

A Digitally Engaged Community Can Create a College Culture of Health

College provides a living laboratory to study habit formation. Uprooted from their home environments and given more autonomy than ever previously, students need to engineer new lifestyle patterns that balance competing constraints. Personal and parental academic pressures, financial stressors, and new social relationships all need to be managed in a novel community that has some oddities. One oddity is that students are, for the most part, cloistered away from contact with members of disparate groups and generations. Hence, they lack connection with different others who might help them place their academic worries into a broader life perspective. The second oddity is that, although college administrators are tasked to advocate *in loco parentis* for students' wellbeing, their job contingencies bias them to share the students' excess valuation of academic success, relative to other aspects of wellbeing. The student health-related challenges that do capture the concern of high-level campus administration tend to be publicly visible and media-worthy: binge drinking, sexual violence, suicide. In contrast, an insidious health threat that occurs quietly, without fanfare, and without champions for change is the loss during the college years of 13-20% of long-term health due to the acquisition of chronic disease risk behaviors (e.g., overeating, physical inactivity, smoking). Once acquired, these unhealthy lifestyle behaviors are more likely to persist than to improve over the life course, undermining long term health and well-being.

Preventing the acquisition of chronic disease risk behaviors during college is a hard problem that exemplifies many core challenges in the science of behavior change. The significant health threat to be addressed is not motivationally compelling to the major constituencies managing students' lives – students themselves, college administrators, parents. The shared priority that does dominate these groups' attention is academic success, which many students perceive as being in competition with taking time to practice healthy eating, physical activity, and social interaction. Even if students could be gotten to try to improve these health behaviors, few would know where to begin: most do not know how many calories or fruits and vegetables they currently consume or how many minutes of moderate-vigorous intensity physical activity they now accumulate. Moreover, given their other priorities and time constraints, few students could be expected to engage in the burdensome self-monitoring activities that remain the state of the art in changing lifestyle behaviors. And yet without effective preventive strategies, even this best-educated segment of our population can be expected to be swept up into the ongoing epidemic of obesity, inactivity, and related chronic disease.

To effectively treat and prevent further acquisition of risk behaviors, we can envision an intervention with three components: technical, motivational, and sociocultural. The technical component addresses the challenge of obtaining dense personally meaningful data from students without requiring them to perform burdensome, volitional self-monitoring. The proposed solution involves the use of smartphone, environmental and worn sensors that allow low-burden, passive sensing of physical activity, sleep, stress, eating, smoking, and energy absorption. The application of data mining strategies will make it possible first to detect and then to predict an individual's health risk behaviors in real time, learning the digital and contextual markers that signify increasing states of behavioral risk. The added

elegance of this technical strategy is that it steps partway toward addressing the students' low motivation for health behavior change because the receipt of highly personalized behavioral feedback is so highly engaging. To further motivate students, we propose to engage them in conducting personalized N=1 experiments, whereby they study the effects of intentionally worsening and improving their risk behaviors on outcomes they personally care about (grades, stress, appearance). Whereas self-experimentation can be expected to heighten the student's individual, personal motivation for health behavior change, social engagement is needed to reshape socio-cultural norms in ways that will sustain healthy lifestyle changes. The more densely interconnected is the network of community members that is actively committed to healthy lifestyle change, the stronger and more consistent will be the norms and the positive reinforcement for healthy lifestyle behaviors. Hence, students and members of the surrounding community who collectively share the same neighborhood surroundings can be engaged to collaboratively invent a toolbox of solutions to overcome barriers to creating a culture of health. For example, since lack of time is the most widely cited barrier to physical activity, a computer science project group can collaboratively design a scheduling app that finds free time and suggests appealing exercises. Students and older community members can team up to co-invent and populate a social media space with healthy recipes, local restaurant menu options, walks, and community events. In so doing, they create a culture of health by establishing healthy lifestyle norms and a toolbox of tactics to achieve them in the digital and environmental space surrounding the college campus.

Biographical Sketch

Bonnie Spring is an expert in developing efficient, effective, scalable technology-supported interventions to foster multiple health behavior changes in diet, physical activity, and tobacco use. After receiving her PhD from Harvard University and becoming board certified in clinical health psychology, she launched a health promotion research program that has been continuously federally funded for more than 30 years. Currently, she directs the Center for Behavior and Health at Northwestern University, where she is Professor of Preventive Medicine, Psychology, Psychiatry, and Public Health. She also serves as the University's Team Science Director and Program Leader for Cancer Prevention. A past president of the Society of Behavioral Medicine, she is a winner of the Society's Research to Practice Translation and Distinguished Research Mentor awards. A winner of The Obesity Society's e-Health Pioneer Award, she is also Immediate past chair of the American Heart Association's Behavior Change Committee, a standing study section member for the National Institutes of Health (NIH), an elected member of the American Psychological Association's (APA) Board of Scientific Affairs, past member of APA's Advisory Steering Committee on Treatment Guidelines, and Founding Editor and Editor-in-Chief of *Translational Behavioral Medicine*. Her NIH-funded learning modules on evidence-based practice (www.ebbp.org) and the science of team science (www.teamscience.net) are freely available online.