The Acute Effects of a Single Bout of Exercise on Brain and Cognition

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There is a growing public health burden of physical inactivity among individuals of industrialized nations. Children have become increasingly inactive, leading to concomitant increases in the prevalence of being overweight and unfit. Poor physical activity behaviors during childhood often track throughout life and have implications for the prevalence of several chronic diseases during adulthood. Particularly troubling is the absence of public health concern for the effect of physical inactivity on brain and mental health, including cognition. It is curious that this has not emerged as a larger societal issue, given its relationship to increased body mass and other mental health disorders (e.g., depression, anxiety) that have captured public attention. My research program has investigated the relation of physical activity to cognitive and brain health. *In this talk, I will specifically focus on the relationship of single doses (i.e., bouts) of exercise on acute, transient changes in brain and cognition.* My techniques of investigation involve a combination of multimodal neuroimaging, behavioral assessments, and scholastic outcomes in an effort to translate basic laboratory findings into everyday life. Central to this translational approach is the identification of etiological substrates of brain networks that are susceptible to health behaviors. As such, the overarching goal of my research program is to determine factors that improve cognition, maximize brain health, and promote the effective functioning of individuals across the lifespan. Findings from my research have indicated that single bouts of exercise are positively related to acute changes in brain function, executive function, and scholastic achievement. Such discoveries are timely and important for public health concerns related to chronic disease prevention as a function of childhood inactivity. These findings link pervasive societal concerns with brain health and cognition, and have implications for the educational environment and the context of learning.