Chapter 9
Consciousness-Based Education:
Effects on Brain Integration and Practical Intelligence

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ABSTRACT

Consciousness-based education balances academic challenge with students' ability to master the material (1) using a block system to spread academic work across the semester, (2) teaching strategies to connect individual lectures to larger discipline principles, and (3) incorporating Transcendental Meditation practice into the curriculum. Brain integration and constructive thinking were compared in 27 freshman/senior pairs involved in consciousness-based university education. As seniors, these subjects had higher levels of brain integration, associated with emotional stability and success in life, and higher global constructive thinking, associated with work success and stable personal and social relationships. These variables typically do not change during college.

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INTRODUCTION

The brain is not a static structure, but a self-adapting organ that continually modifies connections between individual neurons based on ongoing experiences (Buonomano & Merzenich, 1998). For instance, in violin players, brain areas that represents the left hand, which is constantly taking new positions to make different chords, are eight times larger than those that represent the right hand, which simply holds the bow (Elbert, Pantex, Wienbruch, Rockstroh, & Taub, 1995). Experienced taxi-cab drivers compared to novice drivers have more dense connections in areas of the brain needed to drive a cab: computing routes, calculating travel times, and changing routes in response to traffic or construction obstruction (Maguire, Woollett, & Spiers, 2006). Similarly, experienced interpreters have more extensive connections in brain areas related to learning, motor control and executive functioning (Hervais-Adelman, Moser-Mercer, & Golestani, 2015).

The environment and culture, including levels of stress and sleep deprivation, leave their mark on the structure and functioning of the brain (Ansari, 2015). Repeated stressful experiences cause high secretion of glucocorticoids that lead to decreased hippocampal mass (Sapolsky, 1996), which is an important brain area for memory. Stress also leads to decreased size of the prefrontal cortex (Kim et al., 2014), which is important for executive functioning. Fatigue also impacts frontal functioning. Lack of sleep reduces blood flow to the prefrontal executive areas (Arnsten & Goldman-Rakic, 1998) leading to reduced vigilance (Pattyn, Neyt, Henderickx, & Soetens, 2008), lower moral reasoning (Olsen, Pallesen, & Eid, 2010), higher prevalence of car accidents (Summala & Mikkola, 1994), and higher incidents of misdiagnoses by nurses (Daly & Wilson, 1983).

Academic learning during college years changes the brain. Law students who did additional studying to prepare for their LSAT had enhanced development of prefrontal attention circuits compared to law students who were planning to take the LSAT in the future, and so did not study extra (Mackey, Whitaker, & Bunge, 2012). Musicians compared to non-musicians exhibit more connections in the hippocampus and medial and superior frontal regions, as well as insula and posterior cingulate areas (Groussard et al., 2014). A recent study reported that complex training environments such as action video games enhanced brain plasticity and learning capacity (Bavelier, Green, Pouget, & Schrater, 2015).

College students are reported to have higher levels of physical and psychological stress and related behaviors compared to working adults (Feld & Shusterman, 2015). The three leading causes of college stress—academic performance, pressure to succeed, and post-graduation plans—are leading to increasing numbers of students visiting university counseling centers over the last five years (Beiter et al., 2015).