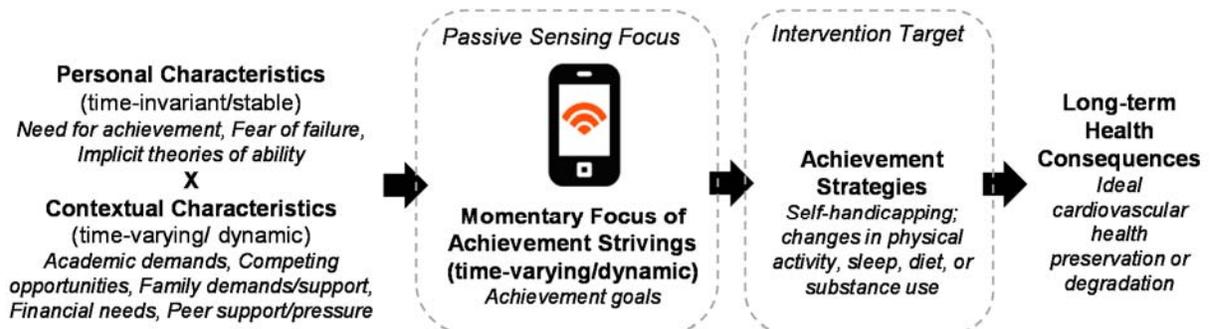


**Vision Statement – David Conroy, Ph.D.**  
**Future Technology to Preserve College Student Health and Foster Wellbeing**

**Passively-Sensing & Regulating Motivation to Integrate the Pursuit of Competence & Health**

Every year, universities compete to recruit the most promising emerging adults in America to fill their incoming classes. These talented and hard-working students have aspirations of developing into creative artists, innovative scientists, and titans of industry. As students negotiate the competing demands of college life, their pursuit of excellence can, at times, become single-minded and introduce behavioral adaptations that detract from long-term health. For example, they may sacrifice sleep in service of studying, sobriety for stress relief, exercise in exchange for extra time, or productivity in favor of procrastination. Given the intelligence of these students, it is implausible to think that these short-sighted decisions reflect intentional self-sabotage or an explicit rejection of healthy living. Instead, it seems more likely that these decisions reflect momentary compromises between competing demands for competence and health. Sometimes students organize their behavior in a way that leads to symmetrical wins for competence and health; at other times, they organize their behavior asymmetrically and compromise their health behavior in order to achieve short-term academic/professional goals. Thus, the ways in which students' competence pursuits are energized and oriented can impact their health behaviors and long-term health trajectories. This vision is predicated on the **assumptions** that competence and health behaviors are not mutually-exclusive and behavior can be organized to serve both goals. Developing the technology to sense and shape the dynamics of students' competence motivation automatically while minimizing burden during this critical developmental period will provide a powerful new tool for preserving health.

What is competence motivation and how can it be sensed? Competence motivation refers to the processes that energize, orient, and sustain achievement-related behaviors. These processes unfold over time as people interact with and respond to the context around them. Historically, motivation has been inferred from self-reports of dispositions and states in different contexts. Advances in pervasive computing open new possibilities for detecting the ebb and flow of motivation in near real-time. Patterns of data that predict suboptimal or dysfunctional strivings (defined here as those leading to asymmetrical decisions about competence vs health) could be used to trigger motivational interventions that would lead to more symmetrical pursuits of competence and health. These interventions could take a number of forms, including individual appeals (e.g., text messages), automatic scheduling constraints (e.g., blocking calendar time for healthful activities), financial incentives (e.g., Dutch lottery opportunities), and motivational priming (e.g., game-like tasks to activate more optimal motivational processes). Figure 1 summarizes this conceptual model.



**Figure 1.** Conceptual model of health-influencing achievement strategies arise out of motivational dynamics generated by students in context

Over the past 50 years, psychologists have developed many theories of competence motivation. The most integrative model to date is the hierarchical model of achievement motivation. Two constructs from that model are highlighted for this vision statement. The first is the aversive achievement motive, **fear of failure**. This motive reflects a tendency for one's competence pursuits to be energized by shame that is aroused by the mere prospect of failing. This anticipatory emotion produces self-protective behavior which can manifest in self-sabotaging cognitive or behavioral withdrawal. Although strong fear of failure can cripple competence pursuits, some students adapt by heightening their commitment to competence (e.g., working longer hours or striving for unrealistically-high goals). The emotional demands of chronic shame-based motivation in an environment focused on achievement exerts a toll on health regardless of whether students can channel that motive to achieve at a high level. Sensing when this motive is leading students to compromise their health would open the possibility for just-in-time interventions to help them self-regulate more effectively.

The second construct of note is the **achievement goal**. These goals represent a student's momentary aim or purpose in pursuing competence. They are characterized by both a *definition of competence* (learning/improving/trying one's hardest vs outperforming others) and the *incentive* motivating behavior (succeeding vs not failing). Figure 2 illustrates four goals that often characterize competence pursuits in college students. A large literature has accumulated showing almost unequivocally adaptive consequences of mastery-approach goals, mixed

<p><b>Mastery-Approach Goals</b> <i>Striving to learn &amp; improve</i></p>	<p><b>Performance-Approach Goals</b> <i>Striving to outperform others</i></p>
<p><b>Mastery-Avoidance Goals</b> <i>Striving not to worsen</i></p>	<p><b>Performance-Avoidance Goals</b> <i>Striving not to be outperformed by others</i></p>

**Figure 2.** The 2x2 model of achievement goals

consequences of mastery-avoidance and performance-approach goals, and unequivocally dysfunctional consequences of performance-avoidance goals. For example, students who adopt performance-avoidance goals (i.e., focus on not getting the worst grade in the class) receive lower grades, experience greater anxiety, and report more physical symptoms than peers who do not adopt these goals. Sensing a shift to performance-avoidance goals in particular would be valuable for triggering interventions to reorient achievement strivings.

Overall, the vision outlined here is one based on the idea that **some forms of competence motivation can lead ambitious and intelligent students to compromise their health**. The challenge is to **develop passive-sensing technology that reveals these motivational dynamics**. When students' competence motivation creates a vulnerability, we can deliver just-in-time adaptive interventions that appeal to the better angels of their motivation and help them resist the demons that compromise both their competence and health in the long-term. By balancing the pursuit of competence and health, we can help college students to develop competence and preserve health, accelerate their maturation, smooth their transition into adulthood, and establish a strong foundation for healthy habits across adulthood.

**Background/Credentials of the Proposer:** David E. Conroy, Ph.D., is a Professor of Preventive Medicine at Northwestern University. He seeks to understand why people fail to move enough despite abundant evidence that physical activity is health enhancing so he can develop more effective behavioral interventions to improve population health. Dr. Conroy spent 15 years investigating achievement motivation and, over the past decade, shifted his focus to infer mechanisms underlying health behavior change. He has over 90 peer-reviewed publications, delivered invited talks in North America, Europe, and Asia, and is a member of the editorial board for several major journals in exercise and health psychology. His work has been funded by grants from the National Institutes of Health as both a principal investigator and co-investigator.