



THE MOLECULAR UNDERPINNINGS OF HUMAN WIRING

Independent White Paper

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AcuMax Index® is premised on the belief that the drives of autonomy, communication, work style and decision making are the product of human hardwiring. While much research as to the causes and expression of hardwiring remains to be initiated, interpreted and published – there is a growing body of knowledge of the impact on personality at the molecular level which sheds considerable light about “hardwiring” which this white paper seeks to discuss further in the context of the human hardwiring measured by AcuMax.

There’s a growing problem with the rapid emergence of self-proclaimed “change agents” in the field of training and development who are focused on futile efforts to change people. This paper proposes an alternative way of utilizing the data from personality assessment and neuroscience (neuro-transmitters) and hormones secreted by the endocrine system; specifically, dopamine, estrogen, serotonin and testosterone. When these factors of *hardwiring* are looked at holistically, as a harmonious system, there is little possibility for change, but many opportunities for optimization through a coaching methodology designed to work within the parameters of what’s available to help an individual apply their personality deliberately and to its fullest potential. This paper proposes this alternative as a more effective form of coaching and development that preserves the essence of being.

Leadership coaching or “coaching” in general has become a buzzword over the last several years. Many organizations continue to rely on engagement models as a barometer for quality of culture, leadership, and overall satisfaction; variables that are often statistically dependent on coaching and mentoring and a leader’s ability to motivate and influence. In

2006, International Coach Federation (ICF) and PricewaterhouseCoopers conducted a study to fully understand the growth of this industry. ICF membership grew from approximately 11,000 in 2006 to almost 19,000 by the end of 2011. Even though this industry has more revenue opportunity than qualified professional coaches, it's saturated with ineffective, impractical and outdated content. Most professional coaches rarely utilize science to capture baseline data and instead focus on learning and sharing best practices discovered by those who are experiencing the same challenges and sharing the same opportunity. There is very little respect or appreciation for the variable of hardwiring in the process of coaching and more emphasis and effort on the corrosive idea that anyone can be whoever they want to be. This, after all, plays nicely into the idea of utilizing a toolbox of "best practices" that's sold with the intent to recreate the successes of other "successful" leaders. If Bill Gates can do it, so can you! This ill-fated and oft practiced coaching methodology may offer short-term success, but what about long-term sustainability?

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in the literature. This white paper proposes a connection between a variety of neurotransmitters and hormones with the AcuMax Index® wiring drives (A, B, C, D).

The basis of this white paper is contextualized by the measurable factors (Drives A, B, C, D) of wiring measured by the AcuMax Index® (AI). The relationships between AI drives and biological references later mentioned stem from common personality factors similarly defined and shared between AcuMax Index® social drives (High B and High C) and task drives (High A and High D) with Extraversion and Neuroticism as part of "Eysenck's Three Factor Model of Personality" and novelty seeking as part of "Cloninger's Model of Personality." Both Eysenck's and Cloninger's research have been validated with a variety of scientific methods to identify correlations between personality factors and neurotransmitters that are more active in specific regions of the brain.

The four drives measured by AI are calculated by a specific weighting (algorithm) based on adjectives selected on a psychometric survey. Certain task adjectives result in more intensity on the higher end of the A and D drive scales and certain social adjectives result in more intensity on the higher end of the B and C drive scales. E.g., when both A and D drives are high (more intense), this results in task-orientation. When both C and B drives are high (more intense) this results in social-orientation. This also implies, task orientation that can *often* be rational and unemotional, as a result of High A and/or High D, and may be mitigated by High B and/or High C that can *often* be social and emotional. The following refers to research that posits the neuro-transmitters responsible for this.

The medial and lateral dopamine tracts originate in the primitive part of the brain, referred to as the "limbic system" and end in the cortex, more commonly responsible for the executive functions such as logical decision making and planning. Both of these tracts carry the

neurotransmitter, dopamine. The lateral tracts are responsible for strategic thinking, rational thought, focus, control and are unemotional. The medial tracks are responsible for action, aggression, creativity and impulsive behavior.

AI drive patterns with higher intensity within the “A” drive results in behaviors related to autonomy, dominance, and aggression. High A profiles, when faced with challenges are naturally able to problem solve with little dependency on others for direction. These profiles may be difficult to work with and manage due to their preferences for autonomy and their drive to do things their way. When coupled with a high intensity D drive, this profile (High A and High D; Low B and C), becomes both independent and exhibits elements of a predisposition to perfectionist tendencies. Multiple studies conducted on the hormone testosterone have provided a wealth of reliable data showing the effects of testosterone in reproductive behavior and not directly correlated with personality. Conversely, there are also numerous studies that detail testosterone’s effects on personality through extensive research around cognitive and emotional functioning. One study in particular, children who had been exposed to high concentrations of testosterone as a fetus are more likely to exhibit autistic traits such as a difficulty in empathizing and enhanced abilities analyze, explore and extract the rules that underlie complex systemsⁱ. There are more well-known studies focused on T levels in psychopathy that reveal high testosterone level, when higher than cortisol (mentioned later), dictate the functioning of the amygdala, fostering minimal empathy, aggression and antisocial behaviorⁱⁱ. The Psychoticism / Socialisation dimension of Eysenck’s Three Factor Model of Personality presents a susceptibility to behaviors associated with psychoticism such as Achievement-orientation, dogmatism and cognitive resiliency. Although this scale is associated with a propensity for psychotic tendencies in certain environments, the AI D Drive measures the intensity of similar

behaviors such as those that favor: a) moderate to obsessive loyalty, b) calculated decision making to highly neurotic and analytical thinking, and c) unorthodox to rigidly conventional behavior. With this said, AI does not offer the algorithm to measure psychoticism, but does in fact accurately measure behaviors that fall within the same spectrum. Additionally, the High A drive patterns that are both High A and High D (with B and C greatly reduced are) is an explicitly task-oriented profile susceptible to disregarding rules they don’t believe in and/or do not further their agenda. Both of these drives, when high, are a result of the interplay between dopamine and testosterone.

As stated above, AI drives A and D, when high, are considered as task-dominant drives. When AI is utilized as a coaching tool to facilitate the process of optimization, the social drives, High B and High C are leveraged to mitigate the abrasive impact of High A and/or High D. This is validated by tracking and observing the energized changes in the “adjusted self” defined as how an individual is consciously trying to demonstrate behaviors that are either not present in their “natural-self” or present, but underutilized. 87% of subjects (n=475) tracked over an 8 month period, clearly reveal evidence of the impact social drives have on task drives. As a social drive increases (becomes more intense), task drives decrease even though the natural-self was static over this same 8 month period. 60% of these same subjects reported feelings of enlightenment, optimism, hopefulness and happiness.

Over the last decade, there has been a wealth of breakthrough science and technology devoted to the idea of positive emotions and the biology that drives these emotions. Through studying the aspects of “positive psychology”, many researchers in affective neuroscience have also identified the biological effect on the neurotransmitters that result in an increased allostatic load on individuals that is often detrimental to healthⁱⁱⁱ. One study in particular

showed individuals who have a high need for power and control, especially when this need is higher than affiliation, engages the Sympathetic Nervous System (SNS) (fight or flight response) and releases a variety of stress inducing neurotransmitters like norepinephrine. These same studies suggest carrying this allostatic load fosters the susceptibility to hypertension, myocardial infarction, chronic infections, autoimmune disorder, obesity, influenza, heart failure and diabetes^{iv}. As discussed earlier in this paper, High A and High D drive patterns are task-oriented profiles prone to challenge the status quo and who desire independent control of their environment. The activation of the SNS is obviously not exclusive to task-oriented profiles, but the combination of the intent to control and the chemicals responsible for these drives (High A and High D) certainly creates the optimal environment for SNS activation.

When coaching task-oriented profiles, there's usually a methodology that involves helping the subject understand and demonstrate empathy more frequently. Empathy, along with a variety of other social behaviors, is part of the High B drive measured by AI. As one study shows, testosterone, mentioned earlier in this paper, reduces the ability to empathize^v. This is especially apparent when the A Drive and D Drive are significantly higher (in intensity) than the B Drive. Although extroversion is present, the task orientation overrides the ability to demonstrate empathy. Another study shows, using the "big five personality traits", castrated males treated for sexual reassignment or prostate cancer demonstrated increases in "extraversion" and "agreeableness" when administered with supplemental estrogen. The evidence supports the correlation between estrogen and extroversion and also confirms the challenges in coaching task-oriented profiles to be more empathetic with others. Conversely, when these subjects are encouraged to practice empathy more frequently, they begin to develop relationships by finding commonalities with individuals they work with and/or manage. However, the biological effects of empathy are

not a significant suppressant of the SNS. Even though these subjects are developing relationships with others, their need for control and achieving the outcome is evident, especially in high pressure situations. Estrogen and empathy play a crucial factor in helping task-oriented profiles develop their social or emotional intelligence, but are not effective in the sustainability of long-term and meaningful relationships.

Another AI social drive, High C, is more effective (than High B) when applying the same coaching methodology on High A, High D profiles. Affiliation is an essential motivator for High C profiles and is usually established from compassion. This compassion, due to the need for affiliation, has significantly more impact on suppressing the SNS and results in a cognitive override of impulsivity and unemotional analysis. One study in particular presents compassion as a significant variable in activating the parasympathetic nervous system^{vi}. When these subjects are coached to leverage their High C drive and demonstrate compassion more frequently, they become less stressed, less overwhelmed and are able to problem solve around people-related issues that otherwise frustrate High A, High D profiles. This study shows, when demonstrating compassion, a release of oxytocin and vasopressins, like serotonin and cortisol, reduce the levels of norepinephrine, the neurotransmitter earlier referenced and responsible for allostatic load. High C profiles are naturally able to demonstrate compassion more effectively than High B profiles. Especially when aggression becomes inappropriate, high serotonin levels reduces this aggression and fosters prosocial behaviors.^{vii} This "affiliating" response is clearly noticeable with High C/Highest C AI drive patterns and especially useful when coaching a High C profile to spend more time getting to know their direct reports. When the D drive is high, there's a greater need to focus on the tasks, timelines and details of how the work is being done which can easily and inaccurately define the impressions of others. When the C Drive is high and optimized,

the manager is able to “relate” more effectively with their direct reports by discussing common challenges and focusing on proposed solutions favoring both perspectives. The affiliative response is the chemical chain reaction of oxytocin and serotonin that mitigates some of the intensity experienced from the High D drive. Lastly, another unique characteristic of High C profiles is patience. High C profiles usually have a “plan” in mind - which needs to be executed as arranged - and are often deliberate and methodical in their approach. This isn’t a particularly novel concept about High C profiles; in fact, at times, their patience and need for predictability can be difficult to manage during organizational change. Recent research focused on the serotonergic system^{viii} confirms serotonin regulates patience and reduces impulsive behavior, but also proposes the importance of what’s referred to as “waiting to obtain reward”. High C profiles will effectively leverage their patience and ability to create process if they believe there’s a pay-off. When coaching High C/High D profiles, serotonin contributes to a healthy and productive approach to change management when they are offered some form of acceptable compensation upon completion. Testosterone and dopamine’s effect on tasks that rely on inter-personal

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collaboration, especially when these interactions are essential to project success, can result in negative outcomes such as high employee turnover. As individual contributors, High A, High D profiles are often very effective due to their ability to quickly deliver on tasks that require high amounts of detail and a high pressure, demanding timeline. To understand, at a molecular level, what drives wiring allows us to understand, manage and optimize the interplay between these drives. When a social drive like High B or High C is present in a task-oriented profile our coaching methodology should include optimizing this social drive to increase the dynamics of a profile. The old adage, “you can lead a horse to water, but you can’t make it drink,” summarizes the futility of leadership coaching, especially when there’s a failure to consider the totality of what’s involved with what makes another individual tick.

Everything happens at a molecular level and helping others to understand and engage their natural wiring fully optimizes their natural abilities. One’s hardwiring isn’t so much about leading the horse to water as much as it’s about teaching others

how to utilize that water when they need it most.

ⁱ Auyeung, B. et al. Br. J. Psychol 100, 1-22 (2009)

ⁱⁱ J Abnorm Psychol. 2011 May; 120(2): 389-399

ⁱⁱⁱ Dickerson, Sally S. & Kemeny, Margaret E. 2004. Psychological Bulletin 130(3): 355-391.

^{iv} Sapolsky, R.M 1996. Why stress is bad for your brain, Science. August 9, 1996. 273: 749-750

^v Honk, Schutter, Bos, Kruijt, Lentjes, Cohen (2011) Testosterone administration impairs cognitive empathy in woman

^{vi} Boyatzis, Smith, Blaize (2014) Developing sustainable leaders through coaching & compassion

^{vii} Young, Moskowitz, Serotonin and affiliative behavior.

^{viii} Miyazaki, Miyazaki, Doya (2011), The Role of Serotonin in the Regulation of Patience and Impulsivity. 45: 213-224.