



Adolescents' expectations for the future predict health behaviors in early adulthood

Thomas W. McDade^{a,b,*}, Laura Chyu^a, Greg J. Duncan^c, Lindsay T. Hoyt^{a,d}, Leah D. Doane^e, Emma K. Adam^{a,d}

^a Cells to Society (C2S): The Center on Social Disparities and Health, Institute for Policy Research, Northwestern University, Evanston, IL 60208, USA

^b Department of Anthropology, Northwestern University, 1810 Hinman Avenue, Evanston, IL 60208, USA

^c Department of Education, University of California, Irvine, CA 92697, USA

^d Program on Human Development and Social Policy, Northwestern University, Evanston, IL 60208, USA

^e Department of Psychology, Arizona State University, Tempe, AZ 85287, USA

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ABSTRACT

Health-related behaviors in adolescence establish trajectories of risk for obesity and chronic degenerative diseases, and they represent an important pathway through which socio-economic environments shape patterns of morbidity and mortality. Most behaviors that promote health involve making choices that may not pay off until the future, but the factors that predict an individual's investment in future health are not known. In this paper we consider whether expectations for the future in two domains relevant to adolescents in the U.S.—perceived chances of living to middle age and perceived chances of attending college—are associated with an individual's engagement in behaviors that protect health in the long run. We focus on adolescence as an important life stage during which habits formed may shape trajectories of disease risk later in life. We use data from a large, nationally representative sample of American youth (the US National Longitudinal Study of Adolescent Health) to predict levels of physical activity, fast food consumption, and cigarette smoking in young adulthood in relation to perceived life chances in adolescence, controlling for baseline health behaviors and a wide range of potentially confounding factors. We found that adolescents who rated their chances of attending college more highly exercised more frequently and smoked fewer cigarettes in young adulthood. Adolescents with higher expectations of living to age 35 smoked fewer cigarettes as young adults. Parental education was a significant predictor of perceived life chances, as well as health behaviors, but for each outcome the effects of perceived life chances were independent of, and often stronger than, parental education. Perceived life chances in adolescence may therefore play an important role in establishing individual trajectories of health, and in contributing to social gradients in population health.

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Introduction

Health behaviors related to physical activity, diet, and smoking are key determinants of risk for obesity and chronic degenerative diseases in adulthood, and adolescence is an important developmental period during which trajectories of risk are established. Adolescence is often characterized as a period of perceived invulnerability, but adolescents greatly overestimate the chances they will die in the near future (Fischhoff et al., 2000; Fischhoff, Bruine de Bruin, Parker, Millstein, Halpern-Felsher, 2010; Hurd &

McGarry, 1995; Jamieson & Romer, 2008). At the same time, adolescents may underestimate the negative consequences associated with some problem behaviors (Reyna & Farley, 2006). Elevated rates of delinquency and risk taking in adolescence have led some scholars to speculate that low expectations for the future, or an orientation toward the present rather than the future, may contribute to high risk behavior during this developmental period. Several studies have demonstrated significant associations between these temporal constructs and the likelihood an adolescent will engage in substance use/abuse, unsafe sexual activity, violence, crime, and attempted suicide (Borowsky, Ireland, & Resnick, 2009; Caldwell, Wiebe, & Cleveland, 2006; Harris, Duncan, & Boisjoly, 2002; Kruger, Reisch, & Zimmerman, 2008).

While delinquency and other conspicuously dangerous activities have important implications for adolescents, their families, and

* Corresponding author. Department of Anthropology, Northwestern University, 1810 Hinman Avenue, Evanston, IL 60208, USA. Tel.: +1 847 467 4304; fax: +1 847 467 1778.

E-mail address: t-mcdade@northwestern.edu (T.W. McDade).

their communities, this paper focuses on the role of expectations for the future in shaping common health behaviors that set the stage for chronic disease risk later in life. Cardiovascular disease (CVD) is the leading cause of death in the U.S., and a major cause of disability and lost productivity (U.S. Department of Health and Human Services, 2007). While diabetes and CVD have historically been considered diseases of aging, recent research has traced their origins to lifestyle factors much earlier in life related to recent increases in rates of overweight and obesity among children and adolescents (Freedman, Khan, Dietz, Srinivasan, & Berenson, 2001; McGill et al., 2002). Health behaviors are primary tools for the prevention and management of cardiovascular and metabolic diseases, and recent recommendations encourage people to quit smoking, maintain healthy body weight, engage in daily physical activity, and reduce intake of saturated and trans fats, cholesterol, sodium, and simple sugars (Grundey et al., 2005; Lichtenstein et al., 2006).

What factors predict an individual's willingness to commit to these kinds of health-promoting behaviors? Do lower expectations for the future undermine the adoption of positive health behaviors in the present? Research on time perspective and future discounting suggests that these types of considerations may be relevant to individual decision-making, with implications for individual health as well as disparities in population health (Guthrie, Butler, & Ward, 2009; Kruger et al., 2008). Time perspective evaluates the degree to which the past, present, or future serves as a temporal point of reference guiding an individual's attitudes and behaviors (Zimbardo & Boyd, 1999). For example, orientation toward the present has been associated with higher likelihood of drug and alcohol use (Keough, Zimbardo, & Boyd, 1999), and higher levels of formal education have been significantly associated with stronger orientation toward the future (Guthrie et al., 2009).

A distinct, but related concept of time preference considers the extent to which individuals favor immediate utility over delayed utility, and the reasons why less value may be assigned to future events (Frederick, Lowenstein, & O'Donoghue, 2002). The long-term benefits of many health-promoting behaviors are discounted by individuals to varying degrees, with implications for behavior in the present. For example, avoidance of cardiovascular disease may be seen as a long-term benefit of a low fat diet, but fatty foods typically taste good. Their short-term utility may tip the balance toward their consumption despite potential long-term costs to an individual's health. Higher rates of future discounting have been positively associated with alcohol consumption in adolescence (Bishai, 2001), and recent increases in the marginal rate of time preference have been hypothesized as a mechanism contributing to the global epidemic of obesity (Komlos, Smith, & Bogin, 2004).

In this analysis we investigate the role that perceived life chances in adolescence may play in decisions regarding health behaviors. We focus on perceived life chances for two reasons. First, "nothing to lose" attitudes appear to contribute to high risk behavior in adolescence, but prior research has not considered the impact on common, everyday health behaviors that shape risk for chronic diseases that represent principal threats to public health in the US. Second, variation in perceived life chances may represent a cognitive mechanism through which socioeconomic contexts contribute to disparities in population health. Measures of income, education, and occupation are commonly used to locate individuals with respect to social position, based on the assumption that these measures serve as proxies for an individual's "life chances" (Lynch & Kaplan, 2000). Measures of perceived life chances provide an opportunity to assess this phenomenon more directly, as experienced by individuals themselves, and to evaluate whether

subjective expectations for the future are motivational with regard to health behaviors. This line of reasoning builds on prior research into the factors that shape adolescents' expectations for significant future life events (Dornitz, Manski, & Fischhoff, 2001; Fischhoff et al., 2000; Reynolds & Pemberton, 2001).

The transition from adolescence to young adulthood is an important developmental period for these issues since it is marked by increased autonomy and the assumption of greater responsibility for decisions regarding diet, exercise, and other health-related behaviors. This period is also characterized by cognitive shifts that have implications for orientation toward the future and perceptions of vulnerability (Stein, Sarbin, & Kulik, 1968). While adolescents tend to take health for granted, they have a growing ability to reflect on their own behavior, and to weigh the long-term consequences of their actions (Millstein, 1993; Weithorn & Campbell, 1982). From a life course health development perspective, adolescence therefore represents a sensitive period during which habits may form that help shape trajectories of disease risk later in life (Halfon & Hochstein, 2002).

In this paper, we investigate the extent to which levels of cigarette smoking, fast food consumption, and physical activity in young adulthood can be explained by future expectations in adolescence. Analyses employ two measures of future expectations: perceived chances of living to the age of 35, and perceived chances of attending college. We hypothesize that individuals who rate themselves less likely to live to middle age or less likely to attend college will be more likely to smoke, smoke more frequently, consume more meals at fast food restaurants, and exercise less. We also hypothesize that future expectations will be associated with SES in adolescence, but that the impact of expectations on health behaviors will be independent of SES.

Perceived mortality risk and perceived chances of attending college likely represent different domains of future orientation, with each shaped by different experiences and cognitive processes. Our focus on mortality extends prior research on the consequences of perceived risk in adolescence, while attention to college attendance recognizes the importance of higher education for future life chances in our society. College graduates earn on average \$16,000 per year more than non-graduates (U.S. Department of Education, 2009), and live about 30% longer (Meara, Richards, & Cutler, 2008). For adolescents, the prospect of attending college may be a more immediate, and perhaps more salient, gauge of their expectations for the future than perceived risk of premature death. By simultaneously evaluating both these domains we can estimate which aspects of perceived life chances are most important for predicting behavior. We test our hypotheses using prospective data from a large, nationally representative sample that allows us to examine change in health behaviors over time, and to control for a wide range of potentially confounding variables.

Methods

Participants and study design

Data come from the first three waves of the US National Longitudinal Study of Adolescent Health (Add Health), a large, nationally representative study of the social, behavioral, and biological linkages defining health trajectories from adolescence through adulthood (Harris et al., 2009). The Wave I in-home interview was conducted in 1995 following a school-based survey, and included a sample of 20,745 adolescents in grades 7 through 12. All adolescents in grades 7 through 11 in Wave I were targeted about one year later for the Wave II in-home interview. Wave II interviews were conducted successfully with about 72% of the original sample. A third wave of data collection took place in

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