions and forming habits is influenced by neuroplasticity principles discovered by Canadian scientist Donald Hebb in the 1950s. He created Hebb's law to summarize his findings: "Neurons that fire together wire together." Regions of the brain that are frequently activated in tandem will become physically associated with each another over time. The more often a mental activity pattern of mental activity occurs, the more engrained the associated neural pathway becomes within the brain. Similar to a path that becomes worn through a forest by a continued use, it becomes easier for the brain to traverse well-used neural pathways. This implies that the more one makes similar decisions, the more the brain's neural pathways will become accustomed to these types of decisions, making the decision-making task more automated over time.

Aristotle's persuasion model, as discussed in Chapter One (Aristotle, 1992), suggests that humans need to engage all three parts of someone's brain to persuade them. Making a decision also requires persuasion. Leaders may need to persuade themselves that they are making the right and best decisions and then persuade their teams to execute those decisions. The triune brain neuroscientific research noted earlier, as well as Aristotle's persuasion model, intimates that persuasion requires engaging all three areas of the human brain—logical, emotional, and instinctual.

To accomplish this with teams, leaders might draw three vertical lines on a whiteboard, a PowerPoint slide, or other visual aid to create three columns. They can label the first column "emotional," the second "instinctual," and the third "logical." In the emotional column, they

should create purpose and passion statements that are emotional in nature, such as, “Our overarching purpose is to bring joy to millions of people by allowing them to connect and communicate easier with our solutions.”

They can then do the same in the instinctual column. They might write, “Our passion is to help our customers avoid risks and harm via solutions that offer greater security.” Finally, they can list logical statements, such as, “Our goal is to provide affordable ways to connect with solutions that are 50 percent more efficient than any others.”

When making major decisions, leaders can place the document in a prominent location. They can then encourage brainstorming sessions with their team and list all decision ideas or points on a whiteboard. Once there are several decision points on the board, the team can examine each one against the backdrop of the firm’s passion, purpose, and vision. They can then narrow the decision choices down to three finalists to simplify the process.

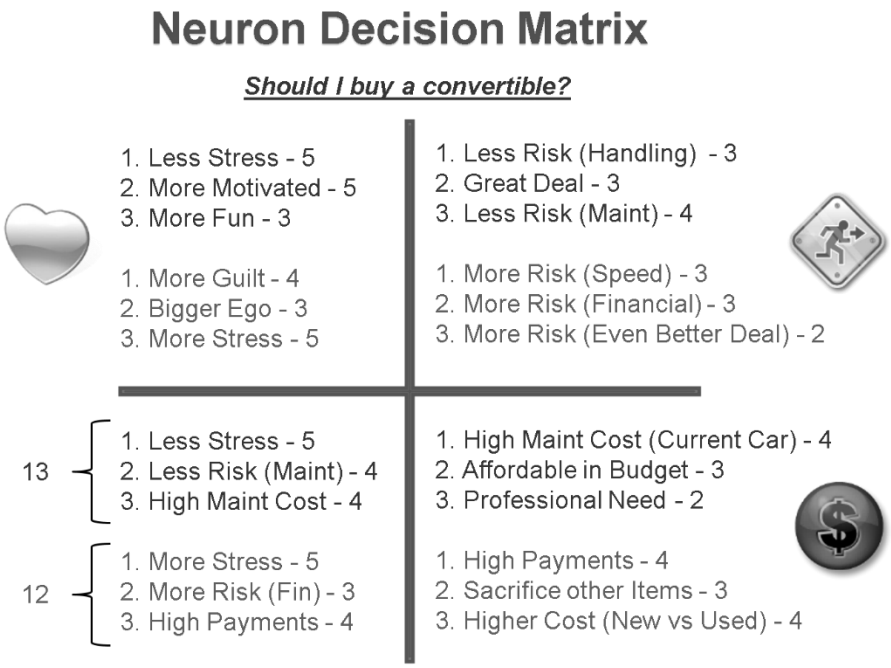
Now, leaders can draw two intersecting lines on the board, one vertical and one horizontal, to create four equal quadrants. They can label the upper left quadrant “emotional,” the upper right one “instinctual,” the lower right one “logical,” and the lower left one “summary.”

The team can examine decision possibility number one, and in the upper left quadrant, list three emotional reasons why this decision is a good one (fulfills the firm’s purpose) and three reasons why it’s bad. They can do the same for the instinctual and logical quadrants. The object of the exercise is to engage all three parts of everyone’s brain to make more balanced decisions. Once the team has listed three good and bad reasons in each quadrant, they can rank each with a number between one and five, with five as the most important. For example, if reason number one resonates strongly (i.e., it aligns well with the passion and purpose), then the team can rate it

as a five. They can use negative numbers for the three reasons they should not make this decision.

Once all the reasons have been scored, the team can select the most important "should do it" and "should not do it" reasons from each quadrant and place them in the fourth bottom left quadrant. Then, they can add up the positive numbers for the three "should do it" reasons and compare it to the sum of the negative "should not do it" numbers. If the "should do it" number is higher, they may consider that course of action. If not, they can eliminate that option and re-evaluate.

In the visual example below, the decision to buy a convertible automobile or not is used. Some of the "should do it" reasons include less stress, less repair risk, and high maintenance costs for the current car. One can compare those against the "should not" reasons of more stress, more financial risk, and higher payments. In this example, the "should" reasons won so the decision-maker should buy the convertible.



(Illustration created by the author)

Summary

While neuroscientific studies and research are still nascent, and information relevant to its adaptation for a leadership frameworks is virtually non-existent, there are studies, books, papers, and research reports that leaders can leverage to create usable leadership strategies, frameworks, and models. Employing strategies to increase oxytocin to increase workplace trust and increase dopamine to improve well-being and job satisfaction have been shown to have positive and profitable results.

Using neuroscientific information to create models to make more effective decisions and better prioritize goals and time focus are two additional strategies that leaders can employ to improve productivity, attain organizational goals, and increase profitability.

CHAPTER SEVEN

Field Analysis of an Effective Neuroscientific Profiling Implementation Plan

Introduction and Overview

To determine the potential effectiveness of the neuroscientific profiling implementation plan and proposed elements, qualitative research was conducted on nine professional leaders using a qualitative data narrative analysis technique.

Qualitative data refers to non-numeric information, such as interview transcripts, notes, video and audio recordings, images, and text documents. Qualitative data analysis can be divided into the following five categories:

1. Content analysis. This refers to the process of categorizing verbal or behavioral data to classify, summarize and tabulate the data.

2. Narrative analysis. This method involves the reformulation of stories presented by respondents, taking into account context of each case and different experiences of each respondent. In other words, narrative analysis is the revision of primary qualitative data by the researcher.

3. Discourse analysis. A method of analyzing naturally occurring speech and all types of written text.

4. Framework analysis. This is more advanced method that consists of several stages, such as familiarization, identifying a thematic framework, coding, charting, mapping, and interpretation.

5. Grounded theory. This method of qualitative data analysis starts with an analysis of a single case to formulate a theory. Then, additional cases are examined to see if they contribute to the theory.

For the purposes of this study, narrative analysis was selected, using interview transcripts from recordings of interviews with the nine professional leaders. Leaders were selected based upon work title and current team size, with ten or more subordinates as the minimum number to qualify for the research study. Guidelines for participant selection are below.

Narrative Analysis Goals and Strategies

The purpose of the proposed study is to develop a usable and simplified framework and implementation plan to utilize recent neuroscience research related to business productivity and moral enhancement. The study will propose using a new approach to personality profiling based on modern neuroscience rather than the observation models of the past, including the OPQ-32, Myers-Briggs, the Big-5, DiSC, and the Enneagram profiling models. Ideally, the potential wide range of applications could enhance employee job satisfaction and improve productivity by adapting leadership skills to the employee's neuroscientific profile. Furthermore, identification of a leader's neuroscientific profile can enhance the ability to adjust the leadership style used based upon the leadership situation and the subordinate's identified profile.

Decades ago, leadership researchers analyzed the difference between introverted and extroverted managers, which led to research on specific leadership behaviors (Hersey & Blanchard, 1969, pp. 26-34). Researchers labeled leaders as either task-oriented or relationship-oriented leaders. Task-oriented leaders were believed to be more introverted and focused on getting the job done, completing tasks, or achieving goals. These leaders exhibit modest concern for employee relationships and place more emphasis on achievements, organization, and structure. The upside noted is higher productivity, but at the cost of morale, which can eventually affect productivity.

Relationship-oriented leaders were viewed as more extroverted and focused on people, relationships, teams, motivation, and support. They encourage collaboration and frequent communication and emphasize employee well-being and happiness. They understand that reducing workplace conflicts and stress can lead to higher productivity. The upside is higher morale and job satisfaction but sometimes at the expense of productivity and profitability.

Management theorists from Ohio State University and the University of Michigan published a series of studies in the 1950s that sought to answer the question of which leadership style might be more effective (Chong, 2017). They discovered that either style can be successful depending upon the situation. This led to a new management approach called *situational leadership*, which forms the basis of the leadership coaching offered by The Blanchard Companies, founded by Ken Blanchard, the author of *The One Minute Manager*. The Blanchard Companies also prescribe to a servant leadership model, which is similar to situational leadership except that it recommends leaders serve subordinates by removing professional barriers to success and placing the needs, aspirations, and interests of others above their own (Sendjaya & Sarros, 2002, p. 57).

The world's number two ranked leadership coach, John Mattone, utilizes the Enneagram as the basis for their leadership framework (Mattone, 2013, pp. 82-100). The use of narrative analysis research allows for a qualitative study to be completed based on feedback regarding the potential effectiveness of a neuroscientific profile-based leadership style that transcends the situational-leadership model, the Enneagram-based model, and similar leadership models in use today.

The goal of the analysis is to determine, based on narrative opinion and feedback, if a neuroscientific profile-based leadership model can be implemented and if the tools proposed for such implementation will be effective and usable.

The strategy to conduct the narrative analysis research consists of a preliminary set of written survey questions, which are used to determine the neuroscience-based personality profile of the participants, to determine the qualifications and experience level of each leader, and to determine the current leadership framework, if any, in use by the participants.

Guidelines for Participation and Selection of Participants

Using advanced search parameters within LinkedIn Sales Navigator, 37 pre-qualified leaders were selected to participate in a survey. Potential participants were required to meet the following minimum criteria:

1. Current leadership role as evidenced by title of vice president or CxO.
2. Company size of more than 100 employees
3. Team size of more than 10 employees
4. Time of leadership role of more than ten years

The above criteria were used to select nine participants at random from the group of 37, wherein each participant selected a different profile type from the list of nine. Based on the research presented earlier, nine distinct personality profiles were created using the Enneagram and the profiles outlined by Dr. Tina Thomas (Thomas, 2016, pp. 173-178), and each of the nine participants represented one of the distinct nine profiles.

Again using the Enneagram's nine personality profiles, which are typically grouped into three triads that are more emotional, instinctual, or logical (as discussed in a previous chapter), the profiles were grouped into these three categories. Three different colors (green, blue, purple) and

nine profile descriptions (helpful, etc.) were used to simplify the profile selection by the participants.

Selection of Narrative Analysis Questions

To ensure satisfactory participation and adequate qualitative data, and to ensure respect for participant convenience and time constraints, the following ten questions were selected for the qualification and preparation survey:

1. When solving leadership challenges at your organization, which of these leadership frameworks do you use most often (select one of three)?

RAPID COMMUNICATION STYLE

CALM COMMUNICATION STYLE

2. (Based upon the answer to Question 1): When solving leadership challenges at your organization, which (blue, green, or purple) framework do you most often employ (select one of three)?
3. Which of the following best describes your primary role with your organization?
    a. I influence leadership decisions as part of a team.
    b. I evaluate leadership decisions as part of a team.
    c. I make final decisions as the leader of my team.

d. I am not involved with leadership decisions.

4. (If answer c is selected above) As a leader, how many people do you manage?
    a. <10
    b. >10

    If the answer above is b, the following verbal interview questions were asked in a telephone interview:

5. Please describe your most prevalent leadership style (task, relationship, situational, servant, other).
6. What is your familiarity with modern neuroscientific leadership theories or practices? (this question seeks to determine whether leaders are familiar with research related to leadership neuroscience)
7. Given that you selected (profile framework selected) as your profile, what is your opinion about the accuracy of this type of profile testing? (this question seeks to determine if the participant agrees with the profile type, which validates the efficacy of using a neuroscience-based approach rather than OCEAN, OPQ32, etc.)
8. What is your opinion about the efficacy of utilizing a neuroscience-based personality profiling approach to adjust your situational-leadership style to improve productivity and morale? (this questions seeks to determine the receptiveness of the participant to using a neuroscience-based approach rather than more traditional models such as Situational Leadership II).
9. What is your view about the effectiveness of using a neuroscience-based time management tool as an improved model over Eisenhower's time management matrix? (this questions seeks to determine the receptiveness of participants to use a

neuroscience-based model to better focus the brain on priority tasks). Leaders were sent a spreadsheet example of how this model works (as outlined in Chapter 6) prior to being asked this question.

10. What is your view about the effectiveness of using a neuroscience-based decision-making model as an improved model over other leadership decision-making approaches? (this question seeks to determine the receptiveness of participants to use a decision-making model designed to empower neuroplasticity for effective decision-making). Leaders were sent an example (as outlined in Chapter 6) of how this model works prior to being asked this question.

Results of Narrative Analysis

Table 1: Narrative Survey Questions and Interview Responses to the Qualitative Research Neuroscientific Leadership Model and Tools Proposed for Participant One.

Lead Perfectly, Enforce Procedures
Ethical, Rules-Based Environment
Integrity & Quality Focus

Question 1: Leadership Framework	Purple
Question 2: Leadership Framework	Leader
Question 3: Leadership Role	Male Chief Executive Officer, >50 years old, >10,000

	employees, New York, Financial Services, MBA
Question 4: Team Size	>10
Question 5: Current Leadership Style	Task-oriented
Question 6: Neuroscientific Familiarity	Limited exposure
Question 7: Neuroscientific Profiling Efficacy Viewpoint	Has used Myers-Briggs and this seems similar, so could be effective if accurate
Question 8: Neuroscientific Profiling Leadership Style Adjustment Efficacy	Prefers task-orientation but can see how this might work for more situational-leadership approaches
Question 9: Neuroscientific Time Management Approach Efficacy	Sees the value in creating percentages for each goal
Question 10: Neuroscientific Decision-Making Approach Efficacy	Prefers this to the Eisenhower model as it seems far more accurate and detailed

Table 2: Narrative Survey Questions and Interview Responses to the Qualitative Research Neuroscientific Leadership Model and Tools Proposed for Participant Two.

Improve Relationships, Help Teammates
Nurturing & Caring Environment
Non-Confrontational Team Focus

Question 1: Leadership Framework	Green
Question 2: Leadership Framework	Helpful
Question 3: Leadership Role	Female Vice President of Human Resources, >40 years old, 5,000 to 10,000 employees, San Mateo, Technology, BSHR
Question 4: Team Size	>10
Question 5: Current Leadership Style	Servant
Question 6: Neuroscientific Familiarity	None
Question 7: Neuroscientific Profiling Efficacy Viewpoint	Can be very effective for team hiring and morale building
Question 8: Neuroscientific Profiling Leadership Style Adjustment Efficacy	Could provide for a higher culture of trust within the organization
Question 9: Neuroscientific Time Management Approach Efficacy	Sees how this is useful for team planning but not individual use
Question 10: Neuroscientific Decision-Making Approach Efficacy	Not familiar with Eisenhower model but agrees this is useful decision-making approach

Table 3: Narrative Survey Questions and Interview Responses to the Qualitative Research Neuroscientific Leadership Model and Tools Proposed for Participant Three.

Exceed Goals, Achieve Success
Confident & Driven Environment
Professional Success Focus

Question 1: Leadership Framework	Green
Question 2: Leadership Framework	Ambitious
Question 3: Leadership Role	Male Vice President, Sales, >35 years old, 1,000 to 5,000 employees, Los Angeles, Cybersecurity, MBA
Question 4: Team Size	>10
Question 5: Current Leadership Style	Servant
Question 6: Neuroscientific Familiarity	None
Question 7: Neuroscientific Profiling Efficacy Viewpoint	Can be very effective if validity can be proven
Question 8: Neuroscientific Profiling Leadership Style Adjustment Efficacy	Could allow for a more effective servant leadership approach
Question 9: Neuroscientific Time Management Approach Efficacy	Very interesting, could be useful to outline team goals & purpose
Question 10: Neuroscientific Decision-Making Approach Efficacy	Prefer the more simplistic Eisenhower model, but open to

	change where it makes sense

Table 4: Narrative Survey Questions and Interview Responses to the Qualitative Research Neuroscientific Leadership Model and Tools Proposed for Participant Four.

Encourage Creativity, Ensure Differentiation
Creative & Artistic Environment
Unique & Refined Focus

Question 1: Leadership Framework	Green
Question 2: Leadership Framework	Creative
Question 3: Leadership Role	Female Vice President of Design, >30 years old, 500 to 1,000 employees, London, Design Agency, BS Liberal Arts
Question 4: Team Size	>10
Question 5: Current Leadership Style	Situational
Question 6: Neuroscientific Familiarity	Heard about neuromarketing for consumer business
Question 7: Neuroscientific Profiling Efficacy Viewpoint	Very creative and outside the box thinking, likes this approach
Question 8: Neuroscientific Profiling Leadership Style Adjustment Efficacy	Could be interesting for team building and creating a team

	passion and purpose
Question 9: Neuroscientific Time Management Approach Efficacy	A bit complicated but can see the use for department goal setting
Question 10: Neuroscientific Decision-Making Approach Efficacy	Has used Eisenhower matrix and agrees this is an interesting new approach that could work well

Table 5: Narrative Survey Questions and Interview Responses to the Qualitative Research Neuroscientific Leadership Model and Tools Proposed for Participant Five.

Innovate Intelligently, Engineer Logically
Scientific & Technical Environment
Observational & Rational Focus

Question 1: Leadership Framework	Blue
Question 2: Leadership Framework	Innovative
Question 3: Leadership Role	Male Chief Information Officer, >50 years old, >10,000 employees, Boston, Technology Services, MS Engineering
Question 4: Team Size	>10
Question 5: Current Leadership Style	Relationship
Question 6: Neuroscientific Familiarity	Has neuroscience knowledge but

	not for leadership
Question 7: Neuroscientific Profiling Efficacy Viewpoint	Based on knowledge of neuroscience, sees how this could be quite useful
Question 8: Neuroscientific Profiling Leadership Style Adjustment Efficacy	Sees how this could enhance a servant or relationship leadership approach if used correctly
Question 9: Neuroscientific Time Management Approach Efficacy	Very detailed and could be useful, but not sure if leaders will be too busy to fill it out
Question 10: Neuroscientific Decision-Making Approach Efficacy	Not familiar with Eisenhower matrix but agrees that this approach is more scientific than others used by leaders

Table 6: Narrative Survey Questions and Interview Responses to the Qualitative Research Neuroscientific Leadership Model and Tools Proposed for Participant Six.

Secure Predictability, Ensure Loyalty
Safe & Dependable Environment
Vigilant & Cautious Focus

Question 1: Leadership Framework	Blue

Question 2: Leadership Framework	Loyal
Question 3: Leadership Role	Male Vice President of Security, >40 years old, >10,000 employees, Chicago, Insurance, MS
Question 4: Team Size	>10
Question 5: Current Leadership Style	Task
Question 6: Neuroscientific Familiarity	Has studied neuroscience but not for leadership
Question 7: Neuroscientific Profiling Efficacy Viewpoint	Allows for a safer and more secure model to ensure proper team selection and management
Question 8: Neuroscientific Profiling Leadership Style Adjustment Efficacy	Could enhance a task-oriented style by more scientifically adjusting the approach
Question 9: Neuroscientific Time Management Approach Efficacy	Likes the detail and cautious approach to ensure the proper time is spent on the right goals
Question 10: Neuroscientific Decision-Making Approach Efficacy	Definitely an enhancement to the Eisenhower matrix

Table 7: Narrative Survey Questions and Interview Responses to the Qualitative Research Neuroscientific Leadership Model and Tools Proposed for Participant Seven.

Empower Excitement, Stimulate Versatility
Optimistic & Dynamic Environment
Trendy & Adaptable Focus

Question 1: Leadership Framework	Blue
Question 2: Leadership Framework	Adventurous
Question 3: Leadership Role	Male Vice President of Business Development, >50 years old, >10,000 employees, Orange County, Retail, MS Marketing
Question 4: Team Size	>10
Question 5: Current Leadership Style	Situational
Question 6: Neuroscientific Familiarity	None
Question 7: Neuroscientific Profiling Efficacy Viewpoint	Very exciting new approach that makes sense based on the latest research
Question 8: Neuroscientific Profiling Leadership Style Adjustment Efficacy	Likes the idea of adjusting the situational model as it is now quite dated and “old school”
Question 9: Neuroscientific Time Management Approach Efficacy	Not enough time to fill this out completely, but might delegate

	this to others on the team
Question 10: Neuroscientific Decision-Making Approach Efficacy	This approach appears to be far more effective as it allows for all three brains to be employed

Table 8: Narrative Survey Questions and Interview Responses to the Qualitative Research Neuroscientific Leadership Model and Tools Proposed for Participant Eight.

Ensure Control, Strengthen Teams
Strong, Assertive Environment
Decisive, Uncompromising Focus

Question 1: Leadership Framework	Purple
Question 2: Leadership Framework	Commanding
Question 3: Leadership Role	Female Chief Marketing Officer, >40 years old, 100 to 500 employees, Dallas, Energy, MBA
Question 4: Team Size	>10
Question 5: Current Leadership Style	Task
Question 6: Neuroscientific Familiarity	Familiar with neuromarketing but not for leadership models
Question 7: Neuroscientific Profiling Efficacy Viewpoint	Could be quite useful for HR team selection and customer

	profile as well
Question 8: Neuroscientific Profiling Leadership Style Adjustment Efficacy	Not sure how this might work for task-orientation but could allow for a softer approach for sensitive individuals
Question 9: Neuroscientific Time Management Approach Efficacy	Might prefer a faster and easier model but could delegate the completion of this to others
Question 10: Neuroscientific Decision-Making Approach Efficacy	Prefer this to the Eisenhower model but also suggest making it faster to complete

Table 9: Narrative Survey Questions and Interview Responses to the Qualitative Research Neuroscientific Leadership Model and Tools Proposed for Participant Nine.

Simplify Processes, Avoid Complications
Trusting, Peaceful Environment
Uncomplicated & Simplified Focus

Question 1: Leadership Framework	Purple
Question 2: Leadership Framework	Peaceful
Question 3: Leadership Role	Female Chief Financial Officer, >50 years old, >10,000

	employees, New York, Banking, MBA
Question 4: Team Size	>10
Question 5: Current Leadership Style	Servant
Question 6: Neuroscientific Familiarity	None
Question 7: Neuroscientific Profiling Efficacy Viewpoint	Leaders should consider the latest research and employ new models to stay relevant
Question 8: Neuroscientific Profiling Leadership Style Adjustment Efficacy	Could enhance the servant style by adjusting the approach and messaging to the individual
Question 9: Neuroscientific Time Management Approach Efficacy	Very powerful approach that can improve the focus on passion and purpose to quantify the goals
Question 10: Neuroscientific Decision-Making Approach Efficacy	Far better than the Eisenhower model as it allows for a more accurate way to adjust the time commits to the goal importance

Summary

The research survey indicates the following conclusions:

1. Most leaders are not familiar with nor use neuroscience-based leadership models.
2. Most leaders agree that using a neuroscience-based model could improve leadership results.
3. Most leaders still use traditional task, relationship, or situational leadership styles.
4. Most leaders agree that the use of neuroscience-based leadership profiling appears to be accurate.
5. Most leaders agree that using a neuroscience-based approach to time management can be beneficial as compared to traditional methodologies.
6. Most leaders agree that using a neuroscience-based approach to leadership decision-making can be beneficial as compared to traditional methodologies.
7. More research is needed across a larger sample size with additional neuroscience-based approaches and tools to provide more conclusive accuracy.

CHAPTER EIGHT

Conclusion

Introduction and Overview

Decades ago, researchers started analyzing the effects of introverted and extroverted managers, which led to research on specific leadership behaviors (Hersey & Blanchard, 1969, pp. 26-34). Researchers created two categories for task-oriented or relationship-oriented leaders.

Task-oriented leaders are seen to be more introverted and focused on getting the job done, completing tasks, or achieving goals. These leaders exhibit modest concern for employee relationships and place more emphasis on achievements, organization, and structure. The upside noted is higher productivity, but this is at the cost of morale, which can eventually affect productivity.

Relationship-oriented leaders are viewed as more extroverted and focus on people, relationships, teams, motivation, and support. They encourage collaboration and frequent communication and emphasize employee well-being and happiness. They understand that reducing workplace conflicts and stress can lead to higher productivity. The upside is higher morale and job satisfaction, but sometimes at the expense of productivity and profitability.

Researchers from Ohio State University and the University of Michigan published a series of studies in the 1950s that sought to determine which leadership style is more effective (Chong, 2017). They discovered that either style can be successful depending upon the situation. This led to a management approach called *situational leadership*, now proffered by The Blanchard Companies. This approach recommends that leaders should use either style depending upon who they are leading and when. They suggest that some people respond better to a task-oriented rather than a relationship-oriented style, and vice versa. This can also change depending

upon the circumstances or situation. For example, if the firm has a critical deadline, a task style may be better. This may be an effective method of ensuring the proper leadership style is employed in a given situation.

The Blanchard Companies also believe in a servant leadership model, wherein leaders serve subordinates by removing professional barriers to success and placing the needs, aspirations, and interests of others above their own (Sendjaya & Sarros, 2002, p. 57).

Based on the latest neuroscientific research, it may be possible to enhance or extend these approaches by ensuring that a leadership or professional work style or approach also aligns with peer, subordinate, or supervisor situations based on neuroscientific personalities, demeanor, and psychological health, as well as roles and responsibilities within a team unit. Most importantly, neuroscience teaches us that subordinates will more often do what a leader does rather than what a leader says. The reason for this may be related to a neuroscientific term called mirror neurons.

Mirror neurons (Winderman, 2015, p. 48) were discovered in the 1980s by neuroscientist Dr. Giacomo Rizzolati and his team from the University of Parma in Italy. They were conducting experiments on monkeys related to motor neurons, which carry signals from the spinal cord to the muscles to allow for movement. One of Rizzolati's lab assistants came into the lab one day while eating an ice cream cone. One of the monkeys, who was still wired up to the monitors, observed the assistant. On the monitor, the monkey's readings lit up with electrical brain activity as if the animal were also eating the ice cream. The primate mimicked the assistant and even moved its arms and mouth as if also enjoying the cone.

Rizzolati's team conducted further research using peanuts and found that the same motor neurons fired in the same way whether the monkeys were handling the peanuts or observing others doing so. Subsequent research on humans led to the theory that mirror neurons trigger our

brain to simulate the action of those we observe. We can also mimic the emotions we witness when expressed by others. This is why people may cry during a sad scene in a movie. They may actually feel the same emotions they observe on the big screen.

Neuroscientists like Dr. Rizzolati, interviewed for this study, believe that mirror neurons play an important role in the learning process, which is why storytelling can be powerful. For leaders, an understanding of mirror neurons suggests the grave responsibility of setting the right examples. It may be easy to say, "do what I say and not what I do," but the human brain may do just the opposite. It may therefore be important to maintain proper and good daily habits. Using Mirror Neurons, a leader's team may observe exhibited discipline, dedication, and actions and then emulate their leader.

Implications and Future Research

McKinsey & Company, one of the world's most respected management consulting firms, determined that around 50 percent of cultural change management efforts fail when leaders do not set good examples by adopting the recommended changes or new behaviors (Boaz & Fox, 2014). The research conducted on mirror neurons appears to support this conclusion.

Plutarch was an ancient Greek educator and historian (Gill, 1983). He stated that most people, whether introverted or extroverted, prefer not to live in a vacuum. Instead, he believed humans are naturally curious and social creatures that imitate others through close observation. Plutarch taught how to accomplish this task through his famous biographical sketches, which pictorially told positive stories about Greek and Roman heroes, including Alexander the Great, Caesar, Cicero, Pericles, and others. His goal was to offer children examples of heroism that they could emulate.

The implication of the research discussed herein is that virtually no effective talent assessment, leadership, or professional engagement enhancement models exist today, especially for remote or hybrid environments, that are based on the latest neuroscientific research, even though this research indicates that such models could improve employee selection, satisfaction, productivity, and retention. In turn, this could increase revenues while decreasing costs.

However, the research conducted on mirror neurons and by McKinsey & Company indicates that it is possible that any new assessment or leadership approach and style may be ineffective if leaders ignore talent acquisition changes, or prescribe more modern approaches to others rather than leading by example. The use of neuroscientific assessment and leadership tools may be one way to expose human resources and other leaders to a new approach based on science rather than observation or guess work.

Further research is needed in this area, which may include A/B testing to validate the ability of neuroscience-based assessment leadership models to drive additional desired results. Recruiting professionals and leadership coaches may need to consider adjusting approaches and models to empower better results, wherein the mirror neurons of colleagues and subordinates are stimulated to encourage desired behaviors and outcomes.

REFERENCES/INDEX

American Psychological Association. (2018). Personality. Retrieved from http://www.apa.org/topics/personality/

Ariely, D., & Berns, G. S. (2010). Neuromarketing: The hope and hype of neuroimaging in business. *Nature Reviews Neuroscience*, *11*(4), 284-292. doi:10.1038/nrn2795.

Aristotle. (1992). *The art of rhetoric* (1st ed.). London, UK: Penguin.

Barna Group. (2015). The different impact of good and bad leadership. Retrieved from https://www.barna.com/research/the-different-impact-of-good-and-bad-leadership/

Barsade, S. G., & Gibson, D. E. (2007). Why does affect matter in organizations? *Academy of Management Perspectives*, 21, 36 –59.

British Broadcasting Corporation. (2009, November 10). Bad bosses 'force staff to quit.' Retrieved from http://news.bbc.co.uk/2/hi/business/8352389.stm

Bergland, C. (2015, May 9). How do your genes influence levels of emotional sensitivity? *Psychology Today*. Retrieved from https://www.psychologytoday.com/us/blog/the-athletes-way/201505/how-do-your-genes-influence-levels-emotional-sensitivity

Boal, K. B., & Hooijberg, R. (2001). Strategic leadership research: Moving on. *The Leadership Quarterly*, 11, 515–549.

Boaz, N., & Fox, E. (2014, March). Change leader, change thyself. *McKinsey Quarterly*.

Boushey, H., & Glynn, S. (2012, November 16). There are significant business costs to replacing employees. Retrieved from https://www.americanprogress.org/wp-content/uploads/2012/11/CostofTurnover.pdf

Boyatzis, R. (2011, January). Neuroscience and Leadership: The Promise of Insights, *The Kensho Search Advantage.* Retrieved from file:///C:/Users/William/Downloads/Neuroscience_and_Leadership_The_Promise_of_Insight.pdf

Braverman, E. (2004). *The edge effect*. Location: Sterling Publishing Co., Inc., New York, New York, 18-26.

Brown, A., & Bartram, D. (2005, June). Relationships between OPQ and Enneagram types. SHL Group plc, v.1.3

Cacioppo, J. T., Berntson, G. G., & Nusbaum, H. C. (2008). Neuroimaging as a new tool in the toolbox of psychological science. *Current Directions in Psychological Science*, 17(2), 62– 67.

Chong, B. (2017, June 28). Tasks & relationships. Retrieved from https://sites.psu.edu/leadership/2017/06/28/tasks-relationships/

Clear, J. (2014, April 29). Use the 'Eisenhower box' to stop wasting time and be more productive. *Entrepreneur*. Retrieved from https://www.entrepreneur.com/article/233054

Edwards, S. (May 2005). The amygdala: The body's alarm circuit. Retrieved from http://www.dana.org/Publications/Brainwork/Details.aspx?id=43615

Fresco, G. (October 12, 2015). Neuroscience of selling. Retrieved from http://adaptiveneuroscience.com/2015/10/12/neuroscience-of-selling/

Gallup. (2013). State of the American workplace. Retrieved from https://community.jivesoftware.com/docs/DOC-94959

Gill, C. (1983). The question of character-development: Plutarch and Tacitus. *The Classical Quarterly*, *33*(2), 469-487. doi:10.1017/S0009838800034741

Goldberg, Lewis R. (1992) "The development of markers for the Big-Five factor structure." Psychological assessment 4.1: 26. http://dx.doi.org/10.1037/1040-3590.4.1.26

Granneman, J. (2015, March 4). Introverts' and extroverts' brains really are different, according to science. *Science*. Retrieved from https://introvertdear.com/news/introverts-and-extroverts-brains-really-are-different-according-to-science/

Harir, A. et al. (2002, July 19). Serotonin transporter genetic variation and the response of the human amygdala. *Science, 297*(5580), 400-403.

Hersey, P., & Blanchard, K. H. (1969). Life cycle theory of leadership. *Training & Development Journal*, *23*(5), 26-34.

Howell, J. (2012). *Becoming conscious: The enneagram's forgotten passageway*. Location: Balboa Press. 203.

Hurlemann, R. et al. (2010, April 7). Oxytocin enhances amygdala-dependent, socially reinforced learning and emotional empathy in humans. *Journal of Neuroscience, 14*, 4999-5007.

Johnson-Laird, P. (2012, May 8). Mental models and cognitive change. *Journal of Cognitive Psychology*, *25*(2), 131-138.

Kleinman, P. (2012). *Psych101*. Location: F+W Media.

MacGill, M. (2017, September 4). What is the link between love and oxytocin? *Medical News Today*. Retrieved from https://www.medicalnewstoday.com/articles/275795.php

MacLean, P. (1990, January 31). The triune brain in evolution: Role in paleocerebral functions, 9.

Mahoney, M. (2003, January 13). The subconscious mind of the consumer (and how to reach it). Retrieved from https://hbswk.hbs.edu/item/the-subconscious-mind-of-the-consumer-and-how-to-reach-it

Mattone, J. (2013, April 13). *Intelligent leadership: What you need to know to unlock your full potential*. Location: Amacom (HarperCollins), New York New York. 82-100

News.com.au (2011, November 16). Two-thirds of Australians have a 'horrible' or 'average' boss, survey finds. Retrieved from https://www.news.com.au/finance/work/survey-finds-two-thirds-of-responders-have-a-horrible-or-average-boss/news-story/7667099c6e13f73c9644a0f53555933a

Quimet, M. (2012, November 15). The real productivity-killer: Jerks. Retrieved from www.inc.com/maeghan-ouimet/real-cost-bad-bosses.html

Schwartz, J. & Thomson, J. (2016, December 5). The Neuroscience of Strategic Leadership, strategy + business, 87, Retrieved from https://www.strategy-business.com/article/The-Neuroscience-of-Strategic-Leadership?gko=d196c

ScienceDaily. (2017). Neocortex. Retrieved from https://www.sciencedaily.com/terms/neocortex.htm

Sendjaya, S., & Sarros, J. (2002, Fall). Servant leadership: It's origin, development, and application in organizations, *Journal of Leadership & Organizational Studies*, *9*(2), 57.

Smith, J. (2016, June 6). Here's why workplace stress is costing employers $300 billion a year. Retrieved from https://www.businessinsider.com/how-stress-at-work-is-costing-employers-300-billion-a-year-2016-6

Society for Human Resource Management. (2015, April 28). Employee job satisfaction and engagement: Optimizing organizational culture for success. Retrieved from https://www.shrm.org/hr-today/trends-and-forecasting/research-and-surveys/pages/jobsatisfaction-and-engagement-rreport-optimizing-organizational-culture-for-success.aspx

Thomas, T. (2016). *Who do you think you are?: Understanding your personality from the inside out*. Location: Morgan James Publishing, New York, New York, 173-178.

Todd, R. et al (2015, April 22). Neurogenetic variations in norepinephrine availability enhance perceptual vividness. *Journal of Neuroscience*, 35 (16) 6506-6516. doi:10.1523/JNEUROSCI.4489-14.2015

University of British Columbia. (2015, May 7). How your brain reacts to emotional information is influenced by your genes. *ScienceDaily*. Retrieved from www.sciencedaily.com/releases/2015/05/150507135919.htm

Vermeulen, F. (2012, July 2). Strategy is the story: A good leader should be a good storyteller. Retrieved from https://www.london.edu/faculty-and-research/lbsr/strategy-is-the-story

Waldman, D., Balthazard, P., & Peterson, S. (2011, February). Leadership and Neuroscience: Can We Revolutionize the Way That Inspirational Leaders Are Identified and Developed? *Academy of Management Perspectives*, 60-74

Weber, L. (2015). What do workers want from the boss? *The Wall Street Journal*. Retrieved from https://blogs.wsj.com/atwork/2015/04/02/what-do-workers-want-from-the-boss/?mod=e2tw

Winerman, L. (2005, October). The mind's mirror: A new type of neuron--called a mirror neuron--could help explain how we learn through mimicry and why we empathize with others. *Monitor*, American Psychological Association, *36*(9), 48.

Wolfgang, J. (2018). Quotation, *Goodreads*, https://www.goodreads.com/quotes/122348-he-who-cannot-draw-on-three-thousand-years-is-living

Zak, P. (2017, February). The neuroscience of trust. Retrieved from https://hbr.org/2017/01/the-neuroscience-of-trust

Zak, P. (2017, January 17). *Trust factor: The science of creating high-performance companies*, Amacom (HarperCollins), New York, New York, 300

Field trials and study results

Aretanium CraniumQuotient tests and subsequent MediKeeper Health Assessment portal data assessment results for 70+ individuals are available upon request. The Leadwell86 ending identifier (e.g; 1e, 1i, 2e, etc.) refers to the determined personality profile type (e.g; Type 1 Extroverted, Type 2 Introverted, etc.).

Unique ID	Group Id	DOB	Registration Date	Zip Code
MK083838	leadwell86	1/1/1970	5/9/2019	92109
MK086607	Leadwell861e	1/1/1970	6/12/2019	92026
MK100853	Leadwell861i	10/28/1947	11/14/2019	EH209ER
MK113129	Leadwell861i	8/9/1958	3/29/2020	32931
MK126641	Leadwell861i	9/12/1980	10/16/2020	91950
MK089270	Leadwell862e	6/6/1960	7/15/2019	92108
MK101844	Leadwell862e	6/25/1969	11/27/2019	GU113JZ
MK104464	Leadwell862e	1/2/1956	1/6/2020	66215
MK106012	Leadwell862e	11/14/1984	1/17/2020	92663
MK109962	Leadwell862e	6/2/1942	2/17/2020	90292
MK116853	Leadwell862e	10/24/1951	6/11/2020	7878259
MK126386	Leadwell862e	9/22/1961	10/14/2020	91910
MK115244	Leadwell862i	4/7/1973	5/6/2020	64801
MK125425	Leadwell862i	11/28/1971	10/3/2020	398157
MK086693	Leadwell863e	5/19/1951	6/14/2019	92028
MK087385	Leadwell863e	8/26/1969	6/21/2019	6082
MK090544	Leadwell863e	9/14/1952	7/31/2019	89128
MK090608	Leadwell863e	2/21/1979	8/1/2019	23836

MK097342	Leadwell863e	8/26/1948	10/10/2019	95683
MK097980	Leadwell863e	8/26/1938	10/16/2019	95683
MK098786	Leadwell863e	1/7/1954	10/23/2019	95030
MK100569	Leadwell863e	3/9/1962	11/12/2019	95020
MK100966	Leadwell863e	1/16/1986	11/16/2019	80111
MK106037	Leadwell863e	11/21/1972	1/17/2020	91214
MK107609	Leadwell863e	2/21/1979	1/28/2020	23836
MK108037	Leadwell863e	1/5/1959	1/30/2020	90292
MK112378	Leadwell863e	12/23/1978	3/13/2020	41011
MK112719	Leadwell863e	5/31/1967	3/19/2020	27613
MK113124	Leadwell863e	10/12/1979	3/29/2020	92071
MK114689	Leadwell863e	6/28/1967	4/25/2020	91910
MK117837	Leadwell863e	4/17/1977	6/25/2020	93001
MK120366	Leadwell863e	4/7/1963	8/3/2020	91105
MK120379	Leadwell863e	1/12/1977	8/3/2020	8094
MK120438	Leadwell863e	8/27/1974	8/4/2020	29229
MK123349	Leadwell863e	5/29/1960	9/12/2020	93021
MK126300	Leadwell863e	6/28/1967	10/13/2020	91910
MK152075	Leadwell863e	10/9/1954	6/21/2021	92262
MK086981	Leadwell863i	1/5/1959	6/18/2019	83864
MK095651	Leadwell863i	11/9/1962	9/18/2019	08502-_
MK103089	Leadwell863i	12/16/1989	12/16/2019	22902
MK104490	Leadwell863i	12/3/1981	1/6/2020	32505
MK113843	Leadwell863i	3/30/1960	4/10/2020	95124
MK116235	Leadwell863i	6/11/1967	5/31/2020	90278
MK120437	Leadwell863i	8/29/1967	8/4/2020	49441
MK087394	Leadwell864e	9/26/1988	6/21/2019	66046
MK106764	Leadwell864e	7/8/1994	1/22/2020	36043
MK113125	Leadwell864e	5/6/1982	3/29/2020	92126
MK108713	Leadwell864i	6/1/1964	2/5/2020	89523
MK137311	Leadwell864i	3/15/1959	2/19/2021	14216
MK094426	Leadwell865e	11/1/1957	9/7/2019	91901
MK107810	Leadwell865e	6/23/1987	1/29/2020	80234
MK109289	Leadwell865e	2/3/1988	2/11/2020	92008
MK111757	Leadwell865e	9/21/1977	3/6/2020	8056
MK117572	Leadwell865e	11/3/1957	6/22/2020	91767
MK120278	Leadwell865e	10/6/1971	7/31/2020	76092
MK122251	Leadwell865e	12/9/1974	9/1/2020	98008
MK092675	Leadwell865i	1/1/1990	8/25/2019	95218
MK106121	Leadwell865i	9/25/1987	1/19/2020	90802
MK110037	Leadwell865i	9/11/1995	2/18/2020	19446
MK110573	Leadwell865i	4/11/1988	2/23/2020	85755
MK111821	Leadwell865i	2/1/1977	3/7/2020	8053

MK115454	Leadwell865i	6/27/1957	5/11/2020	85045
MK120377	Leadwell865i	9/18/1965	8/3/2020	92131
MK123359	Leadwell865i	2/9/1982	9/12/2020	73020
MK129511	Leadwell865i	5/25/1959	11/20/2020	62684
MK087139	Leadwell866i	8/26/1948	6/20/2019	95683
MK087501	Leadwell866i	6/30/1956	6/21/2019	92081
MK090878	Leadwell866i	10/7/1989	8/5/2019	64701
MK101573	Leadwell866i	7/16/1948	11/22/2019	94022
MK105103	Leadwell866i	12/2/1977	1/11/2020	123456
MK117919	Leadwell866i	6/17/1959	6/28/2020	69404
MK090379	Leadwell867e	5/19/1976	7/29/2019	85254
MK099836	Leadwell867e	11/5/1990	11/5/2019	95113
MK113210	Leadwell867e	1/7/1953	3/31/2020	92677
MK109701	Leadwell868e	03/30/1056	2/13/2020	92109
MK103780	Leadwell869i	4/14/1978	12/29/2019	90026

Professional Survey Results across 136 individuals to determine profile type, validated by subsequent vocal calls.

Respondent	StartDate			Title	Profile Type
4707884875	05/05/2016	InterWest Insurance	95864	Systems Engineer	I am observant, intelligent, inventive, and like to understand how things work
4707883447	05/05/2016		92630	IT MAnager	I am observant, intelligent, inventive, and like to understand how things work
4707741738	05/05/2016	PSAV	60176	Support Technician	I am observant, intelligent, inventive, and like to understand how things work
4707594257	05/05/2016	Chapel Hill-Carrboro City Scl	27516	Director of IT Operations	I am observant, intelligent, inventive, and like to understand how things work
4707524990	05/05/2016	LACCD	90017	Data Communications Specialists	I am easy-going, at peace, and prefer to avoid confrontations or arguments
4707377684	05/05/2016	NetApp	1245	IT Manager	I am right most of the time, very ethical, hardworking, and follow the rules
4707259420	05/05/2016	Capricorn	97435	Owner	I am confident, driven, goal-oriented, and strive to be successful
4707214387	05/05/2016	Dynamic Aviation	22812	IT Manager	I want to help others and nurture friendships and relationships
4707195198	05/05/2016	Dolby Laboratories, Inc.	94103	Senior Manager, IT Architecture	I am observant, intelligent, inventive, and like to understand how things work
4706919215	05/05/2016	Draper, Inc	47385	Director of Information Technolo	I am confident, driven, goal-oriented, and strive to be successful
4706891742	05/05/2016	Cimpress (Vistaprint)	N8P 1V9	Senior IT Manager	I am observant, intelligent, inventive, and like to understand how things work
4706001000	05/05/2016	L-3 Communications	92123	PC Support\Communications Tecl	I am confident, driven, goal-oriented, and strive to be successful
4705917111	05/05/2016	SUNY	10001	VP	I am fun, exciting, optimistic, and enjoy exploring new things
4705678325	05/04/2016	OnCore Manufacturing	92078	IT Architect	I am confident, driven, goal-oriented, and strive to be successful
4705676438	05/04/2016	Serco	3000	Director IT	I am observant, intelligent, inventive, and like to understand how things work
4705660359	05/04/2016	University of Chicago Medic	60561	Manager, Backup & Storage	I am confident, driven, goal-oriented, and strive to be successful
4705592086	05/04/2016	Nationwide	43215	Manager, IT Applications	I am observant, intelligent, inventive, and like to understand how things work
4705550206	05/04/2016	Hill College	76645	Vice President of Informationolo	I am confident, driven, goal-oriented, and strive to be successful
4705526219	05/04/2016	Paragould School District	72450	Technology Director	I am observant, intelligent, inventive, and like to understand how things work
4705496971	05/04/2016	Rider University	8648	Associate Director	I am a strong, assertive, in control, and decisive
4705431646	05/04/2016	Monical Pizza Corporation	60915	IS Specialist	I am observant, intelligent, inventive, and like to understand how things work
4705364685	05/04/2016	NCSECU	27603	Sr. Systems Engineer	I am easy-going, at peace, and prefer to avoid confrontations or arguments
4705353193	05/04/2016	Ford Motor Company	60633	Senior IT Manager	I am right most of the time, very ethical, hardworking, and follow the rules
4705249623	05/04/2016	Eversource Energy	6037	Enterprise Architect	I am observant, intelligent, inventive, and like to understand how things work
4705213233	05/04/2016	Equifax	30005	Sr Director Technology	I am confident, driven, goal-oriented, and strive to be successful
4705164717	05/04/2016	Athens Technical College	30601	Vice President for IT	I am right most of the time, very ethical, hardworking, and follow the rules
4705161630	05/04/2016	OneBlood, Inc	32819	IT Manager	I am confident, driven, goal-oriented, and strive to be successful
4705082419	05/04/2016	MT	11201	IT Analyst and Research	I am right most of the time, very ethical, hardworking, and follow the rules
4705077641	05/04/2016	First Midwest Bank	60431	Senior Project Manager	I am confident, driven, goal-oriented, and strive to be successful
4705048322	05/04/2016	AXA	7030	Head of Digital Differentiation	I am observant, intelligent, inventive, and like to understand how things work
4705045946	05/04/2016	HPE	98683	SVC Info Developer	I am easy-going, at peace, and prefer to avoid confrontations or arguments
4705044379	05/04/2016	Steiner Electric Co.	60007	EDI/eCommerce Support	I am confident, driven, goal-oriented, and strive to be successful
4705040465	05/04/2016	Tha Manhattan Club	10019	IT Director	I am a strong, assertive, in control, and decisive
4705036329	05/04/2016	Freddie Mac	22315	Director, Application Services	I am observant, intelligent, inventive, and like to understand how things work
4705030499	05/04/2016	Tulane University	70112	Assistant Vice President for Enter	I am right most of the time, very ethical, hardworking, and follow the rules
4705028818	05/04/2016	Monmouth University	7764	Dir of Service Response for Speci	I am right most of the time, very ethical, hardworking, and follow the rules
4705019455	05/04/2016	MetLife	27517	Project Manager	I am right most of the time, very ethical, hardworking, and follow the rules
4704986084	05/04/2016	Allstate	60062	Risk Management & Compliance	I am confident, driven, goal-oriented, and strive to be successful
4704979670	05/04/2016	Everence	46526	Network Administrator	I want to help others and nurture friendships and relationships
4704967662	05/04/2016	University of Houston	77204	Dir. Architecture and Tech Svcs - E	I am observant, intelligent, inventive, and like to understand how things work
4704966356	05/04/2016	BNP Media	48084	IT Director	I am observant, intelligent, inventive, and like to understand how things work
4704960683	05/04/2016	Gibson, Dunn & Crutcher LLF	90071	eDiscovery SysAdmin/Sr. Program	I am easy-going, at peace, and prefer to avoid confrontations or arguments
4704946131	05/04/2016	fitzpatrick hotel group	10022	director of IT	I am easy-going, at peace, and prefer to avoid confrontations or arguments
4704945458	05/04/2016	Mediabrands	60515	Senior Network Analyst	I am observant, intelligent, inventive, and like to understand how things work
4704933278	05/04/2016	Faribault Public Schools	55021	Network Manager	I am confident, driven, goal-oriented, and strive to be successful
4704930794	05/04/2016	S&P	10041	VP - Global Head Technology Ope	I am confident, driven, goal-oriented, and strive to be successful
4704917725	05/04/2016	TMI Hospitality	58104	Project Manager	I am fun, exciting, optimistic, and enjoy exploring new things
4704911229	05/04/2016	Deutsche Bank	7302	AVP IT	I am fun, exciting, optimistic, and enjoy exploring new things
4704909668	05/04/2016	Equifax	30374	Director, Global Sourcing	I am loyal, cautious, and prefer safe, proven courses of action
4704908736	05/04/2016	ADG, LLC	48348	CIO	I am confident, driven, goal-oriented, and strive to be successful
4704887203	05/04/2016	Design Drafting Services	92117	Mechanical Design Engineer	I am right most of the time, very ethical, hardworking, and follow the rules
4704886750	05/04/2016	AIG	7922	Global F&A IT Risk, Security & Cor	I want to help others and nurture friendships and relationships
4704872305	05/04/2016	UCG	20878	Dir of Software Development	I am confident, driven, goal-oriented, and strive to be successful
4704871036	05/04/2016	Wayne Automatic Fire Sprin	34761	Director of Information Technolo	I am confident, driven, goal-oriented, and strive to be successful
4704864125	05/04/2016	SUNY	10001	SR. IT MANAGER	I am confident, driven, goal-oriented, and strive to be successful
4704860108	05/04/2016	A-dec, Inc.	97132	System Administrator	I am observant, intelligent, inventive, and like to understand how things work
4704854636	05/04/2016	Faith Baptist Schools	91304	Network Administrator	I am observant, intelligent, inventive, and like to understand how things work
4704847156	05/04/2016	RBC		Project Manager	I am confident, driven, goal-oriented, and strive to be successful
4704835288	05/04/2016	YKHC	99559	IT Security Officer	I am easy-going, at peace, and prefer to avoid confrontations or arguments
4704822028	05/04/2016	Legacy Marketing Partners	60654	Director, IT	I am observant, intelligent, inventive, and like to understand how things work
4704813987	05/04/2016	BNYM	8840	Managing Director	I am confident, driven, goal-oriented, and strive to be successful
4704813564	05/04/2016	Belton School District	64082	Director of Technology	I am confident, driven, goal-oriented, and strive to be successful
4704793886	05/04/2016	City of Odessa	79761	Software Systems Analyst	I am observant, intelligent, inventive, and like to understand how things work
4704790558	05/04/2016	AVL	48170	Director of IT	I am confident, driven, goal-oriented, and strive to be successful
4704787462	05/04/2016	Dollar Bank	15222	AVP Enterprise Production Suppo	I am confident, driven, goal-oriented, and strive to be successful
4704785397	05/04/2016	CiOX Health	30005	Sr. Director, IT Infrastructure & Solutions	
4704784135	05/04/2016	Everest	7938	VP, IT	I am observant, intelligent, inventive, and like to understand how things work
4704782675	05/04/2016	Prometheus Laboratories	92121	IS Support Supervisor	I am confident, driven, goal-oriented, and strive to be successful
4704779993	05/04/2016	Bgea	28217	Director, IT	I am observant, intelligent, inventive, and like to understand how things work
4704764553	05/04/2016	Mckinstry	98373	Architect	I am observant, intelligent, inventive, and like to understand how things work
4704763305	05/04/2016	M&T BAnk	14203	Admin Vice President	I am observant, intelligent, inventive, and like to understand how things work
4704757231	05/04/2016	WFUBMC	27157	Applications Analyst II	I am observant, intelligent, inventive, and like to understand how things work
4704751420	05/04/2016	Martin, Pringle, Oliver, Wall	67202	IT	I am observant, intelligent, inventive, and like to understand how things work
4704746809	05/04/2016	TMP Worldwide	10004	Vice President of IT	I want to help others and nurture friendships and relationships
4704739877	05/04/2016	Wastequip	28211	IT Director - Infrastructure	I am observant, intelligent, inventive, and like to understand how things work
4704737977	05/04/2016	PMA	48104	SR. IT Consultant	I am loyal, cautious, and prefer safe, proven courses of action
4704732721	05/04/2016	Newalta Corporation	T3K5H8	BI/BW/BO Technical Analyst	I am confident, driven, goal-oriented, and strive to be successful
4704731461	05/04/2016	Kolcraft Enterprises, Inc	60607	Director, Information Technology	I am right most of the time, very ethical, hardworking, and follow the rules
4704723473	05/04/2016	Belhaven University	39202	IT Director	I am observant, intelligent, inventive, and like to understand how things work
4704719841	05/04/2016	Sacred Heart University	6825	Manager of Information Systems	I am observant, intelligent, inventive, and like to understand how things work
4704717058	05/04/2016	Pioneer Balloon Company	67220	System Analyst	I am observant, intelligent, inventive, and like to understand how things work
4704716752	05/04/2016	Lux	45040	VP of IT	I am observant, intelligent, inventive, and like to understand how things work
4704715826	05/04/2016	Allstate Insurance Co.	28078	Manager - Operations Technology	I am fun, exciting, optimistic, and enjoy exploring new things
4704714057	05/04/2016	FPG Child Development Inst	27510	Director of IT	I am easy-going, at peace, and prefer to avoid confrontations or arguments
4704713612	05/04/2016	Broadcast Music, Inc.	37203	Sr Director, Client Ops	I am loyal, cautious, and prefer safe, proven courses of action
4704713335	05/04/2016	Southern Virginia University	24416	Executive Director of Campus Ope	I am observant, intelligent, inventive, and like to understand how things work
4704712492	05/04/2016	Dex Media	1949	Manager - Windows Server, Mess	I am observant, intelligent, inventive, and like to understand how things work
4704708352	05/04/2016	AIG	7302	Information Officer	I am right most of the time, very ethical, hardworking, and follow the rules
4704705217	05/04/2016	Jockey International Inc.	53140	IT Businsess Systems Manager	I am right most of the time, very ethical, hardworking, and follow the rules
4704698288	05/04/2016	Pikes Peak Hospice	80906	Systems Administrator	I am observant, intelligent, inventive, and like to understand how things work
4704694170	05/04/2016	Dassault Systemes	80021	Systems and Storage Engineer	I am unique and creative and others may think I march to a different beat
4704692209	05/04/2016	Amerisure	48331	CTO	I am confident, driven, goal-oriented, and strive to be successful
4704689239	05/04/2016	Shallowater ISD	79363	Technology Director	I am observant, intelligent, inventive, and like to understand how things work
4704688874	05/04/2016	Opus Holding, L.L.C.	55343	CIO	I am a strong, assertive, in control, and decisive
4704688380	05/04/2016	Jo		IT Manager	I am observant, intelligent, inventive, and like to understand how things work
4704684909	05/04/2016	Karcher	92121	Senior IT Engineer, Staff	I am confident, driven, goal-oriented, and strive to be successful
4704683931	05/04/2016	Geosyntec Consultants	30319	Voice/Network Engineer	I am observant, intelligent, inventive, and like to understand how things work
4704683583	05/04/2016	LVC	17003	Manager of Infrastructure	I am a strong, assertive, in control, and decisive
4704682218	05/04/2016	Best Best & Krieger LLP	92501	Director of Information Services	I am observant, intelligent, inventive, and like to understand how things work
4704681735	05/04/2016	intelligrated	45011	Director IT Infrastructure	I am confident, driven, goal-oriented, and strive to be successful