Youth Survival Expectations: Disadvantaged Contexts and Forecasts for Future Health

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Abstract

In national studies, some youth report they do not think they will live into adulthood. Belief in risk for early death is more prevalent among youth of color and youth living in poverty, and may become a self-fulfilling prophecy as youth give up on self-care and future life investment. The purpose of this dissertation is two-fold, (1) to gain additional insight into the relationship between socio-developmental context and stability and change in youth survival perceptions, and (2) to describe the relationship between youth survival perceptions over time and health in adulthood. Data are from Waves I-IV of the in-home interviews from the National Longitudinal Study of Adolescent to Adult Health. The study sample included 10,120 respondents participating in all four waves (ages 11-34 years). Multinomial logistic regression models are used to examine relationships between youth socio-developmental context, including measures of resource access, experiences of adversity, and perceptions of safety, and survival perceptions during adolescence and the period of transition to young adulthood. Linear regression models are used to determine the predictive ability of perceived survival over time on adult health outcomes, including self-rated health, diagnostic profiles, and an allostatic load index. Findings reveal significant relationships between multiple aspects of youth socio-developmental context and survival perceptions. Findings also reveal significant relationships between youth survival perceptions and adult health, even with adjustment for measures of social class origin, social location, and antecedent health. Examination of youth survival perceptions may represent a unique mechanism in which to study enduring impacts of social context on youth agency, as well as a mechanism to address

health disparities by establishing a link between survival perceptions and long-term health outcomes.

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Chapter 1: Introduction

Background of the Problem

An individual's orientation to the future has implications for healthy decision-making and one's capacity for recovery in the wake of challenging and adverse life experiences. This dissertation is an investigation of a central component of individual agency, optimism about the future as expressed by youth survival perceptions. The influence of survival perceptions could operate throughout life, not just in youth, with impact on mid-life behaviors and later health as well as behaviors of individuals toward the end of life. Optimism and perceptions about life expectancy are especially threatened in times of turmoil. For large segments of the world's population, wars, civic unrest, environmental catastrophes, economic recessions and depressions, and social austerity negatively affect perceptions of safety and stability, and individuals' capacities for planning and envisioning a long life ahead (Fung & Carstensen, 2006; Västfjäll, Peters, & Slovic, 2008).

National studies indicate that a significant number of youth living in the United States (US) are severely limited in their ability to see themselves into the future, and that they overestimate their risk of dying prematurely. Using data from the National Longitudinal Study of Youth, Fischhoff and colleagues (2000) found that on average 15-16 year olds estimated their probability of death from any cause to be about 19% within

the following year and just over 20% by the end of the second decade of life. In reality, the annual death rate for US teens in this age group is less than 0.1%, and 0.4% of teens die before the age of 20 years (Minino, Heron, Murphy, & Kochanek, 2007).

In subsequent years, additional national studies have replicated findings of youth-expressed perceptions of risk for premature death. In their telephone study of fatalism among 14-22 year olds, Jamieson and Romer (2008) found that almost 1 in 15 young people perceived high risk of death by age 30 years. In a study using data from the National Longitudinal Study of Adolescent Health (Add Health, rebranded The National Longitudinal Study of Adolescent to Adult Health), Borowsky and colleagues (2009) found that nearly 1 in 7 youth respondents perceived a high risk of early death, defined as a belief in a 50-50 chance or less of survival to age 35 years. Research shows that such misunderstanding of mortality risk among youth is not without costs. Expressions of hopelessness in clinical encounters have been correlated with depression and general maladjustment (Johnson & McCutcheon, 1981; Prociuk, Breen, & Lussier, 1976), in addition to adolescent violence and risk behaviors among youth in urban and inner-city environments (Bolland, 2003; Valadez-Meltzer, Silber, Meltzer, & D'Angelo, 2005).

Belief in risk for premature death is more prevalent among youth self-identifying as of African, Latin, and Native descent and youth living in poverty (Borowsky et al., 2009; Warner & Swisher, 2015). For youth expressing perception of risk for early death, this belief may become a self-fulfilling prophecy as they give up on self-care and investment in the future. In follow-up to Borowsky and colleagues, Duke and colleagues (2011) found that persistence in youth inability to envision at least a good chance of

living into adulthood (age 35 years) was associated with poor outcomes in the period of transition to young adulthood, including high school dropout and unemployment, limited civic and community engagement, poor mental health, and a low likelihood of participation in regular physical activity. Importantly, such outcomes portend limited prospects for later socioeconomic development, such as gainful employment, healthy family formation and connection to stable peer networks, and the achievement of optimal future health.

Statement of the Problem

The inability to envision oneself living a long life presents a challenge to the development of individual agency. Agency represents an individual's role in shaping his or her environment. The self, at the core of agency, is responsible for processing experiences and managing motivation (Gecas, 2004). The self is active in creating subjective experiences (Gecas), which influence thought processes, emotions related to risk perceptions, and pessimistic and optimistic thinking about the future (Västfjäll et al., 2008). Belief in high risk for premature death may negatively affect agency via youth's internalization of environmental cues indicating little control over what happens to them and focus on seeking risk behaviors with more immediate gratification. As such, a belief in the likelihood of early mortality may have a negative effect on judgement and prosocial behavior.

During adolescence, belief in a long life is essential for the development of a healthy orientation towards the future. Future orientation operationalized as the "… human ability to anticipate future events, to give them personal meaning, and to operate

with them mentally (Nurmi, 1991, p. 4)," is built from an ability to visualize and to project oneself forward in time. One's orientation to the future is embedded in culture and socially informed. In the absence of social and developmental contexts that foster an ability to see themselves forward in time, youth may assume limited chance for survival, placing them at increased risk of poor health and behavioral outcomes throughout their lives. By extension, the health and behavioral outcomes associated with low perceived survival[1] may be a source of disparities in health within and among communities.

In the literature, future orientation is divided into contexts for educational achievement, career opportunity, romantic relationships, and family formation (Kerpelman & Mosher, 2004; McCabe & Barnett, 2000). In the absence of belief in a long life, youths' capacity to participate in planning and goal-directed behavior, necessary for achieving healthy family and career outcomes, is compromised. In early work focused on understanding developmental processes associated with youth development of future time perspective, Nurmi (1991) notes that among adolescents exhibiting risk and problem behaviors, future orientation is pessimistic and limited in time and scope. More recent work of Sharp and Coatsworth (2012) points to the importance of the perception of opportunity in developing a positive orientation towards the future. Perceptions of limited opportunities for achievement are negatively correlated

[1] In the literature, the following phrases are used interchangeably: "low perceived survival" "perception of risk for premature death", "perception of risk for early death", "early death perception" and "high perceived risk for early or premature death".

with clarity about, interest in and belief in the importance of, and optimism towards the future.

Furthermore, some literature suggests that having an optimistic orientation towards the future may be a protective factor for youth of African descent and youth living in impoverished environments (McCabe & Barnett, 2000), some of the groups of young people who express greater perceptions of risk for early death. Among rural, impoverished, African American adolescents, higher self-efficacy, a greater sense of control over their environment and responsibility for what happens to them, and positive identity development (via opportunities and subjective experiences allowing personal expression) are linked to positive future orientation (Kerpelman & Mosher, 2004; Sharp & Coatsworth, 2012).

Purpose and Scope of the Study

This study is a secondary data analysis designed to accomplish a two-fold purpose: (1) to identify characteristics of developmental domains (home, school, and neighborhood as contexts for disadvantage-advantage) related to stability and change in survival perceptions during adolescence and the period of transition to young adulthood; and (2) to evaluate relationships between youth survival perceptions over time and health outcomes in later adulthood. Data for the analyses originate from respondents participating in all available waves of the in-home interviews of the National Longitudinal Study of Adolescent to Adult Health (referred to as Add Health going forward). Available data for Add Health (Waves I-IV) covers the life course periods of adolescence through young adulthood, and into mature adulthood (Carolina Population

Center, The National Longitudinal Study of Adolescent to Adult Health, www.cpc.unc.edu/projects/addhealth).

Using data from the in-home interviews of Add Health, I evaluate the relevance of social context to adolescent survival perceptions and the relevance of youth survival perceptions to later health. Measures of context (developmental domains) include household economics and resources, experience of adversity in childhood, perceived safety in the school environment, neighborhood demographics and collective efficacy, and perceived safety in the neighborhood. Measures of health in adulthood, include self-rated health, a mental health disorder index, an index of diagnoses representing the leading causes of morbidity and mortality among adults in the US, and a measure of allostatic load (summary measure of abnormal physiological parameters in the body as noted via biomarker measurement, e.g., blood pressure, resting heart rate, body mass index). The inclusion of biomarker data in conceptions of health, particularly during the period of adulthood marking the mid-20's to mid-30's may give particular insight into disease risk well before diagnoses are usually made, sometimes 20, 30, or more years later. Any negative perception, including low perceived survival, may be a source of poor health for individuals, resulting from negative health behaviors, stress physiology, and the interaction between behaviors and activation of the stress response.

This work is important because of its relevance to a broad audience, including social and health researchers, health care providers, parents and youth advocates, and its potential to contribute to literature concerning youth development, life course, and social determinants of health. For analyses evaluating relationships between social contexts and

survival perceptions, this work will address one core question: Are there complexities in the relationship between contexts for social development and adolescent expression of perceptions of risk for early death? Assessing relationships between social context and youth survival perceptions may provide insight into intervention points for improving youth survival perceptions and by extension, youth future orientation. For health care providers in the clinic, the work has the potential to begin to address different core questions: When seeing young people, is youth expression of perceived survival important for predictions about future health? Beyond screening for depression and specific behaviors, which is currently considered best practice (Hagan, Shaw, & Duncan, 2008), should providers be asking youth explicitly about survival perceptions?

The Study in Research Context: MacArthur Foundation's Research Network on Socioeconomic Status & Health

The research for this dissertation is situated within a larger body of work outlined in the MacArthur Foundation's Research Network on Socioeconomic Status & Health (www.macses.ucsf.edu/whatsnew/). Within the work of the MacArthur Foundation, the contribution of socio-environmental context and exposure to stress over time is translated into health consequences that are cumulative. Normal functioning of key body systems, including the cardiovascular, immune, and metabolic systems, is disrupted with prolonged exposure to resource limitation and resulting stress from deficits in physical and social location (MacArthur Research Network on Socioeconomic Status & Health). Further, poor health habits, developed as a means of coping with stress and related to limitations in the immediate social and physical environment, may advance the disruption

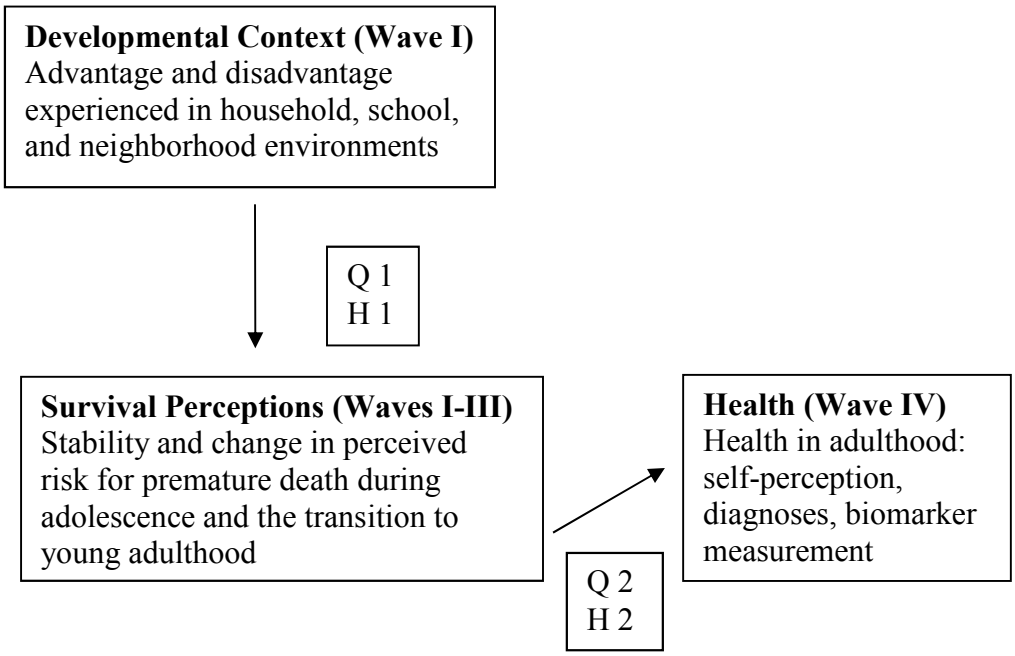
of body systems already set in place by stress physiology (MacArthur Research Network on Socioeconomic Status & Health).

Perceptions of limited survival and limited life chance may bring disproportionate susceptibility to stress and negative health. In earlier work examining relationships between young adult perception and health in later adulthood, Peterson and colleagues (1988) describe a negative and pessimistic explanatory style as a predictor for poor health in middle and late adulthood among a sample of graduates of the Harvard University classes of 1942-1944. Perceptions related to a negative explanatory framework might be even more detrimental for individuals living in disadvantaged socioeconomic environments. Youth living in chaotic and violent neighborhoods may actively engage in behaviors reflecting a negative outlook and perceptions of limited life chances, such as violence involvement and school dropout. Indeed, Fischhoff and colleagues (2000) postulate that adolescent risk-taking behaviors may be related to an exaggerated feeling among youth that they are not going to live long.

When health and health disparities are addressed in the larger literature, the focus is often on access to medical care and exposure to infectious and chemical compounds. However, using the MacArthur Research Network framework and related literatures addressing the translation of stress into physiology and biomarker measurement, my work proposes to examine the full developmental context and its relationship to individual survival perceptions, as well as to investigate such perceptions and their influence on health. For the purposes of this study, I examine the impact of social and physical developmental contexts on youth expression of survival perceptions. Using the

expression of survival perceptions over time, which I postulate represent a convergence of social exposures, I examine the relationship between perception and subsequent health (Figure 1.1).

Figure 1.1 Framework for Dissertation Analyses.



Research Questions and Hypotheses

Research Question 1: How do characteristics of an adolescent's socio-developmental environment interact and link to stability (stable optimism, stable pessimism) and change of survival perceptions?

Hypothesis 1: Contexts characterized by disadvantage will be associated with youth persistence in perception of risk for early death (low perceived survival).

Research Question 2: What is the relationship between survival perceptions during adolescence and young adulthood and measures of health in adulthood?

Hypothesis 2: Beyond demographics and some conditions measured in childhood and adulthood, young people who persist in perception of high risk for early death will have worse health in adulthood when compared to individuals who consistently perceive low risk for early death.

Summary of Chapters

Chapter 1 provided a brief introduction to the dissertation. Chapter 2 provides a review of the literature most salient to the dissertation. Chapter 3 outlines the research methodology used, including the data structure, study design, measures, and analytic plan. Chapters 4 and 5 present the study findings. Chapter 6 contextualizes the results, and provides a discussion of the limitations, implications, and conclusions that can be drawn from the study.

Youth Survival Expectations: Disadvantaged Contexts and Forecasts for Future Health

Chapter 2: Literature Review

This dissertation proposes that links between youth survival perceptions, early contexts for development, and future adult health may be examined within a framework that establishes cumulative impact of socio-environmental location and stress on the health of individuals and populations throughout the life course. The present chapter begins with a brief review of optimism and future orientation, why these concepts are important for youth development, and how these concepts relate to youth survival perceptions. The chapter moves on to provide a review of youth perceived vulnerability, as expressed via survival perceptions, and how youth expression of survival perceptions may relate to constructs in an interdisciplinary literature, including a negative or pessimistic attributional style, constraint in socially expected durations, and limitations in possible selves. Next is a brief revisit of social context and its relationship to perception, followed by a review of mechanisms linking perception to physical and mental health. The chapter concludes with an outline of the conceptual model for the proposed dissertation analyses.

Optimism and Future Orientation: Significance for Individual Agency and Health

Optimism is defined by the extent to which people hold positive expectations for the future and anticipate favorable outcomes in life situations (Carver, Scheier, & Segerstrom, 2010; Hirsch, Wolford, LaLonde, Brunk, & Morris, 2007). Optimism is felt to be relatively stable over time, but not without some malleability (Carver et al.).

Research suggests a role for socioeconomic context in the development of optimism and pessimism (defined by individuals' anticipations for bad experiences and outcomes) (Carver et al.). One's development of an optimistic outlook is impacted by social location throughout the life course; however, childhood socioeconomic status may be particularly relevant. For example, in the Cardiovascular Risk in Young Finns Study, Heinonen and colleagues (2006) note that after controlling for adult socioeconomic status, childhood socioeconomic status significantly predicted self-reported optimism and pessimism in adulthood, 21 years after initial measurement. Respondents who were congruent in childhood and adult socioeconomic status, whether high or low, had the highest optimism and pessimism scores respectively; respondents incongruent in childhood and adult socioeconomic status had intermediate optimism and pessimism scores (Heinonen et al., 2006).

Optimism includes aspects of hope and future thinking. It incorporates an individual's confidence in achieving goals (Carver et al., 2010); in the absence of this confidence in setting and accomplishing goals, individuals may withdraw efforts toward planning for the future and identifying a purpose or reason for life. Carver and colleagues note, "[w]ithout confidence about the future, there may be nothing to sustain life (Carver et al., p.883)." In the context of survival perceptions, if youth doubt they will live into adulthood (have uncertainty or lack confidence in being able to survive into adulthood), they may withdraw from planning about a future, give up on trying in school, reject playing by the rules, and engage in risky behaviors.

Optimism is important, not only for its inclusion of a future planning perspective, but also for its relationship with subjective well-being, particularly in times of adversity. Broadly, optimism is noted to confer resilience to stress and stressful life events, including such things as cancer diagnoses and treatment, cardiac surgery, childbirth and postpartum depression, caregiving and depression, and managing distress in the transition to college (Carver et al., 2010). In the context of low to moderate levels of stress and negative life events, optimism has a protective effect against suicidality (Hirsch et al., 2007). Optimism is positively related to individuals' taking active steps to protect their health, such as eating healthy, engaging in less risky sexual behaviors, and learning about diagnoses and taking steps to minimize further risk (Carver et al., 2010). The combination of resilience to stress and active steps to protect one's health places one in a better position to achieve better physical health, a sense of well-being, and longevity. Of note, optimism's effects on physical and subjective health and well-being appear independent of other factors such as mood, self-esteem, and locus of control (Scheier & Carver, 1992).

In the context of youth development, optimism represents a cornerstone for self-regulation of behavior and a framework for the development of judgements about the future. Optimism facilitates a tendency to see things in a better light (Carver et al., 2010), and by extension, greater likelihood of the development of a positive approach to shaping one's life course and greater persistence in setting and achieving goals. For example, using data from the 4-H Study of Positive Youth Development (2002-2010), Schmid and

colleagues (2011) find that youths' positive and hopeful future expectations are related to later intentional self-regulation, adaptive behaviors, and goal management skills.

Hitlin and Johnson (2015) explicate the importance of having an optimistic anchor for a future time perspective. Utilizing data from the Youth Development Study (1988-2011), Hitlin and Johnson employ a measure of adolescent generalized life expectations to predict financial outcomes and well-being during the transition to adulthood using variable-centered and person-centered approaches. In variable-centered analyses (treating life expectations and mastery as separate constructs operating in tandem), the authors find that optimistic life course expectations in adolescence significantly forecast economic and health-related outcomes in young adulthood, including: (1) higher levels (and growth) in hourly pay and biweekly earnings and (2) higher average levels of physical (self-rated health) and mental well-being (depressive affect and self-esteem). The links between life course expectations and outcomes remain significant even after taking into account adolescent levels of mastery and models updating mastery over time (except in the case of depressive affect). In the person-centered approach, four latent classes are identified: (1) 'hopefuls'—slightly lower levels of mastery, but optimistic expectations for life course chances; (2) 'confident'—above average mastery and expectations of life course chances; (3) 'average'—average mastery and expectations for life course chances; and (4) 'pessimistic'—below average mastery and expectation for life course chances. Results from latent class models suggest advantages for having above average levels of mastery and optimistic life course expectations and detriments for individuals below average on both levels. This work

suggests the salience of youth optimism about the future as a component of individual agency in producing better adult socioeconomic and health outcomes.

In sum, optimism is critical for individual agency and health on multiple levels. Optimism is integral to one's ability to plan for a future, seek goals of attainment, and protect one's health. Optimism has implications for how one regulates behavior and the extent to which stress affects physical and mental well-being. Further, the impact of optimism is seen across the life course. Thus, in the context of survival perceptions, a lack of optimism about the future manifest as negative expectations of living into adulthood, may set the stage for poor social and health outcomes, and may create greater impact of stress via more wear and tear on the body.

Before moving to more detailed discussion of youth perceptions of survival and vulnerability in the literature, an additional construct, future orientation, warrants brief review. As described earlier, there is a future aspect included in conceptions of optimism. As well, optimism and future orientation include aspects of hope, future time-oriented cognitions and planning behaviors (Sun & Shek, 2012; Trommsdorff, 1983). Yet, in addition to thinking about the future and planning, future orientation encompasses the degree to which an individual is able to anticipate future consequences of decisions (Steinberg et al., 2009). Alternately, future orientation has been defined as multidimensional, comprised of cognitive, motivational, and affective components, with optimism as one dimension of the affective component of future orientation (Nurmi, 1991; Trommsdorff, 1983).

Distinct from optimism perhaps in a more intentional process, future orientation is defined by a common core of domains across cultures, including education, career, marriage, and family attainment and completion (Seginer, 2003). Across cultural groups, there may be differential investment in each of the domains reflective of interpersonal and other socio-environmental cues. For example, Seginer identifies three distinct functions of the family context that affect youth development of future orientation: (1) parents' resources affect how adolescents construct future orientation—in constructing the future, adolescents reproduce family social status; (2) authoritative parenting practices facilitate autonomy and indirectly promote self-esteem; and (3) parental beliefs shape parenting practices and content for expectations communicated to children. Parent and teacher expectations for young people (e.g., via communications about opportunities for success) and situational factors such as social and economic conditions influence youth anticipation and evaluation of their future (Trommsdorff, 1983). Indeed, some literature suggests than in situations of social deprivation, it may be adaptive to avoid thinking about the future, as this is more easily reconciled with appraisals of limited opportunity (Trommsdorff). By extension, in the absence of socio-environmental cues supporting youth development of a belief in a long life, youth future orientation may be severely constrained.

In contrast in recent literature, a potential protective effect is ascribed to the development of future orientation for youth living in poverty, rural youth, and African American youth; and research is focused on the development of interventions that promote exploration and development of future orientation among these groups of youth

(Kerpelman & Mosher, 2004; Sharp & Coatsworth, 2012). Providing opportunities for identity exploration, responsibility, and experiences of success are associated with higher levels of future orientation (Kerpelman & Mosher; Sharp & Coatsworth).

As in the case of optimism, future orientation is linked to health and well-being. Using data from the Temple University Adolescent Cognition and Emotion Project, Hamilton and colleagues (2015) found that the effects of peer and familial victimization on subsequent levels of youth hopelessness were intensified among early adolescents with low future orientation (future orientation as assessed by measuring respondents' awareness, anticipation of, and planning for the future). The authors hypothesize that in the context of low future orientation, youth may become entrenched in current experiences of victimization, leading to hopelessness about the future and the development of depression. Among a sample of adjudicated adolescents, higher mean scores on a seven-item measure of attitudes and perceived efficacy towards the future (collectively referenced as future orientation) were associated with lower likelihood of substance use (marijuana, hard drugs [crack, cocaine, crystal methamphetamine, and others], and alcohol), lower likelihood of alcohol use during intercourse, and perceptions of greater risk associated with substance use behaviors (Robbins, 2004). Using an individual's orientation to time perspective as a measure of future orientation, Hall and colleagues (2015) found that higher levels of future orientation (as assessed by individuals' greater focus on and value of long-term consequences of behaviors) were associated with healthier behavioral trajectories, such as smoking, attempts to quit, and

successful cessation; and eating healthy foods, exercising, and achieving a lower body mass index.

In summary, the literature points to optimism and higher levels of future orientation as facilitators of individual agency, as manifest by achievement and better health behaviors. Characteristics of one's socio-environment have significant influence on the development of an optimistic orientation to the future. Optimism and future orientation reflect future thinking and expected positive experiences and outcomes. Expressions of youth survival expectations, as in the case of low perceived survival into adulthood, may reflect limitations in optimism and a lack of future time perspective. In consideration of how one's socio-environment influences perceptions about the future (in the current study conceptualized as perceptions of likelihood of survival into adulthood), a better understanding of the potential complexities in relationships between aspects of the socialization environment is needed; this is the first task of the dissertation analyses.

The next five sections provide description of what is known about one aspect of youths' orientation to the future, youth expressed survival perceptions. The sections review the following: how perceptions are measured in the current literature, what is linked to youth development of survival perceptions, what is known about the salience of these perceptions for developmental and behavioral outcomes, and how these types of expressions may relate to earlier constructs in an interdisciplinary literature.

Youth Perceptions of Vulnerability: Expressed Survival Perceptions

Research suggests that adolescents' perceptions about significant life events are accurate in predicting later life experiences. Teens beliefs with respect to the probability

of career and physical events, including remaining in school, obtaining a degree, getting a job, pregnancy outcomes, crime victimization, and arrest are often grounded in real life experience (Fischhoff et al., 2000; Parker & Fischhoff, 2001).

However, the current literature presents a significant exception to adolescents' accuracy about important life events. In national studies teens in the United States greatly overestimate their risk of dying prematurely (Borowsky et al., 2009; Bruine de Bruin, Parker, & Fischhoff, 2007; Fischhoff et al., 2000; Halpern-Felsher & Millstein, 2002; Jamieson & Romer, 2008). Across studies, youth perceptions of risk for death vary based on data-unique parameters and study-specific variable constructs. Youth expectations range from: an estimated 20% probability of death by age 20 years (Fischhoff et al.); to 6.7% perceived high risk of death by age 30 years (Jamieson & Romer); to 14.3% reporting a 50-50 chance or less of living to age 35 years (Borowsky et al.). In reality, deaths to adolescents 12-19 years of age comprise a small fraction of total deaths occurring in the United States each year. From 1999-2006, less than one percent of total US deaths each year occurred in this age group (average of 16,375 deaths/year among 12-19 year olds) (Minino, 2010).[2]

[2] Looking across race and ethnic groups, national estimates on mortality rates for teens reveal the following statistics: Non-Hispanic white adolescents 0.06% annual (0.3% of white teens die by age 20 years), Non-Hispanic black adolescents 0.08% annual (0.5% of black teens die by age 20 years), Hispanic adolescents 0.06% annual (0.4% of Hispanic teens by age 20 years), American Indian/Alaska Native adolescents 0.08% annual (0.5% of American Indian/Alaska Native teens by age 20 years), and Asian/Pacific Island adolescents 0.03% annual (0.2% of Asian/Pacific Island teens die by age 20 years) (Minino et al., 2007). In 2010 life expectancy at age 15 years across some race and ethnic groups was: 64.4 years for Non-Hispanic white teens (62.0 years for males, 66.6 years for females); 60.8 years for Non-Hispanic black teens (57.6 years for males, 63.7 years for females); and 66.8 years for Hispanic teens (64.1 years for males, 69.3 years for females) (Murphy, Xu, & Kochanek, 2013). The five leading causes of death among youth ages 12-19 years are: unintentional accident; homicide; suicide; cancer; and heart disease (Minino, 2010).

Youth Perceptions of Vulnerability: Survival Perceptions and Context

The perception of risk for premature death is expressed more often among youth living in poverty, measured at family and neighborhood or block group levels, and youth self-identifying as of African, Latin, and Native descent (Borowsky et al., 2009; Nguyen, Hussey, et al., 2012; Swisher & Warner, 2013; Warner & Swisher, 2015). Beyond poverty status and race and ethnic identity, youth low perceived survival is repeatedly linked to violence exposure and involvement, which for some youth may represent an accurate perception (Brezina, Tekin, & Topalli, 2009; Duke, Skay, Pettingell, & Borowsky, 2009; Swisher & Warner; Warner & Swisher, 2014).

Brezina et al. (2009) explicate a relationship between violence exposure and the development of survival perceptions. Using a mixed methods approach, the authors first use Add Health data to link anticipation of early death and criminal activity and second, in qualitative work, Brezina and colleagues interview young, African American male offenders (e.g., offenses including drug dealing, robbery, and carjacking) residing in Atlanta, Georgia to identify attitudes and beliefs related to perceptions of risk for premature death. Among this group of African American males, perceptions of risk for early death originated in the context of daily exposure to violence, giving way to a pervasive sense of vulnerability. Messages from family and friends served to reinforce perceptions of vulnerability resulting in the males' acceptance of an early death as part of life. The authors outline several themes related to acceptance of the prospect of premature death: a disregard for future consequences of behavior (vulnerability to harm is realized and accepted); an orientation to the here and now; a focus on immediate rewards

and benefits; an attraction to risky behavior and neutralization of fear; and an unpredictability schema—the world is a chaotic place so there is no reason to invest in conventional pursuits.

In other research, characteristics of multiple contexts are implicated in the development of survival perceptions. Young (1999) presents a vision of social reproduction situating behavior as a product of social reality that has accumulated. Using life historical narratives of 26 low-income black males in Chicago moving through the transition to adulthood (ages 20-25 years), Young points to the absence of certain types of capital, symbolic of resources or access to resources that facilitate upward mobility, as leading to diminished capacity to navigate social experience. Diminished capacities become cemented over time into schemata of interpretation. "… [T]he public space was located by these men as an obstacle to securing the essential prerequisite for conceiving of future life chances: a consistently secure belief they could survive into adulthood (Young, p. 210)." The schema of limited life chance pertained to multiple contexts, including family life, formal institutional experience, and peer associations. Family life offered admonitions to make something of oneself, but little in the way of skills with which to operate. School represented an institutional location creating internal conflict and anxiety, as well as exposing one to conflict brought by others. Peer associations were lacking in networking activities that would facilitate information and idea exchange for individuals' mobility pursuits.

Youth Survival Perceptions: Future Behavior, Status, and Health

Perception of risk for premature death during adolescence is not a benign occurrence. Expressions related to low perceived survival are linked to poor behavioral and developmental outcomes in the period of transition to adulthood and in mature adulthood. For example, Borowsky and colleagues (2009) using Add Health data note that youth's expressed belief in a 50-50 chance or less of living to age 35 years significantly predicted young adult outcomes, including a fight-related injury in the past year and history of police arrest.

Nguyen, Hussey, and colleagues (2012) suggest a long-term relationship between youth survival expectations and socioeconomic status attainment in adulthood. In their study using Add Health data, low perceived survival (belief in a 50-50 chance or less of living to age 35 years in Waves I and III) predicted lower educational attainment in mature adulthood, Wave IV (less than a high school education and high school education vs. college). Low perceived survival at Waves I and III was also linked to increased odds of having personal earnings in the lowest income quartile vs. the highest quartile in adulthood. Low perceived survival at Wave III (respondents 18-26 years) was associated with greater experiences of material hardships in mature adulthood (e.g., time without phone service, inability to pay rent/mortgage, gas/oil/electricity cut off, and food insecurity).

Nguyen, Villaveces, et al. (2012) link youth low perceived survival with risk behaviors and self-directed violence in adulthood for Add Health respondents, including regular substance use, suicidal ideation, and history of suicide attempt. Perception of a 50-50 chance or less of living to age 35 years at Waves I or III of Add Health predicted

exceeding daily limits for moderate drinking, smoking a pack or more of cigarettes a day, and using illicit substances other than marijuana at least weekly among respondents. Respondents persisting in low survival expectations (Wave I and III) were particularly vulnerable in mature adulthood. Compared to respondents who consistently expressed at least a good chance for survival to age 35 years, respondents who expressed high perceived risk for early death exhibited twice the risk of suicidal ideation, more than three times the risk of suicide attempt, two times the likelihood of exceeding daily limits for moderate drinking, 2.5 times the likelihood of smoking at least a pack of cigarettes a day, and more than three times the likelihood of using illicit substances other than marijuana at least weekly in adulthood.

Youth Survival Perceptions: Stability and Change Linked to Outcomes

Borowsky and colleagues (2009) noted that perceptions of risk for early death in their Add Health study were not always stable over time. Just under half of youth (45%) expressing the belief that they would not live long at Wave I continued to hold this belief approximately one year later. The remaining youth (55%) reporting a 50-50 chance or less of survival to age 35 years in Wave I had changed their perception and reported at least a good chance of living to the age of 35 years at Wave II (Borowsky et al., 2009). In contrast, most youth who perceived at least a good chance of living to age 35 years in Wave I held this same belief one year later at Wave II (89.3%). The finding of changing perceptions of risk for early death provided the basis for an additional study evaluating the significance of change in perception of high risk for premature death for developmental and behavioral outcomes in the period of transition to young adulthood,

measured at Wave III of Add Health. Persistence in perception of risk for dying early (Wave I and Wave II) was linked to poor mental health, lower likelihood of obtaining a high school/general equivalency diploma and of being employed, poor problem solving skill, lower likelihood of civic and community engagement, and lower life satisfaction (Duke et al., 2011). Youth who changed their perception of high risk for premature death between Waves I and II had better young adult outcomes, including better mental health scores and a greater likelihood of community participation, but they did not achieve the same level of positive outcomes as youth who had always reported a belief of at least a good chance of living to the age of 35 years (Duke et al.).

Survival Perceptions: Relation to Constructs in the Literature

Based on studies to date, perception of risk for premature death in adolescence appears congruent in meaning to constructs for hopelessness (Beck, Weissman, Lester, & Trexler, 1974; Johnson & McCutcheon, 1981; Prociuk et al., 1976) and the reformulation of the learned helplessness model (Nolen-Hoeksema, Girgus, & Seligman, 1986; Peterson & Barrett, 1987; Peterson & Seligman, 1984). Both of these theories posit a pessimistic or negative explanatory framework (attribution of negative events as fixed, global, and personal; expectations for future bad events; giving up and helpless behaviors—signifying severe limitations in individual agency) as a risk factor for future negative events. Expressions of hopelessness and a global negative outlook have been correlated with risk involvement among youth in urban and inner city environments (Bolland, 2003; Valdez-Melzer et al., 2005). Peterson and Barrett postulate that a negative explanatory framework predisposes an individual to frustration and failure in the

face of adverse life events, which ultimately results in the development of fatalistic and passive reaction patterns. In the example of survival perceptions, past experiences of adversity may pervade expectations for the future such that the individual envisions continued adversity including being at risk for premature loss of life.

Merton's description of socially expected durations may offer an additional framework in which to situate the relevance of youth expectations for survival at the individual level and for the larger society (Merton, 1984). Socially expected durations (SEDs) represent a product of a range of social structures and interpersonal relationships; they symbolize a link between these structures (e.g., groups, organizations, social statuses) and individual action (Merton). Merton identifies three examples of contexts for the development of socially prescribed expectations about future time: (1) structural and institutional durations are prescribed by authority and power, and are highly visible (e.g., prisons, school, the armed forces); (2) collective durations represent group patterns for expectations which reflect more or less uncertainty; and (3) social life durations signify expectations embedded in interpersonal and social contacts. SEDs affect anticipatory social behavior and have public and shared consequences (e.g., affecting one's willingness to engage with others or to become involved in organizational life; expectations about permanency or duration of residence influence one's engagement within the community and local social life) (Merton).

Merton's SEDs appear to have some congruency with Neugarten, Moore, and Lowe's (1965) description of value patterns among cultural groups that establish expectations for age-linked behaviors and function as a form of social control (suggesting

consequences for divergence from socially-derived prescriptions). This is seemingly in contrast to contemporary thinking about age-graded deadlines in which a rough guideline for the "normal biography" exists, but if one deviates from socially-derived timings (e.g., later timing for family, work, and education-related transitions), there are few, if any perceived consequences for the individual's life course or for others in the immediate social milieu (Settersten, 1998; Settersten & Hägestad, 1996a; Settersten & Hägestad, 1996b). In the example of survival perceptions, an expectation or perception of having limited time in one's life may prompt divergence from normative trajectories for development and participation in behaviors yielding negative personal and social consequences and limitations for future upward mobility and success.

Youth perceived survival may relate to what Markus and Nurius (1986) refer to as possible selves. The concept of possible selves offers a link between self-knowledge, cognition, and motivation and includes an individual's ideas of what he or she might become, what he or she would like to become, and what he or she may be fearful of becoming (Markus & Nurius). Possible selves are an evaluative and interpretive lens of the self and represent an individual's hopes, fears, goals, and threats (Markus & Nurius). They represent positive and negative self-images in the future state and connect current behaviors to future states (Oyserman, Brickman, & Rhodes, 2007). As such, possible selves function as incentives for future behaviors; for example, what one perceives as selves to strive for and move toward versus the selves to be avoided (Markus & Nurius). During adolescence, possible selves are increasingly vital for self-regulation and well-being (Oyserman & Fryberg, 2006). Self-esteem becomes a dynamic ratio between 'the

selves one wishes to attain' divided by 'the current selves' (taking account of failure of attainment); and, perceptions and aspirations are periodically pruned to come into line with the reality of accomplishments (Oyserman & Fryberg). In the same way, declines in incidents of failure would be expected to produce gains in self-esteem and potential expansion of aspirations. Possible selves are shaped by social context, gender, significant others (parents and other family, and peers), role models, media images, and socio-cultural identities (Oyserman & Fryberg). When social contexts lack images of possible selves for groups of people who are like the adolescent, possible selves for the adolescent may be completely missing or severely restricted (Oyserman & Fryberg). In the example of youth perceived survival expectations, negative attributions and the internalization of environmental cues likely guide what the individual accepts as knowledge about self and becomes formative in the development of self-concept. This knowledge may truncate schema for possible selves, diminishing hopes and goals and accentuating fears and threats, perhaps providing a catalyst to dwell on the feared self (without tangible strategies for how to avoid the feared self) instead of positive expected and hoped for selves.

In summary, for some young people, perceptions of increased risk for premature death may be reflective of social reality, for example, based on exposure to repeated violence and experiences of loss of life in one's immediate environment; however, some youth in the United States greatly overestimate their risk of dying prematurely. The perception of risk for premature death is linked to negative behavioral and developmental outcomes, as well as limited socioeconomic status attainment in adulthood. Thus far, this

chapter has touched on the relationship between social location and perception (in the development of optimism and future orientation, as well as some reference to poverty and race-ethnic identity as it relates to survival perception), as a means to set the stage for the first task for the dissertation analyses: to examine potential complexities between socializing domains in the development of survival perceptions. Yet, are there implications of such perceptions for future health? In the next sections, I review in more detail what is known about relationships between social location, and perception and stress as pathways to differences in health. This review sets the stage for the second task of the dissertation analyses: to extend examination of relationships between perception and health, operationalized as examination of potential relationships between youth survival perceptions and health in adulthood. As alluded to in the first sections of this chapter, optimism and future orientation are linked to health, postulated to influence individual agency and health behaviors. The following two sections review proposed mechanisms for the physiologic translation of perception and stress and its implications for individual and population-level health. The final section of this chapter outlines the conceptual model for the dissertation analyses.

Disadvantage, Perception, and Health: How Resource Limitations Get under the Skin

Prevailing models for the social determinants of health identify a cumulative impact for socioeconomic status (SES); social determinants models emphasize increased frequency, contexts, and duration of disadvantage in facilitating worse physical and psychological outcomes (MacArthur Research Network on Socioeconomic Status & Health). Matthews and colleagues (2010) postulate a reduced reserve capacity among

individuals living in poverty, such that the experience of living in a resource poor context lends itself to having limited personal and community means for coping with stressful life events, giving way to increased negative cognition. Chen and Matthews (2001) extend the discussion by linking context, poverty and race-ethnic identity, to increased stressful life events. The experiences of stressful life events are hypothesized to shape cognitive frameworks such that bias in appraisal and interpretation of the world is produced—the world is a threatening place—supporting lowered expectancies for a positive future (Chen & Matthews, 2001). Using poverty and race-ethnic identity as a backdrop for lowered expectancies for a positive future (two elements of context already linked to lowered survival expectations among youth), one could further postulate lowered individual agency and vulnerability in the face of challenges, which may give way to lowered expectations for living a long life. Examining the impact of social determinants on subjective life expectancy, Mirowsky and Ross (2000) identify inability to work due to disability and recalled recent and past economic hardships as predictors of lowered subjective life expectancy. The authors suggest that, "[e]xpecting to die early may prove to be an especially pernicious hidden injury of class" (Mirowsky & Ross, p. 133).

Other constructs representing structural determinants (representing conditions in which we are born, live, and work; also defined as social determinants of health) are linked to the production of stress, over and above the impact of individual economic characteristics. Residential context itself is theorized to produce stress. Sellström and Bremberg (2006) submit that up to 10% of the variation in child health outcomes may be explained by neighborhood effects after adjustment for individual characteristics and

family context. Neighborhood disadvantage (including poverty and related measures of residential instability, poor neighborhood cohesion, and neighborhood lack of collective efficacy) is theorized to exacerbate individual risk and the production of stress. Ross and Mirowsky (2001) identify a biodemography of stress, linking perceived neighborhood disorder and related fears to poor self-reported health and physical functioning, and greater frequency of chronic conditions among adult participants in the 1995 Community, Crime, and Health Survey. The authors postulate a link between threatening environments and poor health via chronic release of endogenous catecholamines and corticosteroids (the agents of the stress response).

Work that is more recent is beginning to link mental health (or the absence of mental health) to physical location. Using data from the Chicago Community Adult Health Study, Mair and colleagues (2012) examine whether feelings of hopelessness are associated with neighborhood conditions, including physical disorder and decay, perceived violence and disorder, social cohesion and reciprocal exchange, and census-based neighborhood measures (e.g., poverty, unemployment, percent high school dropouts). The authors find that economic and physical characteristics of neighborhoods, specifically unemployment rates, greater physical disorder, and perceived disorder, contribute to feelings of hopelessness beyond that of individual attributes.

Physiologic Pathways Linking Disadvantage, Stress, and Health

Adaptive physiologic systems in the body include the hypothalamic-pituitary-adrenal axis (HPA), the autonomic nervous system, the metabolic-endocrine system, and the immune system. These systems represent the body's internal milieu that is

instrumental in individuals' adaptation to environmental demands. Allostasis is the dynamic process in which the body is able to respond to a perceived threat or challenge (Karlamangla, Gruenewald, & Seeman, 2012). In the context of repeated perceived threats or stresses (produced in contexts of resource limitation and disorder), there is continued and intense activation of the physiologic systems, making what was previously a healthy response designed to protect and preserve the body a detriment. Disadvantage, stress, and adversity accelerate pathophysiologic processing of the adaptive systems of the body by triggering continual alterations of normal function, resulting in increased neuroendocrine and cardiovascular reactivity, depression of immune function, and buildup of fat deposition (Evans, 2003), ultimately rendering individuals and groups vulnerable to greater morbidity and mortality. Chronic dysregulation of the normally adaptive systems results in allostatic load, giving way to accelerated weathering such as physical and mental decline.

Allostatic load represents complex and dynamic processes of physiologic change created in response to socio-environmental demands. Allostatic load may be evidenced in four contexts: (1) frequent stressors (e.g., resulting in blood pressure surges), (2) failure to habituate to repetition of the same stressors (e.g., persistent elevations of cortisol), (3) failure to terminate adaptive autonomic and neuroendocrine responses (e.g., glucocorticoid elevation as new baseline which precipitates obesity and/or diabetes), and (4) failure to respond sufficiently to a test (e.g., inadequate hypothalamic-pituitary-adrenal regulation of the inflammatory response) (McEwen & Gianaros, 2010). In addition, lifestyle behaviors, including tobacco and alcohol use, poor dietary habits, and

physical inactivity, may be incorporated into allostatic load models as mechanisms by which individuals attempt to cope with life events or function within a context of disadvantage. These behaviors, used as a means to achieve short-term relief from stress, may contribute further to the process of weathering resulting from allostatic load (e.g., acceleration of atherosclerosis or progression to Type 2 Diabetes) (McEwen & Gianaros, 2010).

Weathering may be measured via an allostatic load score, a summary of vital sign and biomarker quantities across biological systems (Geronimus, Hicken, Keene, & Bound, 2006). Seeman and colleagues (2004) provide empirical evidence for the salience of allostatic load in contributing to differentials in health status by socioeconomic location. Reporting on mortality data from the MacArthur Study of Successful Aging, the researchers point to a cumulative index of biological dysregulation[3] in explaining just over one-third (35.4%) of the difference in mortality risk for individuals of higher (high school education or more) versus lower (less than high school education) educational attainment.

Small physiologic changes evident in childhood and adolescence may portend poor health later in life. In a study of rural youth in New York State, Evans (2003) showed that as childhood exposure to cumulative risk (exposure to poverty, residential crowding, noise, housing problems, violence, family separation and turmoil, single parent

[3] Biological dysregulation was quantified via an index of respondent physical measurements (i.e., systolic and diastolic blood pressure; waist-hip ratio), other cardiovascular risk factors (e.g., cholesterol; hemoglobin A1C), lung function (peak flows), kidney function (creatinine clearance), inflammatory markers (e.g., interleukin-6; C-reactive protein; albumin; fibrinogen), and stress hormones (e.g., urinary cortisol; urinary norepinephrine; urinary epinephrine; serum dehydroepiandrosterone sulfate).

household, maternal high school dropout) increases, wear and tear on the body increases as measured by allostatic load (e.g., heightened cardiovascular and neuroendocrine parameters and increased deposition of body fat). In a follow-up study, Evans and colleagues (2007) identified continued impact of cumulative risk exposure on allostatic load among rural adolescents three to four years later, namely slower and less efficient recovery of blood pressure after an acute stressor. In their study of participants in the Northern Swedish cohort, Gustafsson and colleagues (2012) found that experience of social adversities (parental loss via divorce/separation, death, or parents never living together, residential instability, parental illness, personal illness) during adolescence and the period of transition to young adulthood was positively associated with allostatic load in mid-adulthood (age 43 years), lending support for the cumulative risk and sensitive period life course models. Using data from the Wisconsin Longitudinal Study, Singer and Ryff (1999) identified direct associations between the extent of adversity experiences (economic and social—parent-child interactions and quality of spousal ties) and the likelihood of high allostatic load in later adulthood (age 59 years).

Dissertation Conceptual Model

In research question 1 of this dissertation analyses (Figure 2.1), I examine the relationship between early contexts for development and youth survival perceptions over time. With the exception of works identifying poverty (at individual and neighborhood levels) and violence involvement (victimization and perpetration) in relation to low perceived survival (Borowsky et al., 2009; Duke et al., 2009; Nguyen, Hussey, et al., 2012; Swisher & Warner, 2013; Warner & Swisher, 2014), little is known about how

context operationalized as household economics and resources, school, and neighborhood characteristics as well as experiences of adversity (i.e., adverse childhood experiences, ACEs) inter-relate and relate to youth perceptions of survival.

In research question 2 of this dissertation analyses (Figure 2.1), I examine the relationship between youth survival perceptions and adult health beyond what is available in the current literature. One study has linked youth low perceived survival to substance use and suicidality in adulthood (Nguyen, Villaveces, et al., 2012). Using broad measures for health, including self-rated health, a mental health disorder index, a diagnostic index of the leading causes of morbidity and mortality among US adults, and a measure of allostatic load, the link between survival perceptions and health is further explored.

Summary

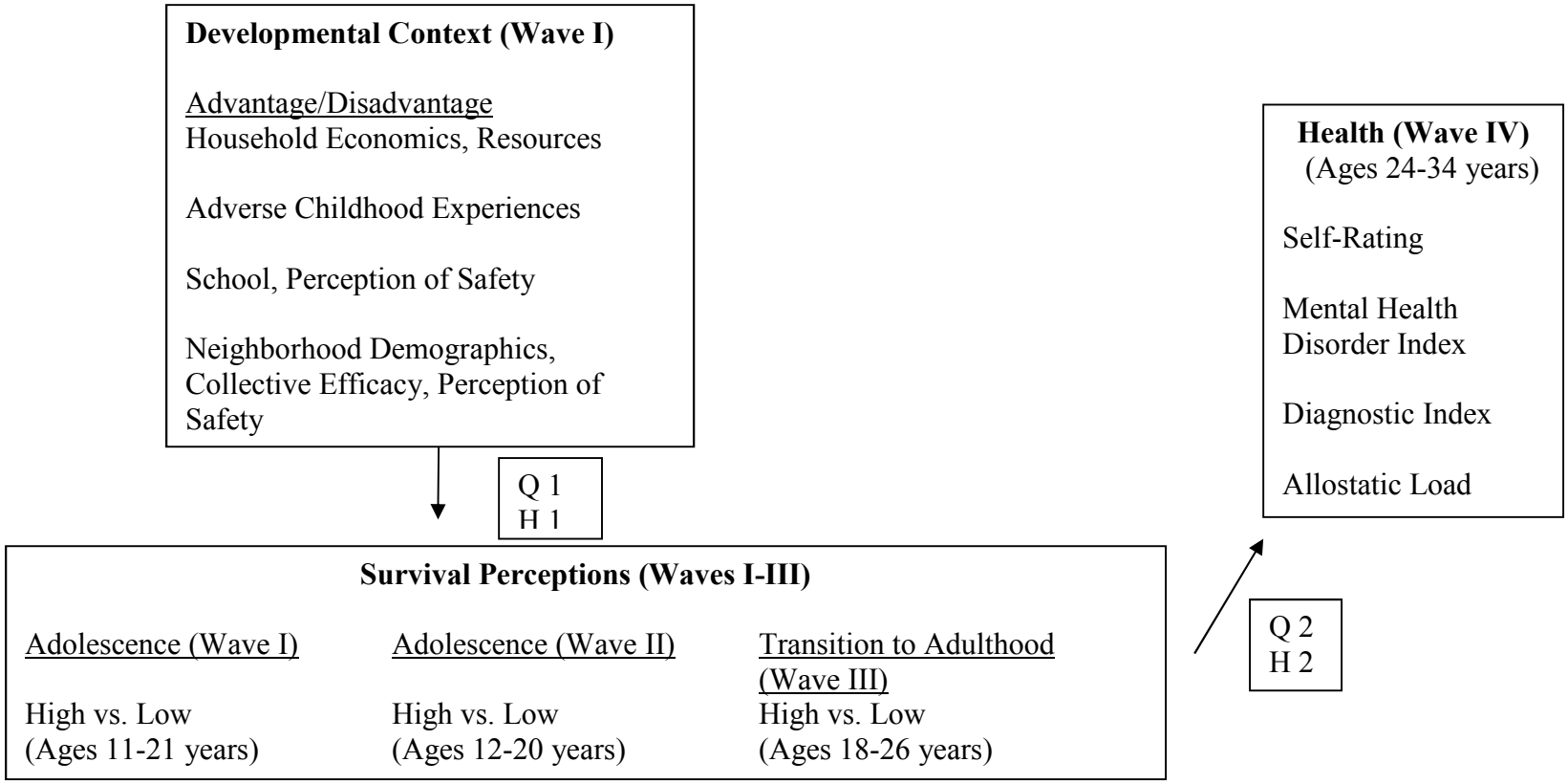
Having a positive orientation to the future is necessary for successful navigation of the life course. Optimism and future orientation are necessary for the development of healthy behaviors in the face of adversities and for sustaining health over time. A sizable minority of youth in the US has severe limitations in their future outlook, manifest as expressions of a shortened life expectancy. This reflection, often occurring in contexts of poverty and violence exposure, may signal poor decision-making and behavior placing youth on a trajectory for poor health later in life.

There is good evidence establishing links between social disadvantage, stress, negative perceptions and poor health over the life course via depletion of resources, poor coping behaviors, and stress physiology (measured via allostatic load). However,

complexities in relationships between socio-environmental characteristics and youth expressing perception of risk for early death are not fully understood. In addition, the significance of youth perception of risk for premature death for future health, manifest as indicators of risk for (and diagnoses of) the leading causes of morbidity and mortality for US adults, remains to be elucidated.

In consideration of complexities in the relationship between context and the development of perceptions about risk for early death, I envision contribution to life course health development models showing that interactions with socializing agents relate to patterns for survival perceptions. Once established, perceptions affect health behaviors and individual adaptive capacity (physiology). The potential clinical and scientific translational value of these analyses include advancing knowledge of the relevance of early social context for health production and establishing the salience of youth perceived survival as an indicator of risk for disparate health outcomes in adulthood via development of early markers for chronic disease.

Figure 2.1. Conceptual Model.



Youth Survival Expectations: Disadvantaged Contexts and Forecasts for Future Health

Chapter 3: Research Methods

Data

Data for the analyses originate from the in-home interviews of the National Longitudinal Study of Adolescent to Adult Health (Add Health), a nationally representative study with three follow-up waves to date (researchers are currently in the field for Wave V data collection) (Carolina Population Center, The National Longitudinal Study of Adolescent to Adult Health). Available data for Add Health cover the life course periods of adolescence through young adulthood, and into mature adulthood for individuals living in the United States. The initial sampling frame for Add Health included all high schools in the US that had an 11th grade and a minimum of 30 students enrolled (N= 26,666). A stratified sample of 80 high schools was selected and for each high school, a feeder school was selected with its probability of being chosen proportional to its student contribution to the high school. The final sample included 132 schools (80 high schools and 52 middle schools) during the 1994-95 school year.

An overall in-home sample (N= 20,745) was created from rosters of school survey participants and additional students in participating schools, including oversamples of specific populations of students (e.g., black adolescents with college-educated parents; Cuban, Puerto Rican, and Chinese youth; youth with physical disabilities, twin and other sibling pairs). Over successive waves, response rates have ranged from 77%-88% (based on % responding from the overall in-home sample, N=

20,745): Wave I (1994-95, response rate 79%), Wave II (1996; response rate 88%), Wave III (2001-02, response rate 77.4%), and Wave IV (2007-08, response rate 80.3%) (Add Health Study Design, http://www.cpc.unc.edu/projects/addhealth/design; Harris, 2013). Youth in 12th grade during Wave I data collection were not contacted for Wave II participation. In Waves III and IV, all potential participants were contacted (including individuals who were in 12th grade in Add Health Wave I). To identify the most complete sample of respondents with survival perceptions, analyses were limited to respondents participating in all available waves of Add Health. Analyses for the current study include in-home sample respondents participating in Add Health Waves I-IV (n= 10,120), and who have a valid sampling weight (n= 9421).

During in-home interviews, participants completed 90 minute interviews at four points in time, Wave I (participants ages 11-21 years), Wave II (participants ages 12-20 years), Wave III (participants ages 18-26 years), and Wave IV (participants ages 24-34 years). Interviews included questions about social context and demographic information, health beliefs and behaviors, connections in primary socializing domains (e.g., family, school, peer, and neighborhood), and personal, relational, functional, and health outcomes in adolescence and adulthood. The study design allows for direct measure of social disadvantage via geocoding of respondent residence location in addition to measurement of family, school, and neighborhood characteristics. Wave IV data collection procedures were expanded to include the collection of biological data using blood spots for the measurement of metabolic, inflammatory, and immune function markers (collections were made on the entire national sample for Wave IV, Add Health

Study Design Wave IV, http://www.cpc.unc.edu/projects/addhealth/design/wave4). Information on sensitive and confidential topics was obtained through a computer-assisted, self-interviewing procedure. A detailed security system assists researchers in linking questionnaires across waves of the study while also preserving confidentiality and barring purposeful identification of participants.

During the first wave of in-home data collection, a parent (usually the resident mother) was asked to complete a 40-minute interviewer-assisted, paper and pencil questionnaire separately and in a private setting. Questionnaires included queries about personal health status, adult interpersonal relationships and the home environment, parent educational attainment and employment, household income and receipt of financial assistance, parent community engagement, behaviors of the adolescent, parent-adolescent relationships, and neighborhood characteristics. Approximately 85% of eligible parents (parents with a child who participated in the Wave I in-home interview) were included in the Add Health Wave I data set (n= 17,610).

All Add Health protocols have received Human Subjects Institutional Review Board approval. Additional details of the Add Health study design and methodology for all available data are published elsewhere (Harris, 2013). Data collection for Add Health Wave V is currently underway (Add Health Wave V Data Collection, http://www.cpc.unc.edu/projects/addhealth/design/wave-v-1).

The current analyses use data from multiple components of Add Health, including the respondent questionnaire data from Waves I, II, III, and IV of the in-home sample, parent questionnaire data from Wave I, and respondent neighborhood data from Wave I

(tract data merged at the individual level from respondent Wave I addresses). For the analyses, I use data made available via contractual agreement between owners of the Add Health data set (University of North Carolina at Chapel Hill, Carolina Population Center) and the Department of Pediatrics, Division of General Pediatrics and Adolescent Health, University of Minnesota (referred to as restricted-use data).[4]

Measurement

The Process of Defining Youth Perceived Survival

Using latent class analysis (Pennsylvania State University, Stata plugin, https://methodology.psu.edu/downloads/lcastata), stability and change in participant expressed survival perceptions were examined for Add Health Waves I-III (all waves in which respondent survival perceptions were assessed). Respondents were asked: "What do you think are the chances that you will live to the age of 35?" Survey response options were "almost no chance," "some chance, but probably not," "a 50-50 chance," "a good chance," and "almost certain." A series of latent class models (models with one class through seven classes) corresponding to the range of participant responses across Add Health Waves I-III were examined. The five and seven class solutions did not converge. The Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) were used to help determine the optimal class solution. To understand the attributes of each class, item response probabilities were examined. A class

[4] Public-Use data are available from the following sources: The Odum Institute at the University of North Carolina at Chapel Hill (UNC), the Inter-University Consortium for Political and Social Research (ICPSR), and Sociometrics.

corresponding to low perceived survival (stable pessimism, respondent consistent report of "almost no chance," and/or "some chance, but probably not," and/or "a 50-50 chance") was not identified. Because a class corresponding to low perceived survival could not be identified via latent class models, alternatives were explored to assist with conceptualizing respondent survival perceptions over time that would allow for examination of relationships between early social context and low survival perceptions, and low survival perceptions and later health (research questions established for this dissertation).

A second construct for youth survival perceptions was examined in the data, reflecting insights gained while conducting a separate research project examining the contemporary relevance of measuring survival perceptions among youth living in the Twin Cities Metro area in Minnesota. Via focus group and individual interviews, the separate study was designed to accomplish three tasks: (1) measure survival perceptions among diverse groups of youth ages 12-21 years and to gain better understanding of youths' reasoning behind response option choices (such as in the response options offered in the Add Health questions about perceived survival); (2) to identify time points in a young person's life in which survival perceptions become part of personal narratives and become manifest in patterns of behavior; and (3) to identify experiences that send a message to youth that life and life chances are limited. In the separate study, participants were asked to respond to the Add Health question, in written format, and to give their impression of whether or not this was a good way to ask about survival perceptions: "What do you think are the chances that you will live to the age of 35?" Twin Cities'

youth were given the same response options as in the original Add Health survey, and they were also given the chance to write in their own response. Review of the responses by youth showed a recurring theme; youth reported that the "50-50 chance" option if chosen, was not always chosen because they perceived worry about life expectancy or a fear of dying early. Some youth interpretations of the "50-50 chance" response option reflected teachings in the home and in the church: "You don't know what will happen from one day to the next. It isn't really up to you. The Lord works in mysterious ways; 'He' is in charge. You just don't know what will happen tomorrow, but you trust. This is faith."

Based on these observations, a variable for low perceived survival using the Add Health data was conceptualized as respondents consistently reporting "almost no chance," and/or "some chance, but probably not," when answering the questions about chances of living to age 35 during Add Health Waves I-III. Respondents reporting "a 50-50 chance", "a good chance" and "almost certain" were categorized as perceiving better chance for survival. Very few respondents (n= 3, unweighted data) consistently reported "almost no chance," and/or "some chance, but probably not," when answering the questions about chances of living to age 35 during Add Health Waves I-III, raising concerns about the stability when creating estimation models. Using weighted data, models examining relationships between survival perceptions and later health were computed; however, models testing relationships between early social context and survival perceptions were severely limited by loss of observations due to limited variability in predictor and outcome variable combinations. Given this, alternate

processes were pursued in defining respondents' perceived survival over time for the dissertation analyses.

Based on previous work and what is known about adolescent mortality via vital statistics information, perceived risk for early death (low perceived survival) for the dissertation analyses is defined by respondents reporting "almost no chance," "some chance, but probably not," and "a 50-50 chance," when responding to the question: "What do you think are the chances that you will live to the age of 35?" These response options represent all options that are inaccurate for most US youth based on vital statistics (Minino, 2010; Minino et al., 2007). All other respondents, those reporting "a good chance" and "almost certain" are categorized as being optimistic with respect to life expectancy (having high perceived survival). Analyses to date demonstrating relationships between perceptions of risk for early death, defined by including those youth reporting only a 50-50 chance of living to age 35, and poor developmental, behavioral, and socioeconomic outcomes in adulthood suggests its significance as a potential marker for risk (Borowsky et al., 2009; Duke et al., 2011; Duke et al., 2009; Nguyen, Hussey, et al., 2012; Nguyen, Villaveces, et al., 2012).

Two sets of analyses using different patterns for survival perceptions over the course of Add Health Waves I-III were performed. In the first set of analyses, youth survival perceptions were grouped into three categories (Table 3.1): (1) low perceived survival—respondent report of a 50-50 chance or less of survival to age 35 years for Add Health Waves I-III; (2) changing perception (described as survival uncertainty)—respondent report of a 50-50 chance or less of survival to age 35 years in at least one

wave (but not all three waves); and (3) high perceived survival—respondent report of a good and/or almost certain chance of survival to age 35 years for Add Health Waves I-III.

In the second set of analyses, youth survival perceptions were grouped into five categories, representing closer study of perceptions during adolescence (Add Health Waves I, II) and the period corresponding to the transition to young adulthood (Add Health Wave III). The five categories include (Table 3.1): (1) low perceived survival in adolescence—respondent report of a 50-50 chance or less of survival to age 35 years for Add Health Wave I and/or Wave II, and low perceived survival in young adulthood—respondent report of a 50-50 chance or less of survival to age 35 years in Add Health Wave III; (2) changing perception, end low—respondent report of a good and/or almost certain chance of survival to age 35 years in adolescence (Add Health Waves I and II), but then report of a 50-50 chance or less of survival to age 35 years in young adulthood (Add Health Wave III); (3) changing perception, end high—respondent report of a 50-50 chance or less of survival to age 35 years in adolescence (Add health Waves I and II), but then report of a good or almost certain chance of survival to age 35 years in young adulthood (Add Health Wave III); (4) changing perception, mostly high—respondent report of a 50-50 chance or less of survival to age 35 years only once in adolescence (Add Health Wave I or Wave II, not both), leaving at least one time during adolescence when the respondent reported a good or almost certain change of survival to age 35 years, and then report of a good or almost certain chance of survival to age 35 years in young adulthood (Add Health Wave III); and (5) high perceived survival—respondent report of

a good and/or almost certain chance of survival to age 35 years in adolescence and young adulthood (as defined previously).

Constructs for Early Social Context

Early social context is defined by circumstances reported by respondents and respondents' parents in Add Health Wave I (or respondent report about an experience in a later wave, but the experience occurred in the time frame before Add Health Wave I—e.g., childhood abuse which is measured in Add Health Wave III) across four domains related to household economics and resources, adverse childhood experiences, perceptions of school safety, and neighborhood characteristics. The choice of domains reflects a recognition that youth perceptions are shaped by interactions within primary socializing environments. Variables for all constructs were coded to represent disadvantage.

Household economics and resources are defined by four variables created from parent data in Add Health Wave I (Table 3.2): parent does not have enough money to pay bills; parent or household member receives public assistance (welfare receipt, receipt of Aid to Families with Dependent Children, last month receipt of food stamps, receipt of housing subsidy or public housing); parent and parent's current spouse/partner are unemployed (but looking for work); and parent has difficulty accessing medical care for the family (parent report that it is somewhat hard or very hard to get medical care for the family vs. somewhat easy or very easy).

Adverse childhood experiences (ACEs) are defined by seven variables (Table 3.2). In Add Health Wave III, respondents were asked to reflect back on experiences

taking place by the time 6th grade started (thus referencing experiences occurring before participation in Add Health; Add Health started with respondents when they were in grades 7-12).[5] Respondents reflected on the following experiences: being left alone when an adult should have been present; not having basic needs met; experiences of physical abuse (frequency in which a parent or adult caregiver slapped, hit, or kicked respondent); experiences of sexual abuse (frequency in which parent or adult caregiver touched respondent in a sexual way, forced respondent to touch them in a sexual way, or forced sex on the respondent); frequency of social services investigations of the home or number of social services attempts to take the respondent out of their living situation; and placement in foster care. History of parent incarceration (biological mother, biological father spending time in jail or prison) was measured in Add Health Wave IV. In instances where questions asked for the number of times an event happened (e.g., frequency of social services investigations) or the response options were presented in ordinal format (e.g., experiences of physical abuse, response options 1= one time, 5= 10 or more times), a dichotomous variable representing any experience of the event was created (reflecting the trauma occurring with any one of the experiences; Felitti & Anda, 2010).

Perception of school safety was created from youth report in Add Health Wave I (Table 3.2). Respondents were asked how much they agree or disagree with the statement (5-point Likert Scale): "You feel safe in your school." A dichotomous variable was

[5] Questions were asked when respondents were 18-26 years of age, timing corresponding to removal of any reporting requirement in instances of neglect and/or abuse.

created to reflect youth feeling unsafe in school (0= strongly agree, agree, neither agree nor disagree; 1= strongly disagree and disagree with the statement).

Neighborhood disadvantage is defined by 3 constructs (Table 3.2): an index of neighborhood contextual items from tract level information (adults ≥ 25 years without a high school degree or equivalent; number of female headed households with children under the age of 18 years; male unemployment; families with income below the 1989 poverty line; and violent crime per 100,000 residents); collective efficacy; and youth perceptions of neighborhood safety. Similar to the work of Gerken and Harris (2014) and Harris and Gerken (2013), for each of the neighborhood tract variables, disadvantage was defined if an individual fell into the highest quartile for each tract measure. The neighborhood demographic index is a summary measure of highest quartiles for each tract variable. Neighborhood collective efficacy is a dichotomous variable based on youth responding 'true' or 'false' when asked whether: "People in this neighborhood look out for each other." Youth reporting 'false' are described as having low neighborhood collective efficacy. Perception of neighborhood safety is a dichotomous variable based on youth report of 'yes' or 'no' when asked: "Do you usually feel safe in your neighborhood?" Youth reporting 'no' are described as feeling unsafe in their neighborhood.

Health Outcomes in Adulthood

Four variables were created to represent adult health outcomes, measured in Add Health Wave IV (Table 3.3). Self-rated health is a measure of health linked to morbidity and mortality outcomes (Ferraro & Farmer, 1999; Idler & Benyamini, 1997; Jylhä, 2009;

Miilunpalo, Vuori, Oja, Pasanen, & Urponen, 1997), and is validated for samples of youth and young adults (Bauldry, Shanahan, Boardman, Miech, & Macmillan, 2012; Fosse & Haas, 2009; Vingilis, Wade, & Seeley, 2002). For self-rated health, respondents reported on their subjective rating of their health from "poor" (5) to "excellent" (1) (responses were recoded so that a higher number corresponds to better health).

The mental health disorder index (Table 3.3) was created by summing individual, dichotomous responses to questions asking if respondents had ever been told by a doctor, nurse, or other health professional they had certain conditions (depression, anxiety-panic disorder, and post-traumatic stress disorder), and respondent report of seriously thinking about suicide or having attempted suicide at least once in the past 12 months. The potential score range for the mental health disorder index is 0-5.

The diagnostic index covers the leading causes of morbidity and mortality for US adults as available in the data set (Felitti, Anda, Nordenberg, Williamson, Spitz, Edwards, et al., 1998; Johnson, Hayes, Brown, Hoo, & Ethier, 2014). The index (Table 3.3) was created by summing individual, dichotomous responses to questions asking if respondents had ever been told by a doctor, nurse, or other health professional they had certain conditions (cancer, leukemia, lymphoma; elevated cholesterol, triglycerides, lipids; hypertension, high blood pressure; diabetes, high blood sugar; heart disease; asthma, chronic bronchitis, emphysema; hepatitis B, C; mood, anxiety disorder) and respondent report of suicide-related thoughts or suicide attempt in last 12 months. Suicidality, as a single construct (combining thoughts and attempts), is included in this index as it is a leading contributor to morbidity and mortality among US adults, Centers

for Disease Control and Prevention, National Center for Injury Prevention and Control, https://www.cdc.gov/violenceprevention/pdf/suicide-datasheet-a.pdf). The potential score range for the diagnostic index is 0-9.

Allostatic load is measure of abnormal physiological parameters in the body (Karlamangla et al., 2012). An allostatic load score (Table 3.3) was created by summing the following components for each respondent (reflecting threshold cut-offs for risk): systolic blood pressure ≥ 140 mmHg; diastolic blood pressure ≥ 90 mmHg; resting heart rate ≥ 90 beats per minute; obese body mass index, BMI ≥ 30; hemoglobin A1C ≥ 6.4%; and high sensitivity C-reactive protein ≥ 3.0 mg/L (Karlamangla et al.).[6] The potential range for the allostatic load score is 0-6.

Covariates

Sociodemographic variables assessed at Add Health Waves I and IV were used as covariates in multivariate analyses (Table 3.4). For analyses examining relationships between early social context and respondent survival perceptions, covariates included in analytic models represent factors previously identified to be significantly related to youth survival perceptions (Borowsky et al., 2009). Covariates included: respondent age (continuous), respondent self-identified race (respondent self-identification in a race

[6] Components of the allostatic load score were measured as follows: C-reactive, an indicator of inflammation, was measured via blood spot. Glycosylated hemoglobin, an indicator of average blood sugar control over the preceding three months, was measured via blood spot. Systolic and diastolic blood pressures, indicators of cardiovascular function particularly as they relate to risk for coronary artery disease and sudden death, were measured in one arm by a trained interviewer. Respondent resting heart rate, another indicator of cardiovascular function with higher values raising concern for abnormal heart rhythm and risk for sudden death, was measured by a trained interviewer. Body mass index, an indicator of lipid metabolism, is a calculated variable from interviewer height and weight measurements.

group, including the group that best fits his or her identification if more than one race group was chosen—white; black, African American; Native American, American Indian; Asian, Pacific Islander; and Other, based on categories presented in the Add Health survey; white race is the referent group in analyses), respondent identification as of Hispanic or Latin origin, respondent biological sex, family structure (two biological parents vs. all other family units), youth report of mother receiving welfare (except in models including parent report of household economics and resources when evaluating relationships between early social context and survival perceptions), and respondent urban residence (dichotomous variable measuring living in an urban area vs. all other areas as assessed by the Add Health interviewer).

In analyses examining relationships between respondent survival perceptions and later health outcomes, covariates chosen reflect early life (Add Health Wave I) and adult conditions (Add Health Wave IV) (Table 3.4). Variables assessed at Wave I and used in all multivariate analyses are respondent biological sex, self-identified race (white race is the referent group), respondent Hispanic or Latin origin, parent education, family structure, and youth report of mother receiving welfare (youth report used due to fewer occurrences of missing data). Parent education is a measured as parent college graduate vs. not college graduate.[7] Family structure is measured as outlined above. Parent education and family structure are used to represent early socioeconomic influence

[7] In the original Wave I survey, parent education was assessed with response options that did not follow a continuous format (e.g., 8th grade or less; 8th grade did not graduate; high school graduate; General Equivalency Diploma; college, not graduate, etc.).

(Bauldry et al., 2012). Parent education and family structure were used to represent early socioeconomic influence because inclusion of parent reported income would have resulted in substantial loss of cases for analyses (~ 20% missing data, partially impacted by recruitment strategies in Wave I).

Variables describing social and economic location in adulthood assessed at Wave IV and used in all multivariate analyses examining the relationship between survival perceptions and health outcomes are respondent education, marital status, and non-marital cohabiting (Table 3.4). Paralleling the parent education variable, respondent education is a dichotomous variable measured as respondent college graduate vs. not college graduate. Recognizing the increasing diversity of family and romantic structures, marriage and non-marital cohabitation were included as control variables even though there is limited information pointing to the health impact of non-marital cohabitation and marriage at relatively young ages (respondents are 24-34 years at Wave IV) (Pollard & Harris, 2013). Proposed mechanisms for the impact of marriage on health include selection (healthier people marry) and protection (social support, material wealth), and the same mechanisms may be hypothesized for the potential impact of cohabitation on health (Pollard & Harris). Nationally and internationally, marriage is linked to longevity, mortality, health-related behaviors, and risk of death (Hu & Goldman, 1990; Waite, 1995). Marital status is a dichotomous variable indicating whether a respondent is living with his or her husband or wife. Cohabiting is a dichotomous variable indicating whether a respondent is living with a boyfriend, girlfriend, or partner (not married). Use of respondent income (~ 5% missing data) was considered as an additional covariate in

models examining the relationship between survival perceptions and adult health outcomes (as another measure of economic location); however in multivariate models, it did not add to the ability of the models to explain additional variance in health outcomes, and its inclusion in models further reduced sample sizes. Age as a continuous variable is also included in multivariate analyses examining relationships between survival perceptions and later health outcomes.

For analytic models looking at relationships between survival perceptions and health outcomes, additional controls were added to adjust for contributions from early health status, exposures, and current US adult health trends (Table 3.4). In multivariate analyses evaluating the relationship between survival perceptions and self-rated health, respondent childhood self-rated health (poor [1] to excellent [5]) was included in analyses. Child self-rated health was included in models to adjust for the potential enduring impact of chronic illness/disability on perceptions of health.

In multivariate analyses evaluating the relationship between survival perceptions and the mental health disorder index as well as the diagnostic index, a measure for depressive symptomatology at Wave I (adapted version of the Center for Epidemiological Studies Depression Scale, CES-D; Radloff, 1977; Weissman, Orvaschel, & Padian, 1980; Faulstich, Carey, Ruggiero, Enyart, & Gresham, 1986; Garrison, Addy, Jackson, McKeown, & Waller, 1991; Perreira, Deeb-Sossa, Harris & Bollen, 2005) and genetic risk for/exposure to suicide (family history and/or friend history of suicide, measured in Waves I, II, and IV) were included in analytic models (Table 3.4). The variable for depressive symptomatology used in analyses is dichotomous, signifying meeting the

equivalent of a threshold for clinical significance vs. not. The measure for suicide exposure is dichotomous, representing exposure vs. not.

In multivariate analyses evaluating the relationship between survival perceptions and the diagnostic index, three additional covariates were included, respondent childhood self-rated health, respondent BMI, and respondent history of smoking (Table 3.4). Respondent childhood self-rated health was included as a proxy for baseline health and health potential (measured in Wave I; youth self-rated health is a valid measure for early health, Fosse & Haas, 2009). Respondent BMI was included as an indicator of health behavior and environmental context contributing to the leading causes of morbidity and mortality for US adults (continuous, measured in Wave IV; Centers for Disease Control and Prevention, Overweight & Obesity, https://www.cdc.gov/obesity/adult/causes.html). Respondent history of smoking was included as an indicator of health behavior contributing to the leading causes of morbidity and mortality for US adults (ever smoker, measured in Wave IV; Centers for Disease Control and Prevention, Smoking & Tobacco Use, https://www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/effects_cig_smoking/index.htm). Respondent BMI and history of smoking were included in models as covariates as a means of adjustment for secular trends; in general, Americans are getting heavier as they age and smoking is still the leading cause of modifiable morbidity and mortality in the US (although BMI may soon surpass). In preliminary analyses, BMI and history of smoking failed as mediators (Kenny 2016) of the relationship between survival perceptions and health outcomes.

In multivariate analyses examining the relationship between survival perceptions and an allostatic load score, respondent childhood self-rated health and history of ever smoking (Table 3.4) was included in analyses. Respondent BMI was not included as a covariate as it is one of the components of the allostatic load score.

Additional variables were considered for inclusion in analytic models evaluating the relationship between survival perceptions and health outcomes. Use of respondent birth weight, as a measure of respondent health potential (reflecting mom's health, mom's health behaviors, environmental influences prior to birth—all of which affect genetic coding and phenotypic expression) was considered for inclusion as a covariate. However, concern for accuracy of parent recall and a large percent of missing data (~ 20% missing data) prohibited use of respondent birth weight in analyses. Respondent nativity was also considered for inclusion in analyses, however at the time of Wave IV data collection, respondents would have lived in the US for more than 10 years, so that any potential health advantage related to non-US origin would likely have been lost (Teruya & Bazargan-Hejazi, 2015). For youth people, the loss of an immigrant health advantage is noted to occur through the adoption of American behaviors (smoking, drinking, high calorie diets, and sedentary life styles) and loss of kinship networking (Teruya & Bazargan-Hejazi).

Research Procedures

Application to perform this secondary data analysis was submitted to the University of Minnesota (UMN) Human Subjects Institutional Review Board (IRB).

This study was deemed exempt from review by the UMN IRB (data represent an existing data set and are de-identified).

Data Analysis

Means with standard deviations, minimum and maximum values, and percentage missingness were calculated for all variables used in analyses (Tables 3.2-3.5). All analyses were performed using Stata 12 SE (StataCorp LP, College Station, Texas). Sampling weights were used to adjust for the complex sampling and cluster design and differential attrition by Wave IV (Chen & Chantala, 2014).

Research Question 1

The current study explored whether contexts for disadvantage related to household economics and resources, adverse childhood experiences, perceptions of school safety, neighborhood demographic characteristics, and perceptions of neighborhood collective efficacy and safety were predictive of individual survival perceptions, measured from adolescence to young adulthood (Table 3.1: low perceived survival, original; changing perception, original; low perceived survival, alternate; changing perception, end low; changing perception, end high; changing perception, mostly high; and high perceived survival). To do this, a series of multinomial logistic regression models were computed. In model 1, relationships between survival perceptions and demographic controls were examined. In model 2, relationships between survival perceptions, demographic controls, and Wave I household economics and resources were examined. In model 3, relationships between survival perceptions, demographic controls, and adverse childhood experiences (ACEs) were examined. In

model 4, relationships between survival perceptions, demographic controls, and perceptions of school safety were examined. In model 5, relationships between survival perceptions, demographic controls and neighborhood characteristics were examined (demographics, collective efficacy, and perceptions of safety). To test for unique complexities in relationships between contexts of disadvantage, in model 6, relationships between survival perceptions, demographic controls, and all measures for contexts of disadvantage (household economics and resources, ACEs, perceptions of school safety, neighborhood measures) were examined.

Research Question 2

To examine the relationship between youth survival perceptions and health in adulthood, a series of multivariate Ordinary Least Squares (OLS) regression analyses were performed. Initial regression models examined the relationship between each of three groups signifying survival perceptions (Table 3.1): (1) low perceived survival, original; (2) changing perception, original; and (3) high perceived survival, and each health outcome. In subsequent models, the relationship between each of the three groups signifying survival perceptions and each health outcome was evaluated with adjustment for measures of early social origin, adult socioeconomic location, and/or measures for baseline health and mental health, BMI, and history of smoking. In final analytic models, comparisons in health outcomes were performed for respondent groups corresponding to persistence in low survival perceptions vs. changing perceptions vs. persistence in belief of making it to age 35 years (high perceived survival). In multivariate comparison models, high perceived survival is the reference category.

In the second set of analyses, youth survival perceptions were grouped into five categories, representing closer study of perceptions during adolescence (Add Health Waves I, II) and the period corresponding to the transition to young adulthood (Add Health Wave III). A series of multivariate OLS regression analyses were performed examining the relationship between each of five groups signifying survival perceptions (Table 3.1): (1) low perceived survival, alternate; (2) changing perception, end low; (3) changing perception, end high; (4) changing perception, mostly high; and (5) high perceived survival, and each health outcome. In subsequent models, the relationship between each of the five groups signifying survival perceptions and each health outcome was evaluated with adjustment for measures of early social origin, adult socioeconomic location, and/or measures for baseline health and mental health, BMI, and history of smoking. In final analytic models, comparisons in health outcomes were performed for respondent groups corresponding to low perceived survival (the alternate construct) vs. changing perception, end low vs. changing perception, end high vs. changing perception, mostly high vs. high perceived survival. In multivariate comparison models, high perceived survival is the reference category.

Descriptions of Analytic Sample

Demographics

Characteristics of the study sample are provided in Table 3.4. Just over half (54.6%) of respondents are female. Based on the options provided in the Add Health survey, 62.5% of respondents self-identified as being of white race. Approximately 15% of respondents reported being of Hispanic/Latin ethnicity. The mean age of respondents

at Waves I and IV was 15.7 years and 28.6 years, respectively. Almost three-fourths of respondents were born in the United States (72.5%, not shown). Just over half of participants lived with their biological mother and father at Wave 1 (54.9%). Approximately one in 10 youth reported their mother received welfare (9.5%).[8] Twenty-five percent of parents were college graduates. One third of residences where youth respondents lived were described as urban by the Add Health interviewer. About 9 in 10 respondents reported at least good health in childhood (92.7%). Just over 25% of respondents met the cut off score for significant depressive symptomatology at Wave I. Less than 5% of respondents reported having a family history and/or friend history of suicide.

As adults, a greater proportion of respondents had graduated from college than their parents (Table 3.4). The mean number of years of education achieved by respondents was 14.7 (not shown), with about one in three respondents being a college graduate in Wave IV. More than half of Add Health respondents were married (39%) or living in an intimate cohabiting relationship (18.9%) in Wave IV. More than half of respondents had ever smoked by Wave IV (63.1%).

Survival Perceptions

A summary of respondents' survival perceptions is provided in Table 3.5. Based on the original constructs for survival perceptions, just over 25% of Add Health respondents reported low perceived survival during at least one wave of Add Health.

[8] Based on parent report, a little more than one in seven youth lived in households receiving some type of public assistance at Wave I (Table 3.2).

Persistence in low perceived survival was reported by 1.5% of respondents. Just under three-fourths of Add Health respondents (73.4%) consistently reported perception of a good chance or better of survival to age 35 years (high perceived survival).

Using the alternate constructs for the survival perception variables (Table 3.5), based on changing perceptions in adolescence (Waves I and II) and the period of transition to young adulthood (Wave III), 4.1% of respondents reported low perceived survival in Add Health Waves I-III. A similar proportion (4.5%) of respondents reported a 50-50 chance or less of living to age 35 years in adolescence (Wave I and II), and then at least a good chance of survival to age 35 years in young adulthood (Wave III) (changing perception, end high). Fewer respondents (3.5%) started off reporting at least a good chance of survival to age 35 years (Add Health Waves I and II), but then reported a 50-50 chance or less of living to age 35 years in young adulthood (Wave III) (changing perception, end low). Just under 15% of respondents reported a 50-50 chance or less of survival to age 35 years once in adolescence (Wave I or Wave II, not both), but then reported at least a good chance of survival to age 35 years in young adulthood (14.5%) (changing perception, mostly high).

Contexts for Disadvantage

A summary of disadvantage contexts is provided in Table 3.2. In terms of household economics and resources, more parents reported not having enough money to pay bills (18.5%) than reported a parent or household member received some type of public assistance (15%), parent and partner are unemployed (0.1%), or parent is having difficulty accessing medical care for the family (14.6%). The most commonly reported

adverse childhood experience was being left alone when a parent should have been present (41.8%), followed by physical abuse (29.4%), and having a biological parent who spent time in jail or prison (17.9%). Similar proportions of respondents reported not having basic needs met (11.6%) and the home being investigated by social services (11.3%). Just under 14% of respondents reported feeling unsafe at school (13.7%), and just over ten percent of students reported not feeling safe in their neighborhood (10.9%). About one in four respondents reported that people do not look out for each other in their neighborhood (27.1%). Neighborhood demographic indicators suggested risk for some respondents, living in census tracts in the highest quartile for one indicator (26.8%), two indicators (15.3%), and ≥ 3 indicators (23.7%) (not shown). Just over one third (34.3%) of respondents did not live in census tracts in the highest quartile for any of the neighborhood demographic indicators at Wave I (adults ≥ age 25 years without high school degree or equivalent; female headed household with children under the age of 18 years; male unemployment; families with income below 1989 poverty line; violent crime per 100,000) (not shown).

Health Outcomes

Respondents are relatively healthy in adulthood, Wave IV (Table 3.3). Overall, respondents reported good or better health (90%, not shown). The mean BMI for respondents was 29.09, which is at the upper end of the range for overweight (24.9-29.9). The percent of obese respondents 36.7% (not shown), is consistent with the national average for US adults. According to the Centers for Disease Control and Prevention 34.9% or 78.6 million US adults are obese (obesity defined by BMI ≥ 30; Centers for

Disease Control and Prevention, Adult Obesity Facts, http://www.cdc.gov/obesity/data/adult.html;). Less than half of respondents had been diagnosed with a chronic illness or disease corresponding to the leading causes of morbidity and mortality for US adults (44.7%, not shown). Even fewer respondents had been diagnosed with a metal health disorder or had a history of suicidality (24%, not shown). The mean allostatic load score of respondents was approximately 1.2; 27.6% of respondents had an allostatic load score of 1, 21.7% had an allostatic score of 2, and 13.6% of respondents had an allostatic load score of ≥ 3 (not shown). Looking at the summary statistics for the individual components of allostatic load (not shown): the mean systolic blood pressure for participants (124.2 mmHg) fell within the range of pre-hypertension (120-139 mmHg), and the mean diastolic blood pressure for participants (78.8 mmHg) fell just below the range for pre-hypertension (80-89 mmHg), suggesting some indication of risk for developing hypertension among respondents. Most respondents had a resting heart rate within the normal range (90th percentile resting heart rate was 89.5 beats/minute; normal range for the average adult is 60-90 beats/minute—some guidelines may go as high as 100 beats/min; well-trained athletes may have a resting heart rate as low as 40 beats/minute). The mean glycosylated hemoglobin level for respondents (5.6%) was right at the upper level of normal (normal $\leq 5.6\%$; pre-diabetes 5.7-6.5%; diabetes $\geq 6.6\%$). The range for the C-reactive protein (CRP) inflammatory marker was 0.08-205.01 mg/L (mean score 4.97 mg/L, standard deviation 8.73 mg/L), suggesting risk (average risk score 1.0-3.0 mg/L, high risk score > 3.0 mg/L) for some respondents (n= 3723 with CRP > 3.0 mg/L).

Youth Survival Expectations: Disadvantaged Contexts and Forecasts for Future Health

Chapter 4: Results, Social Context and Youth Survival Perceptions

Disadvantage in Early Social Contexts and Survival Perceptions

Relationships between Youth Context and Low Perceived Survival (original construct)

Table 4.1 shows multiple demographic and contextual variables were significantly associated with the odds of youth expressing perceptions of a 50-50 chance or less of survival to age 35 years during each of the first three waves of Add Health (low survival perceptions).

In model 1 (demographic variables), identifying as black/African American significantly increased the odds of persistence in low survival perceptions relative to persistence in high survival perceptions (b= 1.656, standard error [SE]= 0.273, $p< 0.001$). Youth report of their mother being on welfare increased the odds for persistence in low survival perceptions relative to persistence in high survival perceptions (b= 0.719, SE= 0.259, $p< 0.01$). For each additional year in age, the odds of persistence in low survival perceptions as compared to persistence in high survival perceptions increased (b= 0.255, SE= 0.085, $p< 0.01$). Two demographic variables were significantly associated with reduced odds of persistence in perceptions of low survival chances relative to persistence in high survival chances, female sex (b= -0.698, SE= 0.226, $p< 0.01$) and family structure including two biological parents (b= -0.662, SE= 0.290, $p< 0.05$).

In model 2 (household economics and resources + demographic variables), two variables related to household economics and resources were significantly associated

with increased odds of persistence in low survival perceptions relative to persistence in high survival perceptions, parent report of household receiving public assistance (b= 0.776, SE= 0.285, p< 0.01) and parent report of having difficulty accessing medical care for the family (b= 0.732, SE= 0.299, p< 0.05). Some patterns observed in model 1 for demographic variables remained. Identifying as black/African American and increasing age were associated with increased odds of persistence in low survival perceptions relative to persistence in high survival perceptions (b= 1.555, SE= 0.297; p< 0.001 and b= 0.201 for every year, SE= 0.085, p< 0.05 respectively). Identifying as female (b= -0.835, SE= 0.247, p< 0.01) and having a family structure including two biological parents (b= -0.666, SE= 0.322, p< 0.05) were associated with decreased odds of persistence in low survival perceptions as compared to persistence in high survival perceptions.

In model 3 (adverse childhood experiences + demographic variables), respondent report of not having basic needs met during childhood was significantly associated with increased odds of persistence in low survival perceptions (b= 0.817, SE= 0.380, p< 0.05) relative to persistence in high survival perceptions. Patterns observed for demographic variables remained. Compared to youth reporting persistence in high survival perceptions, the odds of persistence in low survival perceptions were increased with: increasing age (b= 0.242 for every year, SE= 0.096, p< 0.05); identifying as black/African American (b= 1.541, SE= 0.303, p< 0.001); and youth report of mother receiving welfare (b= 0.753, SE= 0.291, p< 0.05). The odds of persistence in low survival perceptions were decreased with: identifying as female (b= -0.876, SE= 0.270,

p< 0.01); and having a family structure including two biological parents (b= -0.749, SE= 0.342, p< 0.05).

In model 4 (school safety + demographic variables), increased odds of reporting persistence in low survival perceptions as compared to persistence in high survival perceptions was associated with respondent report of feeling unsafe in school (b= 1.146, SE= 0.320, p< 0.001). Some patterns observed for demographic variables remained. Compared to youth reporting persistence in high survival perceptions, the odds of persistence in low survival perceptions were increased with: increasing age (b= 0.258 for every year, SE= 0.088, p< 0.01); identifying as black/African American (b= 1.636, SE= 0.273, p< 0.001); and youth report of mother receiving welfare (b= 0.751, SE= 0.272, p< 0.01). The odds of persistence in low survival perceptions were decreased with: identifying as female (b= -0.649, SE= 0.232, p< 0.01).

In model 5 (neighborhood variables + demographic variables), increased odds of reporting persistence in low survival perceptions as compared to persistence in high survival perceptions were associated with respondent report of low neighborhood collective efficacy (b= 0.861, SE= 0.238, p< 0.001) and feeling unsafe in their neighborhood (b= 0.777, SE= 0.232, p< 0.01). Patterns previously observed for demographic variables continued. Compared to youth reporting persistence in high survival perceptions, the odds of youth persistence in low survival perceptions were increased with: increasing age (b= 0.224 for every year, SE= 0.085, p< 0.05); identifying as black/African American (b= 1.570, SE= 0.314, p< 0.001); and youth report of mother receiving welfare (b= 0.549, SE= 0.265, p< 0.05). The odds of persistence in low

survival perceptions were decreased with: identifying as female (b= -0.797, SE= 0.224, p< 0.01); and having a family structure including two biological parents (b= -0.586, SE= 0.291, p< 0.05).

In model 6 (the final model with all contextual variables entered into the regression equation + demographic variables), some variables remained uniquely associated with increased odds of respondent report of persistence in low survival perceptions as compared to report of persistence in high survival perceptions: parent report of herself/himself or another household member receiving public assistance (b= 0.856, SE= 0.387, p< 0.05); parent report of having difficulty accessing medical care for the family (b= 0.823, SE= 0.295, p< 0.01); youth report of feeling unsafe at school (b= 0.792, SE= 0.353, p< 0.05); youth report of low neighborhood collective efficacy (b= 0.837, SE= 0.307, p< 0.01); and youth feeling unsafe in their neighborhood (b= 0.817, SE= 0.313, p< 0.05). In the final model, one contextual variable not previously observed to be related to youth reporting persistence in low survival perceptions as compared to persistence in high survival perceptions, foster care placement, was associated a 1.524 unit increase (SE= 0.601, p< 0.05) in the odds of persistence in low survival perceptions. In the final model, youth identifying as black/African American remained significantly associated with increased odds of respondent persistence in low survival perceptions (b= 1.485, SE= 0.377, p< 0.001) as compared to persistence in high survival perceptions. As observed previously, the odds of persistence in low survival perceptions were decreased with identifying as female (b= -1.078, SE= 0.316, p< 0.01). In addition, youth identification as Asian/Pacific Islander, was associated with reduced odds of persistence

in low survival perceptions relative to persistence in high survival perceptions (b= -19.813, SE= 0.339, p< 0.001).

Relationships between Youth Context and Changing Survival Perceptions (original construct)

Multiple demographic and contextual variables were significantly associated with the odds of youth expressing changing perceptions of the chances of survival to age 35 years across Waves I-III of Add Health (50-50 chance or less of survival to age 35 years in at least one wave, not all three waves; Table 4.2).

In model 1 (demographic variables), compared to youth reporting persistence in high survival perceptions, the odds of youth reporting changing perception of survival chances were increased with: increasing age (b= 0.078 for every year, SE= 0.026, p< 0.01); identifying as black/African American (b= 0.987, SE= 0.097, p< 0.001); identifying as Native American/American Indian (b= 0.761, SE= 0.256, p< 0.01); identifying as of Hispanic ethnicity (b= 0.468, SE= 0.135, p< 0.01); and youth report of mother receiving welfare (b= 0.551, SE= 0.106, p< 0.001). The odds of youth report of changing survival perceptions were decreased with: identifying as female (b= -0.219, SE= 0.071, p< 0.01); and having a family structure including two biological parents (b= -0.298, SE= 0.069, p< 0.001).

In model 2 (household economics and resources + demographic variables), two variables related to household economics and resources were significantly associated with increased odds of respondent report of changing survival perceptions relative to persistence in high survival perceptions, parent report of herself/himself or another

household member receiving public assistance (b= 0.608, SE= 0.110, p< 0.001) and parent report of having difficulty accessing medical care for the family (b= 0.594, SE= 0.109, p< 0.001). With the addition of household economics and resources to the model, patterns observed in model 1 for demographic variables remained to varying degrees. Compared to youth reporting persistence in high survival perceptions, the odds of youth reporting changing perception of survival chances were increased with: increasing age (b= 0.063 for every year, SE= 0.029, p< 0.05); identifying as black/African American (b= 0.849, SE= 0.098, p< 0.001); identifying as Native American/American Indian (b= 0.708, SE= 0.215, p< 0.01); and identifying as Hispanic (b= 0.359, SE= 0.146, p< 0.05). The odds of reporting changing perception of survival chances were decreased with: identifying as female (b= -0.274, SE= 0.081, p< 0.01); and having a family structure including two biological parents (b= -0.257, SE= 0.070, p< 0.001).

In model 3 (adverse childhood experiences + demographic variables), respondent report of having had their home investigated by social services during childhood was significantly associated with increased odds of report of changing perception of survival chances during Add Health Waves I-III (b= 0.358, SE= 0.124, p< 0.01) relative to a persistence in high survival perceptions during Add Health Waves I-III. Patterns previously observed for demographic variables remained to varying degrees. Compared to youth reporting persistence in high survival perceptions, the odds of report of changing perception of survival chances were increased with: increasing age (b= 0.083 for every year, SE= 0.028, p< 0.01); identifying as black/African American (b= 1.006, SE= 0.108, p< 0.001); identifying as Native American/American Indian (b= 0.713, SE= 0.297, p<

0.05); identifying as Hispanic (b= 0.492, SE= 0.149, p< 0.01); and youth report of mother receiving welfare (b= 0.448, SE= 0.132, p< 0.01). The odds of report of changing perception of survival chances were also increased with identifying as Asian/Pacific Islander (b= 0.385, SE= 0.190, p< 0.05). The odds of reporting changing perception of survival chances were decreased with: identifying as female (b= -0.166, SE= 0.078, p< 0.05); and having a family structure including two biological parents (b= -0.255, SE= 0.080, p< 0.01).

In model 4 (school safety + demographic variables), increased odds of report of changing perception of survival chances as compared to persistence in high survival perceptions were associated with respondent report of feeling unsafe in school (b= 0.607, SE= 0.105, p< 0.001). Some patterns previously observed for demographic variables remained. Compared to youth reporting persistence in high survival perceptions, the odds of report of changing perception of survival chances were increased with: increasing age (b= 0.069 for every year, SE= 0.025, p< 0.01); identifying as black/African American (b= 0.966, SE= 0.098, p< 0.001); identifying as Native American/American Indian (b= 0.682, SE= 0.261, p< 0.05); identifying as Hispanic (b= 0.457, SE= 0.139, p< 0.01); and youth report of mother receiving welfare (b= 0.547, SE= 0.111, p< 0.001). The odds of reporting changing perception of survival chances were decreased with: identifying as female (b= -0.211, SE= 0.073, p< 0.01); and having a family structure including two biological parents (b= -0.285, SE= 0.069, p< 0.001).

In model 5 (neighborhood variables + demographic variables), increased odds of report of changing perception of survival chances as compared to persistence in high

survival perceptions were associated with respondent neighborhood demographic index (b= 0.164 for every additional feature signifying disadvantage, SE= 0.047, p< 0.01) and report of feeling unsafe in the neighborhood (b= 0.508, SE= 0.115, p< 0.001). Patterns previously observed for demographic variables continued. Compared to youth reporting persistence in high survival perceptions, the odds of report of changing perception of survival chances were increased with: increasing age (b= 0.077 for every year, SE= 0.026, p< 0.01); identifying as black/African American (b= 0.738, SE= 0.120, p< 0.001); identifying as Native American/American Indian (b= 0.665, SE= 0.243. p< 0.01); identifying as Hispanic (b= 0.328, SE= 0.150, p< 0.05); and youth report of mother receiving welfare (b= 0.430, SE= 0.110, p< 0.001). The odds of reporting changing perception of survival chances were decreased with: identifying as female (b= -0.275, SE= 0.080, p< 0.01); and having a family structure including two biological parents (b= -0.259, SE= 0.078, p< 0.01). In addition, in this model, urban residence was associated with reduced odds of reporting changing perceptions of survival relative to persistence in report of high survival perceptions (b= -0.172, SE= 0.083, p< 0.05).

In model 6 (the final model with all contextual variables entered into the regression equation + demographic variables), some variables remained uniquely associated with increased odds of respondent report of changing perceptions of survival chances as compared to report of persistence in high survival perceptions: parent report of herself/himself or another household member receiving public assistance (b= 0.414, SE= 0.136, p< 0.01); parent report of having difficulty accessing medical care for the family (b= 0.525, SE= 0.115, p< 0.001); youth report of home social services

investigation (b= 0.382, SE= 141, p< 0.01); youth report of feeling unsafe at school (b= 0.499, SE= 0.131, p< 0.001); youth neighborhood demographic index (b= 0.148 for each additional feature signifying disadvantage, SE= 0.052, p< 0.01); and youth feeling unsafe in their neighborhood (b= 0.340, SE= 0.147, p< 0.05). In the final model, one contextual variable not previously observed to be related to youth report of changing survival perceptions as compared to persistence in high survival perceptions, report of being left alone when an adult should have been present during childhood, was associated a 0.219 unit increase (SE= 0.088, p< 0.05) in the odds of changing survival perceptions. In terms of demographic variables, compared to youth reporting persistence in high survival perceptions, the odds of report of changing perception of survival chances were increased with: increasing age (b= 0.071 for every year, SE= 0.032, p< 0.05); and identifying as black/African American (b= 0.665, SE= 0.130, p< 0.001). The odds of reporting changing perception of survival chances were decreased with: identifying as female (b= -0.280, SE= 0.096, p< 0.01); having a family structure including two biological parents (b= -0.215, SE= 0.087, p< 0.05); and urban residence (b= -0.224, SE= 0.112, p< 0.05).

Relationships between Youth Context and Low Perceived Survival (alternate construct)

Table 4.3 shows multiple demographic and contextual variables were significantly associated with the odds of youth expressing perceptions of a 50-50 chance or less of survival to age 35 years in Add Health Wave I or Wave II (either wave or both waves), and a 50-50 chance or less of survival to age 35 years in Add Health Wave III (low perceived survival, alternate construct).

In model 1 (demographic variables), compared to youth reporting persistence in high survival perceptions, the odds of youth reporting low perceived survival (alternate construct) were increased with: increasing age (b= 0.191 for each year, SE= 0.054, p< 0.01); identifying as Hispanic (b= 0.936, SE= 0.272, p< 0.01); identifying as black/African American (b= 1.497, SE= 0.186, p< 0.001); and youth report of mother receiving welfare (b= 0.488, SE= 0.153, p< 0.01). The odds of reporting low survival perceptions (alternate construct) were decreased with: identifying as female (b= -0.431, SE= 0.152, p< 0.01); and having a family structure including two biological parents (b= -0.365, SE= 0.150, p< 0.05).

In model 2 (household economics and resources + demographic variables), two variables related to household economics and resources were significantly associated with increased odds of reporting low survival perceptions (alternate construct) relative to persistence in report of high survival perceptions, parent report of herself/himself or another household member receiving public assistance (b= 0.591, SE= 0.176, p< 0.01) and parent report of having difficulty accessing medical care for the family (b= 0.671, SE= 0.226, p< 0.01). Some patterns observed in model 1 for demographic variables remained. Increasing age (b= 0.142 for each year, SE= 0.060, p< 0.05), identifying as Hispanic (b= 0.879, SE= 0.287, p< 0.01), and identifying as black/African American (b= 1.349, SE= 0.195, p< 0.001) were associated with increased odds of reporting low survival perceptions (alternate construct) relative to persistence in high survival perceptions. Identifying as female (b= -0.491, SE= 0.172, p< 0.01) was associated with

decreased odds of reporting low survival perceptions as compared to persistence in high survival perceptions.

In model 3 (adverse childhood experiences + demographic variables), respondent report of not having basic needs met during childhood was significantly associated with increased odds of reporting low survival perceptions (alternate construct) (b= 0.835, SE= 0.243, p< 0.01) relative to persistence in high survival perceptions. Patterns observed for demographic variables remained. Compared to youth reporting persistence in high survival perceptions, the odds of reporting low survival perceptions (alternate construct) were increased with: increasing age (b= 0.157 for every year, SE= 0.063, p< 0.05); identifying as Hispanic (b= 0.882, SE= 0.301, p< 0.01); identifying as black/African American (b= 1.541, SE= 0.303, p< 0.001); and youth report of mother receiving welfare (b= 0.391, SE= 0.192, p< 0.05). The odds of reporting low survival perceptions (alternate construct) were decreased with: identifying as female (b= -0.451, SE= 0.169, p< 0.01).

In model 4 (school safety + demographic variables), increased odds of reporting low survival perceptions (alternate construct) as compared to persistence in high survival perceptions were associated with respondent report of feeling unsafe in school (b= 0.861, SE= 0.212, p< 0.001). Previous patterns observed for demographic variables remained. Compared to youth reporting persistence in high survival perceptions, the odds of reporting low survival perceptions (alternate construct) were increased with: increasing age (b= 0.179 for every year, SE= 0.055, p< 0.01); identifying as Hispanic (b= 0.906, SE= 261, p< 0.01); identifying as black/African American (b= 1.492, SE= 0.186, p<

0.001); and youth report of mother receiving welfare (b= 0.519, SE= 0.156, p< 0.01). The odds of reporting low survival perceptions (alternate construct) were decreased with: identifying as female (b= -0.405, SE= 0.156, p< 0.05); and having a family structure including two biological parents (b= -0.342, SE= 0.158, p< 0.05).

In model 5 (neighborhood variables + demographic variables), increased odds of reporting low survival perceptions (alternate construct) as compared to persistence in high survival perceptions were associated with respondent report of low neighborhood collective efficacy (b= 0.587, SE= 0.153, p< 0.001) and feeling unsafe in their neighborhood (b= 0.735, SE= 0.168, p< 0.001). Some patterns previously observed for demographic variables continued. Compared to youth reporting persistence in high survival perceptions, the odds of youth reporting low survival perceptions (alternate construct) were increased with: increasing age (b= 0.180 for every year, SE= 0.055, p< 0.01); identifying as Hispanic (b= 0.732, SE= 284, p< 0.05); and identifying as black/African American (b= 1.312, SE= 0.209, p< 0.001). The odds of reporting low survival perceptions (alternate construct) were decreased with: identifying as female (b= -0.516, SE= 0.156, p< 0.01); and having a family structure including two biological parents (b= -0.320, SE= 0.160, p< 0.05).

In model 6 (the final model with all contextual variables entered into the regression equation + demographic variables), some variables remained uniquely associated with increased odds of respondent report low survival perceptions (alternate construct) as compared to report of persistence in high survival perceptions: parent report of having difficulty accessing medical care for the family (b= 0.609, SE= 0.224, p< 0.01);

youth report of not having basic needs met during childhood (b= 0.705, SE= 0.278, p< 0.05); youth report of feeling unsafe at school (b= 0.706, SE= 0.243, p< 0.01); youth report of low neighborhood collective efficacy (b= 0.574, SE= 0.192, p< 0.01); and youth feeling unsafe in their neighborhood (b= 0.554, SE= 0.218, p< 0.05). In the final model, one contextual variable not previously observed to be related to youth reporting low survival perceptions (alternate construct) as compared to persistence in high survival perceptions, foster care placement, was associated a 1.015 unit increase (SE= 0.468, p< 0.05) in the odds of reporting low survival perceptions. In the final model, youth identifying as Hispanic and black/African American remained significantly associated with increased odds of respondent report of low survival perceptions (alternate construct) (b= 0.669, SE= 0.313, p< 0.05 and b= 1.323, SE= 0.226, p< 0.001 respectively) as compared to persistence in high survival perceptions. As observed previously, the odds of reporting low survival perceptions (alternate construct) were decreased with identifying as female (b= -0.554, SE= 0.201, p< 0.01).

Relationships between Youth Context and Changing Survival Perceptions, End Low

Table 4.4 shows multiple demographic and contextual variables were significantly associated with the odds of youth expressing perceptions of a good or almost certain chance of survival to age 35 years in Add Health Wave I and Wave II, and a 50-50 chance or less of survival to age 35 years in Wave III.

In model 1 (demographic variables), compared to youth reporting persistence in high survival perceptions, the odds of youth reporting changing survival perceptions, end low were increased with: identifying as black/African American (b= 0.877, SE= 0.193,

p< 0.001). The odds of reporting changing survival perceptions, end low were decreased with: identifying as female (b= -0.426 units, SE= 0.169, p< 0.05).

In model 2 (household economics and resources + demographic variables), one variable related to household economics and resources was significantly associated with increased odds of reporting changing survival perceptions, end low relative to persistence in report of high survival perceptions, parent report of household receipt of public assistance (b= 0.430, SE= 0.193, p< 0.05). One variable related to household economics and resources was significantly associated with decreased odds of reporting changing survival perceptions, end low relative to persistence in report of high survival perceptions, parent report of parent and partner being unemployed (b= -20.847, SE= 0.598, p< 0.001). Patterns observed in model 1 for demographic variables remained. Identifying as black/African American (b= 0.786, SE= 0.194, p< 0.001) was associated with increased odds of reporting changing survival perceptions, end low relative to persistence in high survival perceptions. The odds of reporting changing survival perceptions, end low were decreased with: identifying as female (b= -0.561, SE= 0.171, p< 0.01).

In model 3 (adverse childhood experiences + demographic variables), no adverse childhood experiences were associated with differences in the odds of reporting changing survival perceptions, end low relative to reporting persistence in high survival perceptions. Compared to youth reporting persistence in high survival perceptions, the odds of youth reporting changing survival perceptions, end low was increased with: identifying as black/African American (b= 0.852, SE= 0.215, p< 0.001).

In model 4 (school safety + demographic variables), perception of school safety was not associated with differences in the odds of reporting changing survival perceptions, end low relative to reporting persistence in high survival perceptions. Patterns observed in model 1 for demographic variables remained. Identifying as black/African American (b= 0.881, SE= 0.195, p< 0.001) was associated with increased odds of reporting changing survival perceptions, end low relative to persistence in high survival perceptions. The odds of reporting changing survival perceptions, end low were decreased with: identifying as female (b= -0.438, SE= 0.169, p< 0.05).

In model 5 (neighborhood variables + demographic variables), increased odds of report of changing survival perceptions, end low as compared to persistence in high survival perceptions were associated with respondent neighborhood demographic index (b= 0.152 for every additional feature signifying disadvantage, SE= 0.072, p< 0.05). Identifying as black/African American (b= 0.632, SE= 0.213, p< 0.01) was associated with increased odds of reporting changing survival perceptions, end low relative to persistence in high survival perceptions. The odds of reporting changing survival perceptions, end low was decreased with: identifying as female (b= -0.467, SE= 0.179, p< 0.05).

In model 6 (the final model with all contextual variables entered into the regression equation + demographic variables), one variable related to household economics and resources remained significantly associated with decreased odds of reporting changing survival perceptions, end low relative to persistence in report of high survival perceptions, parent report of parent and partner being unemployed (b= -22.323,

SE= 0.774, p< 0.001). Parent report of having difficulty accessing medical care for the family, not previously observed to be related to youth report of changing survival perceptions, end low relative to report of persistence in high survival perceptions, was associated with increased odds of report of changing survival perceptions, end low (b= 0.508, SE= 0.243, p< 0.05). Report of history of foster care placement, also not previously observed to be related to youth report of changing survival perceptions, end low relative to report of persistence in high survival perceptions, was associated with increased odds of reporting changing survival perceptions, end low (b= 1.803, SE= 0.646, p< 0.01). Previous patterns observed for demographic variables remained with the addition of two new relationships. Identifying as black/African American (b= 0.566, SE= 0.264, p< 0.05) was associated with increased odds of reporting changing survival perceptions, end low relative to persistence in high survival perceptions. Identifying as Asian/Pacific Islander and Native American/American Indian were associated with decreased odds of reporting changing survival perceptions, end low relative to persistence in high survival perceptions (b= -1.203, SE= 0.514, p< 0.05; and b= -21.156, SE= 0.643, p< 0.001, respectively). As observed previously, the odds of reporting changing survival perceptions, end low was decreased with: identifying as female (b= -0.633, SE= 0.201, p< 0.01).

Relationships between Youth Context and Changing Survival Perceptions, End High

Table 4.5 shows multiple demographic and contextual variables were significantly associated with the odds of youth expressing perceptions of a 50-50 chance or less of

survival to age 35 years in Add Health Wave I and Wave II, and a good or almost certain chance of survival to age 35 years in Wave III.

In model 1 (demographic variables), compared to youth reporting persistence in high survival perceptions, the odds of youth reporting changing survival perceptions, end high were increased with: increasing age (b= 0.213 for every year, SE= 0.045, p< 0.001); identifying as black/African American (b= 1.016, SE= 0.187, p< 0.001); identifying as Native American/American Indian (b= 1.249, SE= 0.364, p< 0.01); identifying race category as other (b= 0.515, SE= 0.249, p< 0.05); and youth report of mother receiving welfare (b= 0.777, SE= 0.196, p< 0.001).

In model 2 (household economics and resources + demographic variables), two variables related to household economics and resources were significantly associated with increased odds of reporting changing survival perceptions, end high relative to persistence in report of high survival perceptions, parent report of herself/himself or another household member receiving public assistance (b= 0.672, SE= 0.190, p< 0.01) and parent report of having difficulty accessing medical care for the family (b= 0.515, SE= 0.188, p< 0.01). Some patterns observed in model 1 for demographic variables remained. Increasing age (b= 0.231 for every year, SE= 0.048, p< 0.001), identifying as black/African American (b= 0.755, SE= 0.212, p< 0.01), and identifying as Native American/American Indian (b= 1.061, SE= 0.386, p< 0.01) were associated with increased odds of reporting changing survival perceptions, end high relative to persistence in high survival perceptions.

In model 3 (adverse childhood experiences + demographic variables), youth report of having their home investigated by social services was significantly associated with increased odds of reporting changing survival perceptions, end high (b= 0.680, SE= 0.232, p< 0.01) relative to persistence in high survival perceptions. Report of history of physical abuse was associated with decreased odds of reporting changing survival perceptions, end high (b= -0.473, SE= 0.207, p< 0.05) relative to persistence in high survival perceptions. Patterns observed for demographic variables remained. Compared to youth reporting persistence in high survival perceptions, the odds of youth reporting changing survival perceptions, end high were increased with: increasing age (b= 0.213 for every year, SE= 0.051, p< 0.001); identifying as Hispanic (b= 0.576, SE= 0.290, p< 0.05); identifying as black/African American (b= 1.029, SE= 0.207, p< 0.001); identifying as Native American/American Indian (b= 1.431, SE= 0.397, p< 0.001); and youth report of mother receiving welfare (b= 0.864, SE= 0.221, p< 0.001).

In model 4 (school safety + demographic variables), increased odds of reporting changing survival perceptions, end high as compared to persistence in high survival perceptions were associated with respondent report of feeling unsafe in school (b= 0.901, SE= 0.190, p< 0.001). Some previous patterns observed for demographic variables remained. Compared to youth reporting persistence in high survival perceptions, the odds of youth reporting changing survival perceptions, end high was increased with: increasing age (b= 0.213 for every year, SE= 0.047, p< 0.001); identifying as black/African American (b= 0.927, SE= 0.198, p< 0.001); identifying as Native American/American Indian (b= 1.136, SE= 0.356, p< 0.01); identifying race category as

other (b= 0.531, SE= 246, p< 0.05); and youth report of mother receiving welfare (b= 0.744, SE= 0.207, p< 0.001).

In model 5 (neighborhood variables + demographic variables), increased odds of reporting changing survival perceptions, end high as compared to persistence in high survival perceptions were associated with respondent report of feeling unsafe in their neighborhood (b= 0.911, SE= 0.181, p< 0.001). Some patterns previously observed for demographic variables continued. Compared to youth reporting persistence in high survival perceptions, the odds of reporting changing survival perceptions, end high were increased with: increasing age (b= 0.215 for every year, SE= 0.044, p< 0.001); identifying as black/African American (b= 0.861, SE= 0.206, p< 0.001); identifying as Native American/American Indian (b= 1.226, SE= 0.390, p< 0.01); and youth report of mother receiving welfare (b= 0.735, SE=0.202, p< 0.001).

In model 6 (the final model with all contextual variables entered into the regression equation + demographic variables), some variables remained uniquely associated with increased odds of reporting changing survival perceptions, end high as compared to report of persistence in high survival perceptions: parent report of having difficulty accessing medical care for the family (b= 0.577, SE= 0.203, p< 0.01); youth report of having their home investigated by social services (b= 0.811, SE= 0.249, p< 0.01); youth report of feeling unsafe at school (b= 0.913, SE= 0.245, p< 0.001); and youth feeling unsafe in their neighborhood (b= 0.553, SE= 0.234, p< 0.05). Report of history of physical abuse was associated with decreased odds of reporting changing survival perceptions, end high (b= -0.505, SE= 0.224, p< 0.05) relative to persistence in

high survival perceptions. Previous patterns observed for demographic variables remained. Compared to youth reporting persistence in high survival perceptions, reporting changing survival perceptions, end high was increased with: increasing age (b= 0.228 for every year, SE= 0.057, p< 0.001); identifying as black/African American (b= 0.560, SE= 0.268, p< 0.05); and identifying as Native American/American Indian (b= 1.153, SE= 0.441, p< 0.05).

Relationships between Youth Context and Changing Survival Perceptions, Mostly High

Table 4.6 shows multiple demographic and contextual variables were significantly associated with the odds of youth expressing perceptions of a 50-50 chance or less of survival to age 35 years in Add Health Wave I or Wave II (not both), and a good or almost certain chance of survival to age 35 years in Wave III.

In model 1 (demographic variables), compared to youth reporting persistence in high survival perceptions, the odds of youth reporting changing survival perceptions, mostly high were increased with: identifying as Hispanic (b= 0.456, SE= 0.144, p< 0.01); identifying as Asian/Pacific Islander (b= 0.406, SE= 0.195, p< 0.05); identifying as black/African American (b= 0.929, SE= 0.116, p< 0.001); identifying as Native American/American Indian (b= 0.692, SE= 0.329, p< 0.05); and youth report of mother receiving welfare (b= 0.583, SE= 0.128, p< 0.001). The odds of reporting changing survival perceptions, mostly high was decreased with: identifying as female (b= -0.211, SE= 0.082, p< 0.05); and having a family structure including two biological parents (b= -0.347, SE= 0.090, p< 0.001).

In model 2 (household economics and resources + demographic variables), two variables related to household economics and resources were significantly associated with increased odds of reporting changing survival perceptions, mostly high relative to persistence in report of high survival perceptions, parent report of herself/himself or another household member receiving public assistance (b= 0.653, SE= 0.132, p< 0.001) and parent report of having difficulty accessing medical care for the family (b= 0.669, SE= 0.129, p< 0.001). Some patterns observed in model 1 for demographic variables remained. Identifying as black/African American (b= 0.825, SE= 0.114, p< 0.001), and identifying as Native American/American Indian (b= 0.783, SE= 0.260, p< 0.01) were associated with increased odds of reporting changing survival perceptions, mostly high relative to persistence in high survival perceptions. The odds of reporting changing survival perceptions, mostly high was decreased with: identifying as female (b= -0.250, SE= 0.092, p< 0.01); and having a family structure including two biological parents (b= -0.282, SE= 0.095, p<0.01).

In model 3 (adverse childhood experiences + demographic variables), youth report of having their home investigated by social services was significantly associated with increased odds of reporting changing survival perceptions, mostly high (b= 0.324, SE= 0.141, p< 0.05) relative to report of persistence in high survival perceptions. Some previously observed patterns observed for demographic variables remained with the addition of one new relationship. Compared to youth reporting persistence in high survival perceptions, the odds of youth reporting changing survival perceptions, mostly high were increased with: increasing age (b= 0.064 for every year, SE= 0.030, p< 0.05);

identifying as Hispanic (b= 0.423, SE= 0.167, p< 0.05); identifying as Asian/Pacific Islander (b= 0.557, SE= 0.186, p< 0.01); identifying as black/African American (b= 0.952, SE= 0.126, p< 0.001); and youth report of mother receiving welfare (b= 0.434, SE= 0.147, p< 0.01). The odds of reporting changing survival perceptions, mostly high were decreased with: having a family structure including two biological parents (b= -0.434, SE= 0.147, p< 0.01).

In model 4 (school safety + demographic variables), increased odds of reporting changing survival perceptions, mostly high as compared to persistence in high survival perceptions were associated with respondent report of feeling unsafe in school (b= 0.586, SE= 0.123, p< 0.001). Some previous patterns observed for demographic variables remained. Compared to youth reporting persistence in high survival perceptions, the odds of youth reporting changing survival perceptions, mostly high were increased with: identifying as Hispanic (b= 0.450, SE= 0.152, p< 0.01); identifying as Asian/Pacific Islander (b= 0.413, SE= 0.189, p< 0.05); identifying as black/African American (b= 0.917, SE= 0.119, p< 0.001); and youth report of mother receiving welfare (b= 0.579, SE= 0.135, p< 0.001). The odds of reporting changing survival perceptions, mostly high were decreased with: identifying as female (b= -0.205, SE= 0.083, p< 0.05); and having a family structure including two biological parents (b= -0.330, SE= 0.091, p< 0.001).

In model 5 (neighborhood variables + demographic variables), increased odds of reporting changing survival perceptions, mostly high as compared to persistence in high survival perceptions were associated with respondent neighborhood demographic index (b= 0.187 for every additional feature signifying disadvantage, SE= 0.049, p< 0.001) and

respondent report of feeling unsafe in their neighborhood (b= 0.498, SE= 0.163, p< 0.01). Some patterns previously observed for demographic variables remained. Compared to youth reporting persistence in high survival perceptions, the odds of youth reporting changing survival perceptions, mostly high were increased with: identifying as Hispanic (b= 0.321, SE= 0.150, p< 0.05); identifying as black/African American (b= 0.650, SE= 0.138, p< 0.001); and youth report of mother receiving welfare (b= 0.440, SE= 0.133, p< 0.01). The odds of reporting changing survival perceptions, mostly high were decreased with: identifying as female (b= -0.270, SE= 0.095, p< 0.01); and having a family structure including two biological parents (b= -0.318, SE= 0.101, p< 0.01).

In model 6 (the final model with all contextual variables entered into the regression equation + demographic variables), some variables remained uniquely associated with increased odds of reporting changing survival perceptions, mostly high as compared to report of persistence in high survival perceptions: parent report of herself/himself or another household member receiving public assistance (b= 0.457, SE= 0.169, p< 0.01); parent report of having difficulty accessing medical care for the family (b= 0.516, SE= 0.144, p< 0.001); youth report of feeling unsafe at school (b= 0.347, SE= 0.164, p< 0.05); and respondent neighborhood demographic index (b= 0.189 for every additional feature signifying disadvantage, SE= 0.055, p< 0.01). Report of neglect, being left alone when an adult should have been present, was also associated with increased odds of reporting changing survival perceptions, mostly high (b= 0.238, SE= 0.117, p< 0.05) relative to persistence in high survival perceptions. Few previous patterns observed for demographic variables remained. Compared to youth reporting persistence in high

survival perceptions, the odds of youth reporting changing survival perceptions, mostly high were increased with: identifying as black/African American (b= 0.605, SE= 0.141, p< 0.001). The odds of reporting changing survival perceptions, mostly high was decreased with: identifying as female (b= -0.295, SE= 0.118, p< 0.05); and having a family structure including two biological parents (b= -0.277, SE= 0.123, p< 0.05).

Findings in Brief

Multiple contextual and demographic variables were significantly associated with respondent survival perceptions over time. Across survival perceptions constructs (original and alternate constructs), compared to youth reporting persistence in high survival perceptions (reporting a good or better chance of survival to age 35 years in Add Health Waves I-III), the odds of youth reporting any other pattern for survival perceptions (expressing low perceived survival at any time during Add Health Waves I-III) were significantly increased with parent report of having difficulty accessing medical care for the family and respondent identification as black/African American.

Looking at the two low perceived survival constructs, original (respondent report of a 50-50 chance or less of survival to age 35 years in Add Health Waves I-III) and alternate (respondent report of a 50-50 chance or less of survival to age 35 years in Add Health Wave I and/or Wave II, and report a 50-50 chance or less of survival to age 35 years in Add Health Wave III), compared to youth reporting persistence in high perceived survival, the odds of youth reporting low perceived survival were significantly increased with: parent report of difficulty accessing medical care for the family; feeling unsafe at school; respondent perception of low neighborhood collective efficacy; respondent

feeling unsafe in their neighborhood; history of foster care placement; and respondent identification as black/African American. The odds of reporting low perceived survival were decreased with respondent identification as female.

Looking at expressions of low perceived survival in adolescence only, (changing, end high; changing, mostly high), compared to youth reporting persistence in high perceived survival, the odds of youth reporting low perceived survival in adolescence (once or twice) were significantly increased with: parent report of difficulty accessing medical care for the family; feeling unsafe at school; and respondent identification as black/African American. The odds of reporting low perceived survival in adolescence were significantly increased in relation to neighborhood variables: feeling unsafe in their neighborhood among youth reporting low perceived survival at both time points in adolescence (changing, end high), and neighborhood demographics signifying disadvantage among youth reporting low perceived survival at one time point in adolescence (changing, mostly high).

Youth Survival Expectations: Disadvantaged Contexts and Forecasts for Future Health

Chapter 5: Results, Youth Survival Perceptions and Adult Health

Survival Perceptions and Health Outcomes

Youth Survival Perceptions (original constructs)

Using the original definition of low perceived survival (respondent perception of a 50-50 chance or less of survival to age 35 years for Add Health Waves I, II, and III), in the final multivariate model (model 3, Table 5.1), adjusting for age, biological sex, race, Hispanic ethnicity, parent education, family structure, mother welfare status, respondent education, respondent marital and cohabitation status, and respondent youth self-rated health, youth low perceived survival was significantly associated with worse self-rated health in adulthood when compared to youth who consistently reported a good chance or better of survival to age 35 years during Add Health Waves I, II, and III (b= -0.332, SE= 0.112, $p< 0.01$). Compared to respondents who consistently reported a good chance or better of living to age 35 years (Add Health Waves I-III), report of changing perception of survival chances (respondent report of a 50-50 chance or less of survival to age 35 years in at least one Add Health Wave, but not all three) was also significantly associated with worse self-rated health in adulthood (b= -0.095, SE= 0.038, $p< 0.05$). In the same final multivariate model, female sex (b= -0.084, SE= 0.027, $p< 0.01$), Hispanic ethnicity (b= -0.142, SE= 0.064, $p< 0.05$), Asian/Pacific Islander race (b= -0.222, SE= 0.067, $p< 0.01$), and welfare receipt as a youth (b= -0.103, SE= 0.047, $p< 0.05$) were also significantly associated with worse self-rated health in adulthood. Respondent being a

college graduate (b= 0.341, SE= 0.031, p< 0.001), being married (b= 0.089, SE= 0.027, p< 0.01), and having higher self-rated health as a youth (b= 0.218, SE= 0.015, p< 0.001) were significantly associated with better self-rated health in adulthood.

Compared to respondents who consistently reported good or better survival chances, respondents reporting changing perception of survival chances had significantly higher scores on the mental health disorder index, adjusting for age, biological sex, race, Hispanic ethnicity, parent education, family structure, mother welfare status, respondent education, respondent marital and cohabitation status, youth self-rated health, youth symptoms of depression, and history of exposure to suicide (b= 0.131, SE= 0.029, p< 0.001) (model 3, Table 5.2). In the same final multivariate model, several covariates were significantly associated with higher scores on the mental health disorder index, including female sex (b= 0.245, SE= 0.025, p< 0.01), having symptoms of depression as a youth (b= 0.215, SE= 0.032, p< 0.001), and having a history of exposure to suicide (b= 0.288, SE= 0.080, p< 0.001). Hispanic ethnicity (b= -0.136, SE= 0.041, p< 0.01), Asian/Pacific Islander race (b= -0.264, SE= 0.062, p< 0.001), black/African American race (b= -0.352, SE= 0.031, p< 0.001), having a family structure with two biological parents as a youth (b= -0.053, SE= 0.025, p< 0.05), being a college graduate (b= -0.078, SE= 0.025, p< 0.01), being married (b= -0.119, SE= 0.028, p< 0.001), and having higher self-rated health as a youth (b= -0.050, SE= 0.013, p< 0.001) were significantly associated with lower scores on the mental health disorder index.

Respondent report of changing survival perceptions was significantly associated with higher scores on the diagnostic index of the leading causes of morbidity and

mortality for US adults, adjusting for age, biological sex, race, Hispanic ethnicity, parent education, family structure, mother welfare status, respondent education, respondent marital and cohabitation status, youth self-rated health, youth symptoms of depression, history of exposure to suicide, adult body mass index, and history of smoking (b= 0.076, SE= 0.033, p< 0.05) (model 3, Table 5.3). In the same final multivariate model, female sex (b= 0.165, SE= 0.031, p< 0.001), symptoms of depression as a youth (b= 0.201, SE= 0.034, p< 0.001), previous exposure to suicide (b= 0.314, SE= 0.093, p< 0.01), higher BMI (b= 0.016, SE= 0.002, p< 0.001), and history of smoking (b= 0.126, SE= 0.028, p< 0.001) were significantly associated with higher scores on the diagnostic index. Asian/Pacific Islander race (b= -0.229, SE= 0.065, p< 0.01), black/African American race (b= -0.261, SE= 0.041, p< 0.001), and higher self-rated health as a youth (b= -0.083, SE= 0.016, p<0.001) were significantly associated with lower scores on the diagnostic index.

Using the original constructs for youth low perceived survival and changing perception of survival chances, no significant relationships were observed with respondent allostatic load scores in adulthood (model 3, Table 5.4). However, several covariates were associated with respondent adult allostatic load scores. Identifying as of black/African American race (b= 0.345, SE= 0.059, p< 0.001) was significantly associated with higher allostatic load scores in adulthood. Asian/Pacific Islander race (b= -0.251, SE= 0.075, p< 0.01), having a college degree (b= -0.270, SE= 0.046, p< 0.001), and having higher self-rated health as a youth (b= -0.185, SE= 0.022, p< 0.001) were significantly associated with lower allostatic load scores in adulthood.

Youth Survival Perceptions (alternate constructs)

Using the alternate constructs for survival perceptions (based on changes in perceptions in adolescence and during the transition to young adulthood), significant relationships between persistence in low perceived survival and poor health in adulthood were identified in final multivariate models (adjusting for age, biological sex, race, Hispanic ethnicity, parent education, family structure, mother welfare status, respondent education, respondent marital and cohabitation status, and in certain instances youth self-rated health and/or depressive symptomatology at Wave I, respondent exposure to suicidality, and respondent adult body mass index and history of smoking). Compared to respondents who consistently reported a good chance or better of living to age 35 years, respondents who reported perceptions of risk for early death during adolescence and the transition to young adulthood (low perceived survival) had significantly worse self-rated health ($b= -0.283$, $SE= 0.070$, $p< 0.001$) (model 3, Table 5.5), and had significantly higher scores on the mental health disorder index ($b= 0.320$, $SE= 0.089$, $p< 0.001$) (model 3, Table 5.6) and the diagnostic index of leading causes of morbidity and mortality for US adults ($b= 0.288$, $SE= 0.085$, $p< 0.001$) (model 3, Table 5.7).

Compared to respondents who reported a good chance or better of survival to age 35 years during Add Health Waves I-III, respondents who reported a 50-50 chance or less of survival to age 35 years in Add Health Waves I and II, but a good chance or better of survival to age 35 years in Add Health Wave III (changing perception, end high) had significantly worse self-rated health ($b= -0.175$, $SE= 0.077$, $p< 0.05$) (model 3, Table 5.5) and higher scores on the mental health disorder index in adulthood ($b= 0.146$, $SE= 0.050$, $p< 0.01$) (model 3, Table 5.6).

Respondents reporting a good or better chance of survival to age 35 years in Add Health Waves I and II, but perception of a 50-50 chance or less of survival to age 35 years in Add Health Wave III (changing perception, end low) had significantly higher scores on the mental health disorder index in adulthood when compared to respondents always reporting a good chance or better of survival to age 35 years in adolescence and young adulthood (b= 0.188, SE= 0.071, p< 0.05) (model 3, Table 5.6).

When compared to those who consistently reported perception of a good chance or better of survival to age 35 years, respondents reporting a 50-50 chance or less of survival to age 35 years in Add Health Wave I or II (not both) and a good chance or better of survival to age 35 years in Add Health Wave III (changing perception, mostly high) had higher scores on the mental health disorder index in adulthood (b= 0.079, SE= 0.035, p< 0.05) (model 3, Table 5.6).

Using the alternate constructs for youth low perceived survival and changing perception of survival chances, no significant relationships were observed with respondent allostatic load scores in adulthood (Table 5.8).

Covariate relationships with health outcomes exhibited similar patterns as previously in analyses examining relationships between the original constructs for survival perceptions and health outcomes. In the final multivariate model examining relationships between the alternate constructs for youth survival perceptions and adult self-rated health (model 3, Table 5.5), female sex (b= -0.085, SE= 0.026, p< 0.01), Hispanic ethnicity (b= -0.138, SE= 0.063, p< 0.05), Asian/Pacific Islander race (b= -0.225, SE= 0.066, p< 0.01), and welfare receipt as a youth (b= -0.104, SE= 0.047, p<

0.05) were significantly associated with worse self-rated health in adulthood. Respondent being a college graduate (b= 0.340, SE= 0.031, p< 0.001), being married (b= 0.087, SE= 0.027, p< 0.01), and having higher self-rated health as a youth (b= 0.217, SE= 0.015, p< 0.001) were significantly associated with better self-rated health in adulthood.

In the final multivariate model examining relationships between the alternate constructs for youth survival perceptions and scores on the mental health disorder index in adulthood (model 3, Table 5.6), several covariates were significantly associated with higher scores on the mental health disorder index, including female sex (b= 0.247, SE= 0.025, p< 0.001), having symptoms of depression as a youth (b= 0.215, SE= 0.032, p< 0.001), and having a history of exposure to suicide (b= 0.279, SE= 0.079, p< 0.01). Hispanic ethnicity (b= -0.140, SE= 0.041, p< 0.01), Asian/Pacific Islander race (b= -0.260, SE= 0.063, p< 0.001), black/African American race (b= -0.354, SE= 0.031, p< 0.001), having a family structure with two biological parents as a youth (b= -0.054, SE= 0.025, p< 0.05), being a college graduate (b= -0.077, SE= 0.025, p< 0.01), being married (b= -0.116, SE= 0.028, p< 0.001), and having higher self-rated health as a youth (b= -0.049, SE= 0.013, p< 0.001) were significantly associated with lower scores on the mental health disorder index.

In the final multivariate model examining relationships between the alternate constructs for youth survival perceptions and scores on the diagnostic index in adulthood (model 3, Table 5.7), female sex (b= 0.167, SE= 0.030, p< 0.001), symptoms of depression as a youth (b= 0.199, SE= 0.034, p< 0.001), previous exposure to suicide (b= 0.303, SE= 0.093, p< 0.01), higher BMI (b= 0.016, SE= 0.002, p< 0.001), and history of

smoking (b= 0.128, SE= 0.028, p< 0.001) were significantly associated with higher scores on the diagnostic index. Asian/Pacific Islander race (b= -0.225, SE= 0.066, p< 0.01), black/African American race (b= -0.264, SE= 0.041, p< 0.001), and higher self-rated health as a youth (b= -0.081, SE= 0.015, p<0.001) were significantly associated with lower scores on the diagnostic index.

In the final multivariate model examining relationships between the alternate constructs for youth survival perceptions and allostatic load scores in adulthood (model 3, Table 5.8), several covariates were associated with respondent adult allostatic load scores. Identifying as of black/African American race (b= 0.345, SE= 0.058, p< 0.001) was significantly associated with higher allostatic load scores in adulthood. Asian/Pacific Islander race (b= -0.250, SE= 0.074, p< 0.01), having a college degree (b= -0.269, SE= 0.046, p< 0.001), and having higher self-rated health as a youth (b= -0.185, SE= 0.023, p< 0.001) were significantly associated with lower allostatic load scores in adulthood.

Findings in Brief

Compared to respondents who consistently reported high perceived survival, respondents reporting perceptions of low chances of survival during adolescence and/or the transition to youth adulthood had worse health on multiple measures in adulthood. Low perceived survival, using either construct (original or alternate) was associated with worse self-rated health in adulthood. The original construct for changing perceptions of chances of survival was associated with worse self-rated health and higher scores on a mental health disorder index and a diagnostic index of the leading causes of morbidity and mortality for US adults. Further discrimination of the changing perceptions group

(alternate constructs) revealed a consistent relationship between expressions of low perceived survival and high scores on a mental health disorder index, compared to respondents who always reported perceptions of a good or better chance of survival to age 35 years.

Although no significant differences in adult allostatic load scores were observed for respondents reporting high perceived survival vs. low perceived survival in adolescence and/or the transition to youth adulthood, several patterns were observed for significant relationships between covariate measures and allostatic load scores. Compared to respondents identifying as white, respondents identifying as black/African American had significantly higher allostatic load scores in adulthood. Respondents identifying as Asian/Pacific Islander had significantly lower allostatic load scores than white respondents in adulthood. Having a college degree (vs. no college degree) and reporting better self-rated health when a child were associated with lower allostatic load scores in adulthood.

Youth Survival Expectations: Disadvantaged Contexts and Forecasts for Future Health

Chapter 6: Discussion

Using data from the National Longitudinal Study of Adolescent to Adult Health, this study was designed to accomplish a two-fold purpose: (1) to identify characteristics of developmental domains (home, school, and neighborhood) related to stability and change in survival perceptions during adolescence and the period of transition to young adulthood; and (2) to evaluate relationships between youth survival perceptions over time and health outcomes in adulthood. This chapter begins with a summary of the results organized by research questions and hypotheses. After the summary of results, findings are reviewed in context with the current literature on youth survival perceptions. A review of limitations of the study follows. A brief description of next steps related to this study and concluding thoughts complete the chapter.

Summary of Results

Research Question 1: How do characteristics of an adolescent's socio-developmental environment interact and link to stability (stable optimism, stable pessimism) and change of survival perceptions?

Hypothesis 1: Contexts characterized by disadvantage will be associated with youth persistence in perception of risk for early death (low perceived survival).

Disadvantage measures cutting across developmental domains were significantly associated with respondent survival perceptions. As hypothesized, low perceived survival was associated with disadvantage in multiple developmental domains. In

individual contextual models evaluating the relationship between developmental domains (household economics and resources, ACEs, school safety, and neighborhood characteristics) and the original construct for youth low perceived survival (defined as a perception of a 50-50 chance or less of survival to age 35 years in Add Health Waves I, II, and III), parent/household receipt of public assistance, parent report of difficulty accessing medical care for the family, respondent report of basic needs not being met during childhood, feeling unsafe in school and neighborhood environments, and low neighborhood collective efficacy were associated with increased odds in persistence in low perceived survival compared to persistence in high perceived survival. In the final multivariate model, using the original construct for youth low perceived survival, parent/household receipt of public assistance, parent report of difficulty accessing medical care for the family, feeling unsafe in school and neighborhood environments, and low neighborhood collective efficacy remained significantly associated with increased odds of persistence in low perceived survival compared to persistence in high perceived survival. In addition, in the final multivariate model, history of foster care placement was associated with persistence in low perceived survival relative to persistence in high perceived survival.

In individual contextual models evaluating the relationship between developmental domains and the alternate construct for low perceived survival (defined as a perception of a 50-50 chance or less of survival to age 35 years in adolescence [Add Health Wave I and/or Wave II] and in the period of transition to young adulthood [Add Health Wave III]), parent/household receipt of public assistance, parent report of

difficulty accessing medical care for the family, respondent report of basic needs not being met during childhood, feeling unsafe in school and neighborhood environments, and low neighborhood collective efficacy were associated with increased odds in report of low perceived survival compared to report of high perceived survival consistently over time. In the final multivariate model, using the alternate construct for youth low perceived survival, parent report of difficulty accessing medical care for the family, respondent report of basic needs not being met during childhood, feeling unsafe in school and neighborhood environments, and low neighborhood collective efficacy remained significantly associated with increased odds of low perceived survival compared to report of high perceived survival over time. In addition, in the final multivariate model, history of foster care placement was associated with low perceived survival relative to persistence in high perceived survival.

In final multivariate models evaluating the relationship between socio-developmental context and survival perceptions over time, two covariates remained significantly associated with odds of low perceptions of survival to age 35 years relative to persistence of a good or better chance of survival to age 35 years. Across both constructs for low perceived survival, increased odds of low survival perceptions were noted among black/African American respondents. Decreased odds of low survival perceptions were noted among female respondents.

Looking at the full range of survival perception constructs, multiple aspects of disadvantage in developmental contexts were significantly linked to perceptions over time. In the domain of household economics and resources, parent/household receipt of

public assistance and parent report of difficulty accessing medical care for the family were noted to be associated with increased odds of respondent low perceived survival at least once relative to persistence in high perceived survival over time. Parent report of difficulty accessing medical care for the family was consistently associated with youth low perceived survival relative to persistence in high perceived survival. Aspects of adversity in childhood, including neglect, experience of household social service investigation, and foster care placement were associated with increased odds of low perceived survival at some time during adolescence and/or the transition to young adulthood relative to persistence in high perceived survival. During adolescence alone (changing, end high and changing, mostly high), feelings of being unsafe in the school environment and neighborhood context (feeling unsafe vs. neighborhood disadvantage as assessed via census tract characteristics) were associated with low perceived survival relative to high perceived survival. Results may indicate a need to consider more broadly, what may contribute to a young person's expression of a belief in limited chance for survival at different points along the life course, such as indicators of resource access, household dynamics, and feelings of safety in multiple environments.

Some associations between contextual measures and survival perceptions were not immediately intuitive. For example, experience of physical abuse was associated with significantly reduced odds of respondent reporting changing survival perceptions, ending high (defined as respondent report of a 50-50 chance or less of survival to age 35 years in Add Health Waves I and II, and a good or better chance of survival to age 35 years in Wave III) (Table 10), relative to persistence in high perceived survival.

Intuitively, one would expect experience of physical abuse to be associated with increased odds of reporting low perceived survival during adolescence, with potential for this to carry into the period of transition to young adulthood. In this way, perceptions would be a reflection of the trauma that has occurred in the period marking childhood to adolescence (which is the time frame referenced in the survey question about physical abuse). However, an alternate interpretation is one in which the 'changing perception, end high' construct is viewed as a whole, having low perceived survival in adolescence, but transitioning to a more optimistic view about survival as one ages (here designated as the period corresponding to the transition to young adulthood). In this way, the finding that experience of physical abuse in childhood is associated with reduced odds of belonging to the group corresponding to 'changing perception, end high', could be interpreted as youth who experience physical abuse have reduced odds of moving from low perceived survival to a more optimistic view of survival chances with the transition to young adulthood, perhaps indicating a more foreboding circumstance.

The finding of foster care placement being linked to increased odds of respondent reporting changing perception, end low (defined as respondent report of a good or better chance of survival to age 35 years in Add Health Waves I and II, and a 50-50 chance or less of survival to age 35 years in Add Health Wave III), relative to persistence in high perceived survival, was also not expected. A potential explanation for the relationship, not necessarily intuitive at first review (as one may intuitively associate removal from a home as traumatic), is that outside placement may support better feelings about one's future (assuming the outside placement is stable and nurturing), but as one ages out of the

system (corresponding to the period of transition to young adulthood) perceptions about the future become less optimistic.

Across models evaluating the relationship between socio-developmental context and respondent survival perceptions over time, two covariates were most consistently associated with the odds of low perceived survival at some point during adolescence and/or the transition to young adulthood compared to persistence in high perceived survival over time. In final multivariate models, respondent identification as black/African American race was consistently associated with increased odds of report of low perceived survival at some point during adolescence and the transition to young adulthood compared to persistence in high perceived survival over time. In most models (exception: changing, end high), female sex was significantly associated with reduced odds of low perceived survival during adolescence and/or young adulthood compared to persistence in high perceived survival over time. Other covariates are of note in final multivariate models examining relationships between context and the odds of low perceived survival. In the alternate construct for low perceived survival, in addition to identification as black/African American race, Hispanic ethnicity was significantly associated with increased odds of low perceived survival relative to persistence in high perceived survival. In addition to identification as black/African American race, identification as Native American/American Indian race was significantly associated with increased odds of low perceived survival in adolescence (Add Health Waves I and II), and then report of a good or better chance of survival to age 35 years at Add Health Wave III relative to persistence in high perceived survival. Results suggest that for multiple

groups of youth of color, increased odds of low perceived survival may be particularly relevant in adolescence, and for some the relevance of increased in odds of low perceived survival endures into young adulthood (particularly for black/African American males), relative to persistence in high perceived survival. Findings likely represent one manifestation of youth witness, experience, and internalization of inequalities in resource access and opportunity structures.

Research Question 2: What is the relationship between survival perceptions during adolescence and young adulthood and measures of health in adulthood?

> Hypothesis 2: Beyond demographics and some conditions measured in childhood and adulthood, young people who persist in perception of high risk for early death will have worse health in adulthood when compared to individuals who consistently perceive low risk for early death.

As hypothesized, youth low perceived survival was associated with poorer adult health outcomes when compared to youth who reported high perceived survival throughout Add Health Waves I-III. In final multivariate models, using the original construct for low perceived survival (defined as a perception of a 50-50 chance or less of survival to age 35 years in Add Health Waves I, II, and III), one outcome was identified, poorer self-reported health. Using the alternate construct for low perceived survival (defined as a perception of a 50-50 chance or less of survival to age 35 years in adolescence [Add Health Wave I and/or Wave II] and in the period of transition to young adulthood [Add Health Wave III]), three outcomes were identified, poorer self-rated health, higher scores

on the mental disorder health index, and higher scores on the diagnostic index of the leading causes of morbidity and mortality for US adults.

Overall using the alternate constructs for survival perceptions, analyses evaluating the relationship between youth survival perceptions over time and adult health reveal an additional pattern. Compared to respondents reporting high perceived survival throughout adolescence and the transition to young adulthood (Add Health Waves I-III), any expression of low perceived survival at points during adolescence and/or the transition to young adulthood was linked to higher scores on the mental health disorder index in adulthood.

Although in current analyses significant relationships between low perceived survival and adult health did not extend to respondents' allostatic load scores; some relationships between allostatic load scores and covariate measures were significant. For example, Black/African American respondents had significantly higher allostatic load scores than white respondents, perhaps a reflection of an intersection between physiology and social context. Having a college degree (vs. no college degree) was associated with lower allostatic load scores in adulthood, adding to a large literature in which education (directly or indirectly) may be linked to health.

Results in Context

Previous work has established relationships between some contextual characteristics and youth low perceived survival, namely experiences of poverty at family and neighborhood levels (Borowsky et al., 2009; Swisher & Warner, 2013) and violence exposure and involvement (Brezina et al., 2009; Duke et al., 2009; Swisher & Warner,

2013; Warner & Swisher, 2014). Findings from the current study, evaluating relationships between context and survival perceptions over time suggest need for consideration of a broader range of indicators of one's socio-developmental environment that may link to stability and change in youth low perceived survival, such as diminished resources related to access of health care and experiences of adversity (e.g., social services investigation and neglect). Particularly in the case of parent report of having difficulty accessing medical care for the family, the origin of the relationship between this resource access measure and youth survival perceptions warrants further study. For example, in what context could one envision youth awareness of parent challenges in access of medical care for the family; and how does that knowledge become one framework for youth development of perceptions of limited chance of survival into adulthood? Broader conceptions for safety to include perceptions of context related to collective efficacy should also be considered when attempting to understand how social location relates to youth perceptions of chances for survival into adulthood.

Previous work using Add Health data has linked youth survival perceptions to some health outcomes in adolescence, young adulthood, and adulthood, particularly in the context of risk and health behaviors (relating survival perceptions at Waves I and II to outcomes in Waves III and IV). For example, low perceived survival is linked to earlier onset adolescent risk-taking behavior (Harris, Duncan, & Boisjoly, 2002), unsafe sexual activity and suicidality in adolescence and young adulthood (Borowsky et al., 2009), less physical activity and increased depressive symptomatology in young adulthood (Duke et al., 2011), and suicidality, tobacco, excessive alcohol, and illicit substance use in

adulthood (Nguyen, Villaveces, et al., 2012). Further, high perceived survival is linked to higher probabilities of physical activity and lower probabilities of smoking in young adulthood (McDade, Chyu, Duncan, Hoyt, Doane, & Adam, 2011). The current study is the first to use all three waves of Add Health (survival perceptions in Waves I-III) to link survival perceptions over time to adult health outcomes, and to link survival perceptions to health beyond risk and health behaviors. Findings suggest youth survival perceptions may be an indicator of risk for chronic disease, morbidity, and early mortality. Findings also suggest there is value in looking at relationships between survival perceptions and health as respondents age.

Limitations of the Study

This study has some limitations. Because Add Health is based from a school design, the current analyses are not able to account for perceptions of youth who were not enrolled in school to begin with, which may include groups of youth with greater variability in perceptions about life expectancy. In addition, in relation to social context, Add Health begins when respondents are in the 7th-12th grades, limiting the ability to explore fully characteristics of early social location for youth perceptions about their future.

Variability in youth survival perceptions was limited. From earlier work examining relationships between survival perceptions and behavioral and developmental outcomes (Borowsky et al., 2009; Duke et al., 2009), older youth at Wave I reported greater perceptions of a 50-50 chance or less of survival to age 35 years. However, when recruiting for Wave II, youth who were in 12th grade at Wave I (older youth) were not

recruited for participation in Wave II. Thus, these respondents are not included in the current study due to the requirement of respondents to be in all available waves to be included in the analyses, likely resulting in some loss in variability in the conception of survival perceptions constructs.

Beyond the loss of 12th graders in Wave I, additional respondents were excluded due to the requirement that respondents be present in all available Waves for the current analysis, Waves I-IV. Thus a respondent missing in any Wave, is not represented in this analysis (n= 10,120; e.g., Wave IV N= 15,701, Carolina Population Center, The National Longitudinal Study of Adolescent to Adult Health, Restricted-Use Dataset Descriptions, http://www.cpc.unc.edu/projects/addhealth/documentation/restricteduse).

Multiple constructs were created to represent youth survival perceptions. I originally started with dividing respondents into three groups: low perceived survival at three time points; changing perception of chances of survival at least once; and high perceived survival at three times points. In initial analyses evaluating relationships between social context and survival perceptions as defined above, and youth survival perceptions and later health, significant negative associations between context and changing perception, and changing perception and poor health in adulthood were noted. Based on this information, I concluded the current constructs were not capturing nuances in relationships between context and perceptions, and perception and health for the changing perception group. In unpacking the changing perception group, the following questions were considered: (1) What are the implications of low perceived survival at least once in adolescence and also in the transition to young adulthood (when respondents

are even closer to age 35)?; (2) What does it mean to have differences in perception between adolescence and the period of transition to young adulthood (same perceptions in adolescence—congruent, whether low or high in adolescence, but different in the transition to adulthood)?; and (3) Is there any risk associated with low survival perceptions if only once in adolescence? With respect to question 2, earlier work suggests that even in cases where respondents changed perceptions between Add Health Waves I and II from low to high (corresponding to the developmental period of adolescence), they did not achieve to the same degree as respondents who expressed high survival perception during both Waves I and II (Duke et al., 2011). For current analyses in the example of the alternate construct for low perceived survival, results do suggest expression of low perceived survival at least once in adolescence and also in the transition to adulthood may be an indicator of broad contextual risk exposures and a marker for poor future health.

Because of limitations in the variability of survival perceptions among respondents, particularly as it relates to more severe limitations in low perceived survival, survival perception variables were constructed based on vital statistics information (50-50 chance or less is not congruent with what we know about overall mortality for US adolescents, Minino, 2010; Minino et al., 2007). While it is reassuring that most youth anticipated at least a good chance of living into their mid-30's and the use of vital statistics is informative, the need to assess the relevance of social context for a broader range of youth survival perceptions and the significance of a broader range of youth survival perceptions for future health remains. For example, limitations in the number of

respondents reporting more severe low perceptions of survival (respondents reporting "some, chance by probably not" and/or "almost no chance" when answering survival perceptions questions over time) prohibited evaluation of relationships between these perceptions, social context, and health outcomes. Work from a qualitative study of future orientation among youth in the Twin Cities metro area (alluded to in the methods section, Chapter 3) suggests that more severe perceptions of low chances of survival into adulthood may be more salient for some youth with respect to health and behavioral outcomes.

As well, further study of the association between survival perceptions and panel attrition is warranted. Limitations in the variability of survival perceptions for the study sample may indicate a more optimistic sample, as individuals who are doing less well (on multiple dimensions) are more likely to withdraw from longitudinal studies. As such, study findings likely represent conservative estimates.

Sample sizes for the analyses fluctuated based on missing data. Observations of the data reveal that the greatest degree of missing data was located within parent responses in Add Health Wave I, as not all eligible parents participated (~15% of eligible parents were absent from Wave I data collection). Parent data is used to define one construct of early social context for respondents, household economics and resources, and parent education is used as one measure of early socioeconomic location for respondents in models evaluating the relationship between survival perceptions and adult health. The limitation in the availability of parent data reduced the sample size for analytic models due to Stata's listwise deletion procedure. Despite the limitations in

sample size, variables representing parent data were included in analytic models as they reflect examples provided in the literature as salient to measurement of context and health (as documented in the descriptions of measures). Taking into account other data missing at random, sample sizes for analyses using parent data were most limited. Despite the limitations associated with missing data, meaningful relationships between social context and survival perceptions, and youth survival perceptions over time and adult health were identified.

Beyond caution related to the parent data, respondents' missingness on variable indicators in the data are presumed to be missing at random. In final multivariate regression models, participants with missing data were excluded based on Stata's listwise deletion procedure. Although collections for biological specimen were obtained on the entire Wave IV sample, some respondents for the dissertation analytic sample were missing valid values for C-reactive protein (n=999) and glycosylated hemoglobin (n=766). An additional 699 respondent observations were lost due to not having a valid sampling weight. As suggested above, all estimates of relationships between early social context and survival perceptions, and survival perceptions and later health represent conservative assessment.

The measures for neighborhood context were limited. A single item was used to represent a measure of neighborhood collective efficacy. Use of tract level data to define an individual's neighborhood is imperfect (Messer & Kaufman, 2006). Other means of assessment, such as real-time observation of the locations where youth live may give

more insight into how what youth see on a regular basis relates to the development of individual agency and personal narrative.

Although variables chosen as covariates in regression models were based on thoughtful review of sociology, public health, and medical literatures, analytic models cannot account for all unobserved heterogeneity. In particular, analytic models evaluating relationships between survival perceptions and health explain a small amount of the variance for health outcomes (~ 5-13%).

The low prevalence of illness and disease among respondents in Add Health Wave IV limited the ability to demonstrate relationships between survival perceptions and health outcomes, particularly in relation to the measure for allostatic load. If we refer back to the original study by Peterson and colleagues (1988), looking at associations between a negative explanatory framework and future health among groups of Harvard University graduates, their follow-up of graduates to examine health outcomes occurred when respondents were in their middle 50's and beyond. Current results suggest the salience of examining relationships between survival perceptions and health outcomes in Add Health Wave V (when available) when respondents are anticipated to be in their mid-30's to mid-40's, during a period in contemporary society when there is greater prevalence of chronic illness and developing chronic disease among US adults.

Analyses in the current study do not establish causality between youth survival perceptions and adult health outcomes. Rather, measurement of survival perception is likely a proxy for or an alternate indicator of youth agency with respect to future orientation. Survival perceptions are meaningful in the sense that when an otherwise

healthy young person expresses a view of limited chance of living into adulthood, it is cause for concern. Current analyses suggest multiple contextual influences related to low perceived survival that may signal a stress physiology with likely long-term consequence.

Next Steps

This work has the potential to have impact at two levels: (1) advancing knowledge of the relevance of early social context for youth perceptions about survival, and (2) informing clinical interview assessments and anticipatory guidance strategies by signaling relationships between perceptions and future health outcomes.

At the beginning of this dissertation, I questioned whether query about youth survival perceptions in the clinical setting would yield important information that would help a provider's ability to predict what a youth's future health profile may look like. While the question about the predictive ability of youth survival perceptions on future health remains, analyses leading up to this study and the findings of this dissertation support more thoughtful review of provider choice of questions in the clinical setting as well as how one may talk to young people about their future and their perceptions of value and future opportunity.

This dissertation motivates current work focused on collaborating with a community organization to develop a future orientation intervention for young people. Preliminary work for intervention development is alluded to in the methods section, referencing a pilot study designed to evaluate the contemporary relevance of talking to youth about survival perceptions. Although analyses for the pilot study are ongoing, several themes are emerging from the reports of Twin Cities metro youth (ages 12-21

years): (1) young people are thinking about their survival and some see and hear few messages suggesting they will live a long life; (2) the earliest thoughts about survival surface at 10-12 years of age and 25 years is the cut point beyond which many youth do not see themselves living; (3) messages in the home are most salient for survival perceptions, such as how adults talk about the future and the physical and emotional health of adults in close proximity; and (4) youth perceptions about their survival impact health behaviors.

The developing project focuses on intervention design, delivery, and evaluation. Underpinning intervention development is the sociological framework 'possible selves'—the ability of an individual to develop tangible images of living, achieving, and thriving in a future state. This is conceptualized as cognitive representations the individual incorporates into his or her self-concept (Oyserman & Fryberg, 2006), here focused on survival and future orientation. Given findings of higher risk perceptions for early death among youth of color, the framework is being adapted to include a culturally based curriculum designed to help youth understand their relevance to community. The primary hypothesis for the project is that a culturally-adapted 'possible selves' intervention will improve youth survival expectations and will result in youth, parent, and community identification of ongoing strategies for healthy decision-making. The goal is that an intervention such as this may be further adapted to be delivered in other settings in which youth spend significant amounts of time, such as primary and secondary school, and other community programming.

Conclusions

Expression of risk for premature death during adolescence and the period of transition to young adulthood is not a benign occurrence. Results of the current study suggest youth low perceived survival is linked to multiple aspects of social context and may have implications for future health. Next steps necessitate further examination of survival perceptions as personal narrative, motivation for behavior, and a potential indicator of heightened stress physiology.

Table 3.1. Survival Perceptions Outlined

Survival Perception	Low, Wave I	Low, Wave II	Low, Wave III
Low perceived survival, original	Yes	Yes	Yes
Changing perception, original	Yes/No	Yes/No	Yes/No
High perceived survival	No	No	No
Low perceived survival, alternate	Yes/No	Yes/No	Yes
Changing perception, end low	No	No	Yes
Changing perception, end high	Yes	Yes	No
Changing perception, mostly high	Yes/No	Yes/No	No
High perceived survival	No	No	No

Note: Cut point for survival perceptions: 50-50 chance or less of survival to age 35 years vs. 'good' or 'almost certain' chance of survival to age 35 years; low= 50-50 chance or less of survival to age 35 years.
Note: Low perceived survival, original: 50-50 chance or less of survival to age 35 years (all three waves).
Note: Changing perception, original: 50-50 chance or less of survival to age 35 years in at least one wave (not all three waves).
Note: Low perceived survival, alternate: 50-50 chance or less of survival to age 35 years in Wave I or Wave II (either wave or both waves), 50-50 chance or less of survival to age 35 years in Wave III.
Note: Changing perception, end low: 'good' or 'almost certain' chance of survival to age 35 years in Wave I and Wave II, 50-50 chance or less of survival to age 35 years in Wave III.
Note: Changing perception, end high: 50-50 chance or less of survival to age 35 years in Wave I and Wave II, 'good' or 'almost certain' chance of survival in Wave III.
Note: Changing perception, mostly high: 50-50 chance or less of survival to age 35 years in Wave I or Wave II (not both), 'good' or 'almost certain' chance of survival to age 35 years in Wave III.
Note: High perceived survival: 'good' or 'almost certain' chance of survival to age 35 years (all three waves).

Table 3.2. Contexts for Disadvantage

Variables	**Mean (SD)**	**Min**	**Max**	**n (% missingness)** [a]
Contexts for Disadvantage				
Measured in Wave I				
Household economics, resources [b]				
Parent does not have enough money to pay bills	0.185 (0.388)	0	1	8778 (13.26)
Parent or household member receives public assistance [c]	0.150 (0.357)	0	1	8826 (12.79)
Parent and parent partner unemployed	0.001 (0.036)	0	1	9020 (10.87)
Parent with difficulty accessing medical care for family	0.146 (0.354)	0	1	8982 (11.25)
School				
Feel unsafe at school	0.137 (0.344)	0	1	9947 (1.71)
Neighborhood				
Demographic index [d]	1.386 (1.350)	0	5	9184 (9.25)
Low collective efficacy [e]	0.271 (0.445)	0	1	9925 (1.93)
Feel unsafe in neighborhood	0.109 (0.312)	0	1	10074 (0.45)
Measured in Wave III				
Adverse childhood experiences [f]				
Neglect, left alone	0.418 (0.493)	0	1	9413 (6.99)
Neglect, basic needs not met	0.116 (0.321)	0	1	9667 (4.48)
Physical abuse	0.294 (0.456)	0	1	9615 (4.99)
Sexual abuse	0.048 (0.214)	0	1	9751 (3.65)
Social Services investigation	0.113 (0.316)	0	1	10120 (0)
Foster Care placement	0.020 (0.141)	0	1	10110 (0.10)

Measured in Wave IV				
Adverse childhood experiences				
At least one biological parent spent time in jail or prison	0.179 (0.383)	0	1	9559 (5.54)

[a] Percentage missingness based on in-home interviewees participating in Waves I-V of Add Health, n= 10120.
[b] All measures based on parent report.
[c] Dichotomous measure created from parent report of parent/household receives any of the following: welfare receipt; receipt of Aid to Families with Dependent Children; last month receipt of food stamps; receipt of housing subsidy or public housing.
[d] Index created from highest quartile of all tracts for the following indicators: adults ≥ age 25 years without high school degree or equivalent; female headed household with children under the age of 18 years; male unemployment; families with income below 1989 poverty line; violent crime per 100,000.
[e] Based on youth report of 'false' when asked if people look out for each other in their neighborhood.
[f] Occurring by the time respondent started 6th grade.

Table 3.3. Adult Health Outcomes, Wave IV

Variables	Mean (SD)	Min	Max	n (% missingness) [a]
Subjective Assess and Summary Measures				
Self-rated health	3.655 (0.928)	1	5	10120 (0)
Mental health disorder index [b]	0.381 (0.790)	0	5	10062 (0.57)
Leading causes of morbidity and mortality for US adults index [c]	0.661 (0.895)	0	7	9734 (3.81)
Allostatic load score [d]	1.184 (1.210)	0	6	8736 (13.68)

[a] Percentage missingness based on in-home interviewees participating in Waves I-V of Add Health, n= 10120.

[b] Index for mental health disorder index: diagnosis of depression; post-traumatic stress disorder; anxiety disorder; suicidal thoughts; and previous suicide attempt (potential range 0-5).

[c] Index for leading causes of morbidity and mortality of US adults: diagnosis of cancer, leukemia, lymphoma; elevated cholesterol, triglycerides, lipids; hypertension, high blood pressure; diabetes, high blood sugar; heart disease; asthma, chronic bronchitis, emphysema; hepatitis (B, C); mood, anxiety disorder; and suicidality (thoughts, attempts) (potential range 0-9).

[d] Allostatic load score: systolic blood pressure ≥ 140 mmHg; diastolic blood pressure ≥ 90 mmHg; resting heart rate ≥ 90 beats/minute; obese body mass (≥ 30); hemoglobin A1c ≥ 6.4%; and high sensitivity C-reactive protein ≥ 3.0 mg/L (potential range 0-6).

Table 3.4. Demographic and Other Covariate Measures

Variables	**Mean (SD)**	**Min**	**Max**	**n (% missingness)** [a]
Demographic-Covariate Measures				
Measured in Wave I				
Age	15.760 (1.598)	11.387	21.194	10114 (0.06)
Female	0.546 (0.498)	0	1	10120 (0)
Ethnicity, Hispanic [b]	0.154 (0.361)	0	1	10093 (0.02)
Race, Asian, Pacific Islander	0.064 (0.245)	0	1	10120 (0)
Race, black, African American	0.217 (0.412)	0	1	10120 (0)
Race, Native American, American Indian	0.016 (0.126)	0	1	10120 (0)
Race, white	0.625 (0.484)	0	1	10120 (0)
Race, other	0.079 (0.269)	0	1	10120 (0)
Family structure, two biological parents [c]	0.549 (0.498)	0	1	10100 (0.20)
Parent education, college graduate [d]	0.252 (0.434)	0	1	8962 (11.44)
Mother receipt of welfare [c]	0.096 (0.294)	0	1	9677 (4.38)
Residence, urban [e]	0.332 (0.471)	0	1	10024 (0.95)
Self-rated health, youth	3.879 (0.912)	1	5	10118 (0.02)
Significant depressive symptomatology [f]	0.279 (0.448)	0	1	10071 (0.48)
Measured in Wave I, II, IV				
Family history and/or friend history of suicide [g]	0.036 (0.186)	0	1	10120 (0)
Measured in Wave IV				
Age	28.611 (1.631)	24.279	34.346	10120 (0)
Respondent education, college graduate	0.334 (0.472)	0	1	10118 (0.02)
Respondent, living with husband/wife	0.390 (0.488)	0	1	10031 (0.88)
Respondent cohabiting, living with boyfriend/girlfriend/partner	0.189 (0.392)	0	1	10031 (0.88)

Body mass index [h]	29.090 (7.614)	14.4	97.4	9984 (1.34)
Tobacco, ever smoker	0.631 (0.489)	0	1	10088 (0.32)

[a] Percentage missingness based on in-home interviewees participating in Waves I-V of Add Health, n= 10120.
[b] Race group and Hispanic ethnicity are not mutually exclusive categories.
[c] Based on youth report.
[d] Based on parent report.
[e] Based interviewer assessment.
[f] Original Center for Epidemiological Studies Depression Scale (CES-D) cut score for significant symptomatology is 16; adapted measure cut score equivalent is 15-16 or 15.2; quartiles: score of 15 is at 75% (15 is cut score used for adapted measure).
[g] Family and friend suicide history questions not available in Wave III.
[h] Calculated from interviewer measurements of respondent: weight in kilograms ÷ height in meters^2.

Table 3.5. Survival Perceptions

Variables	Mean (SD)	Min	Max	n (% missingness) [a]
Cross-sectional Survival Perceptions				
Wave I				
50-50 chance or less of living to age 35 years	0.137 (0.344)	0	1	10085 (0.35)
Wave II				
50-50 chance or less of living to age 35 years	0.155 (0.362)	0	1	10095 (0.25)
Wave III				
50-50 chance or less of living to age 35 years	0.077 (0.267)	0	1	10073 (0.46)
Longitudinal Survival Perceptions				
Wave I, II, III				
Low perceived survival, original	0.015 (0.121)	0	1	10016 (1.03)
Changing perception, original	0.251 (0.434)	0	1	10016 (1.03)
Low perceived survival, alternate	0.041 (0.199)	0	1	10016 (1.03)
Changing perception, end low	0.035 (0.184)	0	1	10016 (1.03)
Changing perception, end high	0.045 (0.207)	0	1	10016 (1.03)
Changing perception, mostly high	0.145 (0.352)	0	1	10016 (1.03)
High perceived survival	0.734 (0.442)	0	1	10016 (1.03)

Note: Low perceived survival, original: 50-50 chance or less of survival to age 35 years (all three waves).
Note: Changing perception, original: 50-50 chance or less of survival to age 35 years in at least one wave (not all three waves).
Note: Low perceived survival, alternate: 50-50 chance or less of survival to age 35 years in Wave I or Wave II (either wave or both waves), 50-50 chance or less of survival to age 35 years in Wave III.
Note: Changing perception, end low: 'good' or 'almost certain' chance of survival to age 35 years in Wave I and Wave II, 50-50 chance or less of survival to age 35 years in Wave III.

Note: Changing perception, end high: 50-50 chance or less of survival to age 35 years in Wave I and Wave II, 'good' or 'almost certain' chance of survival in Wave III.
Note: Changing perception, mostly high: 50-50 chance or less of survival to age 35 years in Wave I or Wave II (not both), 'good' or 'almost certain' chance of survival to age 35 years in Wave III.
Note: High perceived survival: 'good' or 'almost certain' chance of survival to age 35 years (all three waves).
[a] Percentage missingness based on in-home interviewees participating in Waves I-V of Add Health, n= 10,120.

Table 4.1. Relationships between Youth Context and Low Perceived Survival (original construct)

	Model 1 Coefficient (SE)	Model 2 Coefficient (SE)	Model 3 Coefficient (SE)	Model 4 Coefficient (SE)	Model 5 Coefficient (SE)	Model 6 Coefficient (SE)
Contexts for Disadvantage						
Household economics, resources						
Parent does not have enough money to pay bills		-0.047 (0.326)				-0.134 (0.392)
Parent or household member receives public assistance		0.776** (0.285)				0.856* (0.387)
Parent and parent partner unemployed		1.496 (1.106)				1.641 (0.867)
Parent with difficulty accessing medical care for family		0.732* (0.299)				0.823** (0.295)
Adverse childhood experiences						
Neglect, left alone			-0.056 (0.300)			0.188 (0.333)
Neglect, basic needs not met			0.817* (0.380)			0.605 (0.468)
Physical abuse			0.154 (0.275)			-0.568 (0.357)
Sexual abuse			-0.321			0.027

			(0.585			(0.577)
Social service investigation			0.387 (0.404)			0.167 (0.427)
Foster care placement			1.071 (0.726)			1.524* (0.691)
Biological parent incarcerated			-0.241 (0.308)			-0.037 (0.338)
School						
Feel unsafe at school				1.146*** (0.320)		0.792* (0.353)
Neighborhood						
Demographic index					0.039 (0.100)	-0.095 (0.123)
Low collective efficacy					0.861*** (0.238)	0.837** (0.307)
Feel unsafe in neighborhood					0.777** (0.232)	0.817* (0.313)
Demographic Controls						
Age in years, Wave I	0.255** (0.085)	0.201* (0.085)	0.242* (0.096)	0.258** (0.088)	0.224* (0.085)	0.149 (0.104)
Biological sex, female	-0.698** (0.226)	-0.835** (0.247)	-0.876** (0.270)	-0.649** (0.232)	-0.797** (0.224)	-1.078** (0.316)
Ethnicity, Hispanic	0.552 (0.377)	0.372 (0.438)	0.741 (0.405)	0.551 (0.388)	0.386 (0.354)	0.367 (0.446)
Race, Asian, Pacific Islander	0.629 (0.557)	0.586 (0.766)	-0.308 (0.924)	0.644 (0.549)	0.176 (0.784)	-19.813*** (0.339)

Race, black, African American	1.656*** (0.273)	1.555*** (0.297)	1.541*** (0.303)	1.636*** (0.273)	1.570*** (0.314)	1.485*** (0.377)
Race, Native American, American Indian	0.849 (0.548)	0.914 (0.557)	-0.140 (1.195)	0.660 (0.586)	0.934 (0.544)	-0.099 (1.163)
Race, other	1.002 (0.545)	0.851 (0.642)	0.819 (0.675)	0.774 (0.483)	1.036 (0.560)	0.319 (0.691)
Family structure, two biological parents	-0.662* (0.290)	-0.666* (0.322)	-0.749* (0.342)	-0.572 (0.303)	-0.586* (0.291)	-0.559 (0.377)
Welfare receipt, youth, Wave I	0.719** (0.259)	Not included (see table key)	0.753* (0.291)	0.751** (0.272)	0.549* (0.265)	Not included (see table key)
Urban residence, Wave I	-0.136 (0.262)	-0.082 (0.261)	-0.058 (0.306)	-0.204 (0.244)	-0.228 (0.275)	-0.117 (0.303)

Note: Low perceived survival, original: defined as respondent perception of a 50-50 chance or less of survival to age 35 years for Add Health Wave I, Wave II, and Wave III.
SE: Standard error.
Note: Coefficients and standard errors are based on weighted data. N=10,120 respondents in all Waves, Waves 1-IV; N=9421 respondents with valid sample weights.
Model 1: Low perceived survival and demographic controls, n= 8821 respondents.
Model 2: Low perceived survival, demographic controls (excluding welfare receipt because it is included in household economics and resources measurement), and household economics and resources, n=7826 respondents.
Model 3: Low perceived survival, demographic controls, and adverse childhood experiences, n= 7512 respondents.
Model 4: Low perceived survival, demographic controls, and perceptions of school safety, 8685 respondents.
Model 5: Low perceived survival, demographic controls, and neighborhood context (geocode characteristics, collective efficacy, perceptions of safety), n= 7867 respondents.
Model 6: Low perceived survival, demographic controls (excluding welfare receipt because it is included in household economics and resources measurement), household economics and resources, adverse childhood experiences, perceptions of school safety, and neighborhood context, n= 5808 respondents.

Note: Youth self-identifying as white is reference category for race.
*p< 0.05; **p< 0.01; ***p< 0.001 (two-tailed tests).

Table 4.2. Relationships between Youth Context and Changing Survival Perception (original construct)

	Model 1 Coefficient (SE)	Model 2 Coefficient (SE)	Model 3 Coefficient (SE)	Model 4 Coefficient (SE)	Model 5 Coefficient (SE)	Model 6 Coefficient (SE)
Contexts for Disadvantage						
Household economics, resources						
Parent does not have enough money to pay bills		0.052 (0.104)				0.085 (0.126)
Parent or household member receives public assistance		0.608*** (0.110)				0.414** (0.136)
Parent and parent partner unemployed		-1.025 (0.958)				-0.954 (1.042)
Parent with difficulty accessing medical care for family		0.594*** (0.109)				0.525*** (0.115)
Adverse childhood experiences						
Neglect, left alone			0.161 (0.082)			0.219* (0.088)
Neglect, basic needs not met			0.194 (0.133)			0.051 (0.164)
Physical abuse			-0.083 (0.099)			-0.058 (0.104)
Sexual abuse			0.328			0.204

			(0.198)			(0.243)
Social service investigation			0.358** (0.124)			0.382** (0.141)
Foster care placement			0.408 (0.299)			0.626 (0.364)
Biological parent incarcerated			0.173 (0.089)			0.101 (0.103)
School						
Feel unsafe at school				0.607*** (0.105)		0.499*** (0.131)
Neighborhood						
Demographic index					0.164** (0.047)	0.148** (0.052)
Low collective efficacy					-0.030 (0.086)	0.063 (0.103)
Feel unsafe in neighborhood					0.508*** (0.115)	0.340* (0.147)
Demographic Controls						
Age in years, Wave I	0.078** (0.026)	0.063* (0.029)	0.083** (0.028)	0.069** (0.025)	0.077** (0.026)	0.071* (0.032)
Biological sex, female	-0.219** (0.071)	-0.274** (0.081)	-0.166* (0.078)	-0.211** (0.073)	-0.275** (0.080)	-0.280** (0.096)
Ethnicity, Hispanic	0.468** (0.135)	0.359* (0.146)	0.492** (0.149)	0.457** (0.139)	0.328* (0.150)	0.244 (0.175)
Race, Asian, Pacific Islander	0.256 (0.204)	0.224 (0.221)	0.385* (0.190)	0.267 (0.195)	0.144 (0.217)	0.101 (0.236)

Race, black, African American	0.987*** (0.097)	0.849*** (0.098)	1.006*** (0.108)	0.966*** (0.098)	0.738*** (0.120)	0.665*** (0.130)
Race, Native American, American Indian	0.761** (0.256)	0.708** (0.215)	0.713* (0.297)	0.682* (0.261)	0.665** (0.243)	0.462 (0.292)
Race, other	0.203 (0.165)	0.132 (0.176)	0.212 (0.160)	0.225 (0.162)	0.149 (0.149)	0.119 (0.176)
Family structure, two biological parents	-0.298*** (0.069)	-0.257*** (0.070)	-0.255** (0.080)	-0.285*** (0.069)	-0.259** (0.078)	-0.215* (0.087)
Welfare receipt, youth, Wave I	0.551*** (0.106)	Not included (see table key)	0.448** (0.132)	0.547*** (0.111)	0.430*** (0.110)	Not included (see table key)
Urban residence, Wave I	-0.080 (0.074)	-0.068 (0.082)	-0.127 (0.086)	-0.112 (0.078)	-0.172* (0.083)	-0.224* (0.112)

Note: Changing perception, original: defined as respondent perception of a 50-50 chance or less of survival to age 35 years in at least one wave (not all three waves).
SE: Standard error.
Note: Coefficients and standard errors are based on weighted data. N=10,120 respondents in all Waves, Waves 1-IV; N=9421 respondents with valid sample weights.
Model 1: Low perceived survival and demographic controls, n= 8821 respondents.
Model 2: Low perceived survival, demographic controls (excluding welfare receipt because it is included in household economics and resources measurement), and household economics and resources, n= 7826 respondents.
Model 3: Low perceived survival, demographic controls, and adverse childhood experiences, n= 7512 respondents.
Model 4: Low perceived survival, demographic controls, and perceptions of school safety, 8685 respondents.
Model 5: Low perceived survival, demographic controls, and neighborhood context (geocode characteristics, collective efficacy, perceptions of safety), n= 7867 respondents.
Model 6: Low perceived survival, demographic controls (excluding welfare receipt because it is included in household economics and resources measurement), household economics and resources, adverse childhood experiences, perceptions of school safety, and neighborhood context, n=5808 respondents.

Note: Youth self-identifying as white is reference category for race.
*p< 0.05; **p< 0.01; ***p< 0.001 (two-tailed tests).

Table 4.3. Relationships between Youth Context and Low Perceived Survival (alternate construct)

	Model 1 Coefficient (SE)	Model 2 Coefficient (SE)	Model 3 Coefficient (SE)	Model 4 Coefficient (SE)	Model 5 Coefficient (SE)	Model 6 Coefficient (SE)
Contexts for Disadvantage						
Household economics, resources						
Parent does not have enough money to pay bills		0.078 (0.225)				0.022 (0.234)
Parent or household member receives public assistance		0.591** (0.176)				0.435 (0.224)
Parent and parent partner unemployed		0.125 (1.136)				0.494 (1.030)
Parent with difficulty accessing medical care for family		0.671** (0.226)				0.609** (0.224)
Adverse childhood experiences						
Neglect, left alone			-0.084 (0.185)			0.052 (0.194)
Neglect, basic needs not met			0.835** (0.243)			0.705* (0.278)
Physical abuse			0.073 (0.208)			-0.106 (0.208)
Sexual abuse			0.282 (0.278)			-0.001 (0.336)
Social service investigation			0.141			0.054

			(0.278)			(0.309)
Foster care placement			0.433 (0.497)			1.015* (0.468)
Biological parent incarcerated			0.185 (0.213)			0.278 (0.226)
School						
Feel unsafe at school				0.861*** (0.212)		0.706** (0.243)
Neighborhood						
Demographic index					0.130 (0.067)	0.060 (0.072)
Low collective efficacy					0.587*** (0.153)	0.574** (0.192)
Feel unsafe in neighborhood					0.735*** (0.168)	0.554* (0.218)
Demographic Controls						
Age in years, Wave I	0.191** (0.054)	0.142* (0.060)	0.157* (0.063)	0.179** (0.055)	0.180** (0.055)	0.101 (0.074)
Biological sex, female	-0.431** (0.152)	-0.491** (0.172)	-0.451** (0.169)	-0.405* (0.156)	-0.516** (0.159)	-0.554** (0.201)
Ethnicity, Hispanic	0.936** (0.272)	0.879** (0.287)	0.882** (0.301)	0.906** (0.261)	0.732* (0.284)	0.669* (0.313)
Race, Asian, Pacific Islander	0.054 (0.466)	0.008 (0.464)	-0.303 (0.662)	0.100 (0.453)	-0.316 (0.459)	-0.820 (0.542)
Race, black, African American	1.497*** (0.186)	1.349*** (0.195)	1.488*** (0.208)	1.492*** (0.186)	1.312*** (0.209)	1.323*** (0.226)

Race, Native American, American Indian	0.807 (0.480)	0.406 (0.463)	0.998 (0.582)	0.715 (0.501)	0.813 (0.450)	0.259 (0.430)
Race, other	0.423 (0.330)	0.287 (0.346)	0.350 (0.382)	0.339 (0.272)	0.465 (0.324)	0.172 (0.322)
Family structure, two biological parents	-0.365* (0.150)	-0.295 (0.163)	-0.313 (0.184)	-0.342* (0.158)	-0.320* (0.160)	-0.232 (0.204)
Welfare receipt, youth, Wave I	0.488** (0.153)	Not included (see table key)	0.391* (0.192)	0.519** (0.156)	0.295 (0.171)	Not included (see table key)
Urban residence, Wave I	-0.078 (0.165)	-0.031 (0.156)	-0.107 (0.180)	-0.133 (0.163)	-0.211 (0.175)	-0.232 (0.197)

Note: Low perceived survival, alternate: defined as respondent perception of a 50-50 chance or less of survival to age 35 years at least once at Add Health Wave I and/or Add Health Wave II, and perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave III.
SE: Standard error.
Note: Coefficients and standard errors are based on weighted data. N=10,120 respondents in all Waves, Waves 1-IV; N=9421 respondents with valid sample weights.
Model 1: Low perceived survival and demographic controls, n= 8821 respondents.
Model 2: Low perceived survival, demographic controls (excluding welfare receipt because it is included in household economics and resources measurement), and household economics and resources, n= 7826 respondents.
Model 3: Low perceived survival, demographic controls, and adverse childhood experiences, n= 7512 respondents.
Model 4: Low perceived survival, demographic controls, and perceptions of school safety, 8685 respondents.
Model 5: Low perceived survival, demographic controls, and neighborhood context (geocode characteristics, collective efficacy, perceptions of safety), n= 7867 respondents.
Model 6: Low perceived survival, demographic controls (excluding welfare receipt because it is included in household economics and resources measurement), household economics and resources, adverse childhood experiences, perceptions of school safety, and neighborhood context, n=5808 respondents.
Note: Youth self-identifying as white is reference category for race.

*p< 0.05; **p< 0.01; ***p< 0.001 (two-tailed tests).

Table 4.4. Relationships between Youth Context and Changing Survival Perception, End Low

	Model 1 Coefficient (SE)	Model 2 Coefficient (SE)	Model 3 Coefficient (SE)	Model 4 Coefficient (SE)	Model 5 Coefficient (SE)	Model 6 Coefficient (SE)
Contexts for Disadvantage						
Household economics, resources						
Parent does not have enough money to pay bills		-0.071 (0.222)				-0.247 (0.259)
Parent or household member receives public assistance		0.430* (0.193)				0.457 (0.250)
Parent and parent partner unemployed		-20.847*** (0.598)				-22.323*** (0.774)
Parent with difficulty accessing medical care for family		0.300 (0.228)				0.508* (0.243)
Adverse childhood experiences						
Neglect, left alone			0.174 (0.210)			0.109 (0.234)
Neglect, basic needs not met			0.167 (0.334)			0.187 (0.362)
Physical abuse			0.209 (0.206)			0.200 (0.229)
Sexual abuse			0.184 (0.463)			0.243 (0.508)
Social service investigation			0.308			0.471

			(0.295)			(0.323)
Foster care placement			1.137 (0.714)			1.803** (0.646)
Biological parent incarcerated			0.274 (0.243)			0.141 (0.238)
School						
Feel unsafe at school				0.187 (0.236)		0.354 (0.297)
Neighborhood						
Demographic index					0.152* (0.072)	0.079 (0.103)
Low collective efficacy					-0.004 (0.189)	0.051 (0.236)
Feel unsafe in neighborhood					-0.431 (0.295)	-0.341 (0.372)
Demographic Controls						
Age in years, Wave I	-0.032 (0.051)	-0.001 (0.053)	-0.018 (0.053)	-0.029 (0.052)	-0.025 (0.053)	0.037 (0.062)
Biological sex, female	-0.426* (0.169)	-0.561** (0.171)	-0.373 (0.192)	-0.438* (0.169)	-0.467* (0.179)	-0.633** (0.201)
Ethnicity, Hispanic	0.078 (0.420)	-0.066 (0.483)	0.283 (0.373)	0.112 (0.418)	-0.092 (0.440)	0.153 (0.442)
Race, Asian, Pacific Islander	-0.251 (0.402)	-0.261 (0.443)	-0.260 (0.454)	-0.243 (0.401)	-0.738 (0.393)	-1.203* (0.514)
Race, black, African American	0.877*** (0.193)	0.786*** (0.194)	0.852*** (0.215)	0.881*** (0.195)	0.632** (0.213)	0.566* (0.264)

Race, Native American, American Indian	0.200 (0.589)	0.134 (0.548)	-1.072 (1.043)	-0.088 (0.740)	0.125 (0.545)	-21.156*** (0.643)
Race, other	0.194 (0.522)	-0.008 (0.681)	-0.144 (0.450)	0.181 (0.523)	0.230 (0.513)	-0.473 (0.544)
Family structure, two biological parents	-0.314 (0.567-1.093)	-0.293 (0.181)	-0.083 (0.190)	-0.317 (0.166)	-0.266 (0.175)	-0.073 (0.204)
Welfare receipt, youth, Wave I	0.254 (0.244)	Not included (see table key)	0.064 (0.376)	0.279 (0.247)	0.208 (0.243)	Not included (see table key)
Urban residence, Wave I	-0.253 (0.182)	-0.163 (0.188)	-0.278 (0.212)	-0.269 (0.186)	-0.285 (0.189)	-0.180 (0.235)

Note: Changing survival perception, end low: defined as respondent reported perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave I and Add Health Wave II, but perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave III.
SE: Standard error.
Note: Coefficients and standard errors are based on weighted data. N= 10,120 respondents in all Waves, Waves 1-IV; N= 9421 respondents with valid sample weights.
Model 1: Changing perception, end low and demographic controls, n= 8821 respondents.
Model 2: Changing perception, end low, demographic controls (excluding welfare receipt because it is included in household economics and resources measurement), and household economics and resources, n= 7826 respondents.
Model 3: Changing perception, end low, demographic controls, and adverse childhood experiences, n= 7512 respondents.
Model 4: Changing perception, end low, demographic controls, and perceptions of school safety, n= 8685 respondents.
Model 5: Changing perception, end low, demographic controls, and neighborhood context (geocode characteristics, collective efficacy, perceptions of safety), n= 7867 respondents.
Model 6: Changing perception, end low, demographic controls (excluding welfare receipt because it is included in household economics and resources measurement), household economics and resources, adverse childhood experiences, perceptions of school safety, and neighborhood context, n= 5808 respondents.

Note: Youth self-identifying as white is reference category for race.
*p< 0.05; **p< 0.01; ***p< 0.001 (two-tailed tests).

Table 4.5 Relationships between Youth Context and Changing Survival Perception, End High

	Model 1 Coefficient (SE)	Model 2 Coefficient (SE)	Model 3 Coefficient (SE)	Model 4 Coefficient (SE)	Model 5 Coefficient (SE)	Model 6 Coefficient (SE)
Contexts for Disadvantage						
Household economics, resources						
Parent does not have enough money to pay bills		-0.064 (0.183)				0.147 (0.205)
Parent or household member receives public assistance		0.672** (0.190)				0.394 (0.234)
Parent and parent partner unemployed		0.205 (1.179)				-0.012 (1.443)
Parent with difficulty accessing medical care for family		0.515** (0.188)				0.577** (0.203)
Adverse childhood experiences						
Neglect, left alone			0.362 (0.186)			0.400 (0.206)
Neglect, basic needs not met			0.394 (0.260)			0.265 (0.316)
Physical abuse			-0.473* (0.207)			-0.505* (0.224)
Sexual abuse			0.330 (0.354)			0.045 (0.415)
Social service investigation			0.680**			0.811**

			(0.232)			(0.249)
Foster care placement			-0.108 (0.559)			-0.047 (0.750)
Biological parent incarcerated			0.159 (0.208)			0.121 (0.225)
School						
Feel unsafe at school				0.901*** (0.190)		0.913*** (0.245)
Neighborhood						
Demographic index					0.085 (0.073)	0.067 (0.089)
Low collective efficacy					-0.177 (0.181)	-0.064 (0.221)
Feel unsafe in neighborhood					0.911*** (0.181)	0.553* (0.234)
Demographic Controls						
Age in years, Wave I	0.213*** (0.045)	0.231*** (0.048)	0.213*** (0.051)	0.213*** (0.047)	0.215*** (0.044)	0.228*** (0.057)
Biological sex, female	-0.023 (0.132)	-0.081 (0.146)	0.092 (0.158)	0.010 (0.136)	-0.066 (0.137)	0.079 (0.190)
Ethnicity, Hispanic	0.346 (0.255)	0.375 (0.324)	0.576* (0.290)	0.328 (0.263)	0.281 (0.270)	0.402 (0.347)
Race, Asian, Pacific Islander	0.317 (0.346)	0.367 (0.349)	0.451 (0.351)	0.331 (0.340)	0.339 (0.354)	0.366 (0.384)
Race, black, African American	1.016*** (0.187)	0.755** (0.212)	1.029*** (0.207)	0.927*** (0.198)	0.861*** (0.206)	0.560* (0.268)

Race, Native American, American Indian	1.249** (0.364)	1.061** (0.386)	1.431*** (0.397)	1.136** (0.356)	1.226** (0.390)	1.153* (0.441)
Race, other	0.515* (0.249)	0.276 (0.281)	0.372 (0.273)	0.531* (0.246)	0.479 (0.261)	0.261 (0.289)
Family structure, two biological parents	-0.169 (0.152)	-0.233 (0.155)	-0.179 (0.170)	-0.141 (0.156)	-0.099 (0.161)	-0.222 (0.197)
Welfare receipt, youth, Wave I	0.777*** (0.196)	Not included (see table key)	0.864*** (0.221)	0.744*** (0.207)	0.735*** (0.202)	Not included (see table key)
Urban residence, Wave I	-0.111 (0.167)	-0.078 (0.183)	-0.145 (0.177)	-0.142 (0.177)	-0.187 (0.172)	-0.253 (0.213)

Note: Changing survival perception, end high: defined as respondent reported perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave I and Add Health Wave II, but perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave III.
SE: Standard error.
Note: Coefficients and standard errors are based on weighted data. N= 10,120 respondents in all Waves, Waves 1-IV; N= 9421 respondents with valid sample weights.
Model 1: Changing perception, end high and demographic controls, n= 8821 respondents.
Model 2: Changing perception, end high, demographic controls (excluding welfare receipt because it is included in household economics and resources measurement), and household economics and resources, n= 7826 respondents.
Model 3: Changing perception, end high, demographic controls, and adverse childhood experiences, n= 7512 respondents.
Model 4: Changing perception, end high, demographic controls, and perceptions of school safety, n= 8685 respondents.
Model 5: Changing perception, end high, demographic controls, and neighborhood context (geocode characteristics, collective efficacy, perceptions of safety), n= 7867 respondents.
Model 6: Changing perception, end high, demographic controls (excluding welfare receipt because it is included in household economics and resources measurement), household economics and resources, adverse childhood experiences, perceptions of school safety, and neighborhood context, n= 5808 respondents.
Note: Youth self-identifying as white is reference category for race.

*p< 0.05; **p< 0.01; ***p< 0.001 (two-tailed tests).

Table 4.6. Relationships between Youth Context and Changing Survival Perception, Mostly High

	Model 1 Coefficient (SE)	Model 2 Coefficient (SE)	Model 3 Coefficient (SE)	Model 4 Coefficient (SE)	Model 5 Coefficient (SE)	Model 6 Coefficient (SE)
Contexts for Disadvantage						
Household economics, resources						
Parent does not have enough money to pay bills		0.094 (0.133)				0.135 (0.150)
Parent or household member receives public assistance		0.653*** (0.132)				0.457** (0.169)
Parent and parent partner unemployed		-1.696 (1.131)				-1.536 (1.191)
Parent with difficulty accessing medical care for family		0.669*** (0.129)				0.516*** (0.144)
Adverse childhood experiences						
Neglect, left alone			0.144 (0.101)			0.238* (0.117)
Neglect, basic needs not met			-0.010 (0.171)			-0.243 (0.211)
Physical abuse			-0.072 (0.115)			-0.034 (0.131)
Sexual abuse			0.329 (0.233)			0.304 (0.278)
Social service investigation			0.324*			0.278

			(0.141)			(0.159)
Foster care placement			0.412 (0.379)			0.244 (0.467)
Biological parent incarcerated			0.112 (0.106)			0.023 (0.119)
School						
Feel unsafe at school				0.586*** (0.123)		0.347* (0.164)
Neighborhood						
Demographic index					0.187*** (0.049)	0.189** (0.055)
Low collective efficacy					-0.090 (0.109)	0.025 (0.124)
Feel unsafe in neighborhood					0.498** (0.163)	0.376 (0.205)
Demographic Controls						
Age in years, Wave I	0.051 (0.028)	0.018 (0.031)	0.064* (0.030)	0.039 (0.028)	0.047 (0.029)	0.032 (0.034)
Biological sex, female	-0.211* (0.082)	-0.250** (0.092)	-0.178 (0.096)	-0.205* (0.083)	-0.270** (0.095)	-0.295* (0.118)
Ethnicity, Hispanic	0.456** (0.144)	0.282 (0.148)	0.423* (0.167)	0.450** (0.152)	0.321* (0.150)	0.099 (0.181)
Race, Asian, Pacific Islander	0.406* (0.195)	0.352 (0.209)	0.557** (0.186)	0.413* (0.189)	0.324 (0.220)	0.302 (0.230)
Race, black, African American	0.929*** (0.116)	0.825*** (0.114)	0.952*** (0.126)	0.917*** (0.119)	0.650*** (0.138)	0.605*** (0.141)

Race, Native American, American Indian	0.692* (0.329)	0.783** (0.260)	0.504 (0.441)	0.642 (0.327)	0.563 (0.317)	0.481 (0.409)
Race, other	0.120 (0.187)	0.133 (0.218)	0.266 (0.196)	0.159 (0.184)	0.011 (0.173)	0.197 (0.211)
Family structure, two biological parents	-0.347*** (0.090)	-0.282** (0.095)	-0.347** (0.106)	-0.330*** (0.091)	-0.318** (0.101)	-0.277* (0.123)
Welfare receipt, youth, Wave I	0.583*** (0.128)	Not included (see table key)	0.434** (0.147)	0.579*** (0.135)	0.440** (0.133)	Not included (see table key)
Urban residence, Wave I	-0.038 (0.829-1.167)	0.053 (0.093)	-0.089 (0.098)	-0.070 (0.091)	-0.134 (0.099)	-0.218 (0.120)

Note: Changing survival perception, mostly high: defined as respondent reported perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave I or Add Health Wave II, perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave I or Add Health Wave II, and perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave III.
SE: Standard error.
Note: Coefficients and standard errors are based on weighted data. N= 10,120 respondents in all Waves, Waves 1-IV; N= 9421 respondents with valid sample weights.
Model 1: Changing perception, mostly high and demographic controls, n= 8821 respondents.
Model 2: Changing perception, mostly high, demographic controls (excluding welfare receipt because it is included in household economics and resources measurement), and household economics and resources, n= 7826 respondents.
Model 3: Changing perception, mostly high, demographic controls, and adverse childhood experiences, n= 7512 respondents.
Model 4: Changing perception, mostly high, demographic controls, and perceptions of school safety, n= 8685 respondents.
Model 5: Changing perception, mostly high, demographic controls, and neighborhood context (geocode characteristics, collective efficacy, perceptions of safety), n= 7867 respondents.
Model 6: Changing perception, mostly high, demographic controls (excluding welfare receipt because it is included in household economics and resources measurement), household economics and resources, adverse childhood experiences, perceptions of school safety, and neighborhood context, n= 5808 respondents.

Note: Youth self-identifying as white is reference category for race.
*p< 0.05; **p< 0.01; ***p< 0.001 (two-tailed tests).

Table 5.1. Youth Survival Perceptions and Adult Self-Rated Health

Variables	**Model 1** [a] Coefficient (SE)	**Model 2** [b] Coefficient (SE)	**Model 3** Coefficient (SE)
Survival Perceptions			
Low perceived survival, original	-0.576*** (0.105)	-0.298** (0.112)	-0.332** (0.112)
Changing survival perception, original	-0.229*** (0.038)	-0.086* (0.038)	-0.095* (0.038)
High perceived survival	0.263*** (0.035)	0.107** (0.037)	Referent
Covariates [c]			
Age in years, Wave IV			-0.001 (0.009)
Biological sex, female			-0.084** (0.027)
Ethnicity, Hispanic			-0.142* (0.064)
Race, Asian, Pacific Islander			-0.222** (0.067)
Race, black, African American			-0.049 (0.031)
Race, Native American, American Indian			-0.104 (0.139)
Race, other			-0.021 (0.074)
Parent education, college graduate			0.044 (0.031)
Family structure, two biological parents			0.041 (0.028)
Welfare receipt, youth, Wave I			-0.103* (0.047)
Respondent education, college graduate			0.341*** (0.031)
Respondent married			0.089** (0.027)
Respondent cohabiting			0.004 (0.038)
Self-rated health, youth, Wave I			0.218*** (0.015)
Respondents	9323	7836	7836
R^2			0.129

Note: Low perceived survival, original: defined as respondent perception of a 50-50 chance or less of survival to age 35 years for Add Health Wave I, Wave II, and Wave III.
Note: Changing perception, original: defined as respondent perception of a 50-50 chance or less of survival to age 35 years in at least one wave (not all three waves).
Note: High perceived survival: defined as respondent perception of a 'good' or 'almost certain' chance of survival to age 35 years for Add Health Wave I, Wave II, and Wave III.
SE: Standard error.
Note: Self-rated health coded so that higher number coincides with perception of better health, Add Health Wave IV.
Note: Coefficients and standard errors are based on weighted data. N= 10,120 respondents in all waves, Add Health Waves 1-IV. N= 9421 respondents with valid sample weights.
[a] Bivariate relationship between adult self-rated health (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III).
[b] Relationship between adult self-rated health (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III), adjusted for covariates listed in the table.
[c] Youth self-identifying as white is reference category for race.
*p< 0.05; **p< 0.01; ***p< 0.001 (two-tailed tests).

Table 5.2. Youth Survival Perceptions and Adult Mental Health Disorder Index

Variables	**Model 1** [a] Coefficient (SE)	**Model 2** [b] Coefficient (SE)	**Model 3** Coefficient (SE)
Survival Perceptions			
Low perceived survival, original	0.288 (0.146)	0.257 (0.156)	0.310 (0.156)
Changing survival perception, original	0.152*** (0.030)	0.121*** (0.029)	0.131*** (0.029)
High perceived survival	-0.168*** (0.030)	-0.139*** (0.029)	Referent
Covariates [c]			
Age in years, Wave IV			-0.011 (0.008)
Biological sex, female			0.245** (0.025)
Ethnicity, Hispanic			-0.136** (0.041)
Race, Asian, Pacific Islander			-0.264*** (0.062)
Race, black, African American			-0.352*** (0.031)
Race, Native American, American Indian			-0.040 (0.100)
Race, other			-0.073 (0.050)
Parent education, college graduate			0.020 (0.028)
Family structure, two biological parents			-0.053* (0.025)
Welfare receipt, youth, Wave I			0.043 (0.050)
Respondent education, college graduate			-0.078** (0.025)
Respondent married			-0.119*** (0.028)
Respondent cohabiting			0.018 (0.035)
Symptoms of depression, youth, Wave I [d]			0.215*** (0.032)
Self-rated health, youth, Wave I			-0.050*** (0.013)

Family and/or friend history of suicide [e]			0.288*** (0.080)
Respondents	9274	7801	7801
R^2			0.091

Note: Low perceived survival, original: defined as respondent perception of a 50-50 chance or less of survival to age 35 years for Add Health Wave I, Wave II, and Wave III.
Note: Changing perception, original: defined as respondent perception of a 50-50 chance or less of survival to age 35 years in at least one wave (not all three waves).
Note: High perceived survival: defined as respondent perception of a 'good' or 'almost certain' chance of survival to age 35 years for Add Health Wave I, Wave II, and Wave III.
SE: Standard error.
Note: Mental health disorder index, respondent given a point for each of the following conditions: diagnosis of depression; post-traumatic stress disorder; anxiety disorder; suicidal thoughts; previous suicide attempt (potential range 0-5).
Note: Coefficients and standard errors are based on weighted data. N= 10,120 respondents in all waves, Add Health Waves 1-IV. N= 9421 respondents with valid sample weights.
[a] Bivariate relationship between adult mental health disorder index (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III).
[b] Relationship between adult mental health disorder index (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III), adjusted for covariates listed in the table.
[c] Youth self-identifying as white is reference category for race.
[d] Original Center for Epidemiological Studies Depression Scale (CES-D) cut score for significant symptomatology is 16; adapted measure used in Add Health, adapted measure cut score equivalent is 15-16 or 15.2; quartiles: score of 15 is 75% (15 is cut score used for adapted measure).
[e] Respondent with family and/or friend history of suicide, measured in Add Health Waves I, II, IV.
*p< 0.05; **p< 0.01; ***p< 0.001 (two-tailed tests).

Table 5.3. Youth Survival Perceptions and Leading Causes of Morbidity and Mortality for US Adults

Variables	**Model 1** [a] Coefficient (SE)	**Model 2** [b] Coefficient (SE)	**Model 3** Coefficient (SE)
Survival Perceptions			
Low perceived survival, original	0.221 (0.135)	0.233 (0.146)	0.262 (0.147)
Changing survival perception, original	0.130*** (0.029)	0.068* (0.033)	0.076* (0.033)
High perceived survival	-0.141*** (0.029)	-0.085* (0.033)	Referent
Covariates [c]			
Age in years, Wave IV			0.001 (0.009)
Biological sex, female			0.165*** (0.031)
Ethnicity, Hispanic			-0.082 (0.046)
Race, Asian, Pacific Islander			-0.229** (0.065)
Race, black, African American			-0.261*** (0.041)
Race, Native American, American Indian			-0.067 (0.111)
Race, other			0.045 (0.065)
Parent education, college graduate			0.008 (0.031)
Family structure, two biological parents			-0.048 (0.031)
Welfare receipt, youth, Wave I			0.042 (0.051)
Respondent education, college graduate			-0.001 (0.030)
Respondent married			-0.042 (0.031)
Respondent cohabiting			0.032 (0.036)
Symptoms of depression, youth, Wave I [d]			0.201*** (0.034)
Self-rated health, youth,			-0.083***

Wave I			(0.016)
Family and/or friend history of suicide [e]			0.314** (0.093)
Body mass index, Wave IV			0.016*** (0.002)
History of smoking, Wave IV			0.126*** (0.028)
Respondents	8975	7441	7441
R^2			0.082

Note: Low perceived survival, original: defined as respondent perception of a 50-50 chance or less of survival to age 35 years for Add Health Wave I, Wave II, and Wave III.
Note: Changing perception, original: defined as respondent perception of a 50-50 chance or less of survival to age 35 years in at least one wave (not all three waves).
Note: High perceived survival: defined as respondent perception of a 'good' or 'almost certain' chance of survival to age 35 years for Add Health Wave I, Wave II, and Wave III.
SE: Standard error.
Note: Morbidity and mortality index, respondent given a point for each of the following conditions: diagnosis of cancer, leukemia, lymphoma; elevated cholesterol, triglycerides, lipids; hypertension, high blood pressure; diabetes, high blood sugar; heart disease; asthma, chronic bronchitis, emphysema; hepatitis (B, C); mood disorder, anxiety disorder; suicidality (thoughts, attempts) (potential range 0-9).
Note: Coefficients and standard errors are based on weighted data. N= 10,120 respondents in all waves, Add Health Waves 1-IV. N= 9421 respondents with valid sample weights.
[a] Bivariate relationship between adult morbidity and mortality index (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III).
[b] Relationship between adult morbidity and mortality index (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III), adjusted for covariates listed in the table.
[c] Youth self-identifying as white is reference category for race.
[d] Original Center for Epidemiological Studies Depression Scale (CES-D) cut score for significant symptomatology is 16; adapted measure used in Add Health, adapted measure cut score equivalent is 15-16 or 15.2; quartiles: score of 15 is 75% (15 is cut score used for adapted measure).
[e] Respondent with family and/or friend history of suicide, measured in Add Health Waves I, II, IV.
*p< 0.05; **p< 0.01; ***p< 0.001 (two-tailed tests).

Table 5.4. Youth Survival Perceptions and Adult Allostatic Load Score

Variables	**Model 1** [a] Coefficient (SE)	**Model 2** [b] Coefficient (SE)	**Model 3** Coefficient (SE)
Survival Perceptions			
Low perceived survival, original	0.144 (0.182)	-0.064 (0.216)	-0.086 (0.215)
Changing survival perception, original	0.121** (0.041)	-0.059 (0.045)	-0.062 (0.044)
High perceived survival	-0.126** (0.040)	0.063 (0.043)	Referent
Covariates [c]			
Age in years, Wave IV			0.021 (0.012)
Biological sex, female			-0.031 (0.040)
Ethnicity, Hispanic			0.119 0.079)
Race, Asian, Pacific Islander			-0.251** (0.075)
Race, black, African American			0.345*** (0.059)
Race, Native American, American Indian			0.354 (0.295)
Race, other			-0.005 (0.102)
Parent education, college graduate			-0.077 (0.041)
Family structure, two biological parents			0.049 (0.044)
Welfare receipt, youth, Wave I			0.083 0.075)
Respondent education, college graduate			-0.270*** (0.046)
Respondent married			0.011 (0.043)
Respondent cohabiting			-0.072 (0.056)
Self-rated health, youth, Wave I			-0.185*** (0.022)
History of smoking, Wave IV			0.029 (0.045)

Respondents	8060	6807	6807
R^2			0.055

Note: Low perceived survival, original: defined as respondent perception of a 50-50 chance or less of survival to age 35 years for Add Health Wave I, Wave II, and Wave III.
Note: Changing perception, original: defined as respondent perception of a 50-50 chance or less of survival to age 35 years in at least one wave (not all three waves).
Note: High perceived survival: defined as respondent perception of a 'good' or 'almost certain' chance of survival to age 35 years for Add Health Wave I, Wave II, and Wave III.
SE: Standard error.
Note: Allostatic load score components: systolic blood pressure ≥ 140 mmHg; diastolic blood pressure ≥ 90 mmHg; resting heart rate ≥ 90 beats/minute; obese body mass index (≥ 30); hemoglobin A1c ≥ 6.4%; high sensitivity c-reactive protein ≥ 3.0 mg/L (potential range 0-6).
Note: Coefficients and standard errors are based on weighted data. N= 10,120 respondents in all waves, Add Health Waves 1-IV. N= 9421 respondents with valid sample weights.
[a] Bivariate relationship between adult allostatic load score (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III).
[b] Relationship between adult allostatic load score (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III), adjusted for covariates listed in the table.
[c] Youth self-identifying as white is reference category for race.
*p< 0.05; **p< 0.01; ***p< 0.001 (two-tailed tests).

Table 5.5. Youth Survival Perceptions and Adult Self-Rated Health (alternate constructs)

Variables	**Model 1** [a] Coefficient (SE)	**Model 2** [b] Coefficient (SE)	**Model 3** Coefficient (SE)
Survival Perceptions			
Low perceived survival, alternate	-0.434*** (0.066)	-0.259*** (0.068)	-0.283*** (0.070)
Changing survival perception, end low	-0.182* (0.074)	-0.114 (0.072)	-0.142 (0.073)
Changing survival perception, end high	-0.345*** (0.069)	-0.146 0.077)	-0.175* (0.077)
Changing survival perception, mostly high	-0.110* (0.044)	0.002 (0.046)	-0.032 (0.047)
High perceived survival	0.263* (0.035)	0.107** (0.037)	Referent
Covariates [c]			
Age in years, Wave IV			-0.0005 (0.009)
Biological sex, female			-0.085** (0.026)
Ethnicity, Hispanic			-0.138* (0.063)
Race, Asian, Pacific Islander			-0.225** (0.066)
Race, black, African American			-0.048 (0.031)
Race, Native American, American Indian			-0.108 (0.138)
Race, other			-0.023 (0.073)
Parent education, college graduate			0.044 (0.031)
Family structure, two biological parents			0.043 (0.028)
Welfare receipt, youth, Wave I			-0.104* (0.047)
Respondent education, college graduate			0.340*** (0.031)
Respondent married			0.087** (0.027)
Respondent cohabiting			0.004 (0.038)

Self-rated health, youth, Wave I			0.217*** (0.015)
Respondents	9323	7836	7836
R^2			0.131

Note: Low perceived survival, alternate: defined as respondent perception of a 50-50 chance or less of survival to age 35 years at least once at Add Health Wave I and/or Add Health Wave II, and perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave III.
Note: Changing survival perception, end low: defined as respondent reported perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave I and Add Health Wave II, but perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave III.
Note: Changing survival perception, end high: defined as respondent reported perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave I and Add Health Wave II, but perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave III.
Note: Changing survival perception, mostly high: defined as respondent reported perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave I or Add Health Wave II, perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave I or Add Health Wave II, and perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave III.
Note: High perceived survival: defined as respondent perception of a 'good' or 'almost certain' chance of survival to age 35 years for Add Health Wave I, Wave II, and Wave III.
SE: Standard error.
Note: Self-rated health coded so that higher number coincides with perception of better health, Add Health Wave IV.
Note: Coefficients and standard errors are based on weighted data. N= 10,120 respondents in all waves, Add Health Waves 1-IV. N= 9421 respondents with valid sample weights.
[a] Bivariate relationship between adult self-rated health (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III).
[b] Relationship between adult self-rated health (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III), adjusted for covariates listed in the table.
[c] Youth self-identifying as white is reference category for race.
*p< 0.05; **p< 0.01; ***p< 0.001 (two-tailed tests).

Table 5.6. Youth Survival Perceptions and Adult Mental Health Disorder Index (alternate constructs)

Variables	**Model 1** [a] Coefficient (SE)	**Model 2** [b] Coefficient (SE)	**Model 3** Coefficient (SE)
Survival Perceptions			
Low perceived survival, alternate	0.329*** (0.084)	0.284** (0.089)	0.320*** (0.089)
Changing survival perception, end low	0.135 (0.068)	0.150* (0.071)	0.188* (0.071)
Changing survival perception, end high	0.136* (0.053)	0.156** (0.049)	0.146** (0.050)
Changing survival perception, mostly high	0.079* (0.035)	0.059 (0.036)	0.079* (0.035)
High perceived survival	-0.168*** (0.030)	-0.139*** (0.029)	Referent
Covariates [c]			
Age in years, Wave IV			-0.011 (0.008)
Biological sex, female			0.247*** (0.025)
Ethnicity, Hispanic			-0.140** (0.041)
Race, Asian, Pacific Islander			-0.260*** (0.063)
Race, black, African American			-0.354*** (0.031)
Race, Native American, American Indian			-0.033 (0.101)
Race, other			-0.071 (0.049)
Parent education, college graduate			0.021 (0.029)
Family structure, two biological parents			-0.054* (0.025)
Welfare receipt, youth, Wave I			0.044 (0.049)
Respondent education, college graduate			-0.077** (0.025)
Respondent married			-0.116*** (0.028)
Respondent cohabiting			0.018

			(0.035)
Symptoms of depression, youth, Wave I [d]			0.215*** (0.032)
Self-rated health, youth, Wave I			-0.049*** (0.013)
Family and/or friend history of suicide [e]			0.279** (0.079)
Respondents	9274	7801	7801
R^2			0.094

Note: Low perceived survival, alternate: defined as respondent perception of a 50-50 chance or less of survival to age 35 years at least once at Add Health Wave I and/or Add Health Wave II, and perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave III.
Note: Changing survival perception, end low: defined as respondent reported perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave I and Add Health Wave II, but perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave III.
Note: Changing survival perception, end high: defined as respondent reported perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave I and Add Health Wave II, but perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave III.
Note: Changing survival perception, mostly high: defined as respondent reported perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave I or Add Health Wave II, perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave I or Add Health Wave II, and perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave III.
Note: High perceived survival: defined as respondent perception of a 'good' or 'almost certain' chance of survival to age 35 years for Add Health Wave I, Wave II, and Wave III.
SE: Standard error.
Note: Mental health disorder index, respondent given a point for each of the following conditions: diagnosis of depression; post-traumatic stress disorder; anxiety disorder; suicidal thoughts; previous suicide attempt (potential range 0-5).
Note: Coefficients and standard errors are based on weighted data. N= 10,120 respondents in all waves, Add Health Waves 1-IV. N= 9421 respondents with valid sample weights.
[a] Bivariate relationship between adult mental health disorder index (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III).
[b] Relationship between adult mental health disorder index (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III), adjusted for covariates listed in the table.
[c] Youth self-identifying as white is reference category for race.

[d] Original Center for Epidemiological Studies Depression Scale (CES-D) cut score for significant symptomatology is 16; adapted measure used in Add Health, adapted measure cut score equivalent is 15-16 or 15.2; quartiles: score of 15 is 75% (15 is cut score used for adapted measure).
[e] Respondent with family and/or friend history of suicide, measured in Add Health Waves I, II, IV.
*p< 0.05; **p< 0.01; ***p< 0.001 (two-tailed tests).

Table 5.7. Youth Survival Perceptions and Leading Causes of Morbidity and Mortality for US Adults (alternate constructs)

Variables	**Model 1** [a] Coefficient (SE)	**Model 2** [b] Coefficient (SE)	**Model 3** Coefficient (SE)
Survival Perceptions			
Low perceived survival, alternate	0.304*** (0.076)	0.270** (0.085)	0.288** (0.085)
Changing survival perception, end low	0.103 (0.075)	0.103 (0.077)	0.126 (0.078)
Changing survival perception, end high	0.140 (0.073)	0.126 (0.073)	0.107 (0.076)
Changing survival perception, mostly high	0.052 (0.038)	-0.002 (0.042)	0.017 (0.041)
High perceived survival	-0.141*** (0.029)	-0.085* (0.033)	Referent
Covariates [c]			
Age in years, Wave IV			0.001 (0.010)
Biological sex, female			0.167*** (0.030)
Ethnicity, Hispanic			-0.088 (0.047)
Race, Asian, Pacific Islander			-0.225** (0.066)
Race, black, African American			-0.264*** (0.041)
Race, Native American, American Indian			-0.057 (0.112)
Race, other			0.046 (0.063)
Parent education, college graduate			0.009 (0.031)
Family structure, two biological parents			-0.049 (0.031)
Welfare receipt, youth, Wave I			0.044 (0.051)
Respondent education, college graduate			-0.001 (0.030)
Respondent married			-0.039 (0.031)
Respondent cohabiting			0.032

			(0.036)
Symptoms of depression, youth, Wave I [d]			0.199*** (0.034)
Self-rated health, youth, Wave I			-0.081*** (0.015)
Family and/or friend history of suicide [e]			0.303** (0.093)
Body mass index, Wave IV			0.016*** (0.002)
History of smoking, Wave IV			0.128*** (0.028)
Respondents	8975	7441	7441
R^2			0.084

Note: Low perceived survival, alternate: defined as respondent perception of a 50-50 chance or less of survival to age 35 years at least once at Add Health Wave I and/or Add Health Wave II, and perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave III.
Note: Changing survival perception, end low: defined as respondent reported perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave I and Add Health Wave II, but perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave III.
Note: Changing survival perception, end high: defined as respondent reported perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave I and Add Health Wave II, but perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave III.
Note: Changing survival perception, mostly high: defined as respondent reported perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave I or Add Health Wave II, perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave I or Add Health Wave II, and perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave III.
Note: High perceived survival: defined as respondent perception of a 'good' or 'almost certain' chance of survival to age 35 years for Add Health Wave I, Wave II, and Wave III.
SE: Standard error.
Note: Morbidity and mortality index, respondent given a point for each of the following conditions: diagnosis of cancer, leukemia, lymphoma; elevated cholesterol, triglycerides, lipids; hypertension, high blood pressure; diabetes, high blood sugar; heart disease; asthma, chronic bronchitis, emphysema; hepatitis (B, C); mood disorder, anxiety disorder; suicidality (thoughts, attempts) (potential range 0-9).
Note: Coefficients and standard errors are based on weighted data. N= 10,120 respondents in all waves, Add Health Waves 1-IV. N= 9421 respondents with valid sample weights.

[a] Bivariate relationship between adult morbidity and mortality index (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III).
[b] Relationship between adult morbidity and mortality index (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III), adjusted for covariates listed in the table.
[c] Youth self-identifying as white is reference category for race.
[d] Original Center for Epidemiological Studies Depression Scale (CES-D) cut score for significant symptomatology is 16; adapted measure used in Add Health, adapted measure cut score equivalent is 15-16 or 15.2; quartiles: score of 15 is 75% (15 is cut score used for adapted measure).
[e] Respondent with family and/or friend history of suicide, measured in Add Health Waves I, II, IV.
*p< 0.05; **p< 0.01; ***p< 0.001 (two-tailed tests).

Table 5.8. Youth Survival Perceptions and Adult Allostatic Load Score (alternate constructs)

Variables	**Model 1** [a] Coefficient (SE)	**Model 2** [b] Coefficient (SE)	**Model 3** Coefficient (SE)
Survival Perceptions			
Low perceived survival, alternate	0.141 (0.105)	-0.064 (0.113)	-0.082 (0.113)
Changing survival perception, end low	0.161 (0.112)	0.065 (0.119)	0.044 (0.117)
Changing survival perception, end high	0.248** (0.091)	0.029 (0.103)	0.008 (102)
Changing survival perception, mostly high	0.030 (0.051)	-0.101 (0.060)	-0.104 (0.060)
High perceived survival	-0.126** (0.040)	0.063 (0.043)	Referent
Covariates [c]			
Age in years, Wave IV			0.020 (0.012)
Biological sex, female			-0.031 (0.040)
Ethnicity, Hispanic			0.120 (0.078)
Race, Asian, Pacific Islander			-0.250** (0.074)
Race, black, African American			0.345*** (0.058)
Race, Native American, American Indian			0.352 (0.295)
Race, other			-0.004 (0.101)
Parent education, college graduate			-0.078 (0.041)
Family structure, two biological parents			0.049 (0.044)
Welfare receipt, youth, Wave I			0.084 (0.076)
Respondent education, college graduate			-0.269*** (0.046)
Respondent married			0.011 (0.043)
Respondent cohabiting			-0.073

			(0.056)
Self-rated health, youth, Wave I			-0.185*** (0.023)
History of smoking, Wave IV			0.029 (0.045)
Respondents	8060	6807	6801
R^2			0.055

Note: Low perceived survival, alternate: defined as respondent perception of a 50-50 chance or less of survival to age 35 years at least once at Add Health Wave I and/or Add Health Wave II, and perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave III.
Note: Changing survival perception, end low: defined as respondent reported perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave I and Add Health Wave II, but perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave III.
Note: Changing survival perception, end high: defined as respondent reported perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave I and Add Health Wave II, but perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave III.
Note: Changing survival perception, mostly high: defined as respondent reported perception of a 50-50 chance or less of survival to age 35 years at Add Health Wave I or Add Health Wave II, perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave I or Add Health Wave II, and perception of a 'good' or 'almost certain' chance of survival to age 35 years at Add Health Wave III.
Note: High perceived survival: defined as respondent perception of a 'good' or 'almost certain' chance of survival to age 35 years for Add Health Wave I, Wave II, and Wave III.
SE: Standard error.
Note: Allostatic load score components: systolic blood pressure ≥ 140 mmHg; diastolic blood pressure ≥ 90 mmHg; resting heart rate ≥ 90 beats/minute; obese body mass index (≥ 30); hemoglobin A1c ≥ 6.4%; high sensitivity c-reactive protein ≥ 3.0 mg/L (potential range 0-6).
Note: Coefficients and standard errors are based on weighted data. N= 10,120 respondents in all waves, Add Health Waves 1-IV. N= 9421 respondents with valid sample weights.
[a] Bivariate relationship between adult allostatic load score (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III).
[b] Relationship between adult allostatic load score (Add Health Wave IV) and youth survival perceptions (Add Health Waves I-III), adjusted for covariates listed in the table.
[c] Youth self-identifying as white is reference category for race.
*p< 0.05; **p< 0.01; ***p< 0.001 (two-tailed tests).

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