

UNIVERSITY OF CALIFORNIA

Los Angeles

The Role of Social Status  
during the Transition from Adolescence into Adulthood  
on Smoking and Alcohol Behaviors

A dissertation submitted in partial satisfaction of the  
requirements for the degree Doctor of Philosophy  
in Public Health

by

Camillia Lui

2012

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# ABSTRACT OF THE DISSERTATION

The Role of Social Status  
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Across the life course, substance use is highest in adolescence and young adulthood in the U.S. Although substance use declines with age, a significant number of young adults go beyond normative to problematic use. Despite the strong relationship between low social status and poor health, substance use varies by social status in inconsistent ways. Smoking is higher among lower social status groups. Alcohol use is higher among higher social status groups. Substance use is often higher among Whites compared to racial/ethnic minorities. Problematic substance use is often higher among minorities compared to Whites. These inconsistent patterns may be due to drug type (e.g., smoking vs. alcohol) or difficulty in assessing social status during the transition to adulthood and across race/ethnicity.

The goal of this dissertation is to ascertain the effects of social status on substance use behaviors across race/ethnicity during the transition to adulthood using secondary data analysis of three waves of the National Longitudinal Study of Adolescent Health. Using social stratification theories and the life course perspective, this study conceptualized social status as a life-course construct from adolescence (ages 12-17) to young adulthood (ages 18-26) and adulthood (ages 24-32). Furthermore, social status was examined across the domains of economic, human, and social capitals. Cigarette smoking and heavy episodic alcohol use served as the key outcomes.

Through a person-oriented framework, latent class analysis captured the ebb and flow of social status advantages and disadvantages with four latent groups for the domains of economic and social capitals, and five groups for the domain of human capital. These latent classes were substantively similar across Whites, Blacks, and Latinos; however, variations within subgroups differed. Regardless of domain or race/ethnicity, persistently low social status had higher smoking prevalence when compared to other groups. For heavy episodic drinking, there was no clear pattern across domains and race/ethnicity, which suggest a complex picture that may be difficult to disaggregate. Overall, these findings highlight several dimensions of social status that present opportunities to reduce substance use disparities, and reveal life-course social status groupings from adolescence to adulthood that may provide important avenues to prevent problematic substance use.

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## CHAPTER 1: INTRODUCTION

Across the life course, substance use, such as alcohol, tobacco, and other drugs, is highest among those in late adolescence and young adulthood in the United States (U.S.) (SAMHSA 2011, Windle et al 2005). Most prevention studies focus on substance use initiation, which typically occurs during adolescence (ages 12 to 17), yet peak substance use typically occurs during young adulthood (ages 18-29) (Fothergill et al 2009, Galea & Nandi 2004). According to the 2010 National Survey on Drug Use and Health (NSDUH), the prevalence of past month substance use is highest among 18 to 25 year olds followed by 26-29 year olds (SAMHSA 2011). Although substance use generally declines over the life course, a significant number of people go beyond normative use to problem use, abuse or dependence (Hser et al 2007). The NSDUH showed that abuse or dependence of alcohol and other illicit drugs were highest among 18-25 year olds (SAMHSA 2011).

Substance misuse continues to be a major public health problem (Anderson 2006, Galea & Nandi 2004). Substance-related problems contributed approximately \$12 billion to the nation's health care costs through accidental injuries, overdose, HIV and sexually transmitted infections, cancer, liver and cardiovascular diseases (Williams & Latkin 2007). Research on substance use behaviors often investigates proximal risk and protective factors such as personality traits, deviant behaviors, or family and peer influence (Galea et al 2003). However, the relevant substance-related risk and protective factors vary over the life course (i.e., adolescence versus adulthood) and are dependent on the social context (Schulenberg et al 2003). Interventions that are designed to address these factors are effective in the short-term or within a certain context, but are less effective in the long-term. It is important to develop substance abuse prevention programs that impart longer-term effects over the life course.

Despite improvements in disease etiology, health technology, and medical care, there is a persistence of social inequalities in health outcomes and mortality (House 2002, Phelan et al 2010). To explain this persistence of health inequalities over time, there is a movement to examine more distal factors that explain poor health behaviors across racial, ethnic, and socioeconomic groups (Adler & Stewart 2010, Braveman et al 2010). Health disparities are defined as the population-level differences where disadvantaged socioeconomic status, gender, racial/ethnic minority, and sexual minority groups experience higher rates of disease, greater health risks, and lower quality of health and access to health care (US Department of Health and Human Services 2000). Link and Phelan point to social status as a “fundamental” cause for placing socially disadvantaged groups at poorer health than more socially advantaged groups (1995). For many racial/ethnic minority groups, a disadvantaged social position confers less material resources and power, and exposure to more stressful conditions (Pearlin 1989).

However, the relationship between social disadvantages and poor health does not only operate at the lowest level of disadvantage. Findings from the Whitehall studies showed that it was not only individuals at the bottom of the social strata that had worse health than those above them (Marmot et al 1991). With each upgrade in social strata (regardless of being above a threshold level of occupational position), there was an improvement in health. This social gradient effect occurred across the full range of social statuses (whether measured as income, education or occupation), including variations among those at the very bottom or very top of the social hierarchy (Adler & Rehkopf 2008). Among children and adults, this social gradient effect appears in health outcomes of self-reported health, diabetes, cancer, and cardiovascular diseases (Adler et al 2008, Adler & Stewart 2010).

The effects of social status during the transition from adolescence into adulthood are unclear (Hanson & Chen 2007). Some studies have shown no health difference by social status in adolescence while others have reported a relationship between lower social status and poor adolescent health outcomes (Chen et al 2006, West & Sweeting 2004). The role of social status may exhibit different patterns with substance use behaviors than with other health outcomes. For example, previous research showed that adolescents with higher socioeconomic status (SES) have higher levels of substance use than adolescents with lower SES (Hanson & Chen 2007). However, other research showed the opposite pattern of higher levels of substance use and lower SES (Albrecht & Albrecht 2011, Goodman & Huang 2002).

Early social status may have effects on substance use behaviors later in the life course. Studies have shown that low family socioeconomic status in childhood is associated with problematic substance use behaviors in young adulthood (Daniel et al 2009, Reinherz et al 2000). In contrast, other studies reported a positive association between high family socioeconomic status and young adult binge drinking and drug use, after controlling for college attendance (Crosnoe & Riegle-Crumb 2007, Humensky 2010). By race/ethnicity, substance use has been lower among non-Hispanic Blacks and Hispanics compared to non-Hispanic Whites, but in some studies, problematic substance use behaviors have been found to be higher among Blacks and Hispanics (Galea & Nandi 2004, Godette et al 2009, Hanson & Chen 2007, Warner et al 2006). However, these findings of higher substance use problems among racial/ethnic minority groups are inconsistent. These different patterns may be due to variations in drug type, problems with measuring social status for adolescents and young adults across different racial/ethnic groups, or underlying mechanisms that link social status and risky substance use behaviors.

The overall goal of this dissertation is to ascertain the effects of social status on the health behaviors of cigarette smoking and alcohol use across racial/ethnic groups during the transition from adolescence to adulthood using secondary data analysis of three survey waves (1995, 2001, and 2008) from the National Longitudinal Study of Adolescent Health (Add Health). This study contributes to the literature on social status and substance use behaviors by re-conceptualizing the construct of social status across the life course (i.e., from adolescence into adulthood) and examining the evolving role of life-course social status on substance use behaviors. Using social stratification theories and the life course perspective, this study examines the relationship between social status and substance use behaviors from adolescence to adulthood. I propose the following study aims:

**Study Aim #1:** To examine the effects of social status assessed cumulatively across the early part of the life course (i.e., from adolescence into adulthood) on smoking and alcohol behaviors in adulthood. The main hypothesis is that some patterns of life-course social status are at higher risk for substance use behaviors than others. For this study aim, the construct of life-course social status captures the ebb and flow of advantages or disadvantages across adolescence into adulthood.

**Study Aim #2:** To analyze the variation by race/ethnicity of the impact of life-course social status on adult smoking and alcohol behaviors. The main hypothesis is that patterns of overall lower social status on adult smoking and alcohol behaviors have different effects among non-white racial/ethnic groups compared to their lower social status white counterparts.

This chapter provides an epidemiological overview of health behaviors of smoking and alcohol use among adolescents and young adults and a review of the literature on the relationship between these health behaviors with social status and race/ethnicity. Definitions of social status and the transition to adulthood are also discussed. After providing background on the theories of social stratification and life course perspective, this dissertation's conceptual framework is presented to weave in these theoretical elements together. This chapter concludes with the specific study aims investigated in this dissertation.

## **1.1 BACKGROUND AND SIGNIFICANCE**

### **1.1.1 Epidemiology of Smoking and Alcohol Use from Adolescence into Adulthood**

Tobacco and alcohol are the two most commonly used substances among the general U.S. population (Johnston et al 2011, SAMHSA 2011). Long-term trends show consistent use of cigarette smoking and alcohol among 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> graders in the U.S. since the 1990s (Johnston et al 2011). Initiation and regular use of cigarette smoking and alcohol use are typical behaviors in adolescence even though the legal age to use is not until young adulthood. People generally progress through stages of drug involvement, beginning with legal drugs—alcohol and cigarettes—and moving to illegal drugs, although marijuana use is on the rise as another gateway drug (Golub & Johnson 2002, Kandel et al 1992). This dissertation focuses on cigarette smoking and alcohol behaviors because of their legal nature and the high prevalence among youth and young adults between the ages of 12 and 25.

*Cigarettes:* Despite the 1964's U.S. Surgeon General's report on the harms of smoking and the variety of prevention and policy efforts to reduce smoking, people continue to engage in cigarette smoking. According to the 2010 NSDUH, 23% of Americans aged 12 or older had

smoked cigarettes in the past month (SAMHSA 2011). Adverse health effects of smoking account for nearly one of every five deaths annually in the U.S. (US Department of Health and Human Services 2004). Smoking and exposure to tobacco smoke are associated with lost work productivity and early morbidity and mortality due to chronic disease and cancer (CDC 2008).

Smoking rates generally increase through adolescence and decrease in adulthood. The 2010 NSDUH showed that less than 2% of 12 to 13 year olds smoked in relation to 15% of 16-17 year olds and 32% of 18-20 year olds (SAMHSA 2011). Rates peaked in young adulthood (36% among 21-25 year olds and 37% among 26-29 year olds), and then declined with age. Only 20% of people aged 35 and older reported smoking in the past month. Males reported consistently higher smoking rates than females within each age group. American Indians/Alaskan Natives aged 12 and older reported the highest use of tobacco products (36%) followed by persons who reported two or more races (32%), Whites (29%), Blacks (27%), Hispanics/Latinos (22%), and Asians (13%). These demographic characteristics point to clear age, gender, and racial/ethnic differences in smoking behaviors.

***Alcohol:*** Drinking alcohol has been viewed as a positive health behavior when consumed in moderation in some contexts (e.g., to prevent certain chronic health conditions) and a negative behavior when over consumed in other contexts. Excessive alcohol use is associated with unintentional injuries, interpersonal violence, alcohol poisoning, and lost productivity (Ahern et al 2008, Mokdad et al 2007). Over half of alcohol-related deaths are due to excessive alcohol consumption, making it the third leading preventable cause of death in the U.S. (CDC 2004, Mokdad et al 2004).

The social and cultural acceptance of alcohol has led to normative experiences of alcohol use in adolescence and adulthood. One in two Americans aged 12 or older (52%) drank alcohol

in the past month and 23% of Americans engaged in heavy episodic drinking (HED) in the past month (SAMHSA 2011). HED is defined as five or more drinks (for males) or four or more drinks (for females) on a single occasion at least once in the past 30 days (Mokdad et al 2007, NIAAA 2004). The 2010 NSDUH reported increasing HED rates during adolescence (1% among 12-13 year olds to 15% among 16-17 year olds) and young adulthood (33% among 18-20 year olds and 45% among 21-25 year olds) (SAMHSA 2011). Rates of HED peaked in young adulthood, and then declined to 39% for persons aged 26 to 29, 35% for persons aged 30 to 34, and 29% for persons aged 35 to 39. Males have higher HED rates compared to females (Lemke et al 2008, SAMHSA 2011). HED is highest among Hispanics/Latinos (25%) and American Indians/Alaskan Natives (25%), followed by Whites (24%), persons reporting two or more races (21%), Blacks (20%), and Asians (12%). Variations by demographic characteristics suggest that the normative experiences of alcohol, and especially of risky alcohol behaviors, may be influenced by different social and cultural factors.

***Nicotine and Alcohol Dependence or Abuse:*** Many people experiment with substance use and then may never use again; while others may continue to use these substances. For those who continue to use, some will develop social problems associated with use (e.g., impaired driving, poor productivity at work or school, legal issues) or physiological problems associated with use (e.g., tolerance, withdrawal symptoms, or mental or physical health effects) (Jung 2010). In the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)*, the American Psychiatric Association (APA) defined substance dependence or abuse as continual, persistent use despite experiencing these social and physiological problems (2000). Considered more severe than abuse, dependence is defined as three or more social or physiological problems



reported within a 12-month period. Abuse is defined as the social problems or consequences associated with use.

According to the NSDUH, 9% of the U.S. population aged 12 or older were classified with substance dependence or abuse in the past year (SAMHSA 2011). Past month nicotine dependence was found among 14% of the U.S. population aged 12 or older (SAMHSA 2010). Seven percent of the U.S. population reported alcohol dependence or abuse in the past year (SAMHSA 2011). Past month smoking dependence increased with age from 36% among adolescents who smoke to 53% of adults aged 26 to 34 who smoked (SAMHSA 2010). In comparison, rates of alcohol dependence were highest among young adults aged 18 to 25 (16%) compared to youth aged 12 to 17 (5%) and adults aged 26 and older (6%) (SAMHSA 2011).

Whites have the highest rates of nicotine dependence followed by Blacks, Asians and Hispanics/Latinos (SAMHSA 2010). Racial/ethnic differences are apparent in alcohol dependence where American Indians/Alaskan Natives reported the highest rates (14%), followed by Hispanics/Latinos (8%), Whites (7%), Blacks (6%), and Asians (4%) (SAMHSA 2011). Despite having later substance use onsets and lower substance use compared to Whites, some studies showed that Blacks and Hispanics/Latinos experience higher substance-related problems compared to Whites (Godette et al 2006, Warner et al 2006). However, the patterns of problematic substance use behaviors among non-white racial/ethnic minorities have not been consistent (Godette et al 2009, Warner et al 2006).

***Substance use as a career:*** Hser and colleagues have described longitudinal patterns of substance use within a career and life course framework (Hser et al 2007). Similar to the sociological constructs of a “work career” or a “mental health career”, a career highlights “any sphere of activity in which people move through a series of related and definable stages in a

progressive fashion, moving in a definite direction or toward a recognizable end point or goal” (Aneshensel 1999, p.586). For some people, the end point is non-problematic and non-dependent substance use. For others, this end point is abstinence from substances. A career in substance use is often characterized by onset, acceleration, regular use, problematic use, addiction, cessation, or relapse, which occurs in a non-linear pattern after onset (Hser et al 2007). Hser and colleagues have also framed substance dependence within a chronic disease model that requires ongoing intervention to ensure recovery and disease management to prevent relapse (Hser et al 2009).

Patterns of substance behaviors can also be viewed as a trajectory across the life course. Previous research has identified distinct patterns of cigarette use (Juon et al 2002, Tucker et al 2006) and alcohol use (Oesterle et al 2004, Tucker et al 2003, Windle et al 2005) from adolescence into young adulthood. Common substance use patterns include non-users, experimenters, non-heavy users, early or late on-setters, and chronic heavy users. However, these patterns vary by race/ethnicity where certain minority groups showed later onset of substance use, and once initiated, heavier use (Dauber et al 2009, Lum et al 2009, Wallace et al 2009). Furthermore, studies have highlighted how proximal risk factors, such as internalizing or externalizing behaviors, family/peer influence, or social norms, are associated with substance use trajectories. Although these influences are important to understand, the effects of proximal factors on substance use trajectories may overlook the fundamental factors of why individuals fall into patterns of heavy or problematic use. This dissertation aims to delve deeper into how patterns of distal factors lead to substance use behaviors in adulthood.

### **1.1.2 Transition to Adulthood**

As the evident by the previous section, adolescence and young adulthood are key life stages for the onset and continuation of substance use and misuse. Adolescence (ages 12 to 17) and young adulthood (ages 18 to 29) represent distinct developmental periods in the life course. Between childhood and adulthood, adolescence is characterized by exploring new lifestyles, developing a social identity, and forming peer networks (Harris 2010, Steinberg & Morris 2001). Furthermore, adolescents begin to explore and transition into social roles that are physically, financially, and socially independent from parents or caretakers (Arnett 2000). Adolescence is often depicted as a time of experimentation and onset of risky health behaviors (Mulye et al 2009). During entry into adulthood, these risky behaviors may diminish as people transition to new environments and life responsibilities.

Whereas adolescence served as the transition period in the early-mid 1900s, the norms have currently shifted to where young adulthood serves as the transition period and adulthood begins around the age of 30 (Furstenberg et al 2005). The end of adolescence and beginning of adulthood has become more ambiguous and less predictable. For some, the onset of typical adult roles is occurring at later ages as young adults delay marriage and postpone having children, pursue further schooling in place of work, and remain (to some degree) dependent on their parents (Furstenberg et al 2005). However, for others, onset of adult roles is occurring at an earlier age such as becoming a parent in adolescence or entering the workforce right after high school (Foster et al 2008). These experiences of early and delayed onsets of adult roles provide a complex picture of the transition to adulthood period.

As the transition period lengthens, young adults may be engaging in substance use behaviors for increasingly longer periods of their lives (Harris et al 2006). In contrast, becoming

an adult at a younger age has been associated with higher levels of stress and adoption of poor health behaviors (such as substance use) to cope with the stress (Foster et al 2008, Johnson & Mollborn 2009). Role changes and social influences in young adulthood have been linked to increase substance use (Staff et al 2010). These poor health behaviors can influence later health outcomes as well as social status outcomes. Findings from the National Longitudinal Study of Adolescent Health showed a decline in depression, suicidal thoughts, and violence in young adulthood compared to adolescence, but an increase in poor health behaviors (e.g., less exercise, poor diets, substance use) and earlier onset of chronic conditions (e.g., hypertension, diabetes) in young adulthood (Harris 2010). The continuation of substance use may lead to dependence or abuse. Furthermore, these early health behaviors and lifestyles may trigger pre-disease pathways that lead to poor health outcomes in later life. Unintended consequences from misuse, abuse or dependence may also affect roles and responsibilities in the work place and family, and ultimately lead to lower social status outcomes. Substance misuse and dependence in the early part of the life course have been associated with lower educational outcomes and income levels, and higher poverty in adulthood (Fergusson & Boden 2008, Staff et al 2008). Although young people are in better health relative to their older counterparts, the transition to adulthood period marks a key turning point in health trajectories.

### **1.1.3 Conceptualization of Social Status**

The terms social status, social class, socioeconomic status, and social inequality are often used interchangeably in public health. In addition to these multiple terms, the operationalization of social status in public health research has been convoluted (Braveman et al 2005, Krieger et al 1997, Liberatos et al 1988, Oakes & Rossi 2003). Social status is often categorized into ascribed and achieved statuses (Pampel & Rogers 2004). Ascribed statuses refer to characteristics

individuals are born into such as gender, race/ethnicity, sexual orientation, and family background. Achieved statuses are characteristics individuals garnered during one's life time such as education, prestige, and social ties. To capture changes from adolescence into adulthood, this dissertation uses a combination of ascribed and achieved status to capture the social and economic resources that individuals inherit from their parents and achieve through their lifetime. Furthermore, the umbrella term of "social status" is used in this dissertation.

In public health research, social status is most frequently operationalized as socioeconomic status (SES). Based on Marx's ideas of production and economic inequalities and Weber's concepts of class, status and power, sociologists have derived SES indicators from occupational status, education and income (Grusky et al 2008). Some indicators are based on rankings of prestige tied to occupation while other indicators are based on material wealth and lifestyle consumption attained from one's income and education.

Traditional measures of SES—income, education, and occupational status—place a lot of emphasis on economic and human capital. However, as Bourdieu and other critics note, one's ranking and position in society extend beyond measures of material capital to encompass political, cultural, and social capital (Abel 2008, Bourdieu 1986, Forbes & Wainwright 2001). Through a socio-cultural lens, consumption patterns, lifestyles, and cultural contexts are highly tied to social class (Bourdieu 1986). Examining each of these aspects of status may help us to better understand the relationship between social status and health behaviors and outcomes (Cockerham 2005). Lifestyles and behaviors associated with a social class may point to the mechanisms at play for poor health. Forbes and Wainwright recommend that social status measures should shift from "what do you do?" to "what it means to do what you do?" (2001, p.810). Does a college education represent higher ranking or prestige compared to those who do

not have a college education? Or does it reflect exposure to a lifestyle that encourages positive (or negative) health behaviors?

Krieger and colleagues defined SES as “an aggregate concept that includes both resource-based and prestige-based measures, as linked to both childhood and adult social class position” (1997, p.345). Resource-based measures emphasize one’s material wealth, such as economic, financial, and human capital. Prestige-based measures emphasize one’s rank or status in a social hierarchy as it relates to access or consumption of goods, services, knowledge, social networks, and lifestyles. Similarly, Oakes and Rossi defined SES “as differential access (realized and potential) to desired resources” (2003, p.775). They view this differential access and inequality as a product of (1) scarce resources of material and monetary goods (material capital), (2) skills, knowledge, and capabilities (human capital), and (3) resources derived from a social network and the “network’s status, power, trustworthiness, and abilities of its members” (social capital) (Oakes & Rossi 2003, p. 776).

This dissertation integrates both of these definitions along with Bourdieu’s notion of different capitals to conceptualize social status. Furthermore, the term social status is expanded to incorporate non-economic dimensions that may influence substance use behaviors. The fact that social status is dynamic over the life course also points to a need to go beyond static measures. Social status is examined as the relative position of an individual in society as characterized by his/her economic capital, human capital, and social capital (Krieger et al 1997, Oakes & Rossi 2003). This dissertation applies this definition by examining social status during the early part of the life-course from adolescence into adulthood.

Economic capital is conceptualized as the income, wealth, or assets that provide the financial resources to purchase health, access to resources, attain a certain lifestyle or prestige, or

accumulate power (Grusky et al 2008). Low economic capital reflects accumulated deprivation or poverty, while high economic capital represents accumulated advantage and wealth. Access to health resources can be dependent on material resources and wealth.

Human capital reflects the knowledge, expertise, or skills that provide an individual the cognitive ability to problem solve or learn new information (Becker 1993, Grusky et al 2008). It can also symbolize one's values toward healthy behaviors; social networks that share similar health behaviors; and ability to navigate the health care system (Krieger et al 1997). Low human capital reflects lower educational attainment and less occupational mobility, while high human capital reflects the knowledge and skills attained through higher education and more occupational mobility.

Social capital captures the actual or potential resources acquired from social relations and ties within institutional networks (Bourdieu 1986, Carpiano 2006, Hawe & Shiell 2000). These implied social ties (and the cohesion of the ties) create norms of reciprocity, cooperation, mutual benefits and social trust between people. As a result, the acquired capital from these social relations can be converted into other social status dimensions of economic or human capital. In the context of health, these social ties can promote positive or negative health behaviors and outcomes as well as provide information and resources on accessing health services (Carpiano 2007). Furthermore, low social capital via low social ties creates a sense of isolation that may lead to poor health (Umberson et al 2010). Low social capital points to smaller networks and social ties that may result in less actual/potential resources, while high social capital points to larger networks and social involvement that increase actual/potential resources.

A life-course social status construct captures the build-up of social advantages and disadvantages over the life course. Prior studies have shown that accumulative exposure to low

social status and poverty early in the life course place an individual at greater risk for low social status and poor health outcomes later in life (Case et al 2002, Palloni 2006). Chronic spells of poverty have a greater impact on health than short-term spells of poverty (Do 2009).

Furthermore, studies have shown that longer durations of poverty and unemployment are associated with problematic alcohol use and smoking later in life (Jefferis et al 2004, Mossakowski 2008). The opportunity to capture movements up or down the social status hierarchy through longitudinal repeated measures or through reconceptualization of social status (e.g., poverty and wealth) can further help dissect the role of social status on substance use behaviors.

#### **1.1.4 Interplay of Race/Ethnicity and Social Status on Health**

Race/ethnicity is strongly associated with social status. Data consistently show that Blacks, Hispanics/Latinos, Native Americans, Pacific Islander and some Asian subgroups report lower levels of education, income, and occupational status compared to whites and other Asian subgroups in the U.S. (Williams et al 2010). Disentangling the relationship between social status, race/ethnicity, and health has been at the forefront of health disparities research.

On one hand, social status is viewed as a confounder on the relationship between race and health outcomes (Yu & Williams 1999). On the other hand, social status is viewed as part of the causal pathway between race and health outcomes. Critics of traditional social status measures point to a “nonequivalence of socioeconomic indicators” across racial/ethnic groups (Kaufman et al 1997, Williams et al 2010). For example, Williams and colleagues reported that Blacks have 9 cents and Hispanics/Latinos 12 cents for every dollar of wealth that whites possessed (2010). This contrast in net worth or wealth signifies large inequalities for racial/ethnic groups even if



income is similar between groups. Furthermore, these authors highlighted an earning differential of \$27,000 between black and white men with the same master's degree, demonstrating a differential rate of return on education. These social status measures may not have the same meaning or effect across racial/ethnic groups as evident by the differential rate of the return on education or other measures. Therefore, it is important to keep in mind the implications from comparing racial/ethnic groups to one another and whether the assignment of a reference group (e.g., those most advantaged versus those least advantaged) provides an enhanced understanding of racial/ethnic disparities in health outcomes or simply masks the relationship.

The conundrum of race/ethnicity and social status may extend beyond a measurement issue to a theoretical issue. Dressler and colleagues have pushed for better theoretical models to describe the relationship between race/ethnicity and social status and to help explain the increasing racial/ethnic disparities in health outcomes (Dressler et al 2005). Going beyond biological differences, there are inherent social inequalities that place minority and disadvantaged groups at increased risk and exposure to poor health. The authors point to a structural-constructivist model that expounds on Bourdieu's notion of agency-structure to elucidate the race/ethnicity and social status relationship. In this model, individuals share social beliefs but act within the constraints of an external social structure. This approach views race/ethnicity and social status as deeply intertwined in the U.S. society where the social construction of both terms and political/cultural forces create norms of hierarchy from disadvantaged to advantaged statuses. From this theoretical perspective, the role of social status may differ across racial/ethnic groups based on the group's shared history, racial/ethnic experiences and structural constraints of status attainment.

Recent studies on racial/ethnic differences in health have broadened social status measures to capture these shared experiences, structural constraints, and relative rankings. Using a social status construct composed of poverty and discrimination, Mulia and colleagues found that social disadvantage elevated the risk of alcohol problems for Blacks and Hispanics/Latinos compared to Whites (2008). de Castro and colleagues found significant associations between lower economic opportunity, higher financial strain and lower subjective social status on smoking behaviors among Asian Americans, even after accounting for traditional SES measures (2009).

In moving the health disparities research forward, it is important to address the conceptualization of social status by racial/ethnic groups and examine how this interplay affects substance use behaviors. One approach is to examine the heterogeneity within racial/ethnic groups (e.g., analysis of Hispanics only) or within social status markers (e.g., specific occupational sectors such as blue collar workers) to better elucidate their connections to health (Williams et al 2010). Another approach is through closer examination of the relational dimensions of ethnicity and how racial/ethnic groups are situated within the social structural context via social hierarchies and relative rankings (Ford & Harawa 2010). This dissertation aims to examine the heterogeneity of social status within racial/ethnic groups.

## **1.2 THEORETICAL BACKGROUND**

To investigate the relationship between social status and smoking and risky alcohol behaviors across the transition from adolescence to adulthood, this dissertation integrates social stratification theories and life course perspective.

### **1.2.1 Social Stratification Theories**

This dissertation weaves in several theoretical perspectives from the social stratification literature including status attainment model, cumulative advantage/disadvantage concept, and diminishing returns hypothesis. Within a sociological perspective, the field of social stratification examines how people in society are positioned into different social classes/statuses based on their roles in society and their group memberships (Grusky & Ku 2008). The field's focus on life chances (who gets what and why) that are determined by individual economic, human, physical, cultural, and social capitals attained by intragenerational transmission (within an individual's lifetime) and intergenerational transmission (across generations) (Grusky & Ku 2008). The status attainment model tracks an individual's class of origin to his/her class of destination. Blau and Duncan's original status attainment model emphasized educational attainment as the principal mechanism by which parental education and occupational status influence children's socioeconomic attainment in adulthood (1967). This model has since been expanded to include non-economic factors such as aspirations, ability, and even health as mechanisms for social status attainment (Haas 2006, Hauser et al 1983, Sewell et al 1969).

Previously intergenerational transmission played a large part in determining one's life chances or social status where an individual's occupation/education is likely to resemble the parent's occupation type. This "stickiness" of social status leads to few opportunities for social mobility or movement up or down the social ladder. Intragenerational transmission of social status through educational attainment within an individual's lifetime has become more prominent in the status attainment process, and more importantly, has given way to pathways of upward mobility as well as downward mobility (Alon 2009, Schofer & Meyer 2005). These factors of intergenerational and intragenerational transmission of social status are equally important for the

transition to adulthood period when key status attainment processes are occurring.

However, limiting social status to micro-level processes neglects the structural factors that may affect the status attainment process. The persistence of social inequalities by gender and race/ethnicity in the U.S. attest to the differential conditions for status attainment (above and beyond the individual and family levels). Gender and race/ethnicity are often fixed constructs of social status, but historically and politically, how lived experiences (both advantaged and disadvantaged) differ between groups serves to perpetuate a socially stratified hierarchy and increase health disparities (Grusky et al 2008).

Women and racial/ethnic minorities in the U.S. experience different opportunities than their male and non-Hispanic White counterparts, and are often at a social disadvantage in their access to resources, education, employment, income, and power (Grusky et al 2008). The cumulative dis/advantage theory encapsulates these individual and group social status differences where advantages (e.g., income, resources, wealth, capital) of one individual/group grow over time and the disadvantages of another individual/group grow over time (Dannefer 2003, Merton 1968). Blau and Duncan extended this concept across the life course where advantages and disadvantages that occur at younger ages result in more unequal rates of status attainment in older ages (DiPrete & Eirich 2006). Ultimately, these disadvantages compound over time and only leads to increased risks and even wider social inequalities. As a result, these cumulative advantages/disadvantages lead to different starting points for certain groups. Climbing up from a lower social position is a more difficult path compared to starting in a higher social position.

The diminishing returns hypothesis has also been used to explain social inequalities by racial/ethnic groups (Bowles & Gintis 1976, Farley 1984). This hypothesis states that disadvantaged minority groups (whether by gender or race/ethnicity) do not experience the same

returns as the advantaged majority group. For certain racial/ethnic minority groups, occupying a higher social status position may lead to differential experiences in comparison to their white counterparts in the same social status position (e.g., experiences of discrimination or glass ceiling phenomenon) (Krieger 1999, Portes & Zhou 1993). In the context of health and substance use behaviors, there has been few studies supporting the diminishing returns hypothesis and rather, more evidence for the cumulative dis/advantage theory to explain differentials by race/ethnicity (Farmer & Ferraro 2005).

Finally, to expand on the links between social status and health, Link and Phelan's theory of fundamental causes points to social status as a key source of health differentials (Link & Phelan 1995). They view a fundamental social cause of poor health as a social condition that influences multiple health outcomes, operates through several risk factors, involves resources to avoid risks or minimize deleterious disease effects, and is a condition that continues to affect health no matter the intervening mechanism (Link & Phelan 1995, Link & Phelan 1996). Phelan and Link have furthered their theory by emphasizing how new knowledge can benefit higher social status groups (e.g., higher social status groups were at higher risk for smoking but after the 1964 U.S. Surgeon General's report, their rates dropped) and the role of universal resources and mechanisms (e.g., vaccinations and second-hand smoke policies that apply to everyone) in reducing group disparities (Phelan et al 2010). They also point to Lutfey and Freese's countervailing mechanisms where other factors may undermine the importance of achieving good health. Status attainment of prestige, occupational status or social identity (e.g., masculine identity to engage in HED, thinness as an ideal body image) may serve as counter mechanisms to explain the reverse relationship of high social status and poor health outcomes (Lutfey & Freese 2005). This dissertation applies the notions of status attainment model and cumulative

advantages/disadvantage to gain a better understanding of the role of social status on health. The theory of fundamental causes also serves to explain the relationship of high versus low social status on substance use behaviors.

### **1.2.2 Life Course Perspective**

As the overarching framework for this dissertation, the life course perspective situates behavior and health outcomes within their interactions with time and space (Elder et al 2004). The life course themes of time and timing; network of shared relationships; human agency in decision making; and situating the individual within a historical context all serve as guiding principles for understanding social status and substance use behaviors over the early part of the life course (Elder et al 2004). The timing and sequencing of substance use behaviors can be conceptualized as a trajectory from no use to possible initiation to moving between stages of occasional to frequent use, problematic use, or no use (Hser et al 2007). The patterns of substance use behaviors are best understood within key transition periods, critical points, and linked networks across time and space (Elder et al 2004). Key transition periods such as leaving home or joining the work force indicate a change in social environments that may promote substance use behaviors (Elder et al 2004, Hser et al 2007). Critical or turning points emphasize developmental periods or events where risk of substance use may be the highest due to stress, changing social support, or new social norms (Elder et al 2004). Examples include the loss of a loved one or marital dissolution. Relationships with family and friends and being embedded within school or neighborhoods may also influence access, availability, and norms of substance use. Human agency is an important consideration for understanding the decision to smoke or engage in risky alcohol use. These decisions are made within the constraints of social, historical and economic contexts; family backgrounds; cultural norms; and life developmental stage.

Accruing, maintaining, or losing social status can also be viewed as a key developmental process that fits within the life course framework. Intergenerational transmission of poverty/wealth and family backgrounds help shape one's early life course social status. Shared economic capital and similar cultural and normative influences from parents (and grandparents) provide a foundation for adolescent social status. However, as individuals garner (or lose) capital, their social status changes over time. Young adults are accruing their own material and human capital, while their social capital may be in flux due to changes in their social environment denoted by key turning points such as getting married, leaving home and entering college or the workforce. By adulthood, social status may begin to stabilize and traditional measures of socioeconomic status become a defining marker of social status.

The timing of events and transitions to new life stages can impact social status attainment. Early entry into adulthood (e.g., becoming a parent) has long-term effects on social status and creates a build-up of transitions (e.g., early exit from school and early entry into workforce) (Elder et al 2004). These early transitions have been linked to lower social status attainment and poorer health outcomes (Foster et al 2008, Johnson & Mollborn 2009). The delayed entry into adulthood (e.g., continued schooling) also leads to long-term effects of social status and build-ups of transitions (e.g., further dependence on parents, delayed entry into workforce, and postponing marriage and children) (Arnett 2000, Furstenberg et al 2005). These delayed transitions have been linked to higher social status attainment but the health outcomes are mixed (Furstenberg et al 2005, Harris 2010). In this dissertation, the construct of social status from adolescence into adulthood is operationalized using the key life course themes of timing and transitions, human agency, and the historical context through parental factors.

### **1.3 CONCEPTUAL FRAMEWORK**

This section describes the conceptual framework used to address the specific aims of this dissertation. This dissertation tackles the research gaps raised in the background/significance section to garner a better understanding of the relationship between social status and substance use behaviors during the transition to adulthood. The conceptual framework is guided by the theoretical principles of social stratification theories and the life course perspective. Furthermore, this framework helps to outline the analytic plan used to examine the study aims and test the hypotheses of this research.

Figure 1.1 presents the conceptual framework linking life-course social status to smoking and risky alcohol use in adulthood. As a result of the epidemiological evidence which showed the highest prevalence of substance use/misuse in young adulthood in the U.S., this dissertation focuses on the health outcome of daily smoking and heavy episodic alcohol use in adulthood. From a prevention lens, it is important to go beyond the onset period, which typically occurs in adolescence, and examine the period before problematic use and dependence: the continuation and persistence of use/misuse in adulthood.

The life course perspective and social stratification theories point to social status as a fundamental cause for the persistence of smoking and heavy episodic drinking (HED) in adulthood. Figure 1.1 highlights this relationship of the focal independent variable of social status on the left and the two focal dependent variables of daily smoking and HED in adulthood on the right.

This dissertation defines social status as the relative position of an individual in society as characterized by his/her economic capital, human capital, and social capital. This study applies a multidimensional lens to capture social status as three separate constructs: economic, human, and



social capital. These constructs are depicted in the rectangle boxes within the social status circle. Although not highlighted in the framework, a set of observed variables are used to define economic capital (e.g., income, public assistance), human capital (e.g., education and occupation type), and social capital (e.g., implied social ties through volunteering or civic participation). The public health literature has pointed to several critiques of social status measures which include poor conceptualization of social status and the difficulties of capturing social status over time. Poor conceptualization of social status measures have led to a vague understanding of the role of education or income in relation to a particular health outcome. Forbes and Wainwright emphasize a deeper analysis of social status measures from “what do you do?” to “what it means to do what you do?” (2001, p. 810). Therefore, the intent of this study is to examine the constructs of economic, human, and social capital independently to examine their separate roles and effects on substance use behaviors.

To address the weaknesses of single-point-in-time measures of social status, social status is also conceptualized as a life-course construct from adolescence to adulthood. From a life course perspective, the malleable nature of social status during the transition to adulthood period makes it inappropriate to apply single-point-in-time social status measures to this age cohort. In addition, the transition to adulthood literature raises our awareness of the changing U.S. demographics where there is a delayed onset of adult roles for some groups and an early onset of adult roles for other groups. Therefore, the temporal aspects of employment, postsecondary schooling, financial dependence on parents, and fluidity of organizational memberships are important to consider. Therefore, repeated social status measures from adolescence (including parents), young adulthood, and adulthood are used to create life-course economic capital, human capital, and social capital constructs. Potential patterns of life-course social status may include

persistent advantage or disadvantage or patterns of upward or downward mobility for each construct. To provide a demographic context for each social status construct, individual characteristics of gender, family immigrant status, marital status, and number of children are also accounted for in the framework.

The bottom of Figure 1.1 underscores the role of race/ethnicity in the conceptual framework. The relationship between race/ethnicity, social status and health is convoluted, and thus many public health studies tend to simply adjust or control for race/ethnicity. Health disparities researchers call for a closer inspection of race/ethnicity both methodologically and conceptually. As a result, this study examines the relationship between the social status dimensions and substance use behaviors separately by the racial/ethnic groups of non-Hispanic White (henceforth referred to as White), non-Hispanic Black (henceforth referred to as Black), Hispanic or Latino (henceforth called Latino), and non-Hispanic Asian (henceforth called Asian). Through this stratification, the indicators of economic, human, and social capitals can be assessed within each racial/ethnic group rather than across racial/ethnic groups. By looking at each group individually, this study examines the effects of a specific racial/ethnic group's shared experiences, structural constraints and relative rankings on each social status construct. This approach avoids the problem of "non-equivalence in SES indicators" and enables the opportunity to construct race/ethnic-specific dimensions of economic, human, and social capitals. As a result, there may be distinct patterns of social status and substance use behaviors by each racial/ethnic group that would have been masked if all groups were examined together in one model.

Three factors are absent from the overall conceptual framework. First, the relationship between social status and substance use may be due to social selection, social causation, or both. The premise of social selection is that people who are the healthiest and most capable move up

the social ladder while the least healthy end up at the bottom of the social ladder (Adler & Ostrove 1999). Within this perspective, early substance use behaviors can affect later health and social status outcomes. In the process of social causation, health behaviors and outcomes result from an individual's position within the social structure and the circumstances of exposure to social disadvantages or advantages (Adler & Ostrove 1999). This recursive process of health and social status introduces a complex web of causation issues during the transition from adolescence into adulthood. Although it is important to recognize the bi-directionality of this relationship, it is beyond the scope of this dissertation to address both directions of the relationship. In order to identify ways to prevent problematic substance use behaviors later in the life course, this dissertation takes on a social causation approach to examine how social stratification from adolescence into adulthood influences substance use behaviors.

Second, economic, human and social capitals are highly correlated. Individuals who have higher education and skills (human capital) are likely to have better incomes and lower experiences of economic hardships (economic capital). The social capital connection is not as clear, but the same idea applies where individuals with more cohesive social ties and network (social capital) are also likely to have similar education (human capital) and financial backgrounds (economic capital) as those in their social network. It is important to account for these strong relationships between economic, human, and social capitals. However, as mentioned earlier, most socioeconomic indicators (whether separate constructs of education or holistic constructs that combine several measures of education, income, work) tend to be indistinguishable and ambiguous in the context of what social status truly means in relation to the health outcome of interest. This study focuses on unraveling the role of each social status dimension separately on substance use behaviors.

Third, the key outcomes of smoking and HED in adulthood are also likely to be correlated (as indicated by the shaded circle that encompasses both behaviors). Previous studies have found that concurrent smoking and alcohol use are highly associated among certain subgroups and are likely to be strongly influenced by peers, family, and social context (Harrison et al 2008, Jiang & Ling 2011, Koopmans et al 1997, Nichter et al 2010, Orlando et al 2005). It is important to recognize the dual use of smoking and alcohol. However, in order to tease out the differential social status patterns of smoking and HED, this study examines each behavior separately.

#### **1.4 STUDY AIMS AND HYPOTHESES**

**Primary Research Question:** What role does social status have on substance use behaviors during the transition from adolescence into adulthood?

**Study Aim #1:** To examine the effects of social status assessed cumulatively across the life course on substance use behaviors in adulthood. The main hypothesis is that some patterns of life-course social status are at higher risk for substance use behaviors than others. For this study aim, the construct of life-course social status captures the ebb and flow of advantages or disadvantages across adolescence into adulthood. Furthermore, life-course social status is conceptualized as three separate domains: economic capital, human capital, and social capital.

To address this study aim, I have identified the following research questions and hypotheses:

- 1.1. For each domain of economic, human, and social capitals, what are the patterns of life-course social status from adolescence to adulthood? How often does life-course social status involve patterns of persistent advantage or disadvantage from adolescence to adulthood? How common are patterns of upward or downward mobility from adolescence to adulthood?

H1.1. Life-course social status has social mobility patterns from adolescent status (via parent status) to adulthood status that include persistent advantages and disadvantages as well as upward and downward mobility.

- 1.2. For each domain of social status, what are the effects of life-course social status patterns on cigarette smoking and heavy episodic drinking (HED) in adulthood? Is there a gradient effect between life-course social status and smoking? And HED?

H1.2a. Lower life-course social status patterns, such as persistent disadvantage or downwardly mobile, are positively associated with smoking in adulthood compared to higher life-course social status patterns such as persistent advantage or upwardly mobile.

H1.2b. Higher life-course social status patterns, such as persistent advantage or upwardly mobile, are positively associated with HED in adulthood than lower life-course social status patterns, such as downwardly mobile and persistent disadvantage.

**Hypothesis 1.1:** For each social status construct, I hypothesize that life-course social status reflects social mobility patterns from parent's status and/or adolescent status to young adulthood status and adulthood status. Specifically, some individuals fall into patterns of vertical intergenerational mobility, such as up or down the social ladder (e.g., parents' income to adult income; parents' occupation type to adult occupation type). Other individuals fall into patterns that are horizontal, and thus remain in the same position over time. For economic capital, I hypothesize there are patterns of persistent disadvantage, downwardly mobile, upwardly mobile, and persistent advantage. For human capital, I posit patterns of persistently low human capital, downward levels of human capital, upward levels of human capital, and persistently high human capital. And for social capital, there are patterns of persistently low social capital, downward levels of social capital, upward levels of social capital, and persistently high social capital.

**Hypothesis 1.2a:** In regards to the smoking outcome, I hypothesize that individuals with distinct patterns of lower life-course social status, such as persistent disadvantage or downwardly mobile, are more likely to smoke in adulthood compared to those with a higher life-course social

status such as persistent advantage or upwardly mobile. Previous studies have consistently found an association between lower socioeconomic status and smoking behaviors in adulthood where a gradient effect is evident (Brook et al 2008, Chassin et al 2000, Jefferis et al 2004). Lower social status in childhood is related to adult smoking (Jefferis et al 2004). Current adult smoking is also strongly associated with lower social status (as measured by education, income, and working-class jobs). (Barbeau et al 2004a). However, many studies use a static measure of social status which may disguise the effects of the vertical movements of social status across the life course on smoking.

***Hypothesis 1.2b:*** For the alcohol outcome, life-course social status possesses an opposite trend on adult HED. I hypothesize that individuals with distinct patterns of higher life-course social status, such as persistent advantage or upwardly mobile, are more likely to engage in HED in adulthood than their counterparts in a lower life-course social status, such as downwardly mobile and persistent disadvantage. The literature has reported high HED prevalence among young adults in the college setting (Chen et al 2004). However, recent studies have found heavy alcohol use among socially advantaged groups (as measured by education and income) even after controlling for college attendance (Chen et al 2004, Crosnoe & Riegle-Crumb 2007, Humensky 2010). Social norms and lifestyles within certain context (e.g., college or work environment) can influence heavier alcohol use among socially advantaged groups (Catalano et al 1996, Theall et al 2009). However, HED has also been reported among more socially disadvantaged groups in comparison to their socially advantaged groups (Galea et al 2007, Gilman et al 2008). Therefore, a non-linear relationship between social status and HED may appear.

**Study Aim #2:** To analyze the variation by race/ethnicity of the impact of life-course social status on adult smoking and alcohol behaviors. The main hypothesis is that cumulative

disadvantages for minority racial/ethnic groups have different effects on substance behaviors than cumulative disadvantages for Whites. I pose the following research questions to investigate this study aim and hypotheses:

- 2.1. For each domain of economic, human, and social capitals, how do the patterns of life-course social status from adolescence to adulthood vary by racial/ethnic groups of Whites, Blacks, Latinos, and Asians? How often does life-course social status involve patterns of persistent advantage or disadvantage from adolescence to adulthood for each racial/ethnic group? How common are patterns of upward or downward mobility from adolescence to adulthood for each racial/ethnic group?

H2.1. The number of life-course social status patterns is similar across racial/ethnic groups.

- 2.2. For each racial/ethnic group, Whites, Blacks, Latinos, and Asians, what are the effects of life-course social status on adult substance use behaviors?

H2.2a. Patterns of overall social disadvantage (persistently disadvantage and downwardly mobile) among each racial/ethnic group are positively associated with adult smoking.

H2.2b. Whites with higher life-course social status patterns (e.g., persistent advantage and upwardly mobile) have higher HED behaviors than their lower life-course counterparts (e.g., persistent disadvantage and downwardly mobile). For minority racial/ethnic groups, lower life-course social status patterns (e.g., persistent disadvantage) have higher HED behaviors than their higher life-course social status counterparts (e.g., persistent advantage).

***Hypothesis 2.1:*** Studies that only statistically control for differences of Whites, Blacks, Latinos, and Asians in the social status-health relationship often obscure important racial/ethnic differences (Kaufman et al 1997, Williams et al 2010). It is important to verify the construct of life-course social status by racial/ethnic groups. I hypothesize that the number of life-course social status patterns are similar across racial/ethnic groups. For each racial/ethnic group, I hypothesize there are economic capital patterns of persistent disadvantage, downwardly mobile, upwardly mobile, and persistent advantage. For human capital, I posit patterns of persistently

low human capital, downward levels of human capital, upward levels of human capital, and persistently high human capital among each racial/ethnic group. And for social capital, there are patterns of persistently low social capital, downward levels of social capital, upward levels of social capital, and persistently high social capital among each racial/ethnic group. Being in a lower or higher life-course social status group may have different health implications for Blacks, Latinos, and Asians compared to Whites. Each racial/ethnic group's experiences of advantaged or disadvantaged social status may lead to different substance use behaviors.

***Hypothesis 2.2a:*** In the context of the smoking outcome, my second hypothesis is that patterns of overall social disadvantage (persistently disadvantage and downwardly mobile) among each racial/ethnic group are linked to higher adult smoking. In between-group analyses, smoking rates are generally lower among certain racial/ethnic minority groups than Whites in adolescence, but these rates converge by adulthood where Whites were more likely to quit smoking and therefore have lower smoking rates (Pampel 2008). However, in within-group analyses, Barbeau and colleagues found a steep social gradient effect in smoking patterns where both Whites and Blacks who reported lower social status showed higher rates of smoking compared to their higher social status counterparts (Barbeau et al 2004a). They also reported less steep gradient effects on smoking behaviors among Latinos and Asians. Therefore, I hypothesize that in within-group analyses, Whites and Blacks report a stronger gradient effect on social status and smoking compared to Latinos and Asians.

***Hypothesis 2.2b:*** For alcohol, I hypothesize that life-course social status patterns among Blacks, Latinos, and Asians have a divergent association with adult HED than life-course social status patterns among Whites. In between-group analyses, previous studies have reported higher HED rates among Whites with higher social status than their racial/ethnic counterparts in a

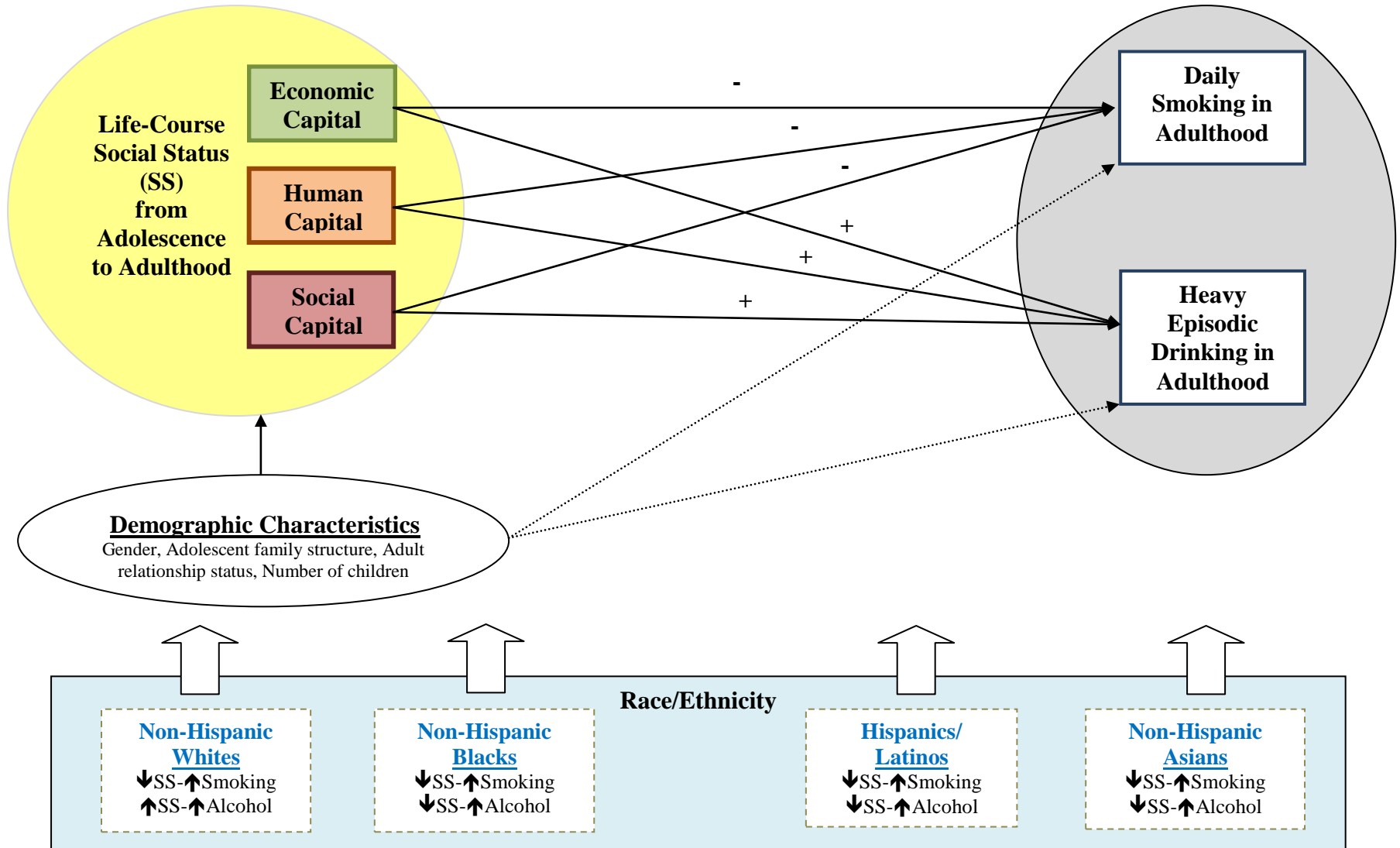


similar social status (Humensky 2010, Paschall et al 2005). However, other studies have found heavier alcohol use among socially disadvantaged Blacks and Latinos in comparison to their White counterparts (Chartier et al 2009, Mulia et al 2008). This non-linear effect on alcohol behaviors may be due to the convoluted relationship between racial/ethnic differences and social status. I posit that Whites with higher life-course social status patterns (e.g., persistent advantage and upwardly mobile) exhibit higher HED behaviors than their lower life-course counterparts (e.g., persistent disadvantage and downwardly mobile). For the minority racial/ethnic groups, I expect the opposite outcome where lower life-course social status patterns (e.g., persistent disadvantage and downwardly mobile) exhibit higher HED behaviors than their higher life-course social status counterparts (e.g., persistent advantage and upwardly mobile).

## **1.5 SUMMARY**

A review of the literature on smoking and alcohol use pointed to high prevalence of these behaviors among adolescents and young adults. The sociological and public health literature on the transition to adulthood and the roles of social status on health helped to identify key gaps in our understanding of the high prevalence of these behaviors. By weaving together theories of social stratification and the life course perspective, this dissertation aims to fill these gaps by investigating the role of life-course social status on cigarette smoking and alcohol use across racial/ethnic groups during the transition from adolescence to adulthood.

**Figure 1.1 Conceptual Framework: Life-Course Social Status, Race/Ethnicity, and Smoking /Alcohol Behaviors**



## **CHAPTER 2: METHODS**

Secondary data analysis of the National Longitudinal Study on Adolescent Health (Add Health) data is used to examine the conceptual model and test the relationships described in Chapter 1. Life-course social status is conceptualized using markers from adolescence (Wave I), young adulthood (Wave III), and adulthood (Wave IV). Then the focal relationship between life-course social status and alcohol and smoking behaviors in adulthood is tested using a person-oriented analytic framework of latent class analysis. This chapter describes Add Health data (including study design and analytic sample derivation), operationalization of key variables, and the analytical plan corresponding to each of the specific study aims. This dissertation has received Institutional Review Board approval from the UCLA Human Subjects Protection Committee (IRB #10-001106).

### **2.1 DATA—NATIONAL LONGITUDINAL STUDY OF ADOLESCENT HEALTH**

#### **2.1.1 Sample Design and Data Collection**

Using a multistage stratified cluster design, 26,666 eligible U.S. high schools were stratified by region, urbanization, school size, school type, and ethnicity (Harris et al 2009). Eligible high schools included an 11<sup>th</sup> grade and a total student population with more than 30 students. A total of 80 high schools were selected from the sampling framework (with a 79% response rate), and 52 feeder schools were also selected into the sample. Feeder schools must have included a 7<sup>th</sup> grade and sent at least 5 graduates to one of the selected high schools. In 1994, in-school surveys were administered to approximately 90,000 students (grades 7-12) and 144 school administrators in the sampled schools.

An additional in-home sample of adolescents was drawn from the school sample with oversampling of disabled youth, African Americans with at least one college-educated parent,

Chinese, Cubans, Puerto Ricans, and siblings (including full and half siblings, twins, and unrelated siblings living in the same household). Students were stratified by grade and gender in each school, and approximately 200 students were selected from each of the 80 pairs of schools. The in-home sample participated in an hour to two-hour long interview facilitated by an interviewer in their home. The response rate for the Wave I in-home interviews was 76% with a total sample size of 20,745. Parents of the Wave I in-home sample were also recruited into the study, and 85% (primarily resident mothers) participated in an interview. The total sample of parent respondents is 17,670.

In 1996, 14,738 adolescent respondents (grades 8-12) completed the Wave II in-home interview (response rate of 88%). Respondents who were seniors in Wave I or who were part of the disabled sample were excluded from Wave II. For the Wave III data collection, original respondents from the Wave I sample were located and re-interviewed between 2001 and 2002. With a response rate of 77%, this wave included 15,197 of Wave I respondents and 1,507 of their romantic partners. Wave IV data collection located and interviewed 80% of the original Wave I respondents between 2007 and 2008. A total of 15,701 respondents participated in the Wave IV in-home interviews (Brownstein et al 2010).

### **2.1.2 Analytic Sample**

This study used the restricted-use data files of Add Health. Data files of Waves I through IV in-home interviews along with Wave I parent interviews were merged according to each unique respondent. Wave II information was used in preliminary analyses to examine trends of alcohol and smoking behaviors. However, since time of data collection was close to Wave I and also represents the adolescent life stage, Wave II data on alcohol or smoking were excluded from the analyses presented in this dissertation. However, if there were missing responses from Wave

I demographic or social status variables, then Wave II variables were substituted. These variables included parent's country of birth, education level, occupation type, and work hours per week.

The main analytic sample was restricted to individuals who participated in Waves I, III, and IV in-home interviews (n=13,034) and have valid data for Wave IV alcohol (n=12,938) and smoking behaviors (n=12,991). Racial subgroups of American Indian/Alaskan Native (n=205) and other racial/multiracial groups (n=315) were excluded due to small sample sizes. A subgroup of respondents did not have valid sample weights (n=3,491). This group included those who were selected outside the sampling frame as part of the genetic sample in Wave I, deceased at Wave III, or did not complete all the in-home interviews (Biemer & Aragon-Logan 2010). After limiting the sample to respondents who had valid sample weights (n=9,412), the final analytic sample is 9,093. See Figure 2.1 for analytic sample derivation for study inclusion.

To highlight differences between the original Wave I in-home survey sample and the final analytic sample, Table 2.1 presents the results from bivariate analyses of the two samples. This analysis shows the potential impact to study generalizability due to respondents who were lost-to-follow-up at Waves III or Wave IV. The two samples were compared by key demographic characteristics, social status indicators, and the outcome variables of substance use. There were significant demographic differences where males, racial/ethnic minorities and older age were less likely to be included in the final analytic sample. Similarly, respondents with low adolescent household income and having a mother with less than a college degree, and possessing less than a college degree in adulthood were less likely to be in the final analytic sample. For the outcome variables, there was a significant difference by smoking but not by alcohol. These differences could potentially underestimate the results for smoking because the final analytic sample accounts for respondents less likely to smoke. Due to higher attrition

among respondents with lower income and education, the results with social status may also have a similar effect and biased towards higher social status groups.

Add Health is a nationally representative sample of adolescents attending 7<sup>th</sup>-12<sup>th</sup> grade during the academic year of 1994-1995. Although weights were applied to account for the differences due to attrition, the study findings are limited to a specific population of adolescents attending a U.S. high school between 1994-1995, who identified as Non-Hispanic White, Non-Hispanic Black, Hispanic or Latino, and Non-Hispanic Asian, and therefore cannot be generalized to the general population.

## **2.2 KEY VARIABLES**

### **2.2.1 Dependent Variables**

As the focal outcome, this dissertation examined cigarette smoking and alcohol use in adulthood (Wave IV). For descriptive purposes, these behaviors were also analyzed in adolescence (Waves I) and young adulthood (Wave III).

#### ***2.2.1a. Cigarette Smoking***

Onset of smoking is a critical behavior for prevention. However, it is the continuation of smoking beyond initiation that is a key behavior to prevent. Add Health data collected a series of smoking behaviors in adolescence, young adulthood, and adulthood. At each wave, respondents were asked the following question: “Have you ever tried cigarette smoking, even just 1 or 2 puffs?” Responses included no (coded as 0) or yes (coded as 1). Respondents were considered having ever smoked if they answered yes. Among those who ever smoked, respondents were asked, “Have you ever smoked cigarettes regularly, that is, at least 1 cigarette every day for 30 days?” Responses included no (0) or yes (1). Respondents were considered having ever smoked regularly if they answered yes.

Respondents who reported ever smoking were also asked about any current smoking: “During the past 30 days, on how many days did you smoke a cigarette?” Responses could range from 0 days (0) to 30 days (30). This measure was combined with ever smoked regularly to create the variable of current smoking behavior. Current smoking behavior included never smoked regularly (0), former regular smoker (1), smoked some days or intermittently in the last 30 days (2), and daily smoking in the last 30 days (3). This measure was created for each wave of data in adolescence, young adulthood, and adulthood. Several studies examining smoking prevalence in the general U.S. population have used a similar smoking categorization of smoking behavior in the last 30 days (Roberts et al 2008, Trinidad et al 2011). Other studies have used smoking intensity or number of cigarettes smoked per day (Cubbin et al 2010, Pierce et al 2011). This indicator of smoking intensity captures a higher threshold of smoking than current smoking behaviors. Therefore, the number of cigarettes smoked by respondents was also examined in Wave IV only. Respondent who were current smokers were asked, “During the past 30 days, on the days you smoked, how many cigarettes did you smoke each day?” Responses ranged from 1 cigarette (1) to 100 cigarettes (100). This measure was categorized into those who smoked less than 11 cigarettes per day (1), between 11-20 cigarettes (2), and more than 20 cigarettes per day (3). Among those who ever engaged in regular smoking, respondents were asked, “Have you ever tried to quit or cut down on smoking or using tobacco?” Responses included no (0) or yes (1). This indicator of quitting smoking was coded as a binary variable. These five smoking measures were used for descriptive purposes only.

For some individuals, smoking behaviors may be characteristic of a particular life stage such as experimentation or peer influence in adolescence. Others may naturally “grow out” of the behavior as they take on more adult roles. However, for some, smoking may persist across

the life course. To capture these patterns of smoking behaviors across time, current smoking at each data wave was dichotomized into those who smoked at least one cigarette in the last 30 days (coded as 1) and those who did not (coded as 0). Then these three measures of current smoking were merged to capture smoking typologies across the life course. Key typologies of smoking behaviors included: never smoked, quitters (current smokers in Waves I or III, but not a current smoker in Wave IV), started smoking in young adulthood (current smokers in Waves III and IV), adolescent smokers who restarted in adulthood (current smokers in Waves I and IV), started smoking in adulthood (current smokers only in Wave IV), and persistent smokers (current smokers in all three waves).

This dissertation focuses on smoking behaviors in adulthood as the primary dependent variable. Daily smoking behavior in adulthood is used as the focal dependent variable for all three study aims. To create this variable, the measure, current smoking behavior, was collapsed into two categories: no daily smoking (composed of those who never smoked regularly, were former regular smokers, or smoked some days or intermittently in the last 30 days; coded as 0) and smoked every day in the last 30 days (coded as 1).

Self-reported measures have been shown to underreport the true prevalence of smoking behaviors in general population surveys (Gorber et al 2009). Biological markers (e.g., cotinine measured from saliva, blood or urine) have been used to validate self-reported smoking behaviors. However, research from several population surveys have shown that self-reported smoking behaviors are a reliable estimate when validated with cotinine, even among different subpopulation groups (Graham & Owen 2003, Rebagliato 2002, Vartiainen et al 2002). There were no available smoking biomarker measures in Wave IV data at the time of this dissertation. Therefore, the dissertation's findings may underestimate the true prevalence of daily smoking.



### ***2.2.1b. Alcohol***

A series of alcohol behaviors was captured in adolescence, young adulthood, and adulthood. At each wave, respondents were asked the following question: “Have you had a drink of beer, wine, or liquor more than two or three times?” (excluding sips or tastes from someone else’s drink). Responses included no (coded as 0) or yes (coded as 1). This dichotomous measure captured whether respondents had ever drunk alcohol up until the survey data collection time of Waves I, III, and IV (ever drank alcohol). Among those who reported using alcohol in the past year, respondents were asked, “During the past 12 months, on how many days did you drink alcohol?” Responses included none (0), 1-2 days (1), once a month or less (2), 2-3 days per month (3), 1-2 days a week (4), and almost every day or daily (5). This indicator captured frequency of past year alcohol use. In addition, among those who reported using alcohol in the past year, respondents were asked, “During the past 12 months, on how many days did you drink [for males] 5 or more or [for females] 4 or more drinks in a row?” Responses included none (0), 1-2 days (1), once a month or less (2), 2-3 days per month (3), 1-2 days a week (4), and almost every day or daily (5). For each wave, a monthly heavy episodic drinking construct was created. This construct was created by collapsing frequency of past year alcohol use into no alcohol use in the past year (0), alcohol use but no monthly heavy episodic drinking in the past year (1), and monthly heavy episodic drinking in the past year (2). This construction follows other Add Health studies that used a three-tiered classification of heavy episodic drinking with Add Health data (Crosnoe & Riegle-Crumb 2007, Guilamo-Ramos et al 2004). These three alcohol measures were used for descriptive purposes only.

To capture drinking behaviors across time, I merged the three life stage variables of heavy episodic drinking to capture typologies across the life course. For some individuals, heavy

episodic drinking may be characteristic of a particular life stage especially in young adulthood. However, for others, monthly heavy episodic drinking may persist across the life course, and may progress to dependence. Heavy episodic drinking was dichotomized into those who reported engaging in heavy episodic drinking at least once in the past 30 days (coded as 1) and those who did not (coded as 0). Key typologies of binge drinking behaviors included: never, only in adolescence (heavy episodic drinking in Wave I), only in young adulthood (heavy episodic drinking in Wave III), started in young adulthood (heavy episodic drinking in Waves III and IV), started in adulthood (heavy episodic drinking only in Wave IV), and persistent heavy episodic drinking (heavy episodic drinking in all three waves).

Since this dissertation focuses on alcohol behaviors in adulthood as the primary dependent variable, monthly heavy episodic drinking in adulthood was used as the focal dependent variable for the study aims. This variable was categorized into the three following categories: no alcohol use in the past year (coded as 0), used alcohol but no monthly heavy episodic drinking (coded as 1), and engaged in heavy episodic drinking on a monthly basis (anywhere from two-three times a month to daily) in the past 12 months (coded as 2).

Self-reported measures have been shown to underreport the true prevalence of alcohol behaviors in general population surveys (Davis et al 2010, Ekholm et al 2008). Underreporting may be due to social desirability bias or memory recall (Davis et al 2010). There have been suggestions for improving self-reported alcohol measures by providing close-ended questions, multiple items, or objective indicators (Ekholm et al 2008). Objective assessments such as urine tests or breath test can be faulty due to alcohol metabolism in the body or inability to capture degree of alcohol consumption over a specific day or time (Midanik 1988). At the time of this

dissertation, there were no available alcohol measures other than self-reported ones in Wave IV data. As a result, the findings may underestimate the true prevalence of heavy episodic drinking.

## **2.2.2 Independent Variables**

### **Social Status**

For this study, social status is conceptualized by incorporating both economic and non-economic dimensions. Social status is defined as the relative position of an individual in society as characterized by his/her economic capital, human capital, and social capital (Krieger et al 1997, Oakes & Rossi 2003). This section first describes each social status dimension, how it is conceptualized, and key constructs. Then each variable used to operationalize the construct are described according to each life stage.

#### ***2.2.2a. Economic Capital***

Economic capital domain captures the financial resources to purchase health, access to resources, attain a certain lifestyle or prestige, or accumulate power. Low economic capital reflects accumulated deprivation or poverty, while high economic capital represents accumulated advantage and wealth.

Income is one of the most widely used economic indicators of social status in the U.S. (Duncan et al 2002). Survey respondents are typically asked to provide an estimate of the total household income before taxes that each household member contributes to the family in the past year. This annual income represents a standard of living and potential consumption patterns within a household through the sharing of goods and services (Duncan et al 2002). However, income measures are sensitive to collect; require standardization (e.g., costs of living differences); and are time- and age-dependent (Liberatos et al 1988). However, given the lack of financial indicators in Add Health, income serves as the best measure for financial resources. To

correct for skewness and non-linearity, income was top-coded at the 99<sup>th</sup> percentile. Preliminary analysis of income distribution showed violations to the normality assumption. Based on likelihood ratio tests, a square root transformation provided better fit than the traditional log transformation. Therefore, I conducted a square root transformation for each income measure. Since income measures were used from three different time points, each income measure was standardized and adjusted to 2008 dollar values using the U.S. Department of Labor's All Urban Consumer Price Index (<ftp://ftp.bls.gov/pub/special.requests/cpi/cpiiai.txt>).

Financial resources may also be obtained informally via family or formally via government programs. Some young adults may still be dependent on parent's support while other young adults may need to contribute to support their family (whether parents or young children). Therefore, family transfers during young adulthood and adulthood were also utilized. Applying to government programs is another financial resource where receipt of public benefits can aid in meeting basic living needs of adequate food, clothing, and housing. Measures of receiving public benefits are included at each life stage.

The inability to maintain basic living needs captures the lower end of the economic capital spectrum. Indicators of economic hardship, lack of health insurance and total amount of debt were included in this dissertation. Experiences of economic hardship included having trouble paying bills or rent/mortgage, electricity or other utilities were turned off due to lack of payment, or worried if there is enough food for the family. An additional indicator of hardship was the lack of health insurance. These two measures were captured at each data collection point. The total amount of debt was captured in adulthood.

Wealth has been shown to be a more stable measure of the higher end of the economic capital spectrum. Wealth represents the accumulated stock of assets or economic reserves at a

given point in time. Income may rise and fall from year-to-year, and given the transitory young adult stage, income may not be reflective of their potential earning power or financial resources. Wealth can capture financial flow from parent's generation to the child's generation. Total amount of assets were used to capture this more stable financial reserve. An additional indicator of higher economic capital is property ownership. Home ownership was also included from young adulthood and adulthood. To capture additional intergenerational transfers, respondents were asked in adulthood whether they received help from family to purchase a home.

### **Adolescence Measures of Economic Capital**

***Household income:*** In the Wave I parent interview, parents were asked, "About how much total income, before taxes did your family receive in 1994/1995? Include your own income, the income of everyone else in your household, and income from welfare benefits, dividends, and all other sources." Responses ranged from \$0 (coded as 0) to \$999 (coded as 999) thousand. This continuous measure was top-coded at the 99% percentile, standardized to 2008 dollar value, and square-root transformed. A large percentage (24%) of respondents was missing household income data. Rather than exclude these respondents, I maximized the data by keeping them in my final sample for analysis. These missing data are accounted for in the latent class modeling using full-information maximum likelihood estimation (see analysis section).

***Received public assistance:*** In the parent interview, parents were asked whether they received any of the following in the last month: general public assistance, Supplemental Security Income, temporary family assistance formerly referred as Aid to Families with Dependent Children, food stamps, housing subsidy/public housing, and unemployment or worker's compensation. These six items were combined into an ordinal variable with the

following categories: none (0), receipt of one public benefit (1), and receipt of two or more benefits (2).

***Experienced economic hardship:*** Parents were asked whether they had enough money to pay the bills. The responses included yes (1) or no (0). This item served as a measure of economic hardship in adolescence.

***Lack of health insurance:*** Parents were asked whether the adolescent respondent was covered by health insurance at any time in the past year. This measure was dichotomized into having health insurance (0) or not having health insurance (1).

### **Young Adulthood Measures of Economic Capital**

***Personal income:*** In Wave III, young adult respondents were asked a series of questions pertaining to income. Due to the large percentage of missing (~80%) for the household income question, respondent's personal income was used instead. Respondents reported the total income from all sources including sum of pre-taxed wages, salaries, public assistance, child support, and other sources received in the past year (2000 or 2001). Responses ranged from \$0 to \$500,909. Respondents who did not give a response to their total personal income were asked to provide their best guess in \$10,000 income intervals. This item was incorporated into the total personal income variable by using the mid-point value of the \$10,000 income interval. This follow-up question helped to minimize the total missing data in personal income by 15%. Personal income was a continuous variable that was top-coded at the 99% percentile, standardized to 2008 dollar value, and square-root transformed.

***Received public assistance:*** In the Wave III interview, three items were used to assess current receipt of public assistance. Benefits included general public assistance or temporary family assistance formerly referred as Aid to Families with Dependent Children, food stamps,

and other. These items were combined into one binary variable of receipt of public assistance (1) or no receipt (0).

***Received family financial support:*** As a source of income, respondents were asked whether they received any money from family or friends during the past year. This item is dichotomized into yes (1) or no (0).

***Experienced economic hardship:*** Five items were used to assess past year economic hardship in young adulthood. These dichotomous measures included not having enough money to pay rent/mortgage or gas/electricity/oil bill, having the gas/electricity/oil was turned off or no telephone service due to lack of payment, and being evicted from the apartment. These items were combined and totaled into one ordinal variable with the following categories: none (0), one economic hardship (1), and two or more economic hardships (2).

***Lack of health insurance:*** Respondents were asked in the Wave III survey whether they were covered by health insurance at any time in the past year. This measure is dichotomized into having health insurance (0) or not having health insurance (1).

***Home ownership:*** A single item was used to assess whether a respondent owned a residence (such as house, condominium, or mobile home) in the Wave III survey. This measure is dichotomized into owning a home (1) or not owning a home (0).

### **Adulthood Measures of Economic Capital**

***Personal income:*** In Wave IV, adult respondents were asked a series of questions pertaining to income. Because household income was collected as a categorical variable which makes it difficult to standardize, respondent's personal income was used instead. Respondents reported the total income from all sources including sum of pre-taxed wages, salaries, public

assistance, child support, and other sources received in the past year (2007 or 2008).

Responses ranged from \$0 to \$999,995. Respondents who did not give a response to their total personal income were asked to provide their best guess in \$10,000 income intervals.

This item was incorporated into the total personal income variable by using the mid-point value of the \$10,000 income interval. This follow-up question helped to minimize the total missing data by 3%. Personal income was top-coded at the 99% percentile, standardized to 2008 dollar values, and square-root transformed.

***Household assets:*** In Wave IV, adult respondents were asked their total value of household assets including bank accounts, retirement plans, and stocks. This ordinal variable was categorized into the following: Less than \$5,000 (coded as 0), \$5,000-9,999 (coded as 1), \$10,000-24,000 (coded as 2), \$25,000-49,999 (coded as 3), \$50,000-99,999 (coded as 4), \$100,000-249,999 (coded as 5), and \$250,000 or more (coded as 6). Since respondents reported their responses in categories, these dollar amounts reflected the dollar value from the year the survey was administered.

***Household debt:*** Adult respondents were asked their total value of household debt including loans, credit card debt, medical or legal bills, but does not include mortgage. This ordinal variable was categorized into the following: Less than \$1,000 (coded as 0), \$1,000-4,999 (coded as 1), \$5,000-9,999 (coded as 2), \$10,000-24,000 (coded as 3), \$25,000-49,999 (coded as 4), and \$50,000 or more (coded as 5). Since respondents reported their responses in categories, these dollar amounts reflected the dollar value from survey administration year.

***Received public assistance:*** In the Wave IV interview, only one item was used to assess past year receipt of public assistance including welfare payments or food stamps. This item was coded as receipt of public assistance (1) or no receipt (0).



***Received family financial support:*** Respondents were asked whether a mother or father figure help to pay for their living expenses or gave them \$50 or more to pay for living expenses during the past year. This item was dichotomized into yes (1) or no (0).

***Given financial support to family:*** Respondents were asked whether they helped to pay for a mother or father figure's living expenses or gave them \$50 or more to pay for living expenses during the past year. This item was dichotomized into yes (1) or no (0).

***Experiences of economic hardship:*** Six items were used to assess past year economic hardship in adulthood. These items included not having enough money to pay rent/mortgage or gas/electricity/oil bill, having the gas/electricity/oil turned off or no telephone service due to lack of payment, being evicted, and worried about not having enough money for food. These items were combined and totaled into an ordinal variable with the following categories: none (0), one economic hardship (1), and two or more economic hardships (2).

***Lack of health insurance:*** Respondents were asked in the Wave IV survey whether they were covered by health insurance at any time in the past year. This measure was dichotomized into having health insurance (0) or not having health insurance (1).

***Home ownership:*** A single item was used to assess whether a respondent owned a residence in the Wave IV survey. This measure was dichotomized into owning a home (1) or not owning a home (0).

***Received family financial support for home:*** Respondents were asked whether parents or other relatives helped to buy, remodel, build or furnish the respondent's home or condominium. This item was dichotomized into yes (1) or no (0).

### ***2.2.2b. Human capital***

Human capital reflects the accumulated knowledge, expertise, or skills that provide an individual the ability to problem solve and attain higher earning potentials (Becker 1993). It can also symbolize one's values toward healthy behaviors and lifestyles; social networks that share similar health behaviors; and the ability to navigate the health care system (Krieger et al 1997).

Education represents the most valued human capital indicator in the social structure. In regards to health, education can capture specific knowledge, intellect, and ability to problem-solve or learn new health information (Braveman et al 2005). Indirectly, education symbolizes one's values toward healthy behaviors, social networks with similar health behaviors, and access to health care and safe environments. The most common measures include highest level of educational attainment; total number of years in school; degrees earned; and type of school (academic or vocational; private or public) (Krieger et al 1997). For this study, highest level of educational attainment was used.

Type of occupation represents another indicator of the human capital domain for social status. Occupations are often grouped by a presumed set of skills required to do a job and are also rated by the presumed prestige associated with the tasks (Krieger 2010). In addition to a particular skill set and ranking, occupational status also reflects presumed exposure to environmental conditions of the workplace (Krieger 2010). These conditions may include physical hazards (e.g. toxins, physical activity), mental stress (e.g. lack of autonomy/flexibility, subordination), and risky health behavior lifestyle (e.g. job demands that lead to poor nutrition or physical activity, social norms of alcohol, tobacco or other drug use) in the workplace.

The most common measure of occupation is through U.S. Census categories such as managerial, professional, clerical, service, and blue-collar. Previous researchers have cited the limitation of using these classes because of the lack of clarity of what these occupational

categories represent and how they are linked to health outcomes (Braveman et al 2005). There are recommendations to use occupational prestige measures instead, such that higher prestige is associated with higher social and health statuses (Krieger 2010). However, as Fujishiro and colleagues found, occupational classification can be meaningful for predicting health outcomes after controlling for other job characteristics (e.g., job strain, social support, and job satisfaction) (2010). Furthermore, prestige rankings only capture the hierarchy of social standing, and thus this measure may overlook respondent's knowledge, expertise, skills, and workplace conditions/influences. For this study, occupational classes were used to capture the human capital domain of skills and workplace exposures.

One additional job characteristic was included. Number of hours worked per week captures potential exposure to workplace conditions and norms. If the individual was not working, then they were given a code of zero. Number of hours worked per week was top-coded at 80 hours per week.

### **Adolescence Measures of Human Capital**

*Level of education:* During the Wave I in-home interviews, adolescent respondents were asked, "How far did your \_\_\_ (mother or father) go in school?" Mother's and father's education levels were categorized into less than high school (coded as 1), high school degree (coded as 2), some college (coded as 3), college degree (coded as 4), and graduate/professional school (coded as 5). Two binary variables were included to indicate whether a resident mother (considered as a biological mother or non-biological mother figure) and resident father (considered as a biological father or non-biological father figure) were present during adolescence when the in-home interview was conducted.

***Occupational type:*** In Wave I in-home interviews, adolescent respondents were asked to identify a resident mother's and/or father's occupation from a list of 14 possible groupings. Add Health used broad occupational categories from the 1990 U.S. Census codes in Wave I. See Table 2.2 for the full list of occupations. Similar to previous studies on occupation and health (Barbeau et al 2004a, Newbern et al 2004), I categorized mother's and father's occupation into the following five classes: not working (0), manual or blue collar (including farming; coded as 1), sales/service/administrative (2), professional other (3), professional/managerial (4), and unspecified other (5).

***Hours worked per week:*** From the Wave I in-home interview, adolescent respondents reported the approximate number of hours the resident mother and resident father worked in a week. Responses ranged from 0 to 168 hours. In addition to these two indicators, respondents reported the number of hours they worked per week during the previous summer. Responses ranged from 0 to 99 hours. For each work hour measure, hours worked per week were top-coded at the 99% percentile,

### **Young Adulthood Measures of Human Capital**

***Level of education:*** For some individuals, being in school encompasses most of young adulthood. Therefore, I limit educational attainment to whether respondents received a high school diploma or GED by Wave III. Since all the respondents are over the age of 18, I make the assumption that they are no longer in high school. This variable was dichotomized into yes (1) or no (0).

***Currently in school:*** To capture whether respondents are still in school, a binary variable of current school status was included. This variable was coded as yes (1) or (0).

**Occupational type:** In Wave III in-home interviews, respondents were asked which best described their job from a list of occupational groups. This list is based off 23 major groups from the 2000 Standard Occupational Classification (SOC) system (US Department of Labor 1999). Following previous public health studies using occupation, I reduced these 23 major groups into the following five classes: no occupation (0), manual or blue collar (including farming; coded as 1), sales/service/ administrative (2), professional other (3), and professional/managerial (4). See Table 2.3. After several iterations of latent class analysis and due to poor fit, this measure was not included in the final human capital model.

**Hours worked per week:** From the Wave III in-home interview, respondents reported the approximate number of hours per week they worked in their current or most recent paying job. Responses ranged from 0 to 90 hours. For each work hour measure, hours worked per week was top-coded at the 99% percentile,

### **Adulthood Measures of Human Capital**

**Level of education:** Respondent's highest education level by Wave IV was categorized into less than high school (1), high school degree (2), some college (3), college degree (4), and graduate/professional school (5).

**Currently in school:** To capture whether respondents are still in school, a binary variable of current school status was included. This variable was dichotomized into yes (1) or no (0).

**Occupational type:** For the Wave IV in-home interviews, the 2000 SOC system was used to classify respondents' current or most recent paying job that was at least 10 hours per week. Respondents were guided through the four SOC levels of major group, minor group, broad occupation, and detailed occupation until the appropriate job title was identified (Add Health Wave IV codebook). The resulting job code is represented by a six digit character variable.

To stay consistent with Wave III occupational classification, I used the first two digits which signifies major group and was only available in Wave III. From these two digits, I categorized respondents into the same five main categories as Wave III: no occupation specified (0), manual or blue collar (including farming; coded as 1), sales/service/administrative (2), professional other (3), and professional/managerial (4). See Table 2.3.

***Hours worked per week:*** From the Wave IV in-home interview, respondents reported the approximate number of hours per week they worked in their current or most recent paying job. Responses ranged from 0 to 168 hours. For each work hour measure, hours worked per week was top-coded at the 99% percentile,

### ***2.2.2c. Social capital***

Social capital is defined as the “features of social organization, such as networks, norms, and social trust, that facilitate coordination and cooperation for mutual benefit” (Hawe & Shiell 2000, p. 67). These implied social ties (and the cohesion of the ties) provide value by giving an individual access to actual or potential resources that can elevate one’s social status. These resources can promote positive or negative health behaviors and outcomes (Carpiano 2007). This dissertation applied an individual-level approach to social capital whereby social organizations and networks play a key role to actual or potential resources to elevate a person’s social status.

Organizational membership and volunteering is a common measure for social capital (Harpham et al 2002). Membership or volunteering one’s time in civic organizations, community or service groups, sports or interest groups are several examples. The key assumption of this indicator is that a member receives potential benefits or access to resources regardless of length of time as a member, degree of commitment, position within the social organization, or size of the organization. Religious participation plays a similar role to organizational membership.

Being a member of a religious institution and attending frequent services are indicators to represent the connectedness and value given to members of this organizational entity. Being a member of these organizations may also influence health lifestyles and behaviors. Through shared social norms and values, some organizations may promote positive health behaviors (e.g., religion, medical-related groups) while others may promote risky health behaviors (e.g., fraternities, sororities).

Civic engagement is another indicator for social capital that captures an individual's investment to the larger community and nation-state (Hawe & Shiell 2000). Voting in local, state or national politics is one example of civic engagement by investing in the political arena.

Researchers have also operationalized social capital through a structural aspect and an individual's ability to make strong and weak social ties with others (Nahapiet & Ghoshal 1998). Strong social ties may signal network embeddedness, social cohesion, and mutual obligations. However, weaker ties within a larger network can also provide greater benefits due to a larger network and potential benefits from this network (Granovet 1973). This feature is most often measured by network size (e.g., number of friends). Finally, social capital can bestow a level of social status or reputation that is derived from the membership and networks (Bourdieu 1986). This characteristic is captured by an individual's perceived status within a network (e.g., hierarchy or social position or prestige within the network).

### **Adolescence Measures of Social Capital**

*Parent organizational memberships:* Parent membership in various organizations is captured in the Wave I parent survey. Parents were asked their involvement with parent/teacher organizations, labor union, hobby or sports groups, and civic/social/military-veterans organizations. Parent organizational membership is a summary measure of parent's

involvement in these groups and categorized into no memberships (coded as 0), one membership (coded as 1), and two or more memberships (coded as 2).

***Parent religious participation:*** In the Wave I parent survey, parents were asked, “how often have you gone to religious services in the past year?” Participation is categorized into none (0), less than once a month (1), at least once a month (2), and at least once a week (3).

***Adolescent organizational memberships:*** In Wave I school interviews, respondents were asked about their participation in school organizations. Organizations included foreign language clubs (e.g., French, German, Latin or Spanish), academic-related clubs (e.g., book, debate team, history, math, science, computer), arts/music clubs (e.g., drama, band, chorus/choir, or orchestra), sports teams (e.g., cheerleading, baseball, basketball, football, soccer, swimming, tennis, track, etc), yearbook/newspaper, leadership groups (e.g., honor society, student council, etc), and other non-specified clubs. After conducting descriptive statistics on all clubs listed through factor analysis and item-correlations, participation in sports teams was found to differ significantly from the other groups. As a result, sports membership was kept as a separate variable than overall adolescent organizational membership. For all other groups, adolescent organizational memberships were summed and categorized into no memberships (0), one membership (1), two memberships (2), three memberships (3), and four or more memberships (4).

***Adolescent religious participation:*** In Wave I in-home interviews, respondents were asked, “In the past 12 months, how often did you attend religious services?” Participation is categorized into none (0), less than once a month (1), at least once a month (2), and at least once a week (3).

### **Young Adulthood Measures of Social Capital**



***Young adult organizational memberships:*** In Wave III in-home interviews, respondents were asked about their past year involvement in volunteering for youth organizations (e.g., little league, boy/girl scouts), service organizations (e.g., big brother or sister), political organizations, solidarity or ethnic-specific groups, church-related organizations, community-development or social action organizations, health-related organizations, education-related organizations, and environmental organizations. Young adult organizational memberships are summed and categorized into no organizational involvement (0), one organization (1), and two or more organizations (2).

***Young adult religious participation:*** In Wave III in-home interviews, respondents were asked, “In the past 12 months, how often did you attend religious services?” Participation was categorized into none (0), less than once a month (1), at least once a month (2), and at least once a week (3).

***Young adult civic engagement:*** In Wave III in-home interviews, respondents were asked whether they voted in the last presidential election in 2000. This measure was dichotomized into yes (1) or no (0).

***Young adult perceived popularity:*** In Wave III in-home interviews, respondents were asked, “How popular are you?” This question was used as a proxy for perceived social status within their social network. This variable was categorized into not at all popular (0), slightly popular (1), moderately popular (2), and very popular (3).

### **Adulthood Measures of Social Capital**

***Adult organizational memberships:*** There are limited social capital measures in the Wave IV in-home interviews. Only one indicator was found to capture features of organizational membership: number of volunteer hours in the past year. Although this measure differs from

adolescence and young adulthood measures, number of volunteer hours served as a proxy for degree of commitment to organizations. Higher frequency of volunteering represents higher social capital and the potential for increased access to the benefits from volunteering with an organization. This adult organizational membership was categorized into no hours (0), 1-19 hours (1), 20-39 hours (2), 40-79 hours (3), and 80 or more hours (4).

***Adult religious participation:*** In Wave IV in-home interviews, respondents were asked, “In the past 12 months, how often did you attend religious services?” Participation was categorized into none (0), less than once a month (1), at least once a month (2), and at least once a week (3).

***Adult civic engagement:*** In Wave IV in-home interviews, respondents were asked how often they voted in a local or statewide election. This variable was dichotomized into a yes (1) and no (0) to assess civic engagement.

***Adult friendships:*** In Wave IV in-home interviews, respondents were asked the number of close friends they have. The question defines close friends as “people whom you feel at ease with, can talk to about private matters, and can call on for help.” This question served as an indicator for social ties and size of network. This variable was categorized into none (0), one-two (1), three-five (2), six-nine (3), and ten or more (4).

### **2.2.3 Demographic Characteristics**

The following demographic variables were included in this dissertation: gender, age, race/ethnicity, family structure, generational status, relationship status, household size, and number of children. Gender was taken from Wave I data with the categories of female (coded as 0) and male (coded as 1). Using the household roster from Wave I, family structure was categorized into two-parent household (0), single-parent household (1) and other type of family

structure (2). The household roster was also used to tally the total number of people living with the respondent at Waves I, III, and IV data. This continuous measure of household size was top-coded at 6 household members for each wave of data. For generational status, measures from Wave I in-home data and parent data were used to identify whether adolescents were first generation (or foreign-born), second generation (born in the U.S. with foreign-born parents), or third generation or higher (respondents and parents are born in the U.S.). Using the Wave IV relationship file, current relationship status was categorized into not in a relationship (0), married (1), cohabitating (2), and dating (3). The total number of children was also assessed from Wave IV data and top coded at 3 children. Age was also calculated from Wave IV data.

Race and ethnicity are recognized as socially, culturally, and historically constructed terms that extend beyond the idea of a biological construct (Dressler et al 2005, Oppenheimer 2001). This dissertation uses the U.S. Government's Office of Management and Budget (OMB)'s classification of five racial categories (Non-Hispanic White, Non-Hispanic Black, American Indian or Alaskan Native, Non-Hispanic Asian, and Native Hawaiian and other Pacific Islander) and one ethnic category (Hispanic or Latino) (US Office of Management and Budget 1997). Although it is important to recognize the social construction and changes in formation of one's racial/ethnic identity over the life course especially during the identify formation in later adolescence and early adulthood, I used the self-reported racial/ethnic identity in adolescence for the race/ethnicity construct. Separate race and ethnicity questions were asked in Wave I in-home data and parent data. These questions are combined to create a race/ethnicity variable with the following categories: non-Hispanic White (henceforth referred to as White), non-Hispanic Black (henceforth referred to as Black), Hispanic or Latino (henceforth called Latino), and non-Hispanic Asian (henceforth referred to as Asian). Due to the small numbers of American

Indian/Native American and individuals who identify as other or mixed race, these racial/ethnic groups were excluded from the analysis.

## **2.3 ANALYSIS**

This section presents the steps involved in the preparation of the final data set, overview of analytic techniques applied to this dissertation, and the analytic strategies used to examine the specific study aims.

Data management and descriptive statistics were conducted in Stata version 12.0 (StataCorp 2011). For statistical procedures using latent variable analysis, Mplus version 6.11 was used (Muthen & Muthen 1998-2011). Both Stata and Mplus have features to account for Add Health's complex survey design and post-stratification sample weights. Survey procedures in Stata and Mplus were used to correct for unequal probability of selection, underestimation of variance due to clustered sample design, and nonresponse bias attrition from Wave I to Wave IV (Harris et al 2009). As a result of using survey weights, the analytic sample must be limited to respondents who have a valid weight variable for Waves I-IV. Although the analytic sample was further limited by excluding missing responses of the focal dependent variables and of small racial/ethnic groups, the analysis must still account for these excluded samples to ensure the calculation of correct standard errors that are based on the full sample design. Therefore, within the survey procedures, the `-SUBPOPULATION-` command in Stata and Mplus were used to account for the specific analytic sample.

### **2.3.1 Analytic Framework**

This dissertation takes on a person-oriented framework (via latent class analysis) for analyzing longitudinal data. In public health research, a variable-oriented framework (via

regression analysis) is most often used. Theories are examined based on constructs operationalized by variables and hypotheses are expressed as relationships between variables. With longitudinal data, this approach focuses on how these relationships change over time. For example, in a traditional regression analysis, we examine how the expected value of the dependent variable (i.e., likelihood of smoking or engaging in heavy episodic drinking) changes in relation to the independent variable (i.e., four-category social status construct). These relationships are then assumed to apply across individuals in the analytic sample unless conditional relationships are included in the model.

In contrast, a person-oriented framework focuses on the individual “as a functioning whole with processes operating at a system level and its components jointly contributing to what happens” over time (Bergman & Trost 2006). These components, such as knowledge, attitudes, biological or psychological characteristics and behaviors, are all related and interact with one another (Bergman & Trost 2006). Individuals are examined based on their patterns of these components or observed characteristics that are relevant to the problem of interest (Bergman & Magnusson 1997). Inter-individual differences are the focus in person-oriented frameworks. For example, in latent class analysis, subgroups of individuals are classified based on their patterns of individual characteristics and/or observed variables. Individuals belong to one of a set of mutually exclusive and exhaustive latent classes (Lanza & Collins 2008). Person-oriented approaches are becoming more common in social and behavioral sciences to explain phenomena such as health behaviors (Auerbach & Collins 2006, Collins & Lanza 2010, Ingledew et al 1995, Thompson et al 2009).

Taking on a person-oriented approach, the first study aim of this dissertation examined the role of life-course social status on alcohol and smoking behaviors in adulthood. The second

study aim also applied a person-oriented approach to analyze the variations by race/ethnicity of life-course social status on adult alcohol and smoking behaviors. These two study aims were achieved through latent class analysis. This next section provides an overview of latent class analysis. Details specific to each study aim are presented in the analytic strategy section.

### **2.3.2 Latent Class Analysis**

Latent class analysis (LCA) has been applied to many health topics, especially in the alcohol and substance abuse literature (Auerbach & Collins 2006, Collins & Lanza 2010, Dauber et al 2009, Whitesell et al 2006). However, researchers are only beginning to apply this technique to understand social status and socioeconomic status (Hallerod & Gustafsson 2011, McLeod & Owens 2004, Roosa et al 2009, Scharoun-Lee et al 2009a, Scharoun-Lee et al 2009b). In this dissertation, LCA is used to identify (1) the optimal number of latent classes or groups of cumulative life-course social status, and (2) the size and characteristics of each latent class. LCA models were conducted using Mplus Version 6.11. This software includes several advantageous features for running LCA models. Latent classes can be constructed from continuous, ordinal, nominal or count variables.<sup>1</sup> Mplus can also account for complex survey design and post-stratification sample weights for the unequal probability of selection of respondents into the sample (Muthen & Muthen 1998-2011). Third, full information maximum likelihood (FIML) estimation in Mplus can be used to estimate model parameters using all available data points, even for cases with missing responses (Muthen & Muthen 1998-2011).

LCA is a non-parametric statistical technique that assumes that patterns among a set of observed variables are explained by an unmeasured latent variable with discrete classes (Collins

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<sup>1</sup> LCA has also been referred to as latent profile analysis (LPA). The difference between the two latent techniques is that LCA uses binary or categorical indicators. In comparison, LPA uses continuous indicators. Although I use both categorical and continuous indicators in my latent models, I use the term LCA because it is more widely used in the public health and substance abuse literature.

& Lanza 2010, Lazarsfeld & Henry 1968, McCutcheon 1987). LCA is similar to factor analysis except that the resulting latent variable is categorical with a multinomial distribution (Collins & Lanza 2010). Observed variables are assumed to be ‘locally independent’ within each class such that any intraclass correlations or multicollinearity between variables are not an issue in LCA but common in variable-oriented frameworks (Clogg 1995, Hagenaars & McCutcheon 2002). Finally, respondents are assumed to belong to only one class or group membership (Lanza et al 2007).

LCA is a powerful technique that can take a complex construct (such as social status) with an array of observed data and distinguish underlying latent groups based on individuals response patterns in the data. LCA models provide the prevalence of each latent class and the amount of error associated with each variable in measuring these latent classes. Disadvantages of using LCA include the potential for misclassification error, and therefore, the results are only an estimate of an individual’s latent class membership (Ingledeu et al 1995).

A LCA model has two key parameters: class-membership probabilities (similar to scores from a factor analysis) and item-response probabilities conditional on class membership (similar to loadings in a factor analysis) (Lanza & Collins 2008). The assumption of LCA models is that the correlations among the observed indicators capture a set of underlying latent classes plus measurement error (Muthen 2004). In the context of this dissertation, the latent class membership probabilities give the probability of a given individual to be in a particular social status class. The item-response or conditional latent class probabilities of social status refer to the average probabilities of endorsing each response category (such as having a high school degree) for each indicator (such as education), given membership in a particular latent class (such as persistently low human capital group).

The key is to identify the best fit LCA model by determining the most appropriate number of classes for the data. To identify the best fit LCA model, several criteria were used including model fit statistics and interpretability of model solution parameters via class homogeneity, class separation, and misclassification error. In regards to model fit statistics, there are four tests that can be applied using un-weighted data. First, the leveling off of log-likelihood values across a series of different LCA class solutions is used. Good model fit is indicated when the values start to plateau (Nylund et al 2007). Second, Bayesian Information Criterion (BIC) values are compared across each model of varying class size with smaller values representing more parsimonious models (Collins & Lanza 2010, Schwarz 1978). Third, fit statistics from the Vuong-Lo-Mendell Rubin (VLMR) likelihood ratio test (with preference for a significant p-value) and likelihood ratio chi-square test (with preference for a non-significant p-value) are used (Muthen & Muthen 1998-2011).

In addition to the model fit statistics, characteristics of high class homogeneity, high class separation, and low misclassification error serve as additional criteria for a good-fit model (Collins & Lanza 2010). For each observed indicator, class homogeneity indicates the degree that individuals in one class endorse the same observed response pattern for that indicator, implying that one response pattern is highly characteristic of this particular latent class. For example, there is high class homogeneity when 90% of individuals in class 1 endorse experiences of economic hardship compared to 10% of individuals in class 2 who endorse experiences of economic hardship. Looking across latent classes, class separation ensures the degree of distinction or uniqueness between groups. For example, class 1 possesses characteristics of high economic hardship and high receipt of public assistance. In comparison, class 2 has the opposite characteristics of low economic hardship and low receipt of public



assistance. An LCA model with high class homogeneity and high class separation ensures the interpretability and demarcation of each latent class. The third criterion for model selection is ensuring low misclassification of class assignments. A value of 0.80 and higher of the “average latent class probabilities for the most likely latent class membership” is a recommended threshold to ensure low misclassification (Muthen & Muthen 1998-2011).

In sensitivity analyses of the first study aim, a variable-oriented framework was used where regression models estimated the effects of life-course social status groups on demographic characteristics and substance use behaviors. The social status results from the latent class analysis (LCA) were applied to a non-latent variable framework. Similar studies have used this approach of transferring LCA findings to a regression-based approach to better understand the effects of LCA groupings to distal outcomes (Pastor et al 2007, Scharoun-Lee et al 2009b). Predicted latent class memberships for each respondent were used for the regression analyses.

In latent class analysis, a posterior probability of an individual’s membership was computed for each class. An individual is traditionally assigned to the group for which they have the highest probability (i.e., modal assignment) (Collins & Lanza 2010, McCutcheon 1987). For study aims one and two, modal assignments were used to describe the respondents most likely to be in each of the groups. To further examine study aim one, I export the final latent class membership data to a non-latent variable framework where the posterior probabilities rather than modal assignments are used to partially account for the measurement error of the latent classification. Therefore, each social status group was weighted by the accuracy of classification using posterior probabilities of group membership (Kleinbaum et al 1998, Pastor et al 2007, Rosner 2006). The weighted categories of a nominal group membership variable were then used to estimate the relationship with the outcome of adult alcohol/smoking behaviors. These

variable-oriented analyses are conducted to support the person-oriented analyses, but are not reported in this dissertation.

### **2.3.3 Dealing with Missing Data**

Missing data is a common problem with longitudinal and population-based surveys. Any respondents who are missing on the key dependent variables of Wave IV smoking and alcohol behaviors were excluded. Furthermore, the sample was limited to respondents who identify as Whites, Blacks, Latinos, or Asians. Due to small numbers, respondents who identified as American Indian/Alaskan Natives or other racial/multiracial groups were excluded. The analytic sample was also limited to respondents who have a valid weight variable for Waves I-IV. Although the analytic sample was limited by these characteristics, the analysis must still account for these excluded subgroups to ensure the correct calculation of standard errors that are based on the full sample design. Therefore, within the survey procedures in Stata and Mplus, the `-SUBPOPULATION-` command was used to identify the specific analytic sample.

If there were missing values for key independent variables and demographic characteristics, they remained in the analytic sample. Mplus has a feature for dealing with missing data responses through full information maximum likelihood (FIML) estimation. This procedure estimates model parameters using all available data points, even for cases with missing responses. FIML assumes that data are missing at random (MAR); however, even if the MAR condition is not completely satisfied, FIML estimation can reduce bias while maximizing the number of observations (Arbuckle 1996, Muthen & Muthen 1998-2011, Wothke 2000).

FIML is the preferred technique over regression-based imputation, and performs comparably with multiple imputation methods in simulation studies (Enders 2010). Another advantage of FIML is that it is more efficient when the statistical software program includes the

feature. Multiple imputation requires a separate analysis to impute the missing data. In FIML, a maximum likelihood estimation process is incorporated into the main mode of estimating the final models in the latent class analyses and multivariate regression analyses. Furthermore, whereas multiple imputation involves careful selection of auxiliary variables that are correlated with missingness or the missing variable (Enders 2010, Rubin 1996), FIML does not require selection of auxiliary variables and uses all variables in the model to compute missingness. For example, to impute missing values of household income, the usual suspects for auxiliary variables include education, employment, family structure, and demographic characteristics (Schenker et al 2006). These additional variables are assumed to be related to the imputed variable, assumed to be good estimators for the missing responses, and should not be used in the final analyses. However, in conceptualizing social status for this study, I also use these additional variables as indicators for my latent class construct. Therefore, FIML is more efficient and advantageous because this missing data procedure does not interfere with my main purpose of analyzing the effects of various domains of social status on alcohol and smoking behaviors.

#### **2.3.4 Analytic Strategy by Study Aim**

The focal relationship of this dissertation is social status as the focal independent variable and alcohol and smoking behaviors as the focal dependent variables. Social status was conceptualized as a life-course social status construct (or cumulative social status construct from adolescence, young adulthood, and adulthood) with domains of economic capital, human capital, and social capital. Social status was operationalized into these three separate domains. Each study aim used these three life-course social status measures: economic capital, human capital, and social capital. The key outcome measures were daily cigarette smoking and heavy episodic alcohol use in adulthood. Separate analyses were conducted for alcohol and smoking.

The overall analytic goals for this dissertation were to describe how social status develops from adolescence into adulthood, empirically determine how to conceptualize life-course social status for each domain of economic capital, human capital, and social capital, and examine the relationships between economic/human/social capitals and substance use behaviors. The specific analytic strategy is presented below for each study aim.

**Study Aim #1:** To examine the effects of social status assessed cumulatively across the life course on alcohol and smoking behaviors in adulthood. The main hypothesis was that individuals with some patterns of life-course social status are at higher risk for smoking and alcohol behaviors than others. For this study aim, the construct of life-course social status captured the ebb and flow of advantages or disadvantages across adolescence into adulthood for economic capital, human capital, and social capital domains. To address this study aim, I have identified the following research questions:

- 1.1. What are the patterns of life-course social status from adolescence to adulthood? How often does life-course social status involve patterns of persistent advantage or disadvantage from adolescence to adulthood? How common are patterns of upward or downward mobility from adolescence to adulthood?
- 1.2. What are the effects of life-course social status patterns on cigarette smoking and alcohol use in adulthood, net of demographic characteristics?

Latent class analyses were conducted to identify a best fit model to operationalize the following domains of social status: economic capital, human capital, and social capital. Since these domains represent distinct features of social status, they are constructed separately from one another. Previous literature on LCA models has reported the inclusion of 30 variables or less in their final models (Scharoun-Lee et al 2009b). However, a preference towards parsimony is

useful for LCA models especially to ensure model convergence and reduce under-identification of the model (Desantis et al 2008, Lanza et al 2007).

Prior to the latent class models, I conducted preliminary analyses to reduce the number of social status indicators. I examined the bivariate relationships among the social status measures including cross-tabulations, correlations, and factor analysis. I also investigated the relationships with the outcomes of alcohol and smoking. These preliminary analyses were conducted to ensure that the selected social status measures are good indicators to include in the latent class models. For the economic capital domain, I included 4 measures from Wave I, 11 measures from Wave III, and 11 measures from Wave IV for a total of 26 measures. In the human capital domain, I included 9 measures from Wave I, 6 measures from Wave III, and 6 measures from Wave IV for a total of 21 measures. For social capital domain, I included 7 measures from Wave I, 5 measures from Wave III, and 5 measures from Wave IV for a total of 17 measures.

A series of LCA models were conducted for each domain specifying one to six classes using both unweighted and weighted data. Model fit statistics (including log-likelihood, BIC, and VLMR values) were compared to identify the best fit model. Furthermore, high class homogeneity, high class separation, and low misclassification error were additional criteria to select the model. The results of the latent class analysis identified four-class models as the best fit for economic capital and social capital, and a five-class model as the best fit for human capital. Once these models were identified, I further examined demographic characteristics for each domain to describe how the classes compare by gender, race/ethnicity, age, generational status, family structure, household size, relationship status in adulthood, and number of children in adulthood. To cross-check the social status dimensions with each other, bivariate analyses examined key social status indicators against the social status latent class model. Key social

status indicators included income, education level, organizational participation, religious participation, voting, and number of close friends. These descriptive findings were conducted in both a latent variable (or person-oriented) framework and a non-latent variable (or variable-oriented) framework.

To achieve the first study aim, the distal outcome of smoking or alcohol was included into each social status latent class model. Latent class models postulate an error-free latent variable as the outcome or dependent variable. Therefore, a distal outcome variable makes up part of the latent variable (Lanza et al in press). Results show the probability of each latent class for endorsing daily smoking or heavy episodic drinking. By investigating study aim 1 within the latent variable framework, we can compare the prevalence of each outcome across the subgroups or latent classes. Furthermore, the misclassification error of an individual's group membership remains constant within the latent classes (Muthen & Muthen 1998-2011).

Additional analyses were conducted to test for statistical significance of the substance use behaviors between social status groups. Within the same latent class model, logistic regression analysis was conducted to examine whether the odds of smoking or HED is significantly higher or lower than a reference group. For the smoking models, the most advantaged or highest social status group served as the reference group whereas for the HED models, the most disadvantaged or lowest social status group served as the reference group.

One disadvantage of using latent class analysis is the potential alteration of the original latent class models when including the distal outcome. Therefore, it is important to assess whether there is minimal or substantial changes in the final classes after adding in the distal outcome. If there are substantial changes to the latent classes, then re-interpretation of the relationship between social status and smoking/alcohol behaviors is required.

Sensitivity analyses were conducted to rule out competing explanations and ensure a degree of reliability for the findings. First, LCA models with one additional and one less class specification than the best-fit model were conducted with the distal outcome. For economic and social capital LCA models, 3-class and 5-class models with the distal outcomes of smoking and alcohol were examined to see if there were similar trends as the best-fitting 4-class model. Similarly, 4-class and 6-class models of human capital were conducted with the distal outcomes of smoking and alcohol to ensure similar findings as the 5-class model. These models confirmed the patterns. Second, a mega social status LCA model was constructed that combines key indicators from economic capital, human capital, and social capital domains. One of the limitations of this study is that domains of economic capital, human capital, and social capital are likely to be correlated with one another. However, there are limitations within Mplus to examine the correlations and relationships among more than one LCA model. One alternative is to conduct an LCA model that includes the distinct measures from each domain in one mega model. Once a best-fit mega social status model was identified, then I examined the trends with the distal outcome of alcohol and smoking. Similar to the previous finding, the pattern for alcohol and smoking were similar with the mega social status model.

**Study Aim #2:** To analyze the variation by race/ethnicity of the effects of social status captured cumulatively across the life course on substance use behaviors in adulthood. The main hypothesis was that cumulative disadvantages for minority racial/ethnic groups have different effects on substance use behaviors than cumulative disadvantages for Whites. I pose the following research questions to investigate this study aim and hypotheses:

- 2.1. How do the patterns of life-course social status from adolescence to adulthood vary by racial/ethnic group?

- 2.2. For each racial/ethnic group, Blacks, Whites, Latinos, and Asians, what are the effects of life-course social status on adult substance use behaviors?

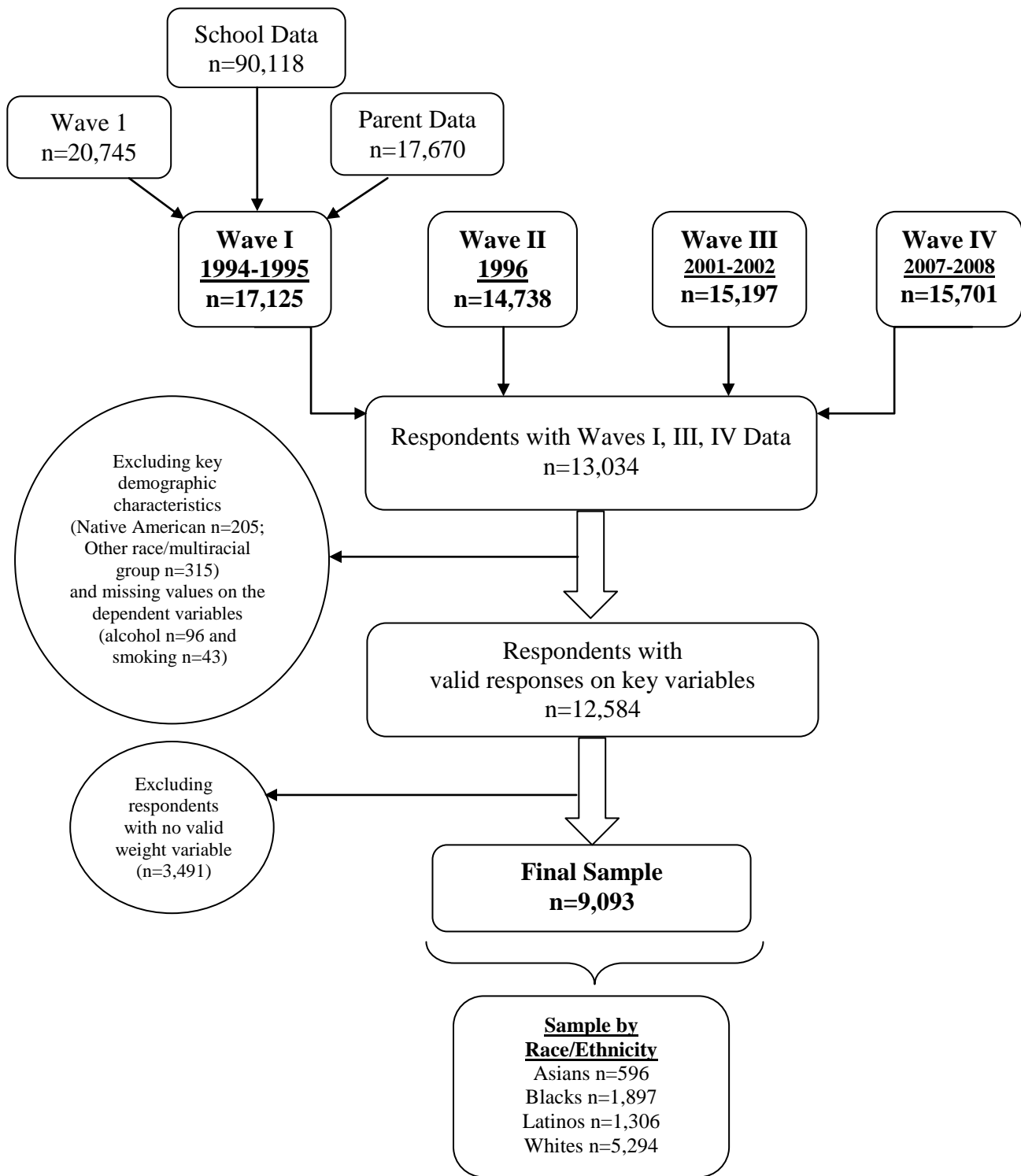
Expanding on study aim #1, this study aim utilized the same social status indicators for the three LCA models of economic capital, human capital, and social capital. Each of these LCA models of social status was stratified by the racial/ethnic groups of Whites, Blacks, Latinos, and Asians. However, further investigation was warranted to examine whether the latent classes can be interpreted in the same manner for each racial/ethnic group. This was done by comparing the individual social status measures to see if there were different means or probabilities by class. In addition, the substantive meaning within each latent class was also examined. Although there was no specific test for measurement invariance, a qualitative approach was used to assess the comparability of the latent classes across racial/ethnic groups.

Similar to study aim #1, a series of LCA models with the distal outcomes of smoking and alcohol were conducted separately for each racial/ethnic group. Trends of smoking and alcohol prevalence for each latent class were compared within each racial/ethnic group following the same methods described above.

## **2.4 SUMMARY**

This chapter provided an overview of the Add Health data (including study design and analytic sample derivation), operationalization of key variables, and the analytical plan corresponding to each of the specific study aims. By using a person-oriented analytic framework, this study conceptualized social status as a construct that is multidimensional and longitudinal from adolescence to adulthood. The next chapter discusses the results of the latent class analysis of life-course social status.





**Figure 2.1 Analytic Sample Selection of Add Health Data**

**Table 2.1 Comparison of Original Add Health Wave I Sample and Final Analytic Sample**

	Wave1 In-Home Sample	Final Analytic Sample	
	Number (n=20,745)	Percent in Final Sample (n=9,093)	Percent Excluded from Final Sample* (n=11,652)
<b>Demographic Characteristics</b>			
Gender (W1)			
Male	10,265	40.1	59.9
Female	10,480	47.5	52.6
		$\chi^2=112.74, p<0.001$	
Race/Ethnicity (W1; n=20,659) <sup>a</sup>			
White	10,844	48.8	51.2
Black/African American	4,608	41.2	58.8
Latino/Hispanic	3,270	39.9	60.1
Asian/Asian American	1,417	42.1	57.9
Native American	205	0.0	100.0
Other/Multiracial	315	0.0	100.0
		$\chi^2=549.81, p<0.001$	
Age (W1; n=20,728) <sup>a</sup>			
12 years old	604	49.2	50.8
13 years old	2,261	54.4	45.6
14 years old	2,791	53.6	46.4
15 years old	3,666	50.4	49.7
16 years old	4,059	48.5	51.5
17 years old	3,924	40.1	59.9
18 years old	3,423	19.8	80.2
		$\chi^2=1,100.00, p<0.001$	
<b>Social Status Characteristics</b>			
Adolescent Household Income (W1; n=15,351) <sup>a</sup>			
Less than \$25,000	4,668	42.7	57.3
\$25,000-\$49,999	5,076	47.2	52.8
\$50,000-\$74,999	3,457	48.6	51.4
\$75,000-\$99,999	1,227	50.7	49.3
\$100,000-124,999	527	48.2	51.8
\$125,000 or more	396	50.5	49.5
		$\chi^2=46.48, p<0.001$	
Mom's Education Level (W1; n=19,459) <sup>a</sup>			
Less than high school	3,943	41.0	59.0
High school diploma/GED	6,652	44.4	55.6
Some college/vocational school	3,718	44.0	56.0
Bachelor's degree	3,677	48.3	51.7
Graduate school	1,469	49.4	50.7
		$\chi^2=55.05, p<0.001$	

R's Education Level (W4; n=15,697) <sup>a</sup>			
Less than high school	1,252	53.8	46.3
High school diploma/GED	2,565	54.2	45.8
Some college/vocational school	6,927	56.5	43.6
Bachelor's degree	3,044	63.5	36.5
Graduate school	1,909	62.1	37.9
		$\chi^2=82.97, p<0.001$	
<b>Dependent Variables</b>			
Daily Smoking (W4; n=15,646) <sup>a</sup>	3,339	56.1	43.9
		$\chi^2=7.35, p=0.007$	
Heavy Episodic Drinking (W4; n=15,570) <sup>a</sup>	3,061	58.3	41.7
		$\chi^2=0.02, p=0.881$	

Notes: Unweighted data. W1=Wave I data; W4=Wave IV data

\*Sample exclusion criteria included lost-to-follow-up in Waves III and IV, missing responses for dependent variables or no valid weight variable, and American Indian/Alaskan Native, and other racial or multiracial respondents

<sup>a</sup> There are missing values for race/ethnicity (n=86), age (for the final analytic sample, n=2, and for the excluded sample, n=15), adolescent household income (for the final analytic sample, n=1,950, and for the excluded sample, n=3,444), mother's education (for the final analytic sample, n=384, and for the excluded sample, n=902), respondent's education (for the excluded sample, n=5,084), adult daily smoking (for the excluded sample, n=5,099), and adult heavy episodic drinking (for the excluded sample, n=5,175).

**Table 2.2 Summary of Resident Parent Occupation**

Occupational Class	SOC major group classification	MOTHER		FATHER	
		Number	Percent	Number	Percent
<b>Professional/ Managerial</b>	Professional 1 (e.g., doctor, lawyer, scientist)	333	1.7	851	5.9
	Manager (e.g., executive, director)	994	5.1	1,603	11.1
<b>Professional Other</b>	Professional 2 (e.g., teacher, librarian, nurse)	3,497	18.0	758	5.3
	Technical (e.g., Computer specialist, radiologist)	620	3.2	861	6.0
<b>Sales/Service/ Administrative</b>	Office worker (e.g., bookkeepers, clerk, secretary)	3,328	17.5	331	2.3
	Sales worker (e.g., insurance agent, store clerk)	1,023	5.3	631	4.4
	Restaurant worker or personal service (e.g., waitress, housekeeper)	1,659	8.5	314	2.2
	Military or security (e.g., police officer, soldier, fire fighter)	89	0.5	521	3.6
<b>Manual/Farming</b>	Craftsperson (e.g., toolmaker, woodworker)	157	0.8	491	3.4
	Construction worker (e.g., carpenter, crane operator)	56	0.3	1,444	10.1
	Mechanic (e.g., electrician, plumber, machinist)	55	0.3	1,533	10.7
	Factory worker or laborer (e.g., assembler, janitor)	1,219	6.3	1,494	10.4
	Transportation (e.g., bus or taxi driver)	121	0.6	503	3.5
	Farm or fishery worker	90	0.5	234	1.6
<b>Other</b>	Other (unspecified)	3,135	16.2	1,998	13.9
<b>Not working</b>		3,017	15.6	790	5.5

Notes: SOC= Standard Occupational Classification

**Table 2.3 Summary of Respondent Occupation in Young Adulthood and Adulthood**

Occupational Class	SOC major group classification	SOC major group code	Wave III		Wave IV	
			Number	Percent	Number	Percent
<b>Professional/ Managerial</b>	Management occupation	11	468	4.5	1,109	7.1
	Business/financial operations occupation	13	554	5.3	979	6.3
	Computer/mathematical occupation	15	354	3.4	450	2.9
	Architecture/engineering occupation	17	115	1.1	229	1.5
	Life/physical/social science occupation	19	83	0.8	147	0.9
	Legal occupation	23	86	0.8	208	1.3
	Healthcare practitioners/technical occupation	29	275	2.7	810	5.2
<b>Professional Other</b>	Community/social services occupation	21	146	1.4	340	2.2
	Education/training/library occupation	25	544	5.2	1,146	7.3
	Arts/design/entertainment/sports /media	27	235	2.3	410	2.6
<b>Sales/Service/ Administrative</b>	Healthcare support occupation	31	549	5.3	932	6.0
	Protective service occupation	33	199	1.9	454	2.9
	Food preparation/serving related occupation	35	1,203	11.6	1,142	7.3
	Building/grounds cleaning/maintenance occupation	37	229	2.2	306	2.0
	Personal care/service occupation	39	418	4.0	458	2.9
	Sales and related occupation	41	1,710	16.5	1,712	11.0
	Office/administrative support occupation	43	1,123	10.8	1,369	8.8
Military specific occupation	55	113	1.1	39	0.3	
<b>Manual/ Farming/ Technical</b>	Farming/fishing/forestry occupation	45	71	0.7	98	0.6
	Construction/extraction occupation	47	582	5.6	910	5.8
	Installation/maintenance/repair occupation	49	404	3.9	568	3.6
	Production occupation	51	537	5.2	894	5.7
	Transportation/material moving occupation	53	376	3.6	621	4.0

Notes: SOC= Standard Occupational Classification

## **CHAPTER 3: RESULTS—Life-Course Social Status**

This chapter presents descriptive statistics of the analytic sample and the latent class findings of the life-course social status domains of economic capital, human capital and social capital from adolescence to adulthood. As part of study aim #1, the hypothesis was that life-course social status has mobility patterns from adolescent status (via parent status) to adulthood status that included persistent advantages and disadvantages as well as upward and downward mobility. These findings set the stage for examining the rest of study aim #1, in which the effects of this life-course social status are examined in relation to substance use behaviors in adulthood (which are presented in the next chapter). For each social status domain, I discuss the process for latent class model selection. Then I present the latent class prevalences and item-response probabilities for the selected latent class analysis (LCA) model. Finally, latent classes are presented in relation to demographic covariates.

### **3.1 SAMPLE CHARACTERISTICS**

Table 3.1 presents the demographic characteristics of the analytic sample. Gender composition was equal. The majority of respondents identified as Whites (70%), followed by Blacks (15%), Latinos (11%), and Asians (4%). Less than one-fifth of respondents were from an immigrant family either first generation (born outside of the U.S.; 4%) or second generation (having a parent born outside the U.S. and respondent born in the U.S.; 11%). A majority of respondents grew up in a two-parent household in adolescence, and almost one-third were from a single parent or other non-traditional type of family structure. The average household size in adulthood was 4.53. The mean age in adulthood was 28.02 with a wide range between 24 and 32. By adulthood, 40% of respondents were currently married compared to one-quarter who were in

a cohabitating relationship and another one-quarter who were dating. The average number of children was 0.83 with a range from 0 to 7.

## **3.2 ECONOMIC CAPITAL DOMAIN**

### **3.2.1 Latent Class Model Selection**

The domain of economic capital captures the financial resources to purchase health, access to resources, attain a certain lifestyle or prestige, or accumulate power. Low economic capital reflects accumulated deprivation or poverty, while high economic capital represents accumulated advantage and wealth. Using Add Health Waves I, III, and IV data, the economic capital construct encompassed measures of financial resources (via family, income/salary/earnings, and government benefits), economic hardship and total debt, lack of health insurance, home ownership, and total assets. An initial set of 26 measures was selected based on the literature (Krieger et al 1997, Oakes & Rossi 2003) and for their potential influences on alcohol/smoking behaviors. Financial resources can lead to purchase of tobacco and alcohol products, and provide access to health services to prevent smoking and risky alcohol behaviors. Through preliminary descriptive analysis within each life stage and across life stages, as well as the association with alcohol and smoking, I reduced the final set of measures to 20 variables. The following variables were not included: car ownership (Wave III), having a credit card (Wave III), having a checking or savings account (Wave III), no money to see a doctor or a dentist (Wave III), and receiving financial help from family for educational costs (Wave IV).

A series of latent class models were tested specifying one to six classes using unweighted data for the remaining 20 variables (Table 3.2). There are limited statistical tests to determine model fit when using weights in latent class analyses. Once the best LCA model was identified, this model and the descriptive analyses were conducted using sample weights. To determine the

best-fit model, both model fit statistics and conceptual reasoning were used (Collins & Lanza 2010, Nylund et al 2007). Findings showed that with each additional class, the log-likelihood and BIC values decreased and leveled off between three- and six-class solutions which suggest a range of acceptable class enumerations. Both the likelihood ratio chi-square test (with preference for a non-significant p-value) and the Vuong-Lo-Mendell-Rubin test (with preference for a significant p-value) statistics supported the higher class solutions. However, upon further examination of the higher class models, the five- and six-class models had trivial class sizes with less than 5% of the respondents falling into a fifth or sixth latent class. Furthermore, the class prevalences and item-response probabilities showed little substantive distinctions in the fifth and sixth latent classes which indicates poor class homogeneity and class separation. Therefore, model fit statistics and conceptual reasoning led to the preferred, more parsimonious four-class LCA model. The average posterior probability of being in a particular class for all the individuals that were assigned to that class ranged between 0.74 and 0.85, which indicates low to moderate misclassification error (Collins & Lanza 2010).

### **3.2.2 Description of Economic Capital Latent Classes**

Table 3.3 presents the latent class prevalences for the four-class model of economic capital, and the conditional response probabilities (for categorical indicators) and means (for continuous indicators) for each observed economic capital indicator in adolescence (W1), young adulthood (W3), and adulthood (W4). The table also shows the mean values and proportions for the total analytic sample. I labeled the four classes as: Class 1—Most economically disadvantaged group (16%); Class 2—Economically downward group (30%); Class 3—Economically upward group (20%); and Class 4—Most economically advantaged group (34%).



**Class 1: Most Economically Disadvantaged** The most economically disadvantaged group was characterized by an adolescent economic environment with low household income, experiences of economic hardship, receipt of public assistance, and lack of health insurance. Sixteen percent of respondents were categorized into this group. In adolescence, the mean household income was \$22,600, compared to the mean of \$56,900 for the total sample. Mean personal income grew slightly from young adulthood to adulthood from \$6,700 to \$8,700. Adolescent experiences of low economic capital persisted where a third of young adult individuals received public assistance and roughly half experienced economic hardship. As adults, a majority received public assistance and more than half experienced economic hardship. Rates of health insurance were consistently low in young adulthood and adulthood. In terms of wealth, only a small proportion owned a home by adulthood (19%). The average debt outweighed the average assets. Total average household assets amounted between \$5,000 and \$10,000 by adulthood. Similarly, total average household debt was also between \$5,000 and \$10,000. Despite receiving family financial support both in young adulthood (35%) and adulthood (22%), this class was the second highest group to report giving financial help back to family members in adulthood (17%).

**Class 2: Economically Downward** Almost one third of respondents were classified into the economically downward from adolescence to adulthood group. Compared to all other classes, this group had the second highest mean adolescent household income of \$65,725. By young adulthood and adulthood, the mean personal incomes were \$9,915 and \$17,795, respectively, with both being the second lowest of all classes. This group experienced little economic hardship and only 11% received public assistance in adolescence. However, experiences of economic hardship and receipt of public assistance gradually grew in young adulthood and adulthood. Lack

of health insurance hovered at 19% and 25% in young adulthood and adulthood, respectively. By adulthood, only one-quarter owned a home. Total household assets ranged between \$10,000 and \$25,000 by adulthood. There was a much higher range for total household debt between \$5,000 and \$25,000. In addition the average debt was more than the average assets. A majority received family financial support in both young adulthood (49%) and adulthood (24%). However, there was little return of giving help to family members in adulthood (7%).

**Class 3: Economically Upward** The third latent class possessed characteristics of upward mobility from adolescence to adulthood. Twenty-percent of respondents fell into this group. In adolescence, this group had the second lowest household income (\$31,624) across the four classes. However, by young adulthood and adulthood, the mean personal incomes grew to \$15,017 and \$31,560, respectively. Compared to all other classes, they represented the highest mean income in young adulthood and the second highest in adulthood. One-third of this group experienced economic hardship and 43% received public assistance in adolescence. Economic hardship and receipt of public assistance declined over time by adulthood. Similarly the proportion of those without health insurance declined from adolescence (46%) to adulthood (15%). By adulthood, almost half of the individuals owned a home. Overall, the average assets were higher than the average debts for this group. Although their mean personal income was not the largest, their total household assets ranged between \$25,000 and \$50,000 in adulthood. The total household debt remained between \$5,000 and \$25,000. This group received very little family financial support in both young adulthood (24%) and adulthood (8%), which was the lowest of all classes. This group was the most likely to provide financial support to their family members in adulthood at 18%.

**Class 4: Most Economically Advantaged** The most economically advantaged group was characterized by an economic environment with high incomes and little experiences of economic hardship across adolescence to adulthood. One-third of respondents belonged to this group. In adolescence, the mean household income was \$88,353. Mean personal income grew from young adulthood to adulthood from \$13,046 to \$44,998. Throughout the transition to adulthood, members of this group were least likely to have received public assistance or be without health insurance. Over half owned a home by adulthood. Total household assets amounted between \$25,000 and \$100,000 by adulthood. Similarly, total household debt was substantially lower between \$10,000 and \$25,000. The average assets outweighed the average debt for this group. Family financial support in young adulthood was highest across all groups (55%), but dropped to the lowest of all groups by adulthood (7%). This group was likely to receive financial support for their home purchase or renovation (29%). However, this group provided little support back to family members in adulthood (3%).

### **3.2.3 Latent Classes by Demographic Characteristics**

To examine the relationship of economic capital class membership to demographic covariates, I conducted additional latent class analyses with gender, immigrant family, race/ethnicity, and marital status. In bivariate analyses using single covariates, I found that each covariate has a statistically significant effect on latent class membership using the log-likelihood ratio test of the base model (with no covariate) to a model with one covariate. To investigate the effects of each covariate while holding constant the other covariates, I conducted another latent class analysis with all of the covariates listed above in one model. Mplus conducts these as multinomial logistic regression models to examine the economic capital latent classes by each covariate. The most economically advantaged group served as a reference group.

In addition to the previous analysis using a latent variable framework, I further examined the relationship of demographic characteristics for each economic capital class membership using a non-latent variable framework. This analysis allowed for comparisons of each economic capital class membership by demographic characteristics without having to refer to a reference group. In addition to the covariates described in the previous paragraph, I examined demographic characteristics of household size, family structure in adolescence, age and number of children in adulthood. Using the modal class assignments (i.e., the most likely class assignment for each individual) in a non-latent variable framework, I conducted bivariate analyses (cross-tabulations and mean comparisons) of economic capital class membership and each covariate. Overall, these findings supported the multinomial logistic regression models in the latent variable framework. For ease of interpretation, I present the bivariate relationships between demographic covariates and economic capital in the non-latent framework in Table 3.4.

For the largest groups of economically advantaged (35%) and economically downward (30%), gender composition was fairly similar. In contrast, although the economically disadvantaged group was only made up 16% of the sample, females were more likely to be in this group than males (21% vs. 12%, respectively). The reverse pattern appeared for the economically upward group where males were more likely to be in this group than females (23% vs. 17%, respectively). By race/ethnicity, being economically advantaged occurred least often among Blacks (14%) and most often among Asians (42%), Whites (40%), and Latinos (21%). Being economically disadvantaged was more likely to occur among Blacks compared to the other groups. Downward mobility was more common among Whites than other groups, whereas upward mobility appeared more often among Latinos than other groups.

Upward mobility was more usual for respondents from immigrant families (whether first or second generation) than respondents from 3<sup>rd</sup> generation or higher families. Economically advantaged and downward mobility were more common among third generation or higher respondents. Similarly, these two economic capital groups encompassed more respondents from two-parent families than single-parent families or other family structure types.

Adulthood characteristics revealed that the economically advantaged was most common among those who were married (42%) followed by dating (34%), cohabitation (25%), and not in a relationship (22%). In contrast, the economically disadvantaged was more common among those not in a relationship (29%) compared to those cohabitating (21%), dating (15%), and being married (11%). The most disadvantaged group had the highest mean number of children at 1.55 followed by the economically upward (0.96), economically downward (0.79), and most advantaged (0.43) groups. A similar trend appeared for household size in adulthood where the most disadvantaged group had the largest household size (4.13) relative to the economically upward (3.61), economically downward (3.04), and most advantaged (2.51) groups.

It is useful to describe the economic capital groups in relation to other social status dimensions. In a non-latent variable framework, economic capital latent classes were compared to characteristics of human capital and social capital indicators (Table 3.5). Economically disadvantaged group was relatively common among those with lower education levels (whether mother's, father's, or respondent's education in adulthood). A similar relationship was evident for the economically advantaged group and respondents with higher education. Economically downward group occurred most often among respondents with some college/technical school (35%), followed by high school/GED (32%), less than high school (24%), college degree (24%), and graduate school (23%). In contrast, economically upward group occurred more often among

those with high school/GED (28%), less than high school (26%), some college/technical school (22%), and college degree and graduate school (both 12%). In the context of social capital, most advantaged group had the highest mean number of close friends whereas the most disadvantaged group had the lowest mean number of close friends. There was a similar trend between the most disadvantaged group and the most advantaged group with organizational membership and volunteering in adolescence and adulthood. The most disadvantaged group had the lowest proportion of adult respondents voting (13%) relative to the economically upward (18%), economically downward (29%), and most advantaged (40%) groups.

### **3.3 HUMAN CAPITAL DOMAIN**

#### **3.3.1 Latent Class Model Selection**

Human capital reflects the accumulated knowledge, expertise, or skills that provide an individual the ability to problem solve and attain higher earning potentials (Grusky et al 2008). It can also symbolize one's values toward healthy behaviors and lifestyles; social networks that share similar health behaviors; and the ability to navigate the health care system (Krieger et al 1997). Education and occupational characteristics for the adolescent stage (including parent indicators), young adult stage, and adult stage were used to conceptualize the human capital domain of life-course social status. An initial set of 21 measures were selected based on the literature (Krieger et al 1997, Oakes & Rossi 2003) and for their potential influences on alcohol/smoking behaviors. Human capital represents knowledge about the risks associated with smoking and risky alcohol use. Yet human capital can also symbolize the type of social environment (whether school, work, or community characteristics) that encourages or discourages smoking or risky alcohol use. Through preliminary analysis within each life stage and across life stages, as well as the association with alcohol and smoking, I reduced the final set

of human capital measures to 17 variables. The following variables were excluded in the final model: respondent work hours during the school year (Wave I), respondent's occupation (Wave III), job satisfaction (Waves III and IV), and supervisory role (Wave 4). In this model, education was entered as a continuous variable to provide a more parsimonious LCA model with fewer degrees of freedom.

A series of LCA models with one to six classes were estimated (See Table 3.6). With each additional class, the log-likelihood and BIC values decreased and leveled off between four- and six-class solutions. Both the likelihood ratio chi-square test and the Vuong-Lo-Mendell-Rubin statistics supported the higher class solutions. With the four-class solution, model parameters showed a large cluster of respondents in one class (~40%). In a five-class solution, respondents were more equally distributed. Adding in an additional class, less than 5% of the respondents fell into the sixth class which was characterized by extreme values. Therefore, model fit statistics and conceptual reasoning led to the selection of a five-class LCA model. The average posterior probability of being in a particular class for all the individuals that were assigned to that class ranged between 0.83 and 0.95, which indicates low misclassification error.

### **3.3.2 Description of Human Capital Latent Classes**

Table 3.7 shows the class prevalences and the class probabilities for the selected five-class solution LCA model for human capital. Table 3.7 also shows the conditional response probabilities (for categorical indicators) and means (for continuous indicators) for each observed variable. I labeled the five classes as: Class 1—persistently low (20%); Class 2—low with continued education (21%); Class 3—upwardly mobile (30%); Class 4—high with parental investments (10%); and Class 5—persistently high (19%).

**Class 1: Persistently Low Human Capital** Respondents in Class 1 are characterized by low levels of parent education and only 63% had a father present in adolescence. Mother's and father's education levels were slightly higher than Class 2 individuals. By young adulthood, 20% of individuals had not completed high school, and only 4% were currently in school. Almost one-third had received vocational training. The average education in adulthood represented the lowest of all classes, and ranged between high school degree/GED and some college. In terms of occupation, both parents worked an average of 40 hours per week. Mother's occupation types were most common in sales/service (46%). The majority of fathers worked in a manual occupation (55%). By adulthood, individuals' average number of hours worked per week was 42. The typical occupation types included manual (47%) and sales/service (44%). Although their parents' education and mother's work status were higher than Class 2, the persistently low human capital group reported lower adult education levels and occupation types than Class 2. Furthermore, their work hours were higher in adolescence and young adulthood than all classes, which signal early schooling exit and early labor force entry.

**Class 2: Low Human Capital with Continuing Adult Education** Twenty-one percent of individuals were classified into the low with continuing education group. While the majority of adolescent households have a mother figure present, 30% did not have a father figure present. Mothers and fathers of Class 2 individuals possessed the lowest education levels with a high school degree/GED or less. By young adulthood, 22% of Class 2 individuals had not completed high school. One-third had received vocational training. Although there is an early entry into the workforce, some respondents do continue schooling in young adulthood (16%) and adulthood (10%). By adulthood, education levels averaged slightly higher than their parents as well as Class 1 with the majority possessing a high school degree or some college. Most Class 2



individuals grew up in single-wage earner families where 64% of mothers were not working. Fathers averaged 35 work hours a week in primarily manual occupations (53%). By adulthood, individuals reported an average number of 39 hours worked per week. The typical occupation types in adulthood included sales/service (48%) and manual (31%).

**Class 3: Upwardly Mobile Human Capital** Making up almost one-third of the total sample, Class 3 showed higher human capital levels than Classes 1 and 2, and represented an upward mobility pattern in human capital. Both mother's and father's education levels were between high school degree and some college. The majority of Class 3 individuals had completed high school by young adulthood. Similarly over half of individuals continued schooling in young adulthood and 24% in adulthood. Less than a quarter (22%) had received vocational training. Class 3's average education in adulthood was higher than parents' education, and ranged between some college and a college degree. In the occupational context, both parents worked full time (39 and 42 hours per week for mothers and fathers, respectively). Mothers worked primarily in sales/service occupations (55%) while father's occupation was primarily in manual labor (44%). In adulthood, Class 3's average number of hours worked per week was 40. The typical occupation types included sales/service (47%) and professional/managerial (29%). Compared to their parents' education and occupation, adult individuals in Class 3 generally did better and can be characterized as an upwardly mobile group in human capital.

**Class 4: High Human Capital with Early Parental Investments** Ten percent of respondents was classified into Class 4, which is characterized by high education and a single-wage earner family. Mothers and fathers of Class 4 individuals possessed the second highest education levels with some college. Having a non-working mother with high education levels signaled early parental investment that led to benefits in later human capital formation for

respondents. By adulthood, education levels averaged slightly higher than their parents with the majority having some college or college degree. Almost one-quarter were in school in young adulthood, and 21% percent were still in school in adulthood. Only 11% had received vocational training. Most Class 4 individuals grew up in single-wage earner families where 43% of mothers were not working. Fathers averaged 42 work hours a week in primarily professional/managerial occupations (53%). Of the mothers who were working, the primary occupation was sales/service (22%). By adulthood, individuals reported an average number of 41 hours worked per week. The typical occupation types in adulthood included professional/managerial (39%), sales/service (30%), and other professional (25%).

**Class 5: Persistently High Human Capital** Class 5 individuals represented the highest level of human capital. Parent's level of education was the highest with mothers and fathers reporting on average a college degree. The majority of Class 5 individuals had completed high school by young adulthood. Similarly 69% of individuals were currently in school in young adulthood and 22% in adulthood. Only a small proportion (14%) had received vocational training. The average education in adulthood was higher with individuals reporting at least a college degree. In terms of occupation, mothers worked on average 38.7 hours per week with a typical occupation of other professional (61%). For fathers, average hours worked per week was 43. Typical types of father's occupation included professional/managerial (37%) and other professional (27%). In adulthood, the average number of hours worked per week was 42. The typical occupation types included professional/managerial (42%), sales/service (29%), and other professional (23%).

### 3.3.3 Latent Classes by Demographic Characteristics

To examine the relationship between human capital class memberships and demographic characteristics, I conducted a latent class analysis with demographic covariates of gender, race/ethnicity, immigrant family, and current marital status. In this analysis, a multinomial logistic regression is conducted with human capital construct as the outcome. I also conducted additional analyses using a non-latent variable framework to examine human capital class membership by demographic characteristics. Overall, these findings in a non-latent variable framework supported the multinomial logistic regression models in the latent variable framework. Similar to the economic capital domain, Table 3.8 shows the bivariate relationships between demographic covariates and human capital in the non-latent framework.

For the persistently high (19%), high with early parental investments (10%), and low with continued adult education (21%) groups, gender composition was fairly similar. In contrast, persistently low human capital, which made up 20% of the sample, occurred more frequently among males (27%) than females (15%). The reverse pattern appeared for the upwardly mobile group where females were more likely to be in this group than males (34% vs. 24%, respectively). By race/ethnicity, being persistently high occurred most often among Asians (30%), followed by Whites (21%), Latinos (13%), and least often by Blacks (7%). Being persistently low or low with continued adult education was more common among Latinos (26% and 33%, respectively) and Blacks (25% and 28%, respectively) compared to the other groups. Upward mobility was fairly similar across racial/ethnic groups.

Upward mobility occurred more frequently for first generation respondents (34%) followed by third generation or higher (29%) and second generation respondents (25%). Persistently low human capital was common among respondents from single-parent families in

adolescence than two-parent families. In contrast, persistently high human capital was common among respondents from two-parent families in adolescence than single-parent families.

Adulthood characteristics revealed that persistently low human capital was more common among those cohabitating (26%), followed by those not in a relationship (23%), married (19%) and dating (18%). In contrast, the persistently high human capital was more common among those dating (24%) than those married (18%), not in a relationship (15%) or cohabitating (15%). The persistently low and low with continued education groups had the highest mean number of children at 1.21 followed by the upwardly mobile (0.81), high with early parental investments (0.43), and persistently high (0.38) groups. A similar trend appeared for household size in adulthood where the persistently low group and low with continued adult education groups had the largest household size (3.65 and 3.60, respectively) relative to the upwardly mobile (3.08), high with early parental investments (2.58), and persistently high (2.54) groups.

Human capital latent classes were also compared to characteristics of economic capital and social capital using a non-latent variable framework. Table 3.9 presents these results. Being in a higher human capital group (i.e., persistently high or high with early parental investments) also meant having higher income levels whether in adolescence, young adulthood, or adulthood. Home ownership had a different pattern where it was more common for upwardly mobile to be a home owner (31%), followed by the persistently high (20%) and persistently low (19%). However, keep in mind that the upwardly mobile group made up the largest proportion of the total sample. For social capital, higher human capital groups had the highest mean number of close friends whereas lower human capital groups had the lowest mean number of close friends.

### **3.4 SOCIAL CAPITAL DOMAIN**

#### **3.4.1 Latent Class Model Selection**

Social capital is defined as the “features of social organization, such as networks, norms, and social trust, that facilitate coordination and cooperation for mutual benefit” (Hawe & Shiell 2000, p. 67). These implied social ties (and the cohesion of ties) provide value by giving an individual access to actual or potential resources that can elevate one’s social status. These resources can also promote positive or negative health behaviors (Carpiano 2007). Volunteering in formal social organizations and religious participation in adolescence (including parent indicators), young adulthood, and adulthood along with number of close friends and voting participation in adulthood were used to conceptualize social capital domain of the life-course social status. An initial set of 17 measures were selected based on the literature (Krieger et al 1997, Oakes & Rossi 2003) and for their potential influences on alcohol/smoking behaviors. I iteratively eliminated variables to reach the final set of 13 measures. The following variables were excluded: school attachment (Wave I), neighborhood social capital (Wave I), number of friends from high school (Wave III), and friends of the same race/ethnicity (Wave IV).

A series of LCA models with one to six classes were estimated (See Table 3.10). With increasing class numbers, the log-likelihood and BIC values decreased but leveled off between the four- and six-class solutions. Despite the use of a large number of randomly perturbed sets of starting values for each model specification, classes of relatively trivial size (<0.5% of the sample) and extreme values were observed for the five-class and six-class solutions. After further examination of model parameters, high class separation and homogeneity all provided substantive support for the four-class solution. The average posterior probability of being in a

particular class for all the individuals that were assigned to that class ranged between 0.83 and 0.94, which indicates low misclassification error.

### **3.4.2 Description of Social Capital Latent Classes**

Table 3.11 presents the class prevalences and the class probabilities for the selected four-class solution LCA model for social capital. This table also shows the conditional response probabilities (for categorical indicators) and means (for continuous indicators) for each observed variable. The four classes are labeled as: Class 1—persistently low social capital (25%); Class 2—downwardly low social capital (31%); Class 3—high in social context (17%); and Class 4—high in religious context (27%).

**Class 1: Persistently Low Social Capital** Individuals in Class 1 was characterized as those with the lowest social capital from adolescence into adulthood. Across each life stage, organizational membership was the lowest for this class. Only 40% of parents were involved in any organizational memberships. Ten percent of Class 1 individuals in young adulthood and 15% in adulthood were actively volunteering. Similarly, religious participation was low at each life stage where the average attendance of religious services was less than once a month. Only 19% of individuals voted in the previous year in young adulthood. By adulthood, the proportion of individuals voting in the last year increased to 40%. The degree of popularity in young adulthood and number of close friends in adulthood were also the lowest of all four classes.

**Class 2: Downwardly Low Social Capital** The second lowest social capital group is characterized by respondents with high religious participation in adolescence and low organizational memberships at all life stages. One-third of individuals were classified into Class 2's downwardly low social capital group. Individuals in Class 2 resembled Class 1 in regards to organizational memberships, degree of popularity, and number of close friends, with the

exception that Class 2 had slightly higher probabilities. The main difference between Class 1 and 2 is religious participation. Class 2 individuals and their parents reported going to religious services at least once a month or more in adolescence. However, by young adulthood and adulthood, Class 2 individuals reported lower religious participation at less than once a month.

**Class 3: High in Social Context** Seventeen percent of individuals was classified into Class 3's high in social context. Key features of this class included a high degree of organizational memberships and low religious participation throughout the life course. Sixty percent of parents were involved in organizational memberships. Volunteering was also high in young adulthood (41%) and adulthood (49%). Religious participation was low in adolescence, but increased slightly in young adulthood and adulthood. Civic participation was high in both young adulthood (61%) and adulthood (87%). The degree of popularity and number of close friends were the highest of all four classes.

**Class 4: High in Religious Context** This class represents the highest overall social capital in terms of organizational memberships, but especially in religious participation. Twenty-seven percent of individuals made up Class 4. Parents of Class 4 individuals were the most involved in organizations (65%). Class 4 individuals were also the most involved in school organizations, sports, young adult organizations, and adult volunteering. Similarly, religious participation at each life stage was high with attendance of more than once a month in the past year. Voting in the last year was also high in both young adulthood (63%) and adulthood (85%). The degree of popularity and number of close friends were the second highest of all four classes after Class 3, however, the numbers were similar.

### **3.4.3 Demographic Characteristics**

I conducted a latent class analysis with covariates to examine the relationship of social capital class membership to gender, immigrant family, race/ethnicity, and marital status (by adulthood). In this analysis, a multinomial logistic regression was performed with social capital construct as the outcome. The high in religious context group (Class 4) served as the reference group. Additional analyses in a non-latent variable framework were conducted to compare each social capital class membership by demographic characteristics without having to refer to a reference group. Using the modal class assignments, I conducted cross-tabulations of social capital class membership and each covariate in Stata. I also included demographic characteristics of household size, family structure in adolescence, age and number of children in adulthood. Overall, these findings supported the multinomial logistic regression models in the latent variable framework. For ease of interpretation, Table 3.12 presents the bivariate relationships between demographic covariates and social capital in the non-latent framework.

The high in religious context, which constitutes 27% of the total sample, occurred more often among females (31%) than males (23%). In contrast, the persistently low (composed of 25% of the total sample) and the downwardly low (composed of 31% of the total sample) occurred less often among females (22% and 29%, respectively) than males (28% and 33%, respectively). By race/ethnicity, the high in religious context was most common among Blacks (36%) and Asians (33%), and less often among Whites (26%) and Latinos (22%). Being in the high in social context was more likely to occur among Whites compared to the other groups. Downward mobility, which made up a majority of the total sample, was more common among Latinos (40%) compared to Blacks (33%), Asians (31%), and Whites (27%).

Persistently low social capital was more usual for respondents from second generation (25%) and third generation or higher families (25%) than first generation families (22%). In



contrast, the downwardly low social capital was more usual for respondents from first generation families (38%), followed by second generation (37%) and third generation or higher (30%).

The high in religious context was most common among respondents from two-parent families than single-parent families or other family structure types. The opposite pattern was evident for the persistently low social capital group.

Adulthood characteristics revealed that the high in religious context was most common among those who were married (33%) followed by dating (30%), not in a relationship (23%), and cohabitation (17%). High in social context was more common among those dating or not in a relationship compared to the other groups. Being in the persistently low group occurred more frequently for respondents cohabitating (32%) followed by those not in a relationship (24%), dating (23%), and married (22%). Keeping in mind the relative size of each social capital group, the persistently low group had the highest mean number of children at 1.02 followed by the downwardly low (0.91), high in social context (0.74), and high in religious context (0.73) groups. A similar trend appeared for household size in adulthood where the downwardly low group had the largest household size (3.47) relative to the persistently low (3.35), high in social context (0.74), and high in religious context (0.73) groups.

In a non-latent variable framework, social capital latent class membership was also compared to characteristics of economic capital and human capital (Table 3.13). Overall, higher social capital groups (i.e., high in social context and high in religious context) also had higher income levels whether in adolescence, young adulthood, or adulthood. Home ownership had a different pattern where 30% of home owners were in the downwardly low group, followed by 27% in the high in religious context group. However, keep in mind that the downwardly low group made up the largest portion of the overall sample. For the human capital domain, both the

persistently low and downwardly low social capital were relatively common among those with lower education levels (whether mother's, father's, or respondent's education in adulthood). The high in social context and high in religious context were both relatively common among those with higher education levels.

### **3.5 SUMMARY OF KEY FINDINGS**

Findings from the latent class analyses identified four latent classes for the domains of economic capital and social capital, and five latent classes for the domain of human capital. These latent classes captured the ebb and flow of social status advantages and disadvantages across adolescence (ages 12-17 in Wave I), young adulthood (ages 18-26 in Wave III), and adulthood (ages 24-32 in Wave IV).

Economic Capital: Within the economic capital domain, 17% of respondents were classified in the most economically disadvantaged group, 28% in the downwardly mobile group, 20% in the upwardly mobile group, and 35% in the most economically advantaged group. Class distinction was most apparent with household income in adolescence (W1), personal income in adulthood (W4), and indicators of economic hardship and public assistance from adolescence into adulthood.

These latent classes showed a more fluid pattern of economic capital development over the life course, and in particular, in the context of intergenerational transfers from parent to child and even child to parent. The downwardly mobile and most advantaged groups were very similar in adolescence, but by adulthood, there were clear distinctions by income, experiences of hardship and public assistance, and having health insurance. This pattern was also true for the most disadvantaged and the upwardly mobile groups. Home ownership as a sign of wealth was also apparent among the top two economic capital groups. Roughly one-half of respondents in

the upwardly mobile and most advantaged groups owned a home, in comparison to less than a quarter of respondents in the most disadvantaged and downwardly mobile groups. Those at the bottom and the upwardly mobile groups received little financial support from their parents in comparison to the downwardly mobile and most advantaged groups. Yet by adulthood, the most disadvantaged and the upwardly mobile were also more likely to provide financial support to their parents. The lack of financial support to parents by the downwardly mobile and the most advantaged may be because the parents do not need financial support compared to the other two groups who are from more disadvantaged households.

Human Capital: The five classes for the human capital domain were most differentiated by education levels and occupation types of both parents and adult respondents. Overall, respondents' education levels were similar to that of their parents. The group with the persistently low human capital (Class 1) had low parent and respondent education levels and working parents in adolescence (20%). Composed of 21% of the sample, Class 2 respondents had lower parent education levels than Class 1 and only one working parent in adolescent. However, by adulthood, their education levels were higher than that of Class 1. Furthermore, Class 2 had more respondents who continued schooling after high school than Class 1. One third of respondents were classified into Class 3, which is characterized by medium education levels of parents and working parents. Individuals in this group showed signs of upward mobility with higher education levels than both their parents by adulthood, and 30% of them reported having a professional/managerial occupation. The last two groups have high human capital in the context of education. Ten percent of respondents were classified into the high with early parental investments group (Class 4) with high levels of education and early parental investments with a non-working mother in adolescence. Nineteen percent of respondents were classified into the

persistently high human capital group (characterized by having the highest levels of education and occupation types).

These findings pointed to more static (non-fluid) characteristics of human capital formation in the life course. With the exception of Class 3, the upwardly mobile group, respondents achieved similar education levels as their parents. The stickiness associated with education may point to parents' transmission of values toward educational attainment early in the life course or could reflect parents' abilities to help their child achieve educational milestones. Occupation types have a similar stickiness concept where respondents report similar jobs as their parents. However, sales/service occupations remain the most common type for all respondents, and thus, each class has a large percentage of respondents in sales/service. Class 3 was the anomaly in relation to education levels and occupation types. Respondents in this group achieved higher education levels and more white-collar occupations than their parents. One explanation is that respondents from immigrant families were more likely to be in this group (in comparison to the group with the highest human capital). Past literature has found a degree of upward mobility in education and occupation among children of immigrant families (Portes & Zhou 1993, Zhou & Bankston 1998).

Social Capital: The most salient indicators of social capital included organizational or voluntary memberships and religious participation. One quarter of respondents fell into the persistently low social capital group (low levels of religious participation and low levels of organizational membership throughout the life course), followed by 31% of respondents who are in the downwardly low social capital group (a high level of adolescent religious participation and low level of organizational participation, with religious participation tending to fall off by adulthood). For the high in social context group, sixteen percent of respondents were classified

into this group characterized by a low level of religious participation that increased slightly by adulthood and a high level of organizational membership. Twenty-seven percent of respondents were in the high in religious context social capital group, which is characterized by high levels of religious participation and high levels of organizational membership throughout the life course.

Social capital findings also reflected a more static (non-fluid) characteristic across the life course. Although organizational and religious participation can wax and wane through the life course, there was a general trend of similarity in adolescence, young adulthood, and adulthood. For example, Class 1's persistently low social capital, characterized by the least parental involvement and school club membership in adolescence, was also the least involved in volunteering and voting in adulthood. Also, this group had the lowest number of reported close friends in adulthood, relative to the other groups. The same pattern held at the other side of the spectrum among the high in religious context group. The key exception was evident with religious participation among the two middle groups. Class 2's downwardly low group had high adolescent religious participation despite low organizational memberships at all other life stages. Yet, this religious participation declined by adulthood. In contrast, Class 3's high in social context had low adolescent religious participation in comparison to their high levels of organizational memberships from adolescence to adulthood. Their religious participation increased slightly by young adulthood and adulthood.

The descriptive findings of life-course social status from this chapter serve to set the stage for examining the remainder of study aim #1. The latent classes of economic capital, human capital, and social capital are analyzed in relation to substance use behaviors of smoking and heavy episodic drinking in adulthood. The next chapter discusses the results of the key focal relationship of each life-course social capital domain and substance use behavior.

**Table 3.1 Sample Demographic Characteristics, n=9,093**

Demographic Characteristics	Mean (SD) or Percent
<i>Adolescence (W1)</i>	
Male	49.9
Race/Ethnicity	
White	69.9
Black	15.3
Latino	11.3
Asian	3.6
Generational Status	
First generation	85.0
Second generation	11.4
Third generation or higher	3.6
Family Structure	
Two-parent family	60.0
Single parent family	37.1
Other	2.9
Mean Household Size	4.53 (1.56)
Mean Age	15.03 (1.64)
<i>Adulthood (W4)</i>	
Relationship Status	
Not in a relationship	8.4
Married	40.6
Cohabitation	25.6
Dating	25.4
Mean Number of Children	0.83 (1.03)
Mean Household Size	3.16 (1.58)
Mean Age	28.02 (1.65)

Notes: Data were adjusted for sample weights and corrected for clustering from the sample design.  
W1=Wave I data; W4=Wave IV data

**Table 3.2 Model Fit for One- to Six-Class Specification of Economic Capital Latent Class Analysis Model, n=9,093**

Number of Classes	Number of Parameters	Log-Likelihood	BIC*	VLM Likelihood Ratio Test*	p-value	Parametric Bootstrap LL Ratio Test	p-value
1	28	-242,962	486,179.80				
2	52	-238,655	477,783.69	8,614.87	< 0.01	8614.87†	< 0.01
3	76	-237,802	476,297.68	1,704.78	< 0.01	1,704.78	< 0.01
4	100	-237,160	475,231.82	1,284.62	< 0.01	1,284.62	< 0.01
5	124	-236,590	474,309.59	1,141.00	< 0.01	1141.00†	< 0.01
6	148	-236,219	473,786.34	742.012	< 0.01	742.01†	< 0.01

Notes: Unweighted data

\*BIC=Bayesian information criterion, VLM= Vuong-Lo-Mendell-Rubin test statistic, Parametric Bootstrap Likelihood Ratio Test

† = The best log likelihood value was not replicated in bootstrap draws. The p-value may not be trustworthy due to local maxima.

**Table 3.3 Four-Class Latent Model of Life-Course Economic Capital, n=9,093**

	Class 1	Class 2	Class 3	Class 4	
	Most Economically Disadvantaged	Economically Downward	Economically Upward	Most Economically Advantaged	TOTAL
<i>Percentage of Sample</i>	<b>16.1</b>	<b>29.7</b>	<b>19.6</b>	<b>34.5</b>	<b>100.0</b>
Sample size	1,464	2,703	1,785	3,142	9,093
<b>Conditional Response (continuous indicators)</b>	<i>Mean Response</i>				
W1 Household Income <sup>a</sup>	\$22,625	\$65,726	\$31,624	\$89,353	\$56,881
W3 Personal Income <sup>a</sup>	\$6,695	\$9,915	\$15,017	\$13,046	\$11,349
W4 Personal Income <sup>a</sup>	\$8,715	\$17,795	\$31,560	\$43,998	\$26,649
W4 Total Assets (0-6) <sup>b</sup>	1.09	1.95	3.20	3.65	2.64
W4 Total Debt (0-5) <sup>b</sup>	1.92	2.62	2.83	2.95	2.67
<b>Item-response probabilities (categorical indicators)</b>	<i>Probability of a Yes response</i>				
<b>ADOLESCENCE (W1)</b>					
Received Public Assistance <sup>c</sup>	68.4	11.3	43.3	8.2	26.5
Experienced Economic Hardship	36.8	6.9	35.5	3.8	16.8
No Health Insurance	61.4	9.1	46.1	2.6	19.6
<b>YOUNG ADULTHOOD (W3)</b>					
Received Public Assistance <sup>c</sup>	30.1	8.2	4.6	0.7	8.7
Experienced Economic Hardship <sup>d</sup>	49.2	25.5	21.0	12.8	24.4
No Health Insurance	40.2	18.7	26.8	2.7	18.8
Owens Home	9.8	7.9	18.6	9.6	11.0
Received help from family	34.8	48.5	23.5	54.9	43.0
<b>ADULTHOOD (W4)</b>					
Received Public Assistance <sup>c</sup>	68.9	28.5	11.1	2.6	23.2
Experienced Economic Hardship <sup>d</sup>	56.3	36.5	12.9	3.5	24.1
No Health Insurance	32.4	24.7	15.1	1.5	16.4
Owens Home	19.3	26.6	47.9	59.7	40.7
Received family help to purchase home	11.3	19.1	11.1	29.2	19.4
Received family help for living	21.5	23.4	7.8	7.3	14.5
Gave financial help to family	16.8	7.2	17.7	3.3	9.8

Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup> Income standardized to 2008 dollar value

<sup>b</sup> Total value of assets including bank accounts, retirement plans, and stocks: 0=<\$5K, 1=\$5K-\$9, 2=\$10K-24K, 3=\$25K-49K, 4=\$50K-99K, 5=\$100K-250K, 6=\$250K and higher; Total debt including all types of loans, credit card debt, medical or legal bills: 0=<\$1K, 1=\$1K-\$4, 2=\$5K-9K, 3=\$10K-24K, 4=\$25K-49K, 5=\$50K and higher.

<sup>c</sup> Receipt of public assistance is a count variable of the number of governmental benefits received in the past year. Benefits included general public assistance, Supplemental Security Income, temporary family assistance formerly referred as Aid to Families with Dependent Children, food stamps, housing subsidy/public housing, and unemployment or worker's compensation.

<sup>d</sup> Experiences of economic hardship is a count variable of the number of hardships experience in the past year. These include not having enough money to pay rent/mortgage or gas/electricity/oil bill, having the gas/electricity/oil was turned off or no telephone service due to lack of payment, and being evicted from the apartment.

**Table 3.4 Distribution of Economic Capital Latent Classes by Demographic Characteristics, n=9,093**

	Class 1	Class 2	Class 3	Class 4	
	Most Economically Disadvantaged (n=1,464)	Economically Downward (n=2,703)	Economically Upward (n=1,785)	Most Economically Advantaged (n=3,142)	TOTAL
<i>Mean</i>					
Household size in adolescence	4.96	4.22	4.88	4.35	4.53
Household size in young adulthood	3.69	3.37	3.49	3.17	3.38
Household size in adulthood	4.13	3.04	3.61	2.51	3.16
Age in adulthood (years)	28.14	27.83	28.27	27.97	28.02
Number of children in adulthood	1.55	0.79	0.96	0.43	0.83
<i>Percentage</i>					
Gender					
Male	11.6	28.8	23.4	36.2	100.0
Female	21.0	30.5	16.6	32.0	100.0
Race/Ethnicity					
White	11.5	31.8	16.4	40.3	100.0
Black	37.4	26.9	21.8	13.9	100.0
Latino	19.7	21.3	36.8	20.5	100.0
Asian	8.3	26.7	22.8	42.2	100.0
Generational Status					
First generation	14.3	20.8	36.1	28.8	100.0
Second generation	16.4	23.6	36.2	23.8	100.0
Third generation or higher	16.4	30.9	17.3	35.4	100.0
Family Structure in Adolescence					
Two-parent family	8.0	32.0	16.3	43.7	100.0
Single parent family	26.5	27.3	26.0	20.2	100.0
Other	41.7	17.1	30.0	11.2	100.0
Relationship Status in Adulthood					
Not in a relationship	28.6	36.0	13.4	22.0	100.0
Married	11.1	23.5	23.1	42.3	100.0
Cohabitation	21.4	32.7	20.2	25.7	100.0
Dating	14.8	33.8	17.2	34.2	100.0



**Table 3.5 Distribution of Economic Capital Latent Classes by Human and Social Capital Characteristics, n=9,093**

	Class 1	Class 2	Class 3	Class 4	
	Most Economically Disadvantaged (n=1,464)	Economically Downward (n=2,703)	Economically Upward (n=1,785)	Most Economically Advantaged (n=3,142)	TOTAL
<b>Human Capital Characteristics</b>					
Mom's Education (%)					
Less than high school	32.5	23.4	31.6	12.5	100.0
High school or GED	16.5	30.1	22.4	31.1	100.0
Some college or technical school	11.6	33.0	17.5	37.9	100.0
College degree	7.2	32.0	11.7	49.2	100.0
Graduate School	2.3	29.1	5.8	62.9	100.0
Father's Education (%)					
Less than high school	26.0	26.3	32.3	15.4	100.0
High school or GED	13.2	34.7	19.0	33.1	100.0
Some college or technical school	5.5	33.9	14.4	46.3	100.0
College degree	3.6	32.7	8.4	55.3	100.0
Graduate School	0.6	25.7	5.8	67.9	100.0
Respondent's Education by Adulthood (%)					
Less than high school	46.4	24.3	25.7	3.6	100.0
High school or GED	26.2	31.6	28.4	13.9	100.0
Some college or technical school	16.4	34.6	21.6	27.6	100.0
College degree	2.8	24.0	11.8	61.4	100.0
Graduate School	2.1	22.9	11.9	63.1	100.0
<b>Social Capital Characteristics</b>					
<i>Mean</i>					
Adolescent religion (0-3) <sup>a</sup>	1.47	1.71	1.67	1.89	1.72
Adult religion (0-3) <sup>a</sup>	1.16	1.13	1.24	1.25	1.20
Adult number of close friends (0-4) <sup>b</sup>	1.76	2.14	2.06	2.44	2.16
<i>Percentage (%)</i>					
Adolescent organizational membership	12.5	30.3	18.3	38.9	100.0
Adult volunteered in last year	9.8	26.9	17.5	45.8	100.0
Adult voted in last year	13.1	28.7	17.9	40.3	100.0

<sup>a</sup>Religious participation in the past year: 0=None, 1=Less than monthly, 2=Monthly, 3=Weekly.

<sup>b</sup>Number of close friends in adulthood: 0=None, 1=One to two, 2=Three to five, 3=Six to nine, 4=Ten or more

**Table 3.6 Model Fit for One- to Six-Class Specification of Human Capital Latent Class Analysis Model, n=9,093**

<b>Number of Classes</b>	<b>Number of Parameters</b>	<b>Log-Likelihood</b>	<b>BIC*</b>	<b>VLM Likelihood Ratio Test*</b>	<b>p-value</b>	<b>Parametric Bootstrap LL Ratio Test</b>	<b>p-value</b>
<b>1</b>	36	-278,972	558,271.22				
<b>2</b>	65	-272,893	546,378.79	12,156.77	< 0.01	12,156.77	< 0.01
<b>3</b>	94	-269,717	540,290.70	6,352.44	< 0.01	6,352.44†	< 0.01
<b>4</b>	123	-267,639	536,398.61	4,156.44	< 0.01	4,156.44†	< 0.01
<b>5</b>	152	-266,737	534,860.32	1,802.63	< 0.01	1,802.63†	< 0.01
<b>6</b>	181	-265,601	532,851.31	2,273.35	< 0.01	2,273.35	< 0.01

Notes: Unweighted data

\*BIC=Bayesian information criterion, VLM= Vuong-Lo-Mendell-Rubin test statistic, Parametric Bootstrap Likelihood Ratio Test

† = The best log likelihood value was not replicated in bootstrap draws. The p-value may not be trustworthy due to local maxima.

**Table 3.7 Five-Class Latent Model of Life-Course Human Capital, n=9,093**

	Class 1	Class 2	Class 3	Class 4	Class 5	
	Persistently Low	Low with Continued Adult Education	Upwardly Mobile	High with Early Parental Investments	Persistently High	TOTAL
<i>Percentage of Sample</i>	<b>20.4</b>	<b>20.9</b>	<b>29.6</b>	<b>10.4</b>	<b>18.6</b>	<b>100.0</b>
Sample size	1,856	1,904	2,694	945	1,695	9,093
<b>Conditional Response (continuous indicators)</b>	<i>Mean Response</i>					
<b>EDUCATION</b>						
Mom Education (1-5) <sup>a</sup>	2.05	1.82	2.40	3.11	4.00	2.59
Dad Education (1-5) <sup>a</sup>	1.93	1.84	2.33	3.71	4.07	2.68
W4 Adult Education (1-5) <sup>a</sup>	2.15	2.39	3.37	3.93	4.02	3.09
<b>WORK HOURS</b>						
Mom's Work Hour/Week	40.51	2.12	39.11	4.44	38.70	27.68
Dad's Work Hour/Week	39.02	34.95	42.17	42.38	43.22	40.33
W1 Adolescent Work Hour	16.79	12.81	13.75	9.83	14.20	13.84
W3 Young Adult Work Hour	32.01	28.79	27.09	19.62	22.26	26.69
W4 Adult Work Hour	41.60	39.29	40.15	40.99	42.23	40.74
<b>Item-response probabilities (categorical indicators)</b>	<i>Probability of a Yes response</i>					
<b>ADOLESCENCE (W1)</b>						
Mother present in adolescence	91.8	95.8	96.5	95.6	98.0	95.6
Father present in adolescence	63.4	70.0	74.6	88.5	81.5	74.1
Mother's occupation						
Not Working	0.2	63.6	0.3	43.2	0.0	18.3
Manual	18.6	3.8	8.9	2.7	1.6	7.6
Sales/Service	45.8	16.2	54.7	21.6	16.9	33.9
Other Professional <sup>b</sup>	15.3	3.0	15.7	13.8	60.6	21.4
Professional/Managerial	6.3	0.8	7.6	3.3	12.6	6.4
Other (unspecified)	13.9	12.6	12.7	15.3	8.3	12.3
Father's occupation						
Not Working	9.5	13.5	4.1	1.4	2.1	6.0
Manual	55.4	52.7	43.9	18.7	9.5	37.3
Sales/Service	14.2	11.7	17.0	15.8	15.7	15.0
Other Professional <sup>b</sup>	4.1	2.9	6.5	16.7	26.9	10.9
Professional/Managerial	6.1	5.0	10.6	35.7	36.8	17.3
Other (unspecified)	10.7	14.1	17.9	11.7	9.0	13.3
<b>YOUNG ADULTHOOD (W3)</b>						
Currently in School	4.3	15.6	50.9	73.9	68.9	39.8
Received Vocational Training	30.5	31.5	22.1	11.2	13.5	23.0
Received High School Degree	70.3	78.4	100.0	99.6	99.6	89.3

**ADULTHOOD (W4)**

Currently in School	3.6	10.3	23.6	21.2	22.1	16.2
Adult Occupation						
Not Specified	2.3	4.0	0.3	0.6	0.5	1.6
Manual	47.1	30.8	11.0	5.5	6.3	21.1
Sales/Service	43.6	48.4	46.6	30.2	28.9	41.3
Other Professional <sup>b</sup>	1.2	3.2	13.6	24.9	22.5	11.7
Professional/Managerial	5.8	13.6	28.6	38.8	41.7	24.3

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Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup> Education Level: 1=Less than high school, 2=High school graduate or GED, 3=Some College or Technical school, 4=College Graduate, 5=Graduate School

<sup>b</sup> Other professional includes community/social services, education/training/library, and arts/design/entertainment/sports/media occupations

**Table 3.8 Distribution of Human Capital Latent Classes by Demographic Characteristics, n=9,093**

	Class 1	Class 2	Class 3	Class 4	Class 5	
	Persistently Low (n=1,856)	Low with Continued Adult Education (n=1,904)	Upwardly Mobile (n=2,694)	High with Early Parental Investments (n=945)	Persistently High (n=1,695)	TOTAL
<i>Mean</i>						
Household size in adolescence	4.44	4.93	4.38	4.66	4.30	4.53
Household size in young adulthood	3.50	3.63	3.27	3.41	3.09	3.38
Household size in adulthood	3.65	3.60	3.08	2.58	2.54	3.16
Age in adulthood	28.32	28.09	27.96	27.48	27.99	28.02
Number of children in adulthood	1.21	1.21	0.81	0.43	0.38	0.83
<i>Percentage</i>						
Gender						
Male	26.5	21.5	24.2	9.5	18.4	100.0
Female	15.3	21.2	33.9	11.1	18.6	100.0
Race/Ethnicity						
White	19.5	18.3	29.7	11.6	20.9	100.0
Black	25.1	27.8	27.8	6.1	13.3	100.0
Latino	25.8	33.3	27.1	7.1	6.8	100.0
Asian	14.2	15.6	27.8	12.7	29.7	100.0
Generational Status						
First generation	10.4	25.6	33.8	10.1	20.1	100.0
Second generation	23.0	26.9	26.5	10.9	12.7	100.0
Third generation or higher	20.8	20.4	29.1	10.3	19.3	100.0
Family Structure in Adolescence						
Two-parent family	16.2	19.4	28.6	13.4	22.4	100.0
Single parent family	27.6	22.3	29.5	6.3	14.2	100.0
Other	19.5	51.6	19.9	3.8	5.2	100.0
Relationship Status in Adulthood						
Not in a relationship	22.9	26.3	26.2	9.4	15.3	100.0
Married	19.2	22.3	30.4	10.2	17.9	100.0
Cohabiting	26.0	22.6	27.9	8.4	15.0	100.0
Dating	17.8	16.6	29.0	12.6	24.0	100.0

**Table 3.9 Distribution of Human Capital Latent Classes by Economic Capital and Social Capital Characteristics, n=9,093**

	Class 1	Class 2	Class 3	Class 4	Class 5	TOTAL
	Persistently Low (n=1,856)	Low with Continued Adult Education (n=1,904)	Upwardly Mobile (n=2,694)	High with Early Parental Investments (n=945)	Persistently High (n=1,695)	
<b>Economic Capital Indicators</b>						
<i>Mean</i>						
Household Income in adolescence <sup>a</sup>	\$45,607	\$40,619	\$60,640	\$92,428	\$96,062	\$56,881
Personal Income in young adulthood <sup>a</sup>	\$17,456	\$14,386	\$15,088	\$12,586	\$14,073	\$11,348
Personal Income in adulthood <sup>a</sup>	\$26,959	\$25,620	\$32,265	\$38,253	\$41,937	\$26,649
<i>Percentage</i>						
Home ownership in adulthood	19.4	18.3	31.4	10.7	20.2	100.0
<b>Social Capital Indicators</b>						
<i>Mean</i>						
Adolescent religion (0-3) <sup>b</sup>	1.38	1.62	1.76	2.02	2.01	1.72
Adult religion (0-3) <sup>b</sup>	1.97	2.19	2.27	2.30	2.29	1.20
Adult number of close friends (0-4) <sup>c</sup>	0.95	0.91	1.19	1.38	1.54	2.16
<i>Percentage</i>						
Adolescent organizational membership	15.3	18.6	31.9	11.7	22.6	100.0
Adult volunteered in last year	12.0	13.9	32.5	15.4	26.2	100.0
Adult voted in last year	15.6	17.2	31.4	12.3	23.5	100.0

<sup>a</sup> Income standardized to 2008 dollar value

<sup>b</sup> Religious participation in the past year: 0=None, 1=Less than monthly, 2=Monthly, 3=Weekly.

<sup>c</sup> Number of close friends in adulthood: 0=none, 1=one to two, 2=three to five, 3=six to nine, 4=ten or more

**Table 3.10 Model Fit for One- to Six-Class Specification of Social Capital Latent Class Analysis Model, n=9,093**

Number of Classes	Number of Parameters	Log-Likelihood	BIC*	VLM Likelihood Ratio Test*	p-value	Parametric Bootstrap LL Ratio Test*	p-value
1	24	-126,236	252,690.29				
2	43	-120,665	241,720.99	11,142.50	< 0.01	11,142.50	< 0.01
3	62	-118,846	238,257.23	3,636.94	< 0.01	3,636.94†	< 0.01
4	81	-117,900	236,538.68	1,891.74	< 0.01	1,891.74†	< 0.01
5	100	-117,323	235,557.03	1,154.84	< 0.01	1,154.84†	< 0.01
6	119	-116,500	234,084.79	1,576.79	< 0.01	1,576.79†	< 0.01

Notes: unweighted data

\*BIC=Bayesian information criterion, VLM= Vuong-Lo-Mendell-Rubin test statistic, Parametric Bootstrap Likelihood Ratio Test

† = The best log likelihood value was not replicated in bootstrap draws. The p-value may not be trustworthy due to local maxima.

**Table 3.11 Four Latent-Class Model of Life-Course Social Capital, n=9,093**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	
	<b>Persistently Low</b>	<b>Downwardly Low</b>	<b>High in Social Context</b>	<b>High in Religious Context</b>	<b>TOTAL</b>
<i>Percentage of Sample</i>	<b>25.0</b>	<b>30.9</b>	<b>16.9</b>	<b>27.1</b>	<b>100.0</b>
Sample size	2,276	2,809	1,540	2,467	9,093
<b>Conditional Response</b>					
<b>(continuous indicators)</b>	<i>Mean Response</i>				
W1 Parent religion (0-3) <sup>a</sup>	0.79	2.01	1.17	2.62	1.73
W1 Adolescent religion (0-3) <sup>a</sup>	0.29	2.56	0.62	2.81	1.72
W3 Young adult religion (0-3) <sup>a</sup>	0.54	1.00	1.11	2.20	1.23
W4 Adult religion (0-3) <sup>a</sup>	0.56	0.96	1.16	2.07	1.20
W3 Young adult popularity (0-3) <sup>b</sup>	1.84	1.89	2.05	2.03	1.94
W4 Adult number of close friends (0-4) <sup>c</sup>	1.89	2.04	2.48	2.35	2.16
<b>Item-response probabilities</b>					
<b>(categorical indicators)</b>	<i>Probability of a Yes response</i>				
<b>ADOLESCENCE (W1)</b>					
Parent organizational membership					
None	59.5	52.8	40.5	35.1	47.4
One	30.3	31.9	33.6	38.4	33.6
Two or more	10.2	15.3	25.9	26.5	19.0
Adolescent organizational membership					
None	62.3	53.4	36.5	25.9	44.4
One	22.3	26.8	29.4	30.2	27.2
Two	9.1	11.5	15.3	20.5	14.3
Three or more	6.2	8.3	18.8	23.5	14.1
Adolescent sport participation	47.0	57.2	65.1	67.8	59.4
<b>YOUNG ADULTHOOD (W3)</b>					
Young adult organizational membership					
None	90.1	82.5	58.8	47.6	70.6
One	9.0	14.0	25.4	24.3	17.6
Two or more	0.8	3.5	15.7	28.1	11.8
Young adult voted in last year	18.2	31.2	60.7	63.0	42.0
<b>ADULTHOOD (W4)</b>					
Adult number of volunteer hours (%)					
None	85.2	78.5	50.8	39.9	64.7
1-19 hours	10.8	14.7	31.3	34.4	22.1
20+ hours	4.0	6.8	17.8	25.7	13.2
Adult voted in last year	39.9	56.0	87.3	85.4	65.6

Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup>Religious participation in the past year: 0=None, 1=Less than monthly, 2=Monthly, 3=Weekly.

<sup>b</sup>Perceived popularity in young adulthood: 0=not at all popular, 1=slightly popular, 2=moderately popular, 3=very popular

<sup>c</sup>Number of close friends in adulthood: 0=none, 1=one to two, 2=three to five, 3=six to nine, 4=ten or more

**Table 3.12 Distribution of Social Capital Latent Classes by Demographic Characteristics, n=9,093**

	Class 1	Class 2	Class 3	Class 4	
	Persistently Low (n=2,276)	Downwardly Low (n=2,809)	High in Social Context (n=1,540)	High in Religious Context (n=2,467)	TOTAL
<i>Mean</i>					
Household size in adolescence	4.4	4.65	4.33	4.61	4.53
Household size in young adulthood	3.39	3.47	3.27	3.35	3.38
Household size in adulthood	3.35	3.27	2.96	2.97	3.16
Age in adulthood	28.14	27.86	28.26	27.94	28.02
Number of children in adulthood	1.02	0.91	0.74	0.73	0.86
<i>Percentage</i>					
Gender					
Male	27.6	32.5	16.5	23.4	100.0
Female	22.4	29.3	17.4	30.9	100.0
Race/Ethnicity					
White	26.9	28.9	18.6	25.7	100.0
Black	16.2	33.4	14.4	36.0	100.0
Latino	25.4	40.2	12.1	22.4	100.0
Asian	25.4	30.8	11.1	32.8	100.0
Generational Status					
First generation	21.6	38.1	11.6	28.7	100.0
Second generation	25.5	36.7	14.1	23.7	100.0
Third generation or higher	24.9	30.0	17.5	27.6	100.0
Family Structure in Adolescence					
Two-parent family	20.5	30.5	16.4	32.6	100.0
Single parent family	32.1	31.1	17.7	19.1	100.0
Other	28.7	34.9	17.9	18.5	100.0
Relationship Status in Adulthood					
Not in a relationship	24.0	35.1	18.4	22.5	100.0
Married	22.0	29.0	15.9	33.2	100.0
Cohabiting	32.2	33.7	17.3	16.8	100.0
Dating	23.0	29.5	18.2	29.3	100.0



**Table 3.13 Distribution of Social Capital Latent Classes by Economic Capital and Human Capital Characteristics, n=9,093**

	Class 1	Class 2	Class 3	Class 4	
	Persistently Low (n=2,276)	Downwardly Low (n=2,809)	High in Social Context (n=1,540)	High in Religious Context (n=2,467)	TOTAL
<b>Economic Capital Indicators</b>					
W1 Household Income <sup>a</sup>	\$53,176	\$58,586	\$76,423	\$71,300	\$56,881
W3 Personal Income <sup>a</sup>	\$15,794	\$15,104	\$16,396	\$13,204	\$11,348
W4 Personal Income <sup>a</sup>	\$27,527	\$30,972	\$35,295	\$35,892	\$26,649
Home ownership in adulthood	20.8	29.7	18.1	27.2	100.0
<b>Human Capital Indicators</b>					
Mom's Education					
Less than high school	35.3	35.2	13.3	16.2	100.0
High school or GED	28.4	31.8	15.9	24.0	100.0
Some college or technical school	19.0	32.1	18.2	30.7	100.0
College degree	16.1	27.8	18.8	37.2	100.0
Graduate School	7.6	24.6	22.3	45.4	100.0
Father's Education					
Less than high school	34.8	36.1	12.4	16.7	100.0
High school or GED	27.2	32.0	16.4	24.4	100.0
Some college or technical school	19.1	31.9	18.3	30.8	100.0
College degree	14.6	27.1	17.4	40.9	100.0
Graduate School	10.4	23.9	24.6	41.2	100.0
Respondent's Education in Adulthood					
Less than high school	48.7	35.5	10.6	5.2	100.0
High school or GED	39.3	38.4	9.5	12.9	100.0
Some college or technical school	25.5	32.5	17.8	24.2	100.0
College degree	12.2	26.0	19.7	42.2	100.0
Graduate School	7.0	19.1	24.7	49.3	100.0

Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup> Income standardized to 2008 dollar value

## **CHAPTER 4: RESULTS – Relationship between Life-Course Social Status and Substance Use Behaviors**

### **4.1 INTRODUCTION**

The first study aim of this dissertation is to examine the effects of social status assessed cumulatively across the life course on smoking and alcohol behaviors in adulthood. The main hypothesis is that individuals with certain patterns of life-course social status are more likely to engage in these risky health behaviors than other patterns. Specifically, lower life-course economic capital, human capital, and social capital are hypothesized to have a higher prevalence of adult daily smoking and a lower prevalence of adult heavy episodic alcohol use.

As described in Chapter 1, social status is defined as the relative position of an individual in society as characterized by his/her economic, human, and social capitals (Krieger et al 1997, Oakes & Rossi 2003). In this study, social status is conceptualized as a multi-dimensional, life-course construct that captures the dynamic changes of social status from adolescence into adulthood. Chapter 3 discussed the development of the three life-course social status constructs of economic, human, and social capitals through latent class analysis (LCA) using data from the National Longitudinal Study of Adolescent Health (Add Health). LCA findings identified four latent classes for the domains of economic capital and social capital, and five latent classes for the domain of human capital. These latent classes captured the ebb and flow of social status advantages and disadvantages across adolescence (ages 12-17 in Wave I), young adulthood (ages 18-26 in Wave III), and adulthood (ages 24-32 in Wave IV).

Within the economic capital domain, 17% of respondents were classified in the most economically disadvantaged group, 28% in the downwardly mobile group, 20% in the upwardly mobile group, and 35% in the most economically advantaged group. The five classes for the human capital domain were most differentiated by education and occupation types of parents and

adult respondents. At the lower end, 20% of respondents fell into the persistently low human capital group and 21% fell into the low with continued adult education group. Thirty percent were classified into the upwardly mobile group. At the higher end, 10% of respondents were classified into the high with early parental investments group and 19% into the persistently high human capital group. For the social capital domain, one-quarter of respondents were categorized into the persistently low social capital group, followed by 31% who were in the downwardly low group, 17% in the high in social context group, and 27% in the high in religious context group.

This chapter investigates the relationship between these constructs of life-course social status and substance use behaviors within a latent variable framework. As described in the methods chapter, to achieve study aim #1, the focal outcome variable of smoking or alcohol was included into the social status latent class analysis model. Conceptually, smoking and alcohol are designated as a distal outcome in a latent class model, but methodologically, they are combined in the same model with the social status measures to create the latent classes (Collins & Lanza 2010, Muthen & Muthen 1998-2011). In a latent class model with a distal outcome, results show the probability of endorsing smoking or alcohol for each latent class. For example, the findings present the probabilities of reporting daily smoking among individuals in the most disadvantaged economic capital group, downwardly mobile group, upwardly mobile group, and the most advantaged economic capital group.

These results differ from a variable-oriented approach such as regression analysis. Regression models examine how the expected value of the dependent variable (i.e., likelihood of smoking or engaging in heavy episodic drinking) changes in relation to the independent variable (i.e., four-category social status construct). By investigating study aim #1 within a latent variable framework, we can compare the prevalence of each distal outcome across social status subgroups

or latent classes and test for statistical significance by designating one of the subgroups as the reference group. Furthermore, by running the distal outcome within the latent class model, the misclassification error of an individual's group membership remains constant within the latent classes (Muthen & Muthen 1998-2011). However, one disadvantage of using latent class analysis is the potential alteration of the original latent class models when including alcohol and smoking as the distal outcome. Therefore, it is important to assess whether there is minimal or substantial changes in the LCA classes after adding in the distal outcome. If there are substantial changes to the latent classes, then re-interpretation of the relationship between social status and smoking/alcohol behaviors is required.

This chapter starts with describing the patterns of smoking and alcohol behaviors across the life course and by demographic characteristics. Then the findings of the LCA models with a distal outcome are presented for each social status dimension. Results on smoking behaviors are presented first, followed by the results for alcohol behaviors.

## **4.2 SMOKING BEHAVIORS**

### **4.2.1 Descriptive Statistics**

A brief description of smoking behaviors in adolescence (ages 12-17 in Waves I), young adulthood (ages 18-26 in Wave III), and adulthood (ages 24-32 in Wave IV) from Add Health is presented in Table 4.1. Overall, the proportion of respondents who ever smoked (defined as those who reported smoking a cigarette at least once in their life) or ever smoked regularly (defined as those who reported smoking at least one cigarette every day for a 30-day period) increased from Wave I to Wave IV. Furthermore, the prevalence of current smoking (defined as smoking at least one cigarette in the last 30 days) rose from 26% in adolescence to 39% in

adulthood. Similarly, the proportion of individuals who ever smoked and tried to quit increased from 21% in adolescence to 35% in adulthood.

In Table 4.2, current smoking at each life stage of adolescence, young adulthood, and adulthood is used to describe various smoking typologies in this sample. These typologies combined the status of respondents' current smoking behavior in the last 30 days (yes or no) in Wave I, Wave III, or Wave IV. Over half of respondents have never engaged in current smoking behavior at any of the three life stages. Approximately 14% reported smoking in young adulthood and in adulthood, and another 8% only reported smoking in adulthood. Ten percent of respondents have maintained current smoking behaviors across the three life stages.

Table 4.3 presents findings of smoking behaviors in adulthood. One in two respondents reported having ever smoked regularly by adulthood. Past month behaviors highlighted a small subset of intermittent smokers who smoked anywhere from one day to almost every other day (15%). Almost one-quarter (24%) of respondents reported smoking every day in the last 30 days. Among these daily smokers, over half smoked at least 11 cigarettes a day including 10% who reported smoking more than 20 cigarettes a day.

To provide more demographic context to the smoking behaviors, Table 4.4 shows current smoking behavior by demographic characteristics in adulthood. Males were more likely to be current daily smokers than females. There was no difference by age in smoking behavior. Minorities and respondents from immigrant families (both first generation and second generation) were less likely to be current smokers relative to the proportion of current smokers among whites and respondents who were third generation or higher. Respondents from single-parent households or other type of household in adolescence were more likely to be current smokers than those from two-parent households in adolescence. Respondents who are not in relationships

or cohabitating with partners were more likely to be current smokers. The average number of children among respondents who were current smokers was 1.06 compared to the average among respondents who were non-smokers was 0.80.

## **4.2.2 Social Status and Smoking**

### ***4.2.2a. Economic Capital***

Results from the latent class analysis with smoking are presented in Table 4.5. The economic capital indicators and probability of endorsement for each latent class are also shown. When including smoking in the latent class model, the pattern of response probabilities for each class, uniqueness of classes, and class sizes remained largely similar to the original economic capital model without smoking (which was presented in Chapter 3). The most disadvantaged group was characterized by respondents who reported the lowest levels of income and highest proportions of public assistance and economic hardship experiences from adolescence into adulthood. When smoking was included in the latent class model, over one-third of respondents (37%) in the most disadvantaged group reported daily smoking. In contrast, the most economically advantaged group reported the lowest prevalence of daily smoking at 10%. This group represented the highest levels of income and lowest proportions of public assistance and economic hardship. With a more advantaged family background in adolescence, daily smoking was more prevalent in the downwardly mobile group than in the upwardly mobile group. For the downwardly mobile group, high adolescent economic capital (as characterized by high income, low receipt of public assistance and little economic hardship) does not serve as a protective factor for daily smoking in adulthood. Their prevalence of smoking (33%) was similar to that of the most disadvantaged group (37%) and higher than that of the upwardly mobile group (22%).

Although their economic capital was low in adolescence, respondents in the upwardly mobile group have a more similar smoking prevalence to the most economically advantaged group.

In additional analyses comparing the observed variables between latent classes, smoking prevalences for the most disadvantaged group, economically downward group, and economically upward group were all significantly higher than the reference group (most economically advantaged group) at p-values of less than 0.001.

#### ***4.2.2b. Human Capital***

Table 4.6 presents findings from the latent class analysis of human capital with smoking. This model with smoking was similar to the original human capital model without smoking (presented in Chapter 3) in relation to the response probabilities, class interpretation, and size of class. There was a bifurcation of smoking prevalence between the human capital groups. The two lowest human capital groups have the largest prevalence of smoking and the three highest human capital groups have the smallest prevalence of smoking.

The persistently low human capital group was characterized by low education levels and manual or sales/service occupations for both parents and respondents. The daily smoking prevalence was highest across all groups at 42%. Compared to the previous group, the low with continuing adult education group possessed slightly higher adult education levels. This group reported a slightly lower daily smoking prevalence at 30%.

Class 3's upward mobility represented a shift from low-to-medium human capital levels. Adolescent households included parents with lower education and occupation types. Individuals in this group showed signs of upward mobility with higher education levels than both their parents by adulthood, and 30% of them reported having a professional/managerial occupation. The smoking prevalence of this group was much lower at 14% than the previous two groups.

The high with early parental investments group included respondents with high education levels of parents and adult respondents. This group reported the lowest daily smoking prevalence of all groups at 12%. The persistently high human capital group was characterized with parental educational attainment of some college and respondents' adult educational attainment of college graduate. Growing up in a dual-wage earner household, the mother's occupation was most likely under other professional type and father's occupation was most likely under professional/managerial type. Similarly, respondents' adult occupation was in the professional/managerial category followed by sales/service. This group with the highest human capital reported a prevalence of daily smoking of 14%.

In separate analyses, the smoking prevalences were found to be significantly higher for the persistently low and low with continuing education groups in reference to the persistently high group at p-values of less than 0.001. In reference to the persistently high group, the smoking prevalence was significantly lower for the upwardly mobile ( $p=0.013$ ) and high with early parental investments ( $p<0.001$ ) groups.

#### ***4.2.2c. Social Capital***

Table 4.7 presents the results of the latent class analysis of social capital with smoking. After including smoking into the latent class model, there was very little change in terms of the pattern of response probabilities for each class, uniqueness of classes, and class sizes from the original social capital model without smoking (which was presented in Chapter 3). From low to high social capital, there was a clear demarcation of daily smoking prevalence. The persistently low social capital group has the highest prevalence of daily smoking while the high with religious context social capital group has the lowest prevalence of daily smoking. Separate



analyses revealed that the smoking prevalence was significantly higher for each social capital group in reference to the high in religious context group at p-values less than 0.001.

The persistently low social capital group (Class 1) was characterized by low levels of adolescent and adult organizational memberships, low levels of parental organizational memberships, and low frequency of religious participation throughout the life course. In addition, individuals in this group have the smallest number of people they would identify as close friends in adulthood. The prevalence of daily smoking for this group was 37%. Despite high levels of religious participation in adolescence, the group with downward social capital (Class 2) possessed a high smoking prevalence (32%), which is similar to the persistently low social capital group. This downwardly low group had low levels of organizational memberships by adulthood and a low number of close friends in adulthood.

The high in social context group (Class 3) was characterized by high levels of social capital and a lower prevalence of daily smoking at 16%. This group has high levels of organizational memberships throughout the life course, a low-to-medium frequency of religious participation, and the highest number of close friends in adulthood. The high in religious context group (Class 4) reported a daily smoking prevalence of 7%. Individuals in this group have parents with high levels of organizational memberships, and they themselves reported high levels of organizational memberships and frequent religious participation throughout the life course.

## **4.3 ALCOHOL BEHAVIORS**

### **4.3.1 Descriptive Statistics**

A brief overview of alcohol behaviors in adolescence (Wave I), young adulthood (Wave III), and adulthood (Wave IV) is presented in Table 4.8. There was a steady increase in respondents who ever drank alcohol from Wave I to Wave IV. Over half of respondents have

reported drinking alcohol at least once by adolescence, and this proportion increased to 80% by adulthood. Furthermore, the frequency of alcohol consumption on a weekly basis rose from 8% in adolescence to 32% in adulthood. Similarly, the proportion of individuals who engaged in heavy episodic drinking (i.e., at least 4 drinks for females and 5 drinks for males in one sitting) on a monthly basis in the last 12 months increased from 10% in adolescence to 22% in adulthood.

Table 4.9 shows the typologies of monthly heavy episodic drinking across each life stage of adolescence, young adulthood, and adulthood. Respondents were asked how often they engaged in heavy episodic drinking in the previous 12 months. Monthly heavy episodic drinking is defined as those who reported engaging in this behavior anywhere from 2-3 times a month to every day. Typologies were created that combined the status of respondents' monthly heavy episodic drinking status (yes or no) in adolescence, young adulthood, and adulthood. More than half of respondents have never engaged in monthly heavy episodic drinking at any of the three life stages. Thirteen percent only engaged in this behavior in young adulthood, and an additional 10% of respondents continued from young adulthood into adulthood. Ten percent reported engaging in monthly heavy episodic drinking in adulthood. Only 2% of respondents have engaged in monthly heavy episodic drinking at each stage of the life-course.

Since the outcome of interest is alcohol behavior in adulthood, Table 4.10 displays these data on adult behaviors. Close to 19% of respondents have never drunk alcohol by adulthood. One-quarter of respondents did not drink alcohol in the past year. Another 25% of respondents were infrequent drinkers who consumed alcohol between 1-2 days of the year to once a month or less. In contrast, almost one-third of respondents reported drinking on a weekly basis in the previous 12 months with 12% who engaged almost every day or daily. Finally, 22% of respondents engaged in heavy episodic drinking on a monthly basis in the last 12 months.

Taking a closer look at who is engaging in monthly heavy episodic drinking in adulthood, Table 4.11 presents the relationship between alcohol behaviors and demographic characteristics. Males were more likely to be heavy episodic drinkers compared to females. There is little difference by age in alcohol behaviors. Whites and third generation or higher respondents were more likely to engage in heavy episodic drinking relative to their other counterparts by race/ethnicity and generational status. Respondents growing up in a two-parent household in adolescence were more likely to be heavy episodic drinkers compared to the other household types in adolescence. Respondents who are dating or cohabitating with partners were more likely to be heavy episodic drinkers. The average number of children among respondents who were heavy episodic drinkers was the smallest (0.60) compared to non-heavy episodic drinkers (0.81) and non-drinkers (1.19).

### **4.3.2 Social Status and Heavy Episodic Drinking**

#### ***4.3.2a. Economic Capital***

To examine the relationship between economic capital and monthly heavy episodic drinking, a latent class analysis model of economic capital with drinking was conducted. Table 4.12 shows each economic capital indicator and the probabilities of endorsement for each latent class. When including heavy episodic drinking in the latent class model, the pattern of response probabilities for each class, uniqueness of classes, and class sizes remain largely similar to the original economic capital model without drinking (which was presented in Chapter 3).

Fifteen percent of respondents in the most economically disadvantaged group reported engaging in monthly heavy episodic drinking. In addition, only half of respondents in this group reported drinking any alcohol in the past year. In contrast, the most economically advantaged group reported the highest prevalence of monthly heavy episodic drinking at 27%. Few

respondents (13%) in this group reported not drinking any alcohol in the past year. The downwardly mobile group also reported a high prevalence with 24% endorsing monthly heavy episodic drinking. For the upwardly mobile group, the drinking prevalence was only slightly higher than that of the most disadvantaged group at 19%. There is no clear pattern across the four groups of economic capital for heavy episodic drinking in adulthood.

Additional analyses were conducted to examine whether HED (vs. non-HED) is statistically significant between economic capital groups. There was a significant difference of higher HED for the downwardly mobile, upwardly mobile and most advantaged groups when compared to the reference group of the most disadvantaged ( $p\text{-value} < 0.01$ ). Furthermore, when comparing the downwardly mobile group to the most advantaged group, there was a significant difference where downwardly mobile group reported slightly lower likelihood than the most advantaged group ( $p\text{-value} < 0.01$ ).

#### ***4.3.2b. Human Capital***

Table 4.13 presents findings from the latent class analysis of human capital with monthly heavy episodic drinking. After including drinking into the latent class model, there is very little change in terms of the pattern of response probabilities for each class, uniqueness of classes, and class sizes from the original human capital model without drinking (as presented in Chapter 3).

Overall, lower human capital groups (persistently low and low with continuing adult education) had a higher proportion of respondents who did not drink alcohol in the past year compared to the higher human capital groups (upwardly mobile, high with early parental investments, and persistently high). Class 2's low with continuing adult education reported the smallest prevalence of heavy episodic drinking. Seventeen percent of individuals in this group endorsed the behavior. In contrast, all other human capital groups had similar and larger heavy

episodic drinking prevalences. The persistently high human capital group (as depicted by the highest education levels among parents and adult respondents) and the persistently low human capital group (as characterized by low education) each reported the largest prevalence at 25%. Twenty-two percent of Class 3 respondents (defined as the upward mobility group) and Class 4 respondents (defined as the high with early parental investments) reported heavy episodic drinking. Similar to economic capital, there is no clear pattern between human capital latent groups and monthly episodic drinking in adulthood.

In separate analyses, the low with continuing education, upwardly mobile, and high with early parental investment group all reported significantly lower HED prevalence compared to the persistently low human capital group ( $p < 0.001$ ). Although there was a significant HED difference between the persistently low and persistently high groups ( $p < 0.001$ ), the prevalences were the same for each group.

#### ***4.3.2c. Social Capital***

Results from the latent class model of social capital with heavy episodic drinking are presented in Table 4.14. This model with drinking is similar to the original social capital model without drinking (as presented in Chapter 3) in relation to the response probabilities, class interpretation, and size of class.

The two groups with the lowest social capital had the same monthly heavy episodic drinking prevalence of 26%. The high with social context group (Class 3) also possessed a similar drinking prevalence of 24%. The high with religious context group (Class 4) reported the smallest prevalence of monthly heavy episodic drinking at 12%. Religion in adulthood may play a strong role in the relationship between social capital and heavy episodic drinking. Among all the latent classes, the high with religious context group was characterized by having the most

frequent participation in religious services in adulthood. This religious involvement may deter one's engagement in heavy episodic drinking. All other groups reported less than monthly attendance at religious services in the past year.

In further analyses, the HED prevalence was significantly lower for the downward and high in social context groups in reference to the persistently low group ( $p < 0.001$ ), but the difference was marginal. However, the HED prevalence was substantially lower for the high in religious context group in comparison to the persistently low group ( $p < 0.001$ ).

#### **4.4 SUMMARY OF KEY FINDINGS**

Smoking and alcohol behaviors tend to rise and fall over the life course. Descriptive statistics from this Add Health sample supported this notion of the increase of these risky behaviors from adolescence into adulthood. Yet a significant decline of these risky behaviors has yet to be captured. Current smoking in the past month increased from adolescence (Wave 1) to adulthood (Wave IV). Heavy episodic drinking peaks in young adulthood (Wave III) at 25%, but falls slightly to 22% in adulthood. Overall, the persistence of these behaviors across the life course was small where 11% of the sample reported the continuation of current smoking behaviors and 2% of the sample reported continuation of heavy episodic drinking from adolescence into adulthood. Yet when we focus on adult behaviors, 14% started smoking in young adulthood and continued into adulthood, and an additional 8% started in adulthood. For alcohol, 13% only engaged in monthly heavy episodic drinking in young adulthood. In comparison, 9% started and continued this behavior from young adulthood to adulthood, and 10% started in adulthood. The transition to early adulthood clearly marks a time when risky health behaviors can become habitual and part of one's lifestyle.

To address the first study aim of the effects of life-course social status on smoking and alcohol behaviors in adulthood, two Wave IV outcomes were used: daily smoking and monthly heavy episodic drinking. From this sample, 24% and 22% engaged in daily smoking and monthly heavy episodic drinking in adulthood, respectively. Findings from the latent class analysis supported the hypothesis that lower life-course social status has a higher association with adult daily smoking. For each of the social status domains, the most economically disadvantaged group (37%), the two lowest human capital groups (42% and 30%, respectively), and the persistently low social capital group (37%) all reported the highest daily smoking prevalences. Furthermore, a clear pattern exists where low social status, regardless of domain, is associated with higher smoking behaviors.

The second hypothesis that lower life-course social status is associated with lower engagement in heavy episodic alcohol use in adulthood was only partially supported. The most economically disadvantaged group and the second lowest human capital group (low with continuing education) reported the smallest prevalence of monthly heavy episodic drinking (15% and 17%, respectively). However, contrary to the hypothesis, the persistently low human capital and persistently low social capital groups reported high prevalence of monthly heavy episodic drinking at 25% and 26%, respectively. Furthermore, there was no clear pattern of high social status with heavy episodic drinking. Rather, there was a different pattern of heavy episodic drinking for each of the social status domains, suggesting a complex picture that may be difficult to disaggregate. Respondents with high adolescent economic capital (i.e., the most economically advantaged group and the downwardly mobile group) have larger endorsements of heavy episodic drinking (27% and 24%, respectively), perhaps confirming other research suggesting that adolescence is particularly important in the development of problem drinking. For human

capital, all groups except for the Class 2's low with continuing education group have similar drinking prevalences (between 22-25%), possibly reflecting a common culture of heavy episodic drinking across human capital levels. Finally, the effect of social capital on monthly heavy episodic drinking may reflect religious participation more than social context of organizational memberships or civic participation. The high with religious context group reported the lowest drinking prevalence at 12%. All other groups showed similar drinking prevalences (between 24-26%). In summary, life-course social status differentially influences smoking and alcohol behaviors.



**Table 4.1 Descriptives of Smoking Behaviors across the Life Course, n=8,078**

Smoking Behaviors	Wave I	Wave III	Wave IV
	Adolescence	Young Adulthood	Adulthood
	Percent	Percent	Percent
Ever smoked	57.1	64.1	67.8
Ever smoked regularly <sup>a</sup>	23.0	43.3	47.2
Current smoker <sup>b</sup>	26.2	35.3	38.6
Ever tried to quit (among those who ever smoked)	n=4,975 20.7	n=5,347 27.4	n=5,680 34.8

<sup>a</sup> Ever smoked regularly is defined as those who reported smoking at least one cigarette every day for a 30-day period.

<sup>b</sup> Current smoker is defined as smoking at least one day in the last 30 days.

**Table 4.2 Life Course Smoking Typologies from Adolescence into Adulthood, n=9,093**

Typologies of Current Smoking in the Last 30 Days <sup>a</sup>	Unweighted Number	Weighted Percent
Never engaged in current smoking behaviors	5,109	52.4
Quitters	1,066	12.4
Smoked in young adulthood and adulthood	1,099	14.3
Smoked in adolescence and restarted in adulthood	194	2.5
Started smoking in adulthood	615	7.6
Persistent smoking from adolescence to adulthood	900	10.8

<sup>a</sup> Current smoker is defined as smoking a cigarette at least one day in the last 30 days.

**Table 4.3 Descriptives of Smoking Behaviors in Adulthood, n=9,093**

<b>Smoking Behaviors</b>	<b>Unweighted Number</b>	<b>Weighted Percent</b>
Ever smoked regularly <sup>a</sup>	3,847	47.0
Current smoking behaviors in the last 30 days:		
Current daily smokers	1,872	23.8
Current intermittent smokers	1,277	14.6
Former regular smokers	1,041	12.3
Never smoked regularly	4,903	49.2
Daily smoking in the last 30 days	1,872	23.8
Among current daily smokers:		
Less than 11 cigarettes per day	899	44.7
Cigarette consumption (11-20)	793	44.5
Cigarette consumption (>20)	176	10.8
Mean number of cigarettes (Range)	13.9 (1-100)	

<sup>a</sup> Ever smoked regularly is defined as those who reported smoking at least one cigarette every day for a 30-day period.

**Table 4.4 Smoking Behaviors by Demographic Characteristics, n=9,093**

	<u>% Non-Daily Smokers</u>	<u>% Daily Smokers</u>	<u>% Total</u>
	<u>n=7,221</u>	<u>n=1,872</u>	<u>n=9,093</u>
<b>Gender (W1)</b>			
Female	51.8	44.9	50.1
Male	48.2	55.1	49.9
p-value	<0.001		
<b>Race/Ethnicity (W1)</b>			
White	66.0	82.3	69.9
Black	17.1	9.7	15.3
Latino	12.9	5.8	11.2
Asian	4.0	2.2	3.4
p-value	<0.001		
<b>Generational Status (W1)</b>			
1st Generation	4.1	1.9	3.6
2nd Generation	12.7	7.1	11.4
3rd Generation or Higher	83.2	91.0	85.0
p-value	<0.001		
<b>Family Structure (W1)</b>			
Two-parent household	61.9	53.8	60.0
Single-parent household	35.3	42.6	37.1
Other	2.7	3.6	2.9
p-value	<0.001		
<b>Relationship Status (W4)</b>			
Not in a relationship	7.7	10.6	8.4
Married	43.9	30.3	40.6
Cohabitation	23.1	33.2	25.6
Dating	25.2	25.9	25.4
p-value	<0.001		

Notes: W1=Wave I data; W3=Wave III data; and W4=Wave IV data; p-values from chi-square tests of difference between groups.

**Table 4.5 Prevalence of Daily Smoking by Economic Capital Latent Classes**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	
	<b>Most Economically Disadvantaged</b>	<b>Economically Downward</b>	<b>Economically Upward</b>	<b>Most Economically Advantaged</b>	<b>TOTAL</b>
Class prevalence (%)	16.8	29.3	20.2	34.3	100.0
Sample size (n)	1,480	2,661	1,834	3,118	9,093
Prevalence of daily smoking in past month					
Percentage	37.2	33.0	22.3	9.7	23.8

**Table 4.6 Prevalence of Daily Smoking by Human Capital Latent Classes**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	<b>Class 5</b>	
	<b>Persistently Low</b>	<b>Low with Continued Adult Education</b>	<b>Upwardly Mobile</b>	<b>High with Early Parental Investments</b>	<b>Persistently High</b>	<b>TOTAL</b>
Class prevalence (%)	24.4	21.0	25.2	10.3	19.0	100.0
Sample size (n)	2,222	1,912	2,295	936	1,728	9,093
Prevalence of daily smoking in past month						
Percentage	42.0	30.3	13.7	11.8	13.9	23.8

**Table 4.7 Prevalence of Daily Smoking by Social Capital Latent Classes**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	
	<b>Persistently Low</b>	<b>Downwardly Low</b>	<b>High with Social Context</b>	<b>High with Religious Context</b>	<b>TOTAL</b>
Class prevalence (%)	25.4	30.7	16.6	27.3	100.0
Sample size (n)	2,310	2,791	1,510	2,483	9,093
Prevalence of daily smoking in past month					
Percentage	37.3	32.4	16.2	6.9	23.8

**Table 4.8 Descriptives of Alcohol Behaviors across the Life Course, n=8,857**

Alcohol Behaviors	Wave I	Wave III	Wave IV
	Adolescence	Young Adulthood	Adulthood
	Percent	Percent	Percent
Ever drank alcohol <sup>a</sup>	53.5	78.2	81.7
Past 12-months alcohol consumption			
No alcohol use	55.4	25.6	25.3
1-2 days	17.3	11.3	10.4
Once a month or less	11.9	16.7	15.3
2-3 days a month	7.3	15.7	17.0
Once a week or more	8.0	30.7	32.0
Alcohol behaviors in the past year <sup>b</sup>			
No alcohol use	55.4	25.6	25.3
Alcohol use but no monthly heavy episodic drinking	34.9	49.2	52.7
Monthly heavy episodic drinking	9.6	25.2	22.0

<sup>a</sup> Ever drank alcohol is defined as having drank alcohol at least once in their life.

<sup>b</sup> Monthly heavy episodic drinking is defined as having at least four drinks for female s or five drinks for males in one sitting on a monthly basis in the last 12 months.

**Table 4.9 Life Course Heavy Episodic Drinking Typologies from Adolescence to Adulthood, n=8,857**

Life Course Drinking Typologies for Monthly Heavy Episodic Drinking <sup>a</sup>	Unweighted Number	Weighted Percent
No monthly heavy episodic drinking	5,633	60.1
Only in adolescence	409	4.5
Only in young adulthood	1,076	13.4
Started in young adulthood into adulthood	716	9.7
Started in adulthood	868	10.2
Persistent monthly heavy episodic drinking	155	2.1

<sup>a</sup> Monthly heavy episodic drinking is defined as having at least four drinks for female s or five drinks for males in one sitting on a monthly basis in the last 12 months.

**Table 4.10 Descriptives of Alcohol Behaviors in Adulthood, n=9,093**

	<b>Unweighted Number</b>	<b>Weighted Percent</b>
Ever drank alcohol <sup>a</sup>	7,270	81.5
Alcohol consumption in the last 12 months		
No alcohol use	2,444	25.5
1-2 days	976	10.4
Once a month or less	1,407	15.2
2-3 days a month	1,561	16.9
Once or twice a week	1,756	20.3
Almost every day to daily	949	11.7
Alcohol behaviors in the last 12 months <sup>b</sup>		
No alcohol use	2,444	25.5
Alcohol use but no monthly heavy episodic drinking	4,865	52.4
Monthly heavy episodic drinking	1,784	22.1

<sup>a</sup> Ever drank alcohol is defined as having drunk alcohol at least once in their life.

<sup>b</sup> Monthly heavy episodic drinking is defined as having at least four drinks for females or five drinks for males in one sitting on a monthly basis in the last 12 months.

**Table 4.11 Alcohol Behaviors by Demographic Characteristics, n=9,093**

	<b>% No Alcohol Use in Past Year</b>	<b>% Non-Heavy Episodic Drinkers</b>	<b>% Heavy Episodic Drinkers<sup>a</sup></b>	<b>% Total</b>
	<b>n=2,444</b>	<b>n=4,865</b>	<b>n=1,784</b>	<b>n=9,093</b>
<b>Gender (W1)</b>				
Female	56.5	53.5	34.7	50.1
Male	43.5	46.5	65.3	49.9
	p-value	<0.001		
<b>Race/Ethnicity (W1)</b>				
White	56.8	72.5	78.6	69.9
Black	25.7	12.9	9.7	15.3
Latino	13.8	10.7	9.1	11.2
Asian	3.8	3.9	2.6	3.6
	p-value	<0.001		
<b>Generational Status (W1)</b>				
1st Generation	4.7	3.7	1.9	3.6
2nd Generation	13.4	11.2	9.8	11.4
3rd Generation or Higher	81.9	85.2	88.3	85.0
	p-value	<0.001		
<b>Family Structure (W1)</b>				
Two-parent household	54.5	61.8	61.8	60.0
Single-parent household	41.1	35.7	36.0	37.1
Other	4.4	2.6	2.2	2.9
	p-value	<0.001		
<b>Relationship Status (W4)</b>				
Not in a relationship	11.1	7.3	8.2	8.4
Married	47.2	43.9	25.5	40.6
Cohabitation	22.4	25.1	30.3	25.6
Dating	19.3	23.7	36.0	25.4
	p-value	<0.001		

Notes: W1=Wave I data; W3=Wave III data; and W4=Wave IV data; p-values from chi-square tests of difference between groups.

<sup>a</sup> Monthly heavy episodic drinking is defined as having at least four drinks for females or five drinks for males in one sitting on a monthly basis in the last 12 months.

**Table 4.12 Prevalence of Heavy Episodic Drinking by Economic Capital Latent Classes**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	
	<b>Most Economically Disadvantaged</b>	<b>Economically Downward</b>	<b>Economically Upward</b>	<b>Most Economically Advantaged</b>	<b>TOTAL</b>
Class prevalence (%)	16.7	29.0	19.9	34.4	100.0
Sample size (n)	1,518	2,634	1,809	3,132	9,093
Alcohol behaviors in past year (%) <sup>a</sup>					
No alcohol use	49.8	22.2	28.0	13.0	25.2
Used alcohol, but no monthly heavy episodic drinking	35.4	54.2	53.0	60.4	52.7
Monthly heavy episodic drinking	14.8	23.6	19.0	26.5	22.0

<sup>a</sup> Monthly heavy episodic drinking is defined as having at least four drinks for female s or five drinks for males in one sitting on a monthly basis in the last 12 months.

**Table 4.13 Prevalence of Heavy Episodic Drinking by Human Capital Latent Classes**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	<b>Class 5</b>	
	<b>Persistently Low</b>	<b>Low with Continued Adult Education</b>	<b>Upwardly Mobile</b>	<b>High with Early Parental Investments</b>	<b>Persistently High</b>	<b>TOTAL</b>
Class prevalence (%)	20.9	21	29.3	10.3	18.4	100.0
Sample size (n)	1,902	1,907	2,669	938	1,677	9,093
Alcohol behaviors in past year (%) <sup>a</sup>						
No alcohol use	30.2	38.8	21.8	16.3	14.7	25.2
Used alcohol, but no monthly heavy episodic drinking	45.2	43.9	56.4	62.2	59.9	52.7
Monthly heavy episodic drinking	24.6	17.3	21.8	21.5	25.3	22.0

<sup>a</sup> Monthly heavy episodic drinking is defined as having at least four drinks for female s or five drinks for males in one sitting on a monthly basis in the last 12 months.



**Table 4.14 Prevalence of Heavy Episodic Drinking by Social Capital Latent Classes**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	
	<b>Persistently Low</b>	<b>Downwardly Low</b>	<b>High with Social Context</b>	<b>High with Religious Context</b>	<b>TOTAL</b>
Class prevalence (%)	24.6	32.1	17.4	25.9	100.0
Sample size (n)	2,236	2,917	1,581	2,360	9,093
Alcohol behaviors in past year (%) <sup>a</sup>					
No alcohol use	27.5	23.0	19.2	31.0	25.2
Used alcohol, but no monthly heavy episodic drinking	46.2	50.6	56.5	57.5	52.7
Monthly heavy episodic drinking	26.3	26.4	24.3	11.5	22.0

<sup>a</sup> Monthly heavy episodic drinking is defined as having at least four drinks for females or five drinks for males in one sitting on a monthly basis in the last 12 months.

## **CHAPTER 5: RESULTS – Life-Course Social Status by Race/Ethnicity**

### **5.1 INTRODUCTION**

The second aim of this dissertation was to analyze the variation by race/ethnicity of the effects of social status captured cumulatively across the life course on alcohol and smoking behaviors in adulthood. This chapter describes the life-course social status patterns for each racial/ethnic group of non-Hispanic White (henceforth referred to as White), non-Hispanic Black (henceforth referred to as Black), Hispanic or Latino (henceforth called Latino), and Asian. The main hypothesis was that the social status patterns are similar across racial/ethnic groups, but the variation within these classes differs by racial/ethnic groups such that the levels of social status (e.g., income, education) are higher in one racial/ethnic group than another. As a result of these variations, being in a lower or higher life-course social status group may have different implications on substance use behaviors for Blacks, Latinos, and Asians compared to Whites. Each racial/ethnic group's experiences of advantaged or disadvantaged social status may have a different effect on substance use behaviors. Chapter 6 covers the second part of this study aim by examining the relationship between social status and substance use by racial/ethnic groups.

Using a person-oriented framework via latent class analysis, this chapter presents findings of the life-course social status construct by race/ethnicity. First, the best-fitting latent class models of economic capital, human capital, and social capital dimensions are presented for each racial/ethnic group of White, Black, Latino, and Asian. Through latent class analysis (LCA), latent constructs of social status were developed separately for each racial/ethnic group to determine whether there were statistical and substantive similarities for each domain of economic capital, human capital, and social capital. Similar to the analysis with the total analytic sample (presented in Chapter 3), a series of LCA models for economic capital, human capital

and social capital was tested specifying one to six classes using unweighted data because there are limited statistical tests to determine model fit when using survey weights in Mplus. Once the best LCA model was identified, this model was conducted using survey weights to adjust for the standard errors for the complex sample design. The best-fitting LCA models for economic capital, human capital, and social capital are presented separately for each racial/ethnic group. The chapter concludes with a summary of the key findings.

## **5.2 WHITES**

### **5.2.1 Economic Capital**

Respondents who self-identified as Whites made up over half of the Add Health analytic sample (n=5,294). Model fit statistics and conceptual reasoning provided support for a four-class LCA model of economic capital. The average posterior probability of being in a particular class for all the individuals that were assigned to that class ranged between 0.74 and 0.85 indicating low to moderate misclassification error. Table 5.1 shows the latent class prevalences for the four-class model of economic capital among White respondents, and the conditional response probabilities (for categorical indicators) and means (for continuous indicators) for each observed variable. The interpretability of the four classes resembled that of the overall sample presented in Chapter 3: Class 1—Most economically disadvantaged group (15%); Class 2—Economically downward group (32%); Class 3—Economically upward group (18%); and Class 4—Most economically advantaged group (34%). (Refer to Chapter 3 for descriptions.)

### **5.2.2 Human Capital**

Similar to the overall sample, the best fitting LCA model for human capital among White respondents was a five-class solution. The average posterior probability of being in a particular

class for all the individuals that were assigned to that class ranged between 0.83 and 0.94, which represents low misclassification error. Table 5.2 shows the latent class prevalences for the five-class model of human capital among White respondents. These human capital classes in the White sample resembled that of the overall sample presented in Chapter 3: Class 1—Persistently low (23%); Class 2—Low with continuing adult education (18%); Class 3—Upwardly mobile (29%); Class 4—High with early parental investments (12%) and Class 5—Persistently high (19%). (Refer to Chapter 3 for descriptions.)

### **5.2.3 Social Capital**

For the social capital domain, the best fitting LCA model for the White sample was a four-class solution. The average posterior probability of being in a particular class for all individuals that were assigned to that class ranged between 0.86 and 0.91, which represents low misclassification error. The latent class prevalences for the four-class model of social capital among White respondents and the descriptive characteristics for each observed variable by class are presented in Table 5.3. The interpretability of the four social capital classes resembled that of the overall sample presented in Chapter 3: Class 1—Persistently low (27%); Class 2—Downwardly low (30%); Class 3—High in social context (18%); and Class 4—High in religious context (24%). (Refer to Chapter 3 for descriptions.)

## **5.3 BLACKS**

### **5.3.1 Economic Capital**

The analytic sample was made up of 1,897 respondents who self-identified as Blacks. Model fit statistics showed support for a three-class LCA model. For this three-class model, the

average posterior probability of being in a particular class for all the individuals that were assigned to that class ranged between 0.82 and 0.92, which indicates low misclassification error.

Table 5.4 shows the latent class prevalences for the three-class model of economic capital among Black respondents, and the conditional response probabilities (for categorical indicators) and means (for continuous indicators) for each observed variable. Class 1 is labeled as the most economically disadvantaged group (44%), Class 2 as the economically upward group (25%) and Class 3 as the most economically advantaged group (30%).

**Class 1: Most Economically Disadvantaged** A large proportion of the Black respondents (44%) was categorized into Class 1. The most economically disadvantaged group was characterized by an adolescent economic environment of low household income, economic hardship, receipt of public assistance, and lack of health insurance. These experiences persisted into young adulthood and adulthood. Compared to the other two economic capital latent classes, they reported the lowest average household income in adolescence (\$22,133), as well as the lowest personal incomes in young adulthood (\$6,039) and adulthood (\$8,535). By adulthood, over half experienced economic hardship and only one in ten reported home ownership.

**Class 2: Economically Upward** One quarter of Black respondents were sorted into Class 2. The second latent class possessed characteristics of upward mobility during the transition from adolescence to adulthood. In adolescence, this group had comparable household incomes to the most disadvantaged group (\$23,092 compared to \$22,133, respectively). They also possessed similar adolescent experiences of economic hardship and receipt of public assistance to the most economically disadvantaged group. However, by young adulthood and adulthood, the mean personal income increased from \$11,688 to \$28,464. Compared to the other two classes, they represented the highest mean income in young adulthood and the second

highest in adulthood. Experiences of economic difficulty declined from adolescence to adulthood. This group received little family financial support in adulthood. Furthermore, this group was the most likely to provide financial support to their family members in adulthood.

**Class 3: Most Economically Advantaged** The most economically advantaged group among the Black sample was characterized by an economic environment with high incomes and little experiences of economic hardship during adolescence, young adulthood and adulthood. This group's income levels at each life stage were much greater than the average income levels of the total Black sample. Throughout the transition to adulthood, members of this group were least likely to have received public assistance or be without health insurance. Family financial support in young adulthood was highest across all groups (57%), and this group was also likely to receive financial support for their home purchase or renovation in adulthood (24%). Over a third of respondents owned a home by adulthood. However, this group provided little support back to family members in adulthood.

### **5.3.2 Human Capital**

Model fit statistics showed support for a four-class LCA model of human capital for the Black sample. The average posterior probability of being in a particular class for all the individuals that were assigned to that class ranged between 0.89 and 0.95, which represents low misclassification error. Table 5.5 shows the latent class prevalences for the four-class model of human capital among Black respondents, and the descriptive characteristics for each observed variable by class. Class 1 is labeled as persistently low human capital (29%), Class 2 as low with continuing adult education (40%), Class 3 as high with early parental investments (10%), and Class 4 as persistently high human capital (22%).

**Class 1: Persistently Low Human Capital** A little over one-quarter of Black respondents were classified into the persistently low human capital group. This group is characterized by having the lowest human capital levels (as indicated by education and occupation levels) among both parents and respondents themselves. Although education levels were lowest compared to all other classes, there was slight improvement in mean education level from parents to adult respondents. Both mothers and fathers reported an average level between less than high school and a high school degree, whereas, adult respondents had an average level over a high school degree. Yet despite this slight improvement, continued schooling in young adulthood remained low for this group. Vocational training outweighed post-secondary education, such that 34% of respondents received vocational training in young adulthood compared to only 11% and 9% who were currently in school in young adulthood and adulthood, respectively. Both parents reported working less than full-time in adolescence. A majority of mothers were not working, and fathers worked a mean of 22 hours per week and held jobs primarily in the manual sectors. Adult respondents had the lowest mean number of hours worked per week compared to the other three groups, and they worked primarily in sales/service occupations followed by manual occupations.

**Class 2: Low with Continuing Adult Education** A majority of Black respondents were categorized into this low with continuing adult education (40%). Class 2 showed some upward movement in their education and occupation levels from parents to adult respondents. However, this group maintained relatively low levels of human capital across the life course. This group had the second lowest parent and respondent education levels and occupation types after Class 1. Although their education levels and occupation types were fairly comparable to Class 1's persistently low group, a higher percentage of Class 2 respondents had graduated from high

school by young adulthood. Furthermore, more respondents continued to post-secondary schooling after adolescence which is evident by their higher mean education level in adulthood compared to Class 1. A majority of respondents have both parents working in adolescence with mothers working in primarily the sales/service sector and fathers working in primarily the manual sector. Most adult respondents in this group worked in sales/service sector (46%) followed by manual sector (33%).

**Class 3: High with Early Parental Investments** A small proportion of Black respondents were classified into this group of high human capital with early parental investments (10%). Human capital levels for this group were higher than the previous two classes, and there was an increase in education level and occupation type from parents to adult respondents. While the father's education level was higher than that of the mother's, the mean education level among adult respondents was higher than both parents. Furthermore, more than half continued on to post-secondary schooling in young adulthood and one-quarter were still in school in adulthood. Over half of mothers did not work in adolescence which creates an environment of early parental investments. This early investment was beneficial as evident by the higher human capital levels for respondents in adulthood. Fathers worked primarily in sales/service sector. For adult respondents, almost half reported working in sales/service sector (46%) and roughly one-third reported working in professional/managerial sector (29%).

**Class 4: Persistently High Human Capital** Twenty-two percent of Black respondents were classified into the persistently high group, which had the highest levels of human capital in the Black sample. Both parents' education levels were high with mothers having a higher mean compared to fathers (3.62 versus 3.29, respectively). Adult respondents had an even higher mean education level at 3.88, which is between some college and college graduate. Many respondents



continued to post-secondary schooling in young adulthood and adulthood. Both parents were working close to full-time with mothers working primarily in “other professional” occupations (45%) and fathers having a diverse set of occupations from manual (27%) and other professional (24%). Adult respondents worked primarily in professional/managerial occupations (37%), followed by sales/service (29%), and other professional (22%) occupations.

### **5.3.3 Social Capital**

LCA model building pointed to a four-class solution as the best-fitting model of social capital for the Black sample. The average posterior probability of being in a particular class for all the individuals that were assigned to that class ranged between 0.85 and 0.99, which shows low misclassification error. Table 5.6 shows the latent class prevalences for the four-class model of social capital among Black respondents, and the conditional response probabilities and means for each observed variable. Class 1 is labeled as the persistently low social capital group (31%), Class 2 as the downwardly low social capital group (19%), Class 3 as the high in social context group (22%), and Class 4 as the high in religious context group (29%).

**Class 1: Persistently Low Social Capital** One-third of Black respondents were categorized into Class 1. This persistently low social capital group of the Black sample was characterized by an overall low level of organizational and religious involvement during adolescence, young adulthood, and adulthood. One-third of parents were involved in organizations during adolescence. Furthermore, parents attended religious services on a less than monthly to a monthly basis. Respondents’ organizational involvement declined over time, but kept steady at low levels compared to all other groups. Religious involvement increased slightly from adolescence to adulthood, but remained at a low frequency. Civic participation increased from 38% in young adulthood to 68% in adulthood. Yet compared to other groups, Class 1

continued to have the lowest levels of civic participation. Degree of popularity in young adulthood for Class 1 was one exception. Respondents reported the second highest popularity (between moderately popular and very popular) after Class 4's persistently high in religious context group. Overall the number of close friends in adulthood was fairly comparable across classes with Class 1's ranging between one-to-two and three-to-five close friends.

**Class 2: Downwardly Low Social Capital** Approximately 18% of Black respondents were classified into the downwardly low social capital group. Compared to all other groups, this group reported the lowest levels of social capital for each indicator except for religion. Although they have similar characteristics to the lowest social capital group, Class 2's religious involvement was the second highest for parents (after Class 4's persistently high social capital group) and highest (and equaled to that of Class 4's level) for adolescent respondents. By adulthood, the respondent's degree of religious involvement decreased by half from a mean level of 4.00 (weekly) in adolescence to 2.07 (less than monthly) in adulthood.

**Class 3: High in Social Context** Twenty-two percent of Black respondents were classified into this high in social context group. This group was characterized by a downward shift in social capital levels where parents had higher organizational and religious involvement levels than adult respondents. Despite this downward shift, Class 3 had relatively high social capital levels compared to Classes 1 and 2. In respect to organizational memberships, almost half of parents (42%) were involved in organizational memberships compared to only 36% and 30% of respondents in young adulthood and adulthood. Religious involvement showed a similar pattern where parents reported a mean level of 3.22 (between monthly and weekly attendance) and adult respondents reported a mean level of 2.59 (between less than monthly and monthly

attendance). Yet compared to Classes 1 and 2, respondents reported higher organizational involvement, civic participation, and number of close friends in adulthood.

**Class 4: High in Religious Context** Twenty-nine percent of Black respondents were classified into this group of high social capital in the religious context. Both parents and adult respondents had the highest levels of religious and organizational involvement. Furthermore, these respondents had the highest level of civic participation in young adulthood (74%) and adulthood (91%). They also report the highest level of popularity in young adulthood as well as the highest number of close friends in adulthood. Even with higher levels of social capital, the distinguishing marker for this class is the high religious involvement throughout each life stage.

## **5.4 LATINOS**

### **5.4.1 Economic Capital**

There were 1,306 respondents who self-identified as Latino or Hispanic. Model fit statistics provided support for a three-class LCA model of economic capital for the Latino subsample. The average posterior probability of being in a particular class for all the individuals that were assigned to that class ranged between 0.83 and 0.88, which represents low misclassification error. Table 5.7 shows the latent class prevalences for the three-class model of economic capital among Latino respondents, and the conditional response probabilities (for categorical indicators) and means (for continuous indicators) for each observed variable. Class 1 was classified as the most economically disadvantaged group (25%), Class 2 as the economically upward group (45%) and Class 3 as the most economically advantaged group (29%).

**Class 1: Most Economically Disadvantaged** A quarter of Latino respondents (25%) were classified into the most economically disadvantaged group. This group did not have the lowest mean household income in adolescence, but had the second lowest after Class 2's

economically upward. They possessed the lowest personal incomes in young adulthood (\$7,045) and adulthood (\$10,263). Overall, this group was characterized by an adolescent economic environment with the most experiences of economic hardship, receipt of public assistance, and lack of health insurance. These experiences persisted into young adulthood and adulthood. Only 14% reported owning a home in adulthood.

**Class 2: Economically Upward** Almost half of the Latino respondents (45%) were classified into this economically upward group. The second latent class possessed characteristics of upward mobility from adolescence to adulthood. In adolescence, Class 2 had an even lower household income than the most disadvantaged group (\$28,225 versus \$31,953, respectively). However, the mean personal income grew to \$15,261 in young adulthood and \$33,017 in adulthood. Compared to the other two groups in this Latino sample, Class 2 represented the highest mean income in young adulthood and the second highest in adulthood. Their experiences of economic hardship, receipt of public assistance, and lack of health insurance were similar to the most economically disadvantaged in adolescence. By adulthood, these experiences have declined and resembled those of the most economically advantaged group. This group received little family financial support in adulthood. Furthermore, this group was the most likely to provide financial support to their family members in adulthood at 27%.

**Class 3: Most Economically Advantaged** Almost one-third of Latino respondents were categorized into the most economically advantaged group. This group was characterized by an economic environment with high financial resources and little economic hardship at each life stage. Their income levels at each life stage were much greater than the average income levels of the total Latino sample. Throughout the transition to adulthood, members of this group were least likely to have received public assistance or be without health insurance. Family financial support

in young adulthood was highest (43%), and this group was likely to receive financial support for their home purchase or renovation (24%). Half of the respondents owned a home by adulthood. This group provided little support back to family members in adulthood (10%).

#### **5.4.2 Human Capital**

The LCA model fit statistics point to a four-class solution of human capital for the Latino sample. The average posterior probability of being in a particular class for all the individuals that were assigned to that class ranged between 0.89 and 0.93, which shows low misclassification error. Table 5.8 shows the latent class prevalences for the four-class model of human capital among Latino respondents, and the conditional response probabilities and means for each observed variable. Class 1 was labeled as the persistently low group (23%), Class 2 as the low with continuing adult education group (33%), Class 3 as the high with early parental investment group (18%), and Class 4 as the persistently high human capital group (25%).

**Class 1: Persistently Low Human Capital** Almost one-quarter of Latino respondents were categorized into the low with upward mobility group (23%). This group had the lowest parent education levels where the mean levels were less than a high school degree. Despite having the lowest parent education level, adult respondents' education increased to a level comparable of Class 2 at 2.18. Continued schooling remained low for this group where only 8% and 6% were currently in school in young adulthood and adulthood, respectively. One-quarter received vocational training in young adulthood and early entry into the workforce is evident with a high average hours worked per week (30.4) in young adulthood. Parent's job characteristics provided further evidence for low human capital levels. The majority of mothers did not work in adolescence (70%), and fathers worked an average of 36 hours per week and

held jobs primarily in the manual sectors (58%). Adult respondents worked primarily in manual occupations (42%) and sales/service occupations (40%).

**Class 2: Low with Continuing Adult Education** One-third of Latino respondents were classified into the low human capital with continuing adult education group. Parents had the second lowest education levels of all groups. There was slight improvement in education levels for adult respondents. Both mothers and fathers reported an average level between less than high school and high school degree (1.68 and 1.62, respectively), whereas, adult respondents had an average level over a high school degree (2.17). Overall, respondents in Class 1 and 2 had very similar human capital characteristics of low education levels, early entry into the workforce, vocational training, father's occupation, and adult occupation. The key differences included continued schooling for this group where 11% and 9% were currently in school in young adulthood and adulthood, respectively. Both parents worked full-time in adolescence where a majority of mothers were working in sales/service occupations and fathers in manual occupations. Respondents had the highest average hours worked per week in young adulthood (31.93) and adulthood (41.98) compared to all other groups. Adult respondents worked primarily in manual (44%) or sales/service (36%) occupations.

**Class 3: High with Early Parental Investment** A smaller proportion of Latino respondents were classified into the high with early parental investment group (18%). Father's mean education level (2.34) was higher than the mother's mean education level (2.03). The adult respondent's mean education level was higher than both at 3.42 (between some college and college graduate). A large proportion of respondents continued to post-secondary schooling in young adulthood (65%) and in adulthood (23%). Roughly half of mothers did not work in adolescence, which provides the context for early parental investment. Fathers worked primarily

in manual sector but reported the lowest mean hours worked per week of all groups. For adult respondents, almost half reported working in sales/service sector (46%) and roughly one-third reported working in professional/managerial sector (29%).

**Class 4: Persistently High Human Capital** One-quarter of Latino respondents were classified into this group with the highest human capital levels across all groups. Even with high levels of parents' human capital, there was still an upward movement evident in adulthood. Both parents' education levels were high with mothers having comparable education levels as fathers (2.54 and 2.64, respectively). Adult respondents had an even higher mean education level at 3.69, which is between some college and college degree. Continued post-secondary education in young adulthood (70%) and adulthood (32%) were highest compared to all other groups. Both parents were working close to full-time with mothers having jobs primarily in sales/service sector (48%), followed by "other professional" (22%) sector. Meanwhile fathers' occupation was primarily in manual sector (38%) followed by other professional (17%) and professional/managerial sectors (17%). Adult respondents worked primarily in sales/service (42%), followed by professional/managerial (35%), and other professional (22%) sectors.

### **5.4.3 Social Capital**

LCA model fit statistics for social capital point to a four-class model among the Latino sample. The average posterior probability of being in a particular class for all the individuals that were assigned to that class ranged between 0.83 and 0.92, which indicates low misclassification error. Table 5.9 shows the latent class prevalences for the four-class model of social capital among Latino respondents, and the descriptive characteristics for each observed variable by class. Class 1 was labeled as the persistently low social capital group (25%), Class 2 as the

downwardly low group (30%), Class 3 as the persistently high with social context (12%), and Class 4 as the persistently high with religious context (33%).

**Class 1: Persistently Low Social Capital** One-quarter of Latino respondents were classified into this persistently low social capital group. This group was characterized by low levels of social capital for each life stage of adolescence, young adulthood, and adulthood. Parents had the lowest religious involvement and the second lowest organizational involvement of all groups. Respondents had relatively low religious participation at each life stage. The proportion of respondents involved in organizations or volunteering declined by adulthood where 30% of respondents in adolescence compared to 16% in adulthood were involved. Having the lowest levels across all groups, civic participation was 4% in young adulthood and 28% in adulthood. Both popularity in young adulthood and close friends in adulthood were also low.

**Class 2: Downwardly Low Social Capital** One-third of Latino respondents were classified into the downwardly low social capital group. This group was distinguished by a downward shift in social capital from adolescence into adulthood, and by having parents exhibiting higher social capital than adult respondents. Religious involvement declined from a mean level of 3.61 (between monthly to weekly) in adolescence to 2.24 (between less than monthly to monthly) in adulthood. There was a similar decline for organizational involvement. The proportion of respondents with civic participation, popularity and close friends were very similar, if not lower, to Class 1's social capital levels in young adulthood and adulthood.

**Class 3: Persistently High in Social Context** Twelve percent of Latino respondents were classified into the persistently high in social context group. Respondents in this group had a consistent level of high social capital from adolescence into adulthood. Their high levels revolved around the social context of civic participation and having a high number of close



friends. Parent's involvement in religion (mean level of 2.36) and organizational memberships (35%) were similar to adult respondent's involvement in religion (mean level of 2.15) and volunteering (36%). Furthermore, religious involvement increased from adolescence to adulthood. This group possessed the highest levels of civic participation in young adulthood and adulthood. They also had the highest number of close friends of all groups.

**Class 4: Persistently High in Religious Context** One-third of Latino respondents were classified into the persistently high in religious context group. This group was defined by a persistently high level of social capital in the religious context from adolescence to adulthood. Both parents and respondents had the highest levels of religious involvement and organizational involvement at each life stage. This group also possessed high levels of civic participation and number of close friends at each life stage but at slightly lower levels than Class 3.

## **5.5 ASIANS**

### **5.5.1 Economic Capital**

Respondents who self-identified as Asian or Native Hawaiian/Pacific Islander made up the smallest group of the total sample at 596. Model fit statistics and conceptual reasoning revealed a best fitting LCA model with a two-class solution for economic capital among the Asian sample. The average posterior probability of being in a particular class for all the individuals that were assigned to that class ranged between 0.91 and 0.96, which shows low misclassification error. Table 5.10 shows the latent class prevalences for the two-class model of economic capital among Asian respondents, and the conditional response probabilities (for categorical indicators) and means (for continuous indicators) for each observed variable. This two-class solution divided the Asian sample into an economically disadvantaged group (18%) and an economically advantaged group (82%).

**Class 1: Economically Disadvantaged** Only a small proportion of Asian respondents (18%) were classified into the economically disadvantaged group. This group reported low mean incomes and experiences of economic hardship, receipt of public assistance, and lack of health insurance in adolescence. The average household income in adolescence was \$30,667. The average personal income in young adulthood was \$8,996 and in adulthood was \$19,344. Experiences of economic hardships persisted into young adulthood and adulthood. Only 16% reported owning a home in adulthood. Despite their low economic capital, 28% of respondents gave financial help to their family in adulthood, higher than Class 2's economically advantaged.

**Class 2: Economically Advantaged** The majority of Asian respondents were classified into the economically advantaged group at 82%. This group was characterized by an economic environment with high incomes and little experiences of economic hardship across adolescence to adulthood. Their income levels at each life stage were much greater than the average income levels of the total Asian sample. The average household income in adolescence was \$68,802. The average personal income in young adulthood was \$10,361 and in adulthood was \$35,920. Home ownership jumped from 3% in young adulthood to 32% in adulthood. Less than one-quarter of this group provided financial support to family members in adulthood.

### **5.5.2 Human Capital**

The four-class LCA model for human capital among the Asian sample showed the best LCA model fit and class interpretability. The average posterior probability of being in a particular class for all the individuals that were assigned to that class ranged between 0.91 and 0.98, which represents low misclassification error. Table 5.11 shows the latent class prevalences for the four-class model of human capital among Asian respondents, and the descriptive characteristics for each observed variable by latent class. The four classes include: Class 1—

Persistently low group (20%); Class 2—Downwardly mobile group (22%); Class 3—Upwardly mobile group (29%); and Class 4—Persistently high group (26%).

**Class 1: Persistently Low Human Capital** One-fifth of Asian respondents were classified into the persistently low human capital group. This group was characterized by having the lowest human capital levels (both education and occupation) among both parents and respondents themselves. Although parent and adult respondent education levels were lowest of all groups, there was slight improvement for the adult respondents. Both mothers and fathers reported an average level between less than high school and a high school degree, whereas, adult respondents had an average level over a high school degree. Yet despite this slight improvement, there was little continuation of education and vocational training in young adulthood. Early entry into the workforce was evident where the mean number of hours worked per week in young adulthood is 33.74, the highest of all groups. Both parents reported working an average of 31 hours per week for the mothers, and 40 hours per week for the fathers. A majority of mothers worked in sales/service occupations (37%) or manual occupations (25%) while fathers worked primarily in manual occupations (67%). Adult respondents worked primarily in sales/service occupations (67%) followed by manual occupations (28%).

**Class 2: Downwardly Mobile Human Capital** Twenty-two percent of Asian respondents were classified into downwardly mobile human capital group. There was a downward shift in human capital levels among this group where parents exhibited higher education levels than the adult respondents. Both mothers and fathers had mean education levels between some college and college degree where mothers had an average at 3.81 and fathers had an average at 3.18. Respondents reported an average education level of 2.98 by adulthood, which is between high school graduate and some college. Despite their early entry into the

workforce in young adulthood, 31% of respondents continued to post-secondary schooling, and 37% in vocational training in young adulthood. In terms of occupational status, both parents were working in adolescence with mothers in “other professional” (42%) or sales/service occupations (33%) and fathers in manual occupations (40%). For adult respondents, almost half reported working in sales/service occupations (47%), and another one-third reported working in professional/managerial occupations (31%).

**Class 3: Upwardly Mobile Human Capital** One-third of Asian respondents were classified into the high with upward mobility group. This group was characterized by low human capital for the parents, but high levels for the respondents by adulthood. Although the father’s education level (2.27) was higher than that of the mother’s (1.46), the mean education level among adult respondents was substantially higher than both parents (3.75). Furthermore, more than three-quarters continued to post-secondary education in young adulthood, and one-fifth were in school in adulthood. One-third of mothers in this group did not work in adolescence, but among those who did work, they were working in primarily sales/service or manual sector jobs. Fathers worked primarily in manual (36%) or sales/service (24%) sector jobs. For adult respondents, more than half reported working in professional managerial (57%) sector jobs, followed by one-third in sales/service sector jobs.

**Class 4: Persistently High Human Capital** The persistently high human capital group was made up of one-quarter of the Asian sample. The defining characteristic of this group was having the highest human capital levels among parents and respondents. Both parents and adult respondents had mean education levels of college degree or higher. In addition, respondents in Class 4 were the most likely to continue to post-secondary schooling in young adulthood (85%) and in adulthood (19%), compared to all other groups. Both parents were working close to full-

time with mothers having jobs in “other professional” (38%) or sales/service (23%) sectors, and fathers having jobs in professional/managerial (29%) or “other professional” (24%) sectors. Adult respondents worked primarily in professional/managerial (55%), followed by sales/service (24%), and other professional (21%) occupations.

### **5.5.3 Social Capital**

The LCA model fit statistics for social capital among the Asian sample showed that a four-class model was preferred. The average posterior probability of being in a particular class for all the individuals that were assigned to that class ranged between 0.93 and 0.99, which indicates low misclassification error. Table 5.12 shows the latent class prevalences for the four-class model of social capital among Asian respondents, and characteristics of each observed variable by latent class. Class 1 was labeled as the persistently low group (25%), Class 2 as the downwardly mobile group (30%), Class 3 as the upwardly mobile group (12%), and Class 4 as the persistently high group (33%).

**Class 1: Persistently Low Social Capital** Thirty percent of Asian respondents were classified into this persistently low social capital group. This group was characterized by having the lowest levels of social capital from adolescence into adulthood. Parents had the lowest religious involvement and the lowest organizational involvement of all groups. Respondents had the lowest levels of religious participation at each life stage compared to all other groups. The proportion of respondents involved in organizations or volunteering declined from 60% of respondents in adolescence to 21% in adulthood. Civic participation was 27% in young adulthood and 46% in adulthood. Respondents in this group had the lowest level of popularity in young adulthood, and the second lowest number of close friends in adulthood. However, levels of popularity and number of close friends were fairly similar across all four groups.

**Class 2: Downwardly Mobile Social Capital** The downwardly mobile social capital group had almost one-third of the Asian sample. There was a downward shift in social capital levels from adolescence into adulthood among the Asian respondents. Parents reported higher social capital levels compared to the respondents' levels in adulthood. Religious involvement declined from a mean level of 3.65 (between monthly to weekly) in adolescence to 1.63 (between none to less than monthly) in adulthood. There was a similar decreasing pattern for organizational involvement. However, there were two anomalies in the observed social capital indicators in this group. First, civic participation in young adulthood and adulthood were the highest across groups. Second, respondents' had the highest mean number of close friends in adulthood, although the mean was pretty similar across groups.

**Class 3: Upwardly Mobile Social Capital** Six percent of Asian respondents were classified into this upwardly social capital group. This group was characterized by low social capital in adolescence and young adulthood but high social capital in adulthood. In adolescence, parents had high levels of organizational and religious involvement. Yet respondents had low levels of both organizational and religious involvement in adolescence and young adulthood. However, by adulthood they reported the highest level of religious involvement and the second highest levels of volunteering and civic participation.

**Class 4: Persistently High Social Capital** This group was defined by a persistently high level of social capital from adolescence to adulthood. One-third of Asian respondents were classified into this persistently high group. Although parents exhibited the highest level of religious involvement, parents had the second lowest organizational involvement. Respondents had the highest levels of religious involvement and organizational involvement at each life stage. This group also possessed high levels of voting and number of close friends at each life stage.

## 5.6 SUMMARY OF KEY FINDINGS

The purpose of this chapter was to examine the construct of life-course social status by the racial/ethnic groups of Whites, Blacks, Latinos, and Asians. As part of the second study aim, the first hypothesis was that the social status patterns are similar across racial/ethnic groups, but the variation within these classes differs by racial/ethnic groups such that the levels of social status (e.g., income, education) are higher in one racial/ethnic group than another.

Separate LCA models were conducted for each racial/ethnic group to identify the best-fitting models for each domain of economic capital, human capital, and social capital. By stratifying the LCA models by racial/ethnic groups, the development of each social status domain can be ascertained independent of the influence of other racial/ethnic groups. This approach of using a person-oriented analytic framework accounted for an individual's life-course pattern of observed social status characteristics within each racial/ethnic group. By stratifying by race/ethnicity, the social status classes can capture shared contextual characteristics and unique experiences for a particular racial/ethnic group. However, a significant drawback to this stratified approach was the limited number of statistical tests (such as measurement invariance tests) to assess whether racial/ethnic differences of social status significantly differ from one another.

In this summary of key findings, racial/ethnic differences are presented through a qualitative comparison of the social status domains. With the smallest sample size, the findings of the social status domains for the Asian sample should be interpreted with caution. The findings may be a result of a lack of power to detect substantive differences between the different LCA class solutions or be an artifact of the data. Therefore, the following qualitative summary is limited to a comparison between the White, Black, and Latino samples.

The main hypothesis was partially supported depending on the social status domain. Overall, patterns of life-course social status were substantively similar among the racial/ethnic groups, but there were differences across domains of economic, human, and social capitals. The economic capital dimension had the most similar substantive classes where racial/ethnic groups exhibited patterns of economically disadvantaged and economically advantaged characteristics. All racial/ethnic groups possessed an economically disadvantaged group and an economically advantaged group. Furthermore, there was evidence of social mobility patterns among the White, Black and Latino samples where each group had an upwardly mobile group. However, the White sample differed in that it possessed an additional fourth class of economic capital, compared to the three-class solutions of economic capital for Black and Latino samples. The additional class of downward mobility was evident among the White sample.

There were wider gaps between economic capital indicators within each racial/ethnic group and lower levels of economic capital indicators when comparing across Whites, Blacks, and Latinos. The wide gaps between economic capital indicators were most visible with income. For example, the mean household income in adolescence for Whites ranged from \$26,000 to \$97,000 across the four economic capital groups compared to a range from \$22,000 to \$69,000 for Blacks and from \$28,000 to \$75,000 for Latinos. While the lower spectrum of income was similar across these racial/ethnic groups, the higher spectrum of income revealed the large economic disparities.

Home ownership best exemplified the lower levels of economic capital when comparing across racial/ethnic groups. Among the most economically disadvantaged, the proportion of respondents who were home owners was 25% for Whites, 10% for Blacks, and 14% for Latinos. Among the most economically advantaged, the proportion of respondents who were home



owners was 68% for Whites, 34% for Blacks, and 51% for Latinos. These stark differences are apparent in the higher social status groups especially when comparing Blacks to Whites and Latinos. Although these are qualitative comparisons, the overall latent class similarities of economic capital (e.g., possessing similar patterns of economic disadvantage and advantage, as well as upward mobility) and differences in regards to wider variations in economic indicators across the racial/ethnic groups provide support for the first hypothesis. Economic capital as a latent construct has similar meanings between racial/ethnic groups; however, there are clear disparities in wealth as evident by income and home ownership.

The life-course human capital patterns were similar for the White, Black, and Latino samples where patterns of persistently high and persistently low human capital were evident. The main difference is that Whites had five latent classes of human capital whereas Blacks and Latinos only had four latent classes of human capital. Both the Black and Latino samples did not possess an upwardly mobile human capital group that the White sample did possess. For each racial/ethnic group, respondents showed higher education levels than their parents. Yet despite this upward shift for adult respondents, there were racial/ethnic differences. Among the lowest human capital group, mean education levels were higher for Whites (2.30) than Blacks (2.17) and Latinos (2.17). This trend also appeared for the highest human capital group, where Whites had the highest mean education level at 4.07, followed by the Blacks at 3.88 and Latinos at 3.69.

In terms of occupation, respondents' occupation resembled their parents' occupation for the lowest and highest human capital groups across racial/ethnic groups. The one exception was the persistently high human capital group in the Latino sample where parents were in manual and sales/service occupations while the adult respondents were situated in mostly professional/managerial occupations. The first hypothesis was also supported by these findings

in the human capital domain, where there are substantive similarities of latent classes and the differences in regards to wider variations in human capital indicators appear across racial/ethnic groups. These variations point to racial/ethnic disparities in human capital especially in regards to educational attainment.

There were similar patterns of social capital across racial/ethnic groups where each group had four distinct classes of persistently low, downwardly low, high in social context and high in religious context. Overall, all racial/ethnic groups showed a downward shift in social capital from adolescence into adulthood. Compared to other racial/ethnic groups, Blacks had high religious involvement early on, but participation declined dramatically by adulthood. Furthermore organizational involvement was quite low across all groups in the Black sample. Civic participation in adulthood exemplified the wide variation in social capital indicators across racial/ethnic groups. Across the four latent classes in the White sample, civic participation in adulthood ranged from 41% to 87%. In comparison, the range was 60% to 91% in the Black sample and 28% to 100% in the Latino sample. These findings hint that although the substantive interpretation of the social capital latent classes were similar, the meaning of involvement may have social and cultural elements that encourage or discourage engagement in these formal social capital activities of organizational membership, religion, volunteering, and civic participation.

Overall, the findings supported the first hypothesis of study aim two. The next chapter builds off this one to examine the relationship of social status and substance use behaviors by racial/ethnic groups.

**Table 5.1 Four-Class Latent Model of Life-Course Economic Capital among White respondents, n=5,294**

	Class 1	Class 2	Class 3	Class 4	
	Most Economically Disadvantaged	Economically Downward	Economically Upward	Most Economically Advantaged	TOTAL
<i>Percentage of Sample</i>	15.5	32.1	18.4	34.1	100.0
Sample size	820	1,697	974	1,803	5,294
<b>Conditional Response</b>					
<b>(continuous indicators)</b>			<i>Mean Response</i>		
W1 Household income <sup>a</sup>	\$26,158	\$67,692	\$45,123	\$96,807	\$63,141
W3 Personal income <sup>a</sup>	\$7,923	\$10,199	\$18,951	\$11,764	\$11,863
W4 Personal income <sup>a</sup>	\$10,299	\$18,460	\$35,617	\$43,774	\$26,959
W4 Total assets (0-6) <sup>b</sup>	1.40	2.07	3.43	3.61	2.74
W4 Total debt (0-5) <sup>b</sup>	2.25	2.68	2.87	2.96	2.74
<b>Item-response probabilities</b>			<i>Probability of a Yes response (%)</i>		
<b>(categorical indicators)</b>					
<b>ADOLESCENCE (W1)</b>					
Received public assistance	60.5	10.5	31.4	6.2	21.4
Experienced economic hardship	34.0	6.4	24.0	2.2	13.0
No health insurance	42.4	7.1	29.1	2.2	15.6
<b>YOUNG ADULTHOOD (W3)</b>					
Received public assistance	23.8	7.3	2.6	0.5	6.9
Experienced economic hardship	49.1	23.7	16.4	12.7	22.9
No health insurance	40.9	18.6	17.2	1.3	16.5
Owns home	16.1	6.7	29.8	6.0	12.7
Received help from family	32.7	49.8	16.7	62.3	44.3
<b>ADULTHOOD (W4)</b>					
Received public assistance	61.5	26.2	9.7	2.0	21.0
Experienced economic hardship	56.8	33.6	10.5	2.6	22.9
No health insurance	32.6	25.6	10.0	0.7	15.7
Owns home	29.4	25.4	68.4	59.4	45.4
Received family help to purchase home	14.5	18.2	17.4	30.9	21.5
Received family help for living	16.5	23.7	1.9	7.5	13.0
Gave financial help to family	13.4	6.6	5.7	1.8	6.0

Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup> Dollar value standardized to 2008 prices

<sup>b</sup> Total value of assets including bank accounts, retirement plans, and stocks: 0=<\$5K, 1=\$5K-\$9, 2=\$10K-24K, 3=\$25K-49K, 4=\$50K-99K, 5=\$100K-250K, 6=\$250K and higher; Total debt including all types of loans, credit card debt, medical or legal bills: 0=<\$1K, 1=\$1K-\$4, 2=\$5K-9K, 3=\$10K-24K, 4=\$25K-49K, 5=\$50K and higher.

**Table 5.2 Five-Class Latent Model of Life-Course Human Capital among White respondents, n=5,294**

	Class 1	Class 2	Class 3	Class 4	Class 5	
	Persistently Low	Low with Continuing Adult Education	Upward Mobility	High with Early Parental Investments	Persistently High	TOTAL
<i>Percentage of Sample</i>	22.7	18.2	28.5	11.6	18.9	100.0
Sample size	1,202	964	1,508	616	1,003	5,294
<b>Conditional Response (continuous indicators)</b>	<i>Mean Response</i>					
<b>EDUCATION</b>						
Mother education (1-5) <sup>a</sup>	2.15	1.95	2.53	3.19	4.09	2.72
Father education (1-5) <sup>a</sup>	2.06	1.96	2.51	3.82	4.13	2.81
W4 Adult education (1-5) <sup>a</sup>	2.30	2.40	3.46	3.95	4.07	3.17
<b>WORK HOURS</b>						
Mother's work hour/week	39.87	2.08	38.61	4.58	37.99	28.09
Father's work hour/week	38.89	36.48	43.36	43.34	44.28	41.38
W1 Adolescent work hour/week	18.95	14.36	14.41	10.35	15.11	15.08
W3 Young Adult work hour/week	34.35	29.85	26.35	19.74	22.37	27.24
W4 Adult work hour/week	41.43	40.14	40.26	41.25	42.39	41.07
<b>Item-response probabilities (Categorical Indicators)</b>	<i>Probability of a Yes Response (%)</i>					
<b>ADOLESCENCE (W1)</b>						
Mother present in adolescence	92.4	95.3	96.6	94.1	99.3	96.0
Father present in adolescence	71.4	77.8	78.9	91.7	84.6	80.0
Mother's occupation						
Not working	0.0	62.3	0.0	41.6	0.0	16.0
Manual	13.6	3.3	5.4	3.1	1.9	6.0
Sales/Service	50.5	16.4	56.7	23.6	13.0	35.0
Other professional <sup>b</sup>	16.1	2.6	16.8	11.4	65.7	23.0
Professional/Managerial	7.0	0.8	9.2	2.9	11.2	7.0
Other (unspecified)	12.9	14.6	11.9	17.4	8.2	12.0
Father's Occupation						
Not working	9.6	11.7	2.5	1.0	1.4	5.0
Manual	54.1	51.2	40.6	15.8	7.6	35.0
Sales/Service	14.0	11.4	17.3	15.5	15.3	15.0
Other professional <sup>b</sup>	4.9	3.9	7.9	16.9	26.8	12.0
Professional/Managerial	7.4	6.3	12.8	39.2	40.4	20.0
Other (unspecified)	10.1	15.5	18.9	11.6	8.5	13.0
<b>YOUNG ADULTHOOD (W3)</b>						
Currently in school	4.1	14.0	56.0	74.0	69.9	41.0
Received vocational training	33.0	31.6	19.3	10.7	12.5	22.0
Received high school degree	76.9	80.7	100.0	99.6	99.8	91.0

**ADULTHOOD (W4)**

Currently in school	3.9	9.8	22.7	21.3	22.2	16.0
Adult occupation						
No job type specified	1.9	2.8	0.2	0.6	0.3	1.0
Manual	43.4	33.3	10.2	5.6	5.6	21.0
Sales/Service	45.2	46.3	44.1	29.6	28.9	40.0
Other professional <sup>b</sup>	1.5	3.3	16.2	26.3	22.6	13.0
Professional/Managerial	8.0	14.3	29.3	37.8	42.6	25.0

Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup> Education Level: 1=Less than high school, 2=High school graduate or GED, 3=Some College or Technical school, 4=College Graduate, 5=Graduate School

<sup>b</sup> Other professional includes community/social services, education/training/library, and arts/design/entertainment/sports/media occupations

**Table 5.3 Four-Class Latent Model of Life-Course Social Capital among White respondents, n=5,294**

	Class 1	Class 2	Class 3	Class 4	
	Persistently Low	Downwardly Low	High in Social Context	High in Religious Context	TOTAL
<i>Percentage of Sample</i>	27.3	30.2	18.2	24.3	100.0
Sample size	1,445	1,597	963	1,289	5,294
<b>Conditional Response (continuous indicators)</b>	<i>Mean Response</i>				
W1 Parent religious participation (1-4) <sup>a</sup>	1.64	2.92	2.07	3.67	2.60
W1 Adolescent religious participation (1-4) <sup>a</sup>	1.28	3.54	1.64	3.83	2.65
W3 Young adult religious participation (1-4) <sup>a</sup>	1.47	1.94	2.09	3.24	2.16
W4 Adult religious participation (1-4) <sup>a</sup>	1.47	1.88	2.06	3.06	2.09
W3 Young adult popularity (0-3) <sup>b</sup>	1.85	1.88	2.01	1.99	1.92
W4 Adult number of close friends (0-4) <sup>c</sup>	1.96	2.18	2.57	2.48	2.27
<b>Item-response probabilities (categorical indicators)</b>	<i>Probability of a Yes Response (%)</i>				
<b>ADOLESCENCE (W1)</b>					
Parent organizational membership					
None	56.5	44.9	35.6	30.4	42.7
One	31.8	35.8	36.3	40.2	35.9
Two or more	11.7	19.3	28.1	29.4	21.4
Adolescent organizational membership					
None	61.0	48.4	35.7	23.0	42.5
One	22.9	29.0	28.7	30.3	27.8
Two	9.6	12.9	15.7	22.8	15.2
Three or more	6.5	9.7	19.9	23.9	14.6
Adolescent sport participation	48.7	58.9	66.6	71.1	61.0
<b>YOUNG ADULTHOOD (W3)</b>					
Young adult organizational membership					
None	89.1	80.0	57.1	43.0	69.0
One	9.8	15.2	27.2	25.8	18.6
Two or more	1.1	4.8	15.8	31.2	12.4
Young adult voted in last year	20.9	33.1	60.2	64.6	42.7
<b>ADULTHOOD (W4)</b>					
Adult number of volunteer hours (%)					
None	84.1	73.6	47.8	33.5	61.7
1-19 hours	11.7	17.4	31.8	37.5	23.5
20+ hours	4.1	9.1	20.4	29.0	14.8
Adult voted in last year	41.2	59.4	85.8	87.3	66.4

Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup>Religious participation in the past year: 1=None, 2=Less than monthly, 3=Monthly, 4=Weekly.

<sup>b</sup>Perceived popularity in young adulthood: 0=not at all popular, 1=slightly popular, 2=moderately popular, 3=very popular

<sup>c</sup>Number of close friends in adulthood: 0=none, 1=one to two, 2=three to five, 3=six to nine, 4=ten or more

**Table 5.4 Three-Class Latent Model of Life-Course Economic Capital among Black respondents, n=1,897**

	Class 1	Class 2	Class 3	
	Most Economically Disadvantaged	Economically Upward	Most Economically Advantaged	TOTAL
<i>Percentage of Sample</i>	<b>44.4</b>	<b>25.2</b>	<b>30.4</b>	<b>100.0</b>
Sample size	842	478	577	1,897
<b>Conditional Response (continuous indicators)</b>	<i>Mean Response</i>			
W1 Household income <sup>a</sup>	\$22,133	\$23,091	\$68,875	\$33,299
W3 Personal income <sup>a</sup>	\$6,039	\$11,688	\$10,332	\$8,620
W4 Personal income <sup>a</sup>	\$8,535	\$28,464	\$32,309	\$19,100
W4 Total assets (0-6) <sup>b</sup>	0.83	3.58	2.47	2.02
W4 Total debt (0-5) <sup>b</sup>	1.75	2.65	2.95	2.35
<b>Item-response probabilities (categorical indicators)</b>	<i>Probability of a Yes response (%)</i>			
<b>ADOLESCENCE (W1)</b>				
Received public assistance	68.6	57.5	16.3	50.2
Experienced economic hardship	31.5	47.2	10.4	29.4
No health insurance	29.1	35.0	5.6	23.8
<b>YOUNG ADULTHOOD (W3)</b>				
Received public assistance	30.4	8.6	6.0	17.6
Experienced economic hardship	43.6	32.4	18.5	33.3
No health insurance	36.8	25.7	4.8	24.5
Owens home	4.4	13.4	5.2	7.0
Received help from family	36.2	36.0	56.9	42.2
<b>ADULTHOOD (W4)</b>				
Received public assistance	68.1	13.1	17.2	38.9
Experienced economic hardship	53.6	14.5	24.7	35.0
No health insurance	28.6	18.8	7.0	19.7
Owens home	10.1	34.1	34.0	23.4
Received family help to purchase home	9.8	5.9	23.5	12.8
Received family help for living	23.9	18.4	18.1	20.8
Gave financial help to family	17.5	27.2	8.9	17.5

Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup> Dollar value standardized to 2008 prices

<sup>b</sup> Total value of assets including bank accounts, retirement plans, and stocks: 0=<\$5K, 1=\$5K-\$9, 2=\$10K-24K, 3=\$25K-49K, 4=\$50K-99K, 5=\$100K-250K, 6=\$250K and higher; Total debt including all types of loans, credit card debt, medical or legal bills: 0=<\$1K, 1=\$1K-\$4, 2=\$5K-9K, 3=\$10K-24K, 4=\$25K-49K, 5=\$50K and higher.

**Table 5.5 Four-Class Latent Model of Life-Course Human Capital among Black respondents, n=1,897**

	Class 1	Class 2	Class 3	Class 4	
	Persistently Low	Low with Continuing Adult Education	High with Early Parental Investments	Persistently High	TOTAL
<i>Percentage of Sample</i>	<b>27.8</b>	<b>40.2</b>	<b>10.0</b>	<b>22.0</b>	<b>100.0</b>
Sample size	528	762	190	417	1,897
<b>Conditional Response (continuous indicators)</b>	<i>Mean Response</i>				
<b>EDUCATION</b>					
Mother education (1-5) <sup>a</sup>	1.73	2.13	2.93	3.62	2.46
Father education (1-5) <sup>a</sup>	1.72	1.86	3.29	3.29	2.41
W4 Adult education (1-5) <sup>a</sup>	2.17	2.54	3.60	3.88	2.85
<b>WORK HOURS</b>					
Mother's work hour/week	1.90	40.56	3.14	40.87	27.21
Father's work hour/week	22.75	37.82	35.90	39.06	34.43
W1 Adolescent work hour/week	8.54	10.64	10.08	9.69	9.79
W3 Young Adult work hour/week	22.93	24.15	20.62	22.72	23.11
W4 Adult work hour/week	36.47	39.64	39.37	41.00	39.05
<b>Item-response probabilities (Categorical Indicators)</b>	<i>Probability of a Yes Response (%)</i>				
<b>ADOLESCENCE (W1)</b>					
Mother present in adolescence	90.8	99.9	81.2	100.0	95.5
Father present in adolescence	38.6	40.3	57.9	58.7	45.8
Mother's occupation					
Not working	63.9	0.0	51.8	0.0	21.3
Manual	5.7	22.5	5.5	4.0	12.2
Sales/Service	17.6	42.0	10.2	28.4	29.6
Other professional <sup>b</sup>	3.3	16.8	19.0	45.2	20.3
Professional/Managerial	1.1	4.0	5.7	13.5	5.6
Other (unspecified)	8.3	14.7	7.8	8.9	11.1
Father's Occupation					
Not working	25.3	12.0	3.8	5.9	12.3
Manual	55.6	48.8	23.1	27.2	40.7
Sales/Service	10.5	19.3	29.8	16.6	17.8
Other professional <sup>b</sup>	1.2	2.9	16.6	23.5	10.3
Professional/Managerial	3.5	2.5	17.6	18.6	9.4
Other (unspecified)	3.9	14.5	9.2	8.1	9.5
<b>YOUNG ADULTHOOD (W3)</b>					
Currently in school	10.8	22.3	57.9	65.5	32.7
Received vocational training	34.2	30.4	21.1	13.1	26.5
Received high school degree	69.6	82.8	99.2	100.0	84.8



**ADULTHOOD (W4)**

Currently in school	8.5	16.0	25.3	27.1	17.4
Adult occupation					
No job type specified	5.5	2.2	0.8	1.3	2.7
Manual	25.4	33.7	10.8	10.0	23.7
Sales/Service	63.3	51.5	45.9	29.2	49.1
Other professional <sup>b</sup>	2.5	2.9	13.6	22.2	8.3
Professional/Managerial	3.3	9.7	28.8	37.3	16.2

Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup> Education Level: 1=Less than high school, 2=High school graduate or GED, 3=Some College or Technical school, 4=College Graduate, 5=Graduate School

<sup>b</sup> Other professional includes community/social services, education/training/library, and arts/design/entertainment/sports/media occupations

**Table 5.6 Four-Class Latent Model of Life-Course Social Capital among Black respondents, n=1,897**

	Class 1	Class 2	Class 3	Class 4	TOTAL
	Persistently Low	Downwardly Low	High in Social Context	High in Religious Context	
<i>Percentage of Sample</i>	<b>30.6</b>	<b>18.5</b>	<b>22.3</b>	<b>28.7</b>	<b>100.0</b>
Sample size	580	351	423	544	1,897
<b>Conditional Response (continuous indicators)</b>					
	<i>Mean Response</i>				
W1 Parent religious participation (1-4) <sup>a</sup>	2.53	3.42	3.22	3.58	3.15
W1 Adolescent religious participation (1-4) <sup>a</sup>	1.36	4.00	2.99	4.00	2.97
W3 Young adult religious participation (1-4) <sup>a</sup>	2.02	2.25	2.50	3.18	2.50
W4 Adult religious participation (1-4) <sup>a</sup>	2.23	2.07	2.59	3.22	2.56
W3 Young adult popularity (0-3) <sup>b</sup>	2.24	2.08	2.04	2.27	2.17
W4 Adult number of close friends (0-4) <sup>c</sup>	1.79	1.62	1.90	1.92	1.82
<b>Item-response probabilities (categorical indicators)</b>					
	<i>Probability of a Yes Response (%)</i>				
<b>ADOLESCENCE (W1)</b>					
Parent organizational membership					
None	63.4	68.5	57.5	39.5	56.2
One	22.9	22.1	28.2	34.7	27.3
Two or more	13.7	9.4	14.2	25.9	16.5
Adolescent organizational membership					
None	62.4	66.6	47.0	28.4	49.2
One	22.8	23.2	25.8	34.0	27.0
Two	6.2	6.1	11.9	17.2	10.9
Three or more	8.6	4.1	15.4	20.4	12.9
Adolescent sport participation	56.9	46.6	63.3	60.8	57.7
<b>YOUNG ADULTHOOD (W3)</b>					
Young adult organizational membership					
None	80.3	92.4	73.8	59.8	75.2
One	12.0	6.7	15.5	19.8	14.0
Two or more	7.7	0.9	10.7	20.4	10.8
Young adult voted in last year	38.2	34.1	52.8	73.7	50.8
<b>ADULTHOOD (W4)</b>					
Adult number of volunteer hours (%)					
None	78.5	87.3	69.6	54.9	71.3
1-19 hours	15.9	7.3	21.1	29.2	19.3
20+ hours	5.6	5.4	9.3	15.9	9.4
Adult voted in last year	68.1	60.2	76.9	91.3	75.3

Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup>Religious participation in the past year: 1=None, 2=Less than monthly, 3=Monthly, 4=Weekly.

<sup>b</sup>Perceived popularity in young adulthood: 0=not at all popular, 1=slightly popular, 2=moderately popular, 3=very popular

<sup>c</sup>Number of close friends in adulthood: 0=none, 1=one to two, 2=three to five, 3=six to nine, 4=ten or more

**Table 5.7 Three-Class Latent Model of Life-Course Economic Capital among Latino respondents, n=1,306**

	Class 1	Class 2	Class 3	
	Most Economically Disadvantaged	Economically Upward	Most Economically Advantaged	TOTAL
<i>Percentage of Sample</i>	25.5	45.5	29.0	100.0
Sample size	333	594	379	1,306
<b>Conditional Response</b>				
<b>(continuous indicators)</b>		<i>Mean Response</i>		
W1 Household income <sup>a</sup>	\$31,953	\$28,225	\$75,372	\$41,090
W3 Personal income <sup>a</sup>	\$7,045	\$15,261	\$11,889	\$11,889
W4 Personal income <sup>a</sup>	\$10,263	\$33,017	\$38,076	\$27,151
W4 Total assets (0-6) <sup>b</sup>	0.98	2.97	3.48	2.60
W4 Total debt (0-5) <sup>b</sup>	1.80	2.83	2.95	2.64
<b>Item-response probabilities</b>		<i>Probability of a Yes response (%)</i>		
<b>(categorical indicators)</b>				
<b>ADOLESCENCE (W1)</b>				
Received public assistance	50.9	36.3	7.8	31.8
Experienced economic hardship	34.0	34.3	5.1	25.7
No health insurance	42.4	63.8	2.2	40.8
<b>YOUNG ADULTHOOD (W3)</b>				
Received public assistance	25.7	5.3	1.3	9.6
Experienced economic hardship	43.2	17.1	15.3	23.5
No health insurance	34.6	34.1	10.2	27.5
Owns home	4.1	11.6	6.9	8.3
Received help from family	36.3	23.8	42.7	32.4
<b>ADULTHOOD (W4)</b>				
Received public assistance	54.3	9.4	6.7	20.5
Experienced economic hardship	44.3	13.2	14.4	21.8
No health insurance	38.8	13.0	8.2	18.5
Owns home	14.1	41.3	50.9	36.9
Received family help to purchase home	5.6	13.2	23.7	14.2
Received family help for living	20.9	12.0	15.0	15.2
Gave financial help to family	13.9	27.2	10.2	18.9

Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup> Dollar value standardized to 2008 prices

<sup>b</sup> Total value of assets including bank accounts, retirement plans, and stocks: 0=<\$5K, 1=\$5K-\$9, 2=\$10K-24K, 3=\$25K-49K, 4=\$50K-99K, 5=\$100K-250K, 6=\$250K and higher; Total debt including all types of loans, credit card debt, medical or legal bills: 0=<\$1K, 1=\$1K-\$4, 2=\$5K-9K, 3=\$10K-24K, 4=\$25K-49K, 5=\$50K and higher.

**Table 5.8 Four-Class Latent Model of Life-Course Human Capital among Latino respondents, n=1,306**

	Class 1	Class 2	Class 3	Class 4	
	Persistently Low	Low with Continuing Adult Education	High with Early Parental Investments	Persistently High	TOTAL
<i>Percentage of Sample</i>	23.5	33.3	18.0	25.1	100.0
Sample size	308	435	235	328	1,306
<b>Conditional Response (continuous indicators)</b>	<i>Mean Response</i>				
<b>EDUCATION</b>					
Mother education (1-5) <sup>a</sup>	1.38	1.68	2.03	2.54	1.90
Father education (1-5) <sup>a</sup>	1.35	1.62	2.34	2.64	1.96
W4 Adult education (1-5) <sup>a</sup>	2.18	2.17	3.42	3.69	2.78
<b>WORK HOURS</b>					
Mother's work hour/week	1.84	41.33	4.15	38.85	24.45
Father's work hour/week	36.15	40.97	35.85	42.90	39.23
W1 Adolescent work hour/week	14.06	15.59	8.82	11.09	12.87
W3 Young Adult work hour/week	30.40	31.93	26.34	23.82	28.43
W4 Adult work hour/week	40.31	41.98	39.16	41.07	40.85
<b>Item-response probabilities (Categorical Indicators)</b>	<i>Probability of a Yes Response (%)</i>				
<b>ADOLESCENCE (W1)</b>					
Mother present in adolescence	97.4	90.4	94.7	99.0	95.0
Father present in adolescence	72.2	67.6	86.4	70.6	72.8
Mother's occupation					
Not working	70.0	<0.1	55.0	<0.1	26.8
Manual	2.0	27.5	3.9	9.0	12.2
Sales/Service	14.9	40.5	14.1	47.5	31.4
Other professional <sup>b</sup>	0.4	8.9	16.2	21.7	11.5
Professional/Managerial	<0.1	4.6	2.6	9.3	4.4
Other (unspecified)	12.8	18.5	8.2	12.4	13.7
Father's Occupation					
Not working	12.9	3.7	7.8	1.2	6.1
Manual	57.5	57.0	44.0	37.6	49.6
Sales/Service	10.9	14.4	13.2	12.8	12.9
Other professional <sup>b</sup>	0.4	1.5	7.9	17.0	6.4
Professional/Managerial	2.9	4.1	12.4	17.2	8.8
Other (unspecified)	15.5	19.3	14.8	14.3	16.2
<b>YOUNG ADULTHOOD (W3)</b>					
Currently in school	8.3	10.5	65.0	69.5	34.8
Received vocational training	26.3	26.2	21.3	20.9	24.0
Received high school degree	65.1	67.8	98.9	100.0	80.9

**ADULTHOOD (W4)**

Currently in school	6.1	8.8	23.3	32.1	16.7
Adult occupation					
No job type specified	6.2	1.8	3.7	0.1	2.7
Manual	41.7	44.3	2.5	1.3	25.3
Sales/Service	40.1	36.0	37.8	41.6	38.7
Other professional <sup>b</sup>	<0.1	3.8	15.0	21.8	9.5
Professional/Managerial	12.0	14.1	40.9	35.2	23.7

Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup> Education Level: 1=Less than high school, 2=High school graduate or GED, 3=Some College or Technical school, 4=College Graduate, 5=Graduate School

<sup>b</sup> Other professional includes community/social services, education/training/library, and arts/design/entertainment/sports/media occupations

**Table 5.9 Four-Class Latent Model of Life-Course Social Capital among Latino respondents, n=1,306**

	Class 1	Class 2	Class 3	Class 4	
	Persistently Low	Downwardly Low	High in Social Context	High in Religious Context	TOTAL
<i>Percentage of Sample</i>	<b>25.4</b>	<b>30.1</b>	<b>12.0</b>	<b>32.5</b>	<b>100.0</b>
Sample size	333	393	156	424	1,306
<b>Conditional Response (continuous indicators)</b>	<i>Mean Response</i>				
W1 Parent religious participation (1-4) <sup>a</sup>	2.23	3.06	2.36	3.50	2.92
W1 Adolescent religious participation (1-4) <sup>a</sup>	1.43	3.61	1.50	3.73	2.83
W3 Young adult religious participation (1-4) <sup>a</sup>	1.82	2.23	1.94	2.77	2.27
W4 Adult religious participation (1-4) <sup>a</sup>	1.91	2.24	2.15	2.75	2.32
W3 Young adult popularity (0-3) <sup>b</sup>	1.72	1.82	1.91	1.97	1.86
W4 Adult number of close friends (0-4) <sup>c</sup>	1.72	1.69	2.24	2.15	1.92
<b>Item-response probabilities (categorical indicators)</b>	<i>Probability of a Yes Response (%)</i>				
<b>ADOLESCENCE (W1)</b>					
Parent organizational membership					
None	72.3	77.9	64.6	54.7	66.7
One	25.0	17.3	23.7	34.7	26.0
Two or more	2.7	4.8	11.7	10.7	7.2
Adolescent organizational membership					
None	70.1	75.2	29.9	40.4	55.0
One	17.8	12.0	40.0	29.1	23.3
Two	10.3	9.2	19.0	11.8	11.7
Three or more	1.7	3.5	11.1	18.7	9.9
Adolescent sport participation	30.4	47.2	49.0	64.7	50.6
<b>YOUNG ADULTHOOD (W3)</b>					
Young adult organizational membership					
None	91.8	88.1	70.4	56.3	76.0
One	6.6	11.9	19.5	20.8	14.6
Two or more	1.6	0.0	10.2	22.9	9.5
Young adult voted in last year	4.2	9.4	66.9	50.3	29.4
<b>ADULTHOOD (W4)</b>					
Adult number of volunteer hours (%)					
None	84.1	91.5	64.0	56.7	74.4
1-19 hours	10.6	5.0	29.2	26.9	16.9
20+ hours	5.3	3.5	6.7	16.4	8.7
Adult voted in last year	27.8	27.6	100.0	72.4	52.1

Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup> Religious participation in the past year: 1=None, 2=Less than monthly, 3=Monthly, 4=Weekly.

<sup>b</sup> Perceived popularity in young adulthood: 0=not at all popular, 1=slightly popular, 2=moderately popular, 3=very popular

<sup>c</sup> Number of close friends in adulthood: 0=none, 1=one to two, 2=three to five, 3=six to nine, 4=ten or more

**Table 5.10 Two-Class Latent Model of Life-Course Economic Capital among Asian respondents, n=596**

	Class 1	Class 2	TOTAL
	Economically Disadvantaged	Economically Advantaged	
<i>Percentage of Sample</i>	<b>17.6</b>	<b>82.4</b>	<b>100.0</b>
Sample size	105	491	596
<b>Conditional Response (continuous indicators)</b>	<i>Mean Response</i>		
W1 Household income <sup>a</sup>	\$30,667	\$68,802	\$59,984
W3 Personal income <sup>a</sup>	\$8,996	\$10,361	\$10,093
W4 Personal income <sup>a</sup>	\$19,334	\$35,920	\$32,298
W4 Total assets (0-6) <sup>b</sup>	1.47	3.69	3.32
W4 Total debt (0-5) <sup>b</sup>	2.35	2.61	2.58
<b>Item-response probabilities (categorical indicators)</b>	<i>Probability of a Yes response (%)</i>		
<b>ADOLESCENCE (W1)</b>			
Received public assistance	45.7	14.9	20.7
Experienced economic hardship	33.1	15.2	18.4
No health insurance	52.1	16.3	23.1
<b>YOUNG ADULTHOOD (W3)</b>			
Received public assistance	21.7	2.4	6.1
Experienced economic hardship	28.0	19.7	21.3
No health insurance	57.8	4.8	14.9
Owns home	4.8	3.4	3.6
Received help from family	49.3	53.2	52.5
<b>ADULTHOOD (W4)</b>			
Received public assistance	34.8	6.8	12.2
Experienced economic hardship	35.6	5.6	11.4
No health insurance	46.3	1.8	13.4
Owns home	15.6	31.8	28.7
Received family help to purchase home	2.7	23.3	19.4
Received family help for living	30.8	14.1	17.4
Gave financial help to family	27.9	23.5	24.3

Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup> Dollar value standardized to 2008 prices

<sup>b</sup> Total value of assets including bank accounts, retirement plans, and stocks: 0=<\$5K, 1=\$5K-\$9, 2=\$10K-24K, 3=\$25K-49K, 4=\$50K-99K, 5=\$100K-250K, 6=\$250K and higher; Total debt including all types of loans, credit card debt, medical or legal bills: 0=<\$1K, 1=\$1K-\$4, 2=\$5K-9K, 3=\$10K-24K, 4=\$25K-49K, 5=\$50K and higher.

**Table 5.11 Four-Class Latent Model of Life-Course Human Capital among Asian respondents, n=596**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	
	<b>Persistently Low</b>	<b>Downwardly Mobile</b>	<b>Upwardly Mobile</b>	<b>Persistently High</b>	<b>TOTAL</b>
<i>Percentage of Sample</i>	<b>20.0</b>	<b>21.8</b>	<b>29.3</b>	<b>25.9</b>	<b>100.0</b>
Sample size	119	148	175	154	596
<b>Conditional Response (continuous indicators)</b>	<i>Mean Response</i>				
<b>EDUCATION</b>					
Mother education (1-5) <sup>a</sup>	1.58	3.81	1.46	4.27	2.79
Father education (1-5) <sup>a</sup>	1.70	3.18	2.27	4.06	2.93
W4 Adult education (1-5) <sup>a</sup>	2.42	2.98	3.75	4.37	3.46
<b>WORK HOURS</b>					
Mother's work hour/week	30.97	38.86	25.19	31.73	31.29
Father's work hour/week	39.86	32.26	33.83	40.65	36.49
W1 Adolescent work hour/week	9.08	10.01	9.32	7.07	8.84
W3 Young Adult work hour/week	33.74	32.18	21.60	12.60	23.89
W4 Adult work hour/week	43.97	38.09	42.05	42.61	41.61
<b>Item-response probabilities (Categorical Indicators)</b>	<i>Probability of a Yes Response (%)</i>				
<b>ADOLESCENCE (W1)</b>					
Mother present in adolescence	94.4	94.7	97.8	97.9	96.4
Father present in adolescence	62.1	72.6	91.7	96.1	82.4
Mother's occupation					
Not working	17.6	4.6	31.9	14.0	17.9
Manual	24.5	0.2	20.4	0.3	11.1
Sales/Service	36.8	33.0	26.1	22.5	28.8
Other professional <sup>b</sup>	6.1	41.8	9.8	37.5	24.1
Professional/Managerial	6.1	2.4	3.5	18.4	7.6
Other (unspecified)	8.8	18.0	8.3	7.4	10.5
Father's Occupation					
Not working	9.9	17.7	14.3	3.7	11.1
Manual	67.4	40.3	35.8	15.5	35.2
Sales/Service	12.8	17.9	23.5	12.4	17.2
Other professional <sup>b</sup>	0.0	12.0	5.0	23.6	11.6
Professional/Managerial	9.0	11.8	4.5	28.9	14.3
Other (unspecified)	0.8	0.3	16.9	15.9	10.5
<b>YOUNG ADULTHOOD (W3)</b>					
Currently in school	0.4	31.4	76.5	85.0	52.8
Received vocational training	12.7	37.1	17.3	6.2	18.4
Received high school degree	78.3	97.6	100.0	100.0	95.2



**ADULTHOOD (W4)**

Currently in school	13.5	16.0	13.7	19.4	15.7
Adult occupation					
No job type specified	0.6	4.3	0.3	0.1	1.3
Manual	27.8	11.5	3.6	0.5	9.4
Sales/Service	67.1	46.7	29.8	23.8	39.6
Other professional <sup>b</sup>	0.0	6.7	9.6	20.9	10.0
Professional/Managerial	4.5	30.7	56.8	54.7	39.7

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Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup> Education Level: 1=Less than high school, 2=High school graduate or GED, 3=Some College or Technical school, 4=College Graduate, 5=Graduate School

<sup>b</sup> Other professional includes community/social services, education/training/library, and arts/design/entertainment/sports/media occupations

**Table 5.12 Four-Class Latent Model of Life-Course Social Capital among Asian respondents, n=596**

	Class 1	Class 2	Class 3	Class 4	
	Persistently Low	Downwardly Mobile	Upwardly Mobile	Persistently High	TOTAL
<i>Percentage of Sample</i>	<b>30.1</b>	<b>31.4</b>	<b>5.9</b>	<b>32.4</b>	<b>100.0</b>
Sample size	180	187	35	193	596
<b>Conditional Response (continuous indicators)</b>	<i>Mean Response</i>				
W1 Parent religious participation (1-4) <sup>a</sup>	1.84	3.41	2.78	3.43	2.97
W1 Adolescent religious participation (1-4) <sup>a</sup>	1.30	3.65	1.47	3.81	2.86
W3 Young adult religious participation (1-4) <sup>a</sup>	1.59	2.24	2.67	3.37	2.42
W4 Adult religious participation (1-4) <sup>a</sup>	1.38	1.69	3.70	3.65	2.33
W3 Young adult popularity (0-3) <sup>b</sup>	1.54	1.66	1.69	1.79	1.66
W4 Adult number of close friends (0-4) <sup>c</sup>	2.32	2.49	2.30	2.41	2.40
<b>Item-response probabilities (categorical indicators)</b>	<i>Probability of a Yes Response (%)</i>				
<b>ADOLESCENCE (W1)</b>					
Parent organizational membership					
None	53.7	38.4	37.8	50.1	46.0
One	31.1	38.6	46.4	39.5	37.3
Two or more	15.2	23.0	15.8	10.4	16.7
Adolescent organizational membership					
None	31.4	34.6	58.9	30.7	33.7
One	34.9	26.1	7.3	27.8	28.2
Two	14.2	22.5	20.0	16.3	17.9
Three or more	19.6	16.8	13.8	25.2	20.2
Adolescent sport participation	49.4	59.7	56.5	64.5	58.0
<b>YOUNG ADULTHOOD (W3)</b>					
Young adult organizational membership					
None	75.9	67.9	81.0	51.6	66.0
One	18.7	22.1	5.8	29.8	22.5
Two or more	5.4	10.1	13.2	18.6	11.5
Young adult voted in last year	26.6	35.7	22.5	22.7	28.1
<b>ADULTHOOD (W4)</b>					
Adult number of volunteer hours (%)					
None	79.3	69.1	55.1	49.1	65.1
1-19 hours	14.4	25.0	32.6	22.0	21.3
20+ hours	6.3	5.9	12.3	28.9	13.6
Adult voted in last year	45.7	55.9	55.3	51.5	51.4

Notes: W1=Wave I data; W3=Wave III data; W4=Wave IV data

<sup>a</sup>Religious participation in the past year: 1=None, 2=Less than monthly, 3=Monthly, 4=Weekly.

<sup>b</sup>Perceived popularity in young adulthood: 0=not at all popular, 1=slightly popular, 2=moderately popular, 3=very popular

<sup>c</sup>Number of close friends in adulthood: 0=none, 1=one to two, 2=three to five, 3=six to nine, 4=ten or more

## **CHAPTER 6: RESULTS – Relationship between Life-Course Social Status and Adult Smoking and Heavy Episodic Alcohol Use by Race/Ethnicity**

### **6.1 INTRODUCTION**

The second aim of this dissertation is to analyze the variation by race/ethnicity of the effects of social status captured cumulatively across the life course on alcohol and smoking behaviors in adulthood. The previous chapter described the life-course social status patterns for each racial/ethnic group of Non-Hispanic White (henceforth referred to as White), Non-Hispanic Black (henceforth referred to as Black), Hispanic or Latino (henceforth called Latino), and Non-Hispanic Asian (henceforth referred to as Asian). Findings showed support for similar social status latent classes for Whites, Blacks, and Latinos, but the variations differed qualitatively such that the levels of social status (e.g., income, education) were higher in one racial/ethnic group than another. For example, regardless of which latent class they belonged to, Blacks possessed much lower levels of economic capital than Whites. As a result, these variations, whether in a lower or higher life-course social status group, may have different implications on health behaviors for Whites, Blacks, and Latinos. Each racial/ethnic group's experiences of advantaged or disadvantaged social status may affect engagement in substance use behaviors differently. On a separate note, Asians exhibited distinct social status patterns that differed from the other racial/ethnic groups that could be due to the low sample size. Therefore, the findings for the Asian sample should be interpreted with caution.

This chapter further examines the relationship between life-course social status and substance use behaviors by racial/ethnic groups. The social status latent class models for each racial/ethnic group that was discussed in Chapter 5 were used to test the hypotheses for the second study aim. As described in the methods chapter, a distal outcome, such as smoking and

heavy episodic drinking, can be included into a LCA model. In this model, results show the probability of endorsing daily smoking or heavy episodic drinking for each social status group. Furthermore, additional analyses compared the distal outcome between the social status groups to test for significant differences. For the smoking outcome, the most advantaged social status group is used as the reference group. For the alcohol outcome, the most disadvantaged social status group served as the reference group. These models were stratified by racial/ethnic groups.

For the smoking outcome, the main hypothesis was that patterns of overall social disadvantage among each racial/ethnic group are linked to higher adult smoking. I hypothesized that Whites and Blacks have a wider social gradient effect on smoking (larger variations between social status groups) compared to Latinos and Asians. For the outcome of heavy episodic drinking (HED), I hypothesized that life-course social status patterns among Blacks, Latinos, and Asians have a divergent association with adult HED than life-course social status patterns among Whites. I posited that Whites with higher life-course social status patterns exhibit higher HED than their lower life-course counterparts (e.g., persistent disadvantage and downwardly mobile). For the other racial/ethnic groups, I expect the opposite outcome where lower life-course social status patterns exhibit higher HED than their higher life-course social status counterparts.

To test these hypotheses, this chapter presents the latent class models with smoking and alcohol. These models of substance use behaviors were analyzed separately for each racial/ethnic group. The chapter concludes with a summary of the key findings.

## **6.2 SOCIAL STATUS, RACE/ETHNICITY, AND SMOKING**

This section examines the relationship of daily smoking by social status among each racial/ethnic group. As reported in Chapter 4, almost one-quarter (24%) of all respondents reported smoking every day in the last 30 days in adulthood. When comparing daily smoking

across racial/ethnic groups, White respondents have the highest prevalence at 28% followed by Blacks (15%), Asians (14%) and Latinos (12%). Taking a closer look at this relationship by social status, a stratified approach was used to examine the hypothesis that each dimension of life-course social status has a negative trend on daily smoking among each racial/ethnic group. When conducting the latent class analyses with smoking as a distal outcome, there was little change by pattern of response probabilities for each class, uniqueness of classes and class sizes compared to the original social status models (whether economic capital, human capital or social capital) for each racial/ethnic group. As a result, the interpretation of each group was the same even after including smoking in the latent class models for economic capital, human capital, and social capital. The findings are presented by each racial/ethnic group.

### **6.2.1 Whites**

*Economic Capital* Table 6.1 presents the daily smoking prevalences for the four-class LCA model of economic capital for the White sample. There was a wide gap in smoking prevalences across economic capital groups among the White sample. The most disadvantaged group had the highest prevalence of daily smoking where one out of two White respondents in the most disadvantaged group reported smoking on a daily basis in the last thirty days. Thirty-six percent of White respondents in the economically downward group reported smoking daily, followed by 25% in the economically upward group and 7% in the most advantaged group. In additional analyses comparing the observed variables between latent classes, smoking prevalences for the most disadvantaged group, economically downward group, and economically upward group were all significantly higher than the reference group (most economically advantaged group) at a p-value of less than 0.001.

Human Capital Daily smoking prevalences for each of the 5 latent classes of human capital for the White sample are shown in Table 6.2. Similar to the economic capital findings, the White sample encompassed the most striking difference in smoking prevalence between human capital groups. White respondents in the persistently low and low with continuing education groups have a smoking prevalence of 50% and 41%, respectively. In contrast, the smoking prevalences in the upwardly mobile, high with early parental investments, and persistently high groups were 14%, 13%, and 15%, respectively. The smoking prevalences were significantly higher for the persistently low and low with continuing education groups in reference to the persistently high group at a p-value of less than 0.001. The smoking prevalence was significantly lower for the upwardly mobile and high with early parental investments groups in reference to the persistently high group at a p-value of less than 0.05.

Social Capital Table 6.3 shows the daily smoking prevalences for the four-class LCA model of social capital for the White sample. There is a clear distinction of smoking prevalence between groups with low social capital (whether persistently low or downwardly low) and high social capital (whether high in social or religious contexts). White respondents in the lowest groups of social capital have a prevalence of 42% and 39%, respectively. In contrast, the smoking prevalence in the higher social capital groups was 17% and 8%. The smoking prevalence was significantly higher for each social capital group in reference to the high in religious context ( $p < .001$ ).

### **6.2.2 Blacks**

Economic Capital Table 6.1 also shows the daily smoking prevalences for each of the three economic capital latent classes among the Black sample. Among the three groups of economic capital, the most economically disadvantaged group reported the highest smoking

prevalence. Nineteen percent of Black respondents in the most disadvantaged group reported daily smoking, followed by 14% in the upwardly mobile group, and 10% in the most advantaged group. Smoking prevalences for each economic capital group were statistically significant when compared to the most advantaged group ( $p < 0.05$ ).

Human Capital Daily smoking prevalences for the four-class LCA model of human capital are shown in Table 6.2. Black respondents were categorized into four latent classes of human capital. The persistently low and low with continuing education groups each showed the largest smoking prevalence at 18%. In contrast, the high with early parental investments and persistently high groups possessed smaller smoker prevalences at 12% and 8%, respectively. In reference to the persistently high human capital group, there was a significantly higher smoking prevalence for the persistently low and low with continuing education groups at p-values of less than 0.01. However, there was no statistical difference between the high with early parental investments and the persistently high human capital groups in the Black sample ( $p = 0.06$ ).

Social Capital Table 6.3 presents the smoking prevalences of the four social capital groups among Blacks. The downwardly low had the highest smoking prevalence at 29%. The persistently low group had a smoking prevalence at 16%, followed by the high in social context at 13% and persistently high group at 6%. However, none of the smoking prevalences of each of the groups were statistically different from the high in religious context group.

### **6.2.3 Latinos**

Economic Capital Table 6.1 shows the smoking prevalences for the three-class LCA model of economic capital for the Latino sample. Respondents in the most disadvantaged group reported the highest prevalence of smoking at 24%. The group with the second highest smoking prevalence was not the upwardly mobile but the most advantaged group at 13%. The upwardly

mobile group in the Latino sample had the lowest smoking prevalence at 5%. However, while smoking prevalence was statistically significant between the most disadvantaged and most advantaged groups ( $p=0.03$ ), there was no statistical difference between the upwardly mobile and most advantaged groups ( $p=0.33$ ).

*Human Capital* Daily smoking prevalences for the four human capital groups in the Latino sample are shown in Table 6.2. The two lowest human capital groups had the highest smoking prevalence. However, the low with continuing adult education group reported a higher smoking prevalence at 18% compared to the persistently low group at 11%. The persistently high and high with early parental investments groups had a smoking prevalence of 10% and 7%, respectively. However, there were no statistically significant differences with smoking between any of the human capital groups in reference to the highest human capital group.

*Social Capital* Table 6.3 presents the daily smoking prevalences by the four-class LCA model of social capital among Latinos. The persistently low social capital group possessed the highest smoking prevalence at 23%. The high in social context group had the second highest at 12%, followed by the high in religious context group at 9%. The downwardly low social capital group had the lowest smoking prevalence (8%). However, only the persistently low social capital group was statistically significant in reference to the high in religious context group ( $p=0.03$ ).

#### **6.2.4 Asians**

*Economic Capital* Table 6.1 also shows the daily smoking prevalences for each economic capital latent class among the Asian sample. With only two distinct latent classes of economic capital, there was a clear demarcation in smoking prevalences between the economically disadvantaged (34%) and the economically advantaged group (8%) in the Asian sample. However, this difference was not statistically significant ( $p=0.16$ ).



Human Capital Daily smoking prevalence for the four human capital groups among the Asian sample is shown in Table 6.4. The highest smoking prevalence was evident in the downwardly mobile human capital group at 27%. The next highest was the persistently low human capital group at 20%. The upwardly mobile human capital group had a smoking prevalence of 8% and the persistently high human capital group had a prevalence of 6%. In reference to the persistently high human capital group, the persistently low and the upwardly mobile groups both had significantly higher smoking prevalences at a p-value of less than 0.05. However, the smoking prevalence for the downwardly mobile group was not statistically different when compared to the highest human capital group ( $p=0.10$ ).

Social Capital Table 6.5 presents the daily smoking prevalences for the four-class LCA model of social capital for the Asian sample. The smoking prevalence in the Asian sample displayed a low-high social capital dichotomy in smoking prevalence. However, the highest smoking prevalence was in the downwardly mobile social capital group at 22% compared to the persistently low social capital group at 19%. The two highest social capital groups had lower prevalences of 9% and 5%, respectively. However, the smoking prevalences for these social capital groups were not statistically significant when compared to the highest social capital group.

### **6.3 SOCIAL STATUS, RACE/ETHNICITY, AND HEAVY EPISODIC DRINKING**

This next section examines the relationship of heavy episodic drinking (HED) by social status for each racial/ethnic group. As reported in Chapter 4, three-quarters of all respondents reported engaging in alcohol use in the last 12 months compared to 25% who reported having no alcohol use in the past year. Racial/ethnic minorities were more likely to abstain from alcohol use in the past year compared to Whites. Almost half of Blacks, one-third of Latinos, and 27% of Asians reported having no alcohol use in the past year, compared to 21% of Whites. Among the

total sample, 22% engaged in HED on a monthly basis in the previous 12 months. When comparing HED by racial/ethnic groups, the prevalence among White respondents was the highest at 25% followed by Latinos (19%), Asians (16%), and Blacks (13%).

When examining this relationship with life-course social status, Blacks, Latinos, and Asians were hypothesized to have a divergent social status association with adult HED than life-course social status patterns among Whites. Whites with higher life-course social status patterns (e.g., persistent advantage) were hypothesized to exhibit higher HED than their lower life-course counterparts (e.g., persistent disadvantage). For the other minority racial/ethnic groups, the opposite outcome was expected where lower life-course social status patterns exhibit higher HED than their higher life-course social status counterparts.

When conducting the latent class analyses with HED as a distal outcome, there was little change by pattern of response probabilities for each class, uniqueness of classes and class sizes compared to the original models (whether economic, human or social capital) for each racial/ethnic group. As a result, the interpretation of each group is the same even after including HED in the latent class models for each social status domain. This section presents the results of HED prevalence for the three different social status domains by race/ethnicity.

### **6.3.1 Whites**

*Economic Capital* Table 6.6 presents the four-class LCA model of economic capital and their monthly HED prevalences. Among the White sample, the most economically advantaged and the downwardly mobile groups reported the highest HED prevalence at 30% and 27%, respectively. The most economically disadvantaged had the smallest HED prevalence at 17% followed by the upwardly mobile at 19%. These two groups also had the highest proportion of no alcohol use. Additional analyses were conducted to examine whether HED (vs. non-HED) is

statistically significant between economic capital groups. There was a significant difference of higher HED for the downwardly mobile, upwardly mobile and most advantaged groups when compared to the reference group of the most disadvantaged ( $p\text{-value} < 0.01$ ).

Human Capital Alcohol behaviors for each of the five human capital groups for the White sample are shown in Table 6.7. Overall, the low human capital group with continuing adult education has the highest proportion of respondents who did not drink alcohol in the past year at 32%. Abstinence from alcohol was also high among the persistently low human capital group at 25%. However, there is no consistent pattern for HED prevalence. HED prevalence was greatest among the persistently low (27%) and the persistently high (27%) groups. Consistent with those who did not drink in the past year, the low human capital group with continuing adult education has the lowest HED prevalence at 18%. In additional analyses, the low with continuing education, upwardly mobile, and high with early parental investment group had significantly lower HED prevalence compared to the persistently low human capital group ( $p < 0.001$ ). Although there was a significant HED difference between the persistently low and persistently high groups ( $p < 0.001$ ), the prevalences were the same for each group.

Social Capital Table 6.8 shows the alcohol behaviors for the four-class social capital model for the White sample. The high in religious context group reported the highest percentage of no alcohol use in the past year (27%) followed by the persistently low group (23%). Across groups, HED prevalence was similar around 27-28% except for the high in religious context group which had the smallest prevalence at 14%. Overall, HED prevalence was significantly lower for the downward and high in social context groups in reference to the persistently low group ( $p < 0.001$ ), but the difference was marginal. The HED prevalence was substantially lower for the high in religious context group in comparison to the persistently low group ( $p < 0.001$ ).

### 6.3.2 Blacks

Economic Capital Alcohol behaviors for the three-class LCA model of economic capital among the Black sample are displayed in Table 6.6. Overall, the percentage of non-alcohol users in the Black sample decreased from the most disadvantaged group (55%), economically upward (42%), and most advantaged group (26%). Taking a closer look at HED prevalence, the upwardly mobile group possessed the highest HED prevalence at 19%, followed by the most disadvantage group (11%) and the most advantaged group (10%). In further analyses comparing HED prevalences between groups, the most advantaged group had a significantly lower HED prevalence compared to the most disadvantaged ( $p < .001$ ) while the upwardly mobile had a significantly higher HED prevalence compared to the most disadvantaged ( $p < 0.01$ ).

Human Capital Table 6.7 shows the alcohol behaviors by the four human capital groups among the Black sample. The low with continuing adult education group has the highest proportion of respondents who did not use alcohol in the past year at 58%. Past year abstinence from alcohol was also high among the persistently low human capital group (42%) and the high with early parental investment group (40%). Blacks have a different pattern for HED prevalence where the low with continuing adult education group and the persistently low had the highest HED prevalence at 14% each. HED prevalence declined for the high with early parental investment (12%) and the persistently high (10%) groups. In comparison to the persistently low human capital group, the low with continuing adult education, high with early parental investment and the persistently high groups had significantly lower HED prevalences ( $p < 0.05$ ).

Social Capital Table 6.8 presents the four-class LCA model of social capital and the alcohol behaviors among the Black sample. Having no alcohol use in the past year was highest for the persistently low group (46%), followed by the high in social context (44%), high in

religious context (42%), and downwardly low (37%) groups. For HED, the downwardly low group had the highest prevalence at 20% followed by the high in social context (15%) and the persistently low (14%) groups. The high in religious context group had the lowest HED prevalence at 6%. In reference to the persistently low group, both the downwardly low and the high in social context groups had significantly higher HED ( $p < 0.01$ ). HED among the high in religious context group was significantly lower than the persistently low group ( $p < 0.001$ ).

### **6.3.3 Latinos**

Economic Capital The corresponding alcohol behaviors to the three-class LCA model of economic capital for the Latino sample are presented in Table 6.6. The lower economic capital groups had more respondents who did not drink alcohol in the past year. One in two Latino respondents in the most disadvantaged group abstained from alcohol in the past year, compared to 32% of the upwardly mobile and 12% of the most advantaged groups. For HED, the most advantaged group had the highest prevalence at 23%. The most disadvantaged group and the upwardly mobile group in the Latino sample had comparable rates at 17%. In separate analyses to examine HED prevalences across economic capital groups, HED prevalence for the upwardly mobile group was significantly different than the most disadvantaged group ( $p < 0.05$ ), but the effect is marginal. In contrast, the most advantaged group had a significantly higher HED prevalence compared to the most disadvantaged group ( $p < 0.05$ ).

Human Capital Alcohol behaviors for the five human capital groups among Latinos are presented in Table 6.7. The persistently low human capital group had the highest proportion of respondents who did not use alcohol in the past year (48%). Abstinence from alcohol was also high among the low with continuing education group (33%) compared to the high with early parental investment (24%) and the persistently high (19%) groups. The largest HED prevalence

was found in the persistently high group (22%) and the persistently low group (21%), followed by the low with continuing education group (19%). The high with early parental investment group had the lowest HED prevalence (12%). However, compared to the persistently low human capital group, there was no significant difference in HED prevalence for the high with early parental investment ( $p=0.93$ ) and the persistently high ( $p=0.65$ ) groups. There was a significant difference between the low with continuing education and the persistently low groups ( $p<0.01$ ).

*Social Capital* Table 6.8 presents the alcohol behaviors for each of the four social capital groups among the Latino sample. The downwardly mobile group had the highest percentage of respondents who abstained from alcohol in the past year (37%) followed by the persistently low social capital group (35%), the high in religious context group (27%), and the high in social context group (21%). For HED, there was a decrease in prevalence from low to high social capital. The persistently low and the downwardly low groups had similar HED prevalences at 23% and 22%, respectively. The HED prevalence for the high in social context was 18%, and the high in religious context was 14%. In further analyses, each of the social capital groups had a significantly lower HED prevalence when compared to the persistently low group ( $p<0.05$ ), although the difference between the downwardly low and persistently low groups were marginal.

#### **6.3.4 Asians**

*Economic Capital* Table 6.1 presents the alcohol behaviors for the two latent classes of economic capital among the Asian sample. More than one-third of respondents in the economically disadvantaged group did not engage in alcohol use in the past year compared to one-quarter of respondents in the economically advantaged group who did abstained from alcohol. Although there are only two distinct latent classes of economic capital, the HED

prevalence among the Asian sample was similar for both groups at 16%. There was no statistical difference between these groups ( $p=0.16$ ).

Human Capital Table 6.9 presents the alcohol behaviors for the four-class LCA model of human capital among the Asian sample. Forty-five percent of respondents in the persistently low group had no alcohol use in the past year compared to 26% of the downwardly mobile, 23% of the persistently high, and 17% of the upwardly mobile who reported the same behavior.

Although they have larger numbers who abstained from alcohol use, the lower human capital groups in the Asian sample reported the highest HED prevalence. The persistently low, downwardly mobile, and persistently high groups reported HED prevalences of 22%, 20%, and 18%, respectively. The lowest HED prevalence was found among the upwardly mobile group.

Social Capital Alcohol behaviors for the four social capital groups among the Asian sample are shown in Table 6.10. The upwardly mobile group had the highest percentage of respondents who did not engage in alcohol use in the past year (50%). Abstaining from alcohol was less common for the persistently high (37%), persistently low (30%), and downwardly mobile (12%) groups. There was a stark difference in HED prevalence by social capital groups. The downwardly mobile group had the highest prevalence at 31% followed by the persistently low group at 15%. The lowest HED prevalences were found in the two highest social capital groups of upwardly mobile (0.5%) and persistently high (0.8%). However, the only significant difference was found between the downwardly mobile and the persistently low ( $p=0.01$ ).

## **6.4 SUMMARY OF KEY FINDINGS**

Chapter 4 discussed the relationship between the latent classes of life-course social status and daily smoking in adulthood in the total analytic sample. Overall, there was a negative relationship between social status (regardless of dimension) and daily smoking where lower

social status groups had a higher prevalence of smoking. With the interplay of social status and race/ethnicity, a similar negative trend of smoking and social status was found for each racial/ethnic group. These findings provided support for the second study aim. For economic capital, the lowest economic capital group (e.g., most disadvantaged) had higher smoking prevalences for Whites, Blacks, Latinos, and Asians. The higher economic capital groups (e.g., most advantaged) possessed lower smoking prevalences with the exception of Latino sample. The upwardly mobile group of the Latino sample had the lowest smoking prevalence, but in additional analyses, this finding was not statistically significant.

Although the overall smoking trend remained similar across racial/ethnic groups, the White sample exhibited the greatest degree of smoking variation between social status groups. For example, the prevalence of smoking among all White respondents was 28%. Yet respondents in the most economically disadvantaged group had a smoking prevalence of 53% compared to respondents in the most economically advantaged group who had a prevalence of 7%. The degree of smoking variation was not as stark for the Black or Latino samples. The highest and lowest smoking prevalences within the social status groups for Blacks and Latinos were similar to that of the smoking prevalence of the total sample. For example, within the total Black sample, the smoking prevalence was 15%. The most economically advantaged group had a smoking prevalence of 10% and the most economically disadvantaged group had a prevalence of 19%.

While the smoking results have a clear pattern by social status, results with the alcohol behaviors do not. Across racial/ethnic groups, lower social status groups were less likely to engage in any alcohol use in the past year for the economic capital and human capital domains.

The HED results by social status and race/ethnicity mimic the findings reported in Chapter 4 where there was a different pattern of HED for each social status domain among the



total sample. This pattern is further complicated by race/ethnicity. For economic capital, the highest HED prevalence was found in the most advantaged group in the White and Latino samples. In the Black sample, the highest HED prevalence appeared with the upwardly mobile group, and not with the most advantaged group. There were no significant differences in HED prevalence and economic capital for the Asian sample. The findings on the White sample confirmed the hypothesis that more advantaged groups have higher HED. However, the findings for the Black and Latino samples did not correspond with the hypothesis where the opposite effect was expected in which more disadvantaged groups have higher HED.

HED prevalence by human capital groups was also inconsistent across racial/ethnic groups. Whites and Latinos resembled one another where the lowest and the highest human capital group possessed the highest HED prevalence. However, the Black sample had the highest HED prevalence in the lower human capital groups (persistently low and low with continuing adult education). For the Asian sample, despite higher prevalence in the lower human capital groups, there were no significant differences. These mixed findings provided little support for the hypothesis. In fact, there is little difference in HED prevalence by human capital groups in the White and Latino samples suggesting HED as a normative behavior across groups. Findings from the Black sample did support the hypothesis where lower human capital groups showcased higher HED prevalence.

With social capital, the common thread was that the high in religious context group had the lowest HED prevalence across racial/ethnic groups. Among the White and Latino samples, HED prevalence was fairly similar across the three other social capital groups. In contrast, the highest prevalence of HED was found in the downwardly mobile group in the Black sample. These findings on social capital did not support the hypothesis.

**Table 6.1 Prevalence of Daily Smoking by Economic Capital Latent Classes Stratified by Race/Ethnicity**

	Class 1	Class 2	Class 3	Class 4	
	Most Economically Disadvantaged	Economically Downward	Economically Upward	Most Economically Advantaged	TOTAL
<b>White Sample</b>					
Class prevalence (%)	16.2	32.0	19.0	32.8	100.0
Sample size (n)	856	1,696	1,008	1,735	5,294
Daily smoking in past month (%)	53.5	36.0	25.5	7.5	28.0
<b>Black Sample</b>					
Class prevalence (%)	44.2	-	25.5	30.3	100.0
Sample size (n)	840	-	483	574	1,897
Daily smoking in past month (%)	18.8	-	13.6	10.3	14.9
<b>Latino Sample</b>					
Class prevalence (%)	23.9	-	41.5	34.6	100.0
Sample size (n)	312	-	542	452	1,306
Daily smoking in past month (%)	23.6	-	4.8	13.0	12.1
<b>Asian Sample</b>					
Class prevalence (%)	21.6	-	-	78.4	100.0
Sample size (n)	129	-	-	467	596
Daily smoking in past month (%)	33.9	-	-	8.4	14.4

**Table 6.2 Prevalence of Daily Smoking by Human Capital Latent Classes Stratified by Race/Ethnicity**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	<b>Class 5</b>	
	<b>Persistently Low</b>	<b>Low with Continuing Adult Education</b>	<b>Upwardly Mobile</b>	<b>High with Early Parental Investments</b>	<b>Persistently High</b>	<b>TOTAL</b>
<b>White Sample</b>						
Class prevalence (%)	25.0	18.3	26.2	11.6	18.8	100.0
Sample size (n)	1,324	967	1,390	615	998	5,294
Daily smoking in past month (%)	50.0	40.7	14.6	12.9	14.8	28.0
<b>Black Sample</b>						
Class prevalence (%)	27.4	39.7	-	10.3	22.6	100.0
Sample size (n)	519	753	-	195	429	1,897
Daily smoking in past month (%)	17.8	17.9	-	12.4	7.9	14.9
<b>Latino Sample</b>						
Class prevalence (%)	23.5	33.8	-	18.3	24.3	100.0
Sample size (n)	308	442	-	239	318	1,306
Daily smoking in past month (%)	11.2	17.7	-	6.6	9.5	12.1

**Table 6.3 Prevalence of Daily Smoking by Social Capital Latent Classes Stratified by Race/Ethnicity**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	
	<b>Persistently Low</b>	<b>Downwardly Low</b>	<b>High in Social Context</b>	<b>High in Religious Context</b>	<b>TOTAL</b>
<b>White Sample</b>					
Class prevalence (%)	27.8	29.3	17.7	25.2	100.0
Sample size (n)	1,472	1,549	939	1,334	5,294
Daily smoking in past month (%)	42.2	39.4	16.9	7.9	28.0
<b>Black Sample</b>					
Class prevalence (%)	30.6	18.7	22.3	28.4	100.0
Sample size (n)	580	355	423	540	1,897
Daily smoking in past month (%)	16.4	28.6	13.2	5.6	14.9
<b>Latino Sample</b>					
Class prevalence (%)	24.3	30.1	13.1	32.5	100.0
Sample size (n)	318	393	172	424	1,306
Daily smoking in past month (%)	23.3	8.2	11.7	8.6	12.1

**Table 6.4 Prevalence of Daily Smoking by Human Capital Latent Classes among Asian Sample**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	
	<b>Persistently Low</b>	<b>Downwardly Mobile</b>	<b>Upwardly Mobile</b>	<b>Persistently High</b>	<b>TOTAL</b>
Class prevalence (%)	19.9	24.0	30.1	26.0	100.0
Sample size (n)	119	143	179	155	596
Daily smoking in past month (%)	20.3	26.8	7.8	6.2	14.4

**Table 6.5 Prevalence of Daily Smoking by Social Capital Latent Classes among Asian Sample**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	
	<b>Persistently Low</b>	<b>Downwardly Mobile</b>	<b>Upwardly Mobile</b>	<b>Persistently High</b>	<b>TOTAL</b>
<b>Asian Sample</b>					
Class prevalence (%)	30.3	31.8	5.9	32.0	100.0
Sample size (n)	180	190	35	191	596
Daily smoking in past month (%)	19.0	21.9	8.9	5.0	14.4

**Table 6.6 Prevalence of Heavy Episodic Drinking by Economic Capital Latent Classes Stratified by Race/Ethnicity**

	Class 1	Class 2	Class 3	Class 4	
	Most Economically Disadvantaged	Economically Downward	Economically Upward	Most Economically Advantaged	TOTAL
<b>White Sample</b>					
Class prevalence (%)	16.9	31.1	18.9	33.2	100.0
Sample size (n)	893	1,644	1,001	1,756	5,294
Alcohol behaviors in past year (%) <sup>a</sup>					
No alcohol use	39.5	17.8	20.6	12.5	20.6
Used alcohol, but no monthly heavy episodic drinking	43.1	54.9	60.2	57.6	54.7
Monthly heavy episodic drinking	17.3	27.3	19.2	29.9	24.7
<b>Black Sample</b>					
Class Prevalence (%)	44.6	-	25.5	29.9	100.0
Sample size (n)	846	-	483	568	1,897
Alcohol behaviors in past year (%) <sup>a</sup>					
No alcohol use	54.5	-	42.0	25.9	42.9
Used alcohol, but no monthly heavy episodic drinking	34.2	-	39.5	63.8	44.2
Monthly heavy episodic drinking	11.3	-	18.5	10.3	12.9
<b>Latino Sample</b>					
Class Prevalence (%)	26.3	-	44.6	29.1	100.0
Sample size (n)	343	-	583	380	1,306
Alcohol behaviors in past year (%) <sup>a</sup>					
No alcohol use	51.0	-	31.6	11.8	31.3
Used alcohol, but no monthly heavy episodic drinking	31.7	-	51.2	64.9	49.7
Monthly heavy episodic drinking	17.2	-	17.2	23.3	18.9
<b>Asian Sample</b>					
Class Prevalence (%)	17.8	-	-	82.2	100.0
Sample size (n)	106	-	-	490	596
Alcohol behaviors in past year (%) <sup>a</sup>					
No alcohol use	37.4	-	-	24.6	27.1
Used alcohol, but no monthly heavy episodic drinking	45.8	-	-	59.2	56.7
Monthly heavy episodic drinking	16.8	-	-	16.1	16.3

<sup>a</sup> Monthly heavy episodic drinking is defined as having at least four drinks for females or five drinks for males in one sitting on a monthly basis in the last 12 months.

**Table 6.7 Prevalence of Heavy Episodic Drinking by Human Capital Latent Classes Stratified by Race/Ethnicity**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	<b>Class 5</b>	
	<b>Persistently Low</b>	<b>Low with Continuing Adult Education</b>	<b>Upwardly Mobile</b>	<b>High with Early Parental Investments</b>	<b>Persistently High</b>	<b>TOTAL</b>
<b>White Sample</b>						
Class Prevalence (%)	22.9	18.1	28.8	11.5	18.7	100.0
Sample size (n)	1,213	959	1,527	606	989	5,294
Alcohol behaviors in past year (%) <sup>a</sup>						
No alcohol use	25.1	32.3	17.8	14.1	12.1	20.6
Used alcohol, but no monthly heavy episodic drinking	47.5	49.5	57.4	60.8	60.4	54.7
Monthly heavy episodic drinking	27.4	18.2	24.8	25.1	27.4	24.7
<b>Black Sample</b>						
Class Prevalence (%)	26.4	38.8	-	11.1	23.7	100.0
Sample size (n)	500	737	-	211	449	1,897
Alcohol behaviors in past year (%) <sup>a</sup>						
No alcohol use	57.7	42.2	-	40.1	28.7	42.9
Used alcohol, but no monthly heavy episodic drinking	28.1	44.0	-	47.6	6.1	44.2
Monthly heavy episodic drinking	14.2	13.8	-	12.3	10.3	12.9
<b>Latino Sample</b>						
Class Prevalence (%)	23.5	34.7	-	18.1	23.7	100.0
Sample size (n)	307	454	-	236	309	1,306
Alcohol behaviors in past year (%) <sup>a</sup>						
No alcohol use	48.0	32.7	-	24.1	18.9	31.3
Used alcohol, but no monthly heavy episodic drinking	30.6	48.3	-	64.1	59.2	49.7
Monthly heavy episodic drinking	21.4	18.9	-	11.9	21.8	18.9

<sup>a</sup> Monthly heavy episodic drinking is defined as having at least four drinks for female s or five drinks for males in one sitting on a monthly basis in the last 12 months.

**Table 6.8 Heavy Episodic Drinking by Social Capital Latent Classes Stratified by Race/Ethnicity**

	Class 1	Class 2	Class 3	Class 4	
	Persistently Low	Downward Mobility	High in Social Context	High in Religious Context	TOTAL
<b>White Sample</b>					
Class prevalence (%)	26.3	31.7	19.1	22.9	100.0
Sample size (n)	1,390	1,680	1,012	1,212	5,294
Alcohol behaviors in past year (%) <sup>a</sup>					
No alcohol use	23.5	17.7	14.4	26.9	20.6
Used alcohol, but no monthly heavy episodic drinking	47.6	53.6	58.6	59.6	54.7
Monthly heavy episodic drinking	28.9	28.6	27.0	13.5	24.7
<b>Black Sample</b>					
Class prevalence (%)	30.6	18.7	22.3	28.4	100.0
Sample size (n)	580	354	423	540	1,897
Alcohol behaviors in past year (%) <sup>a</sup>					
No alcohol use	46.2	36.9	44.0	42.3	42.9
Used alcohol, but no monthly heavy episodic drinking	39.4	43.4	40.8	52.1	44.2
Monthly heavy episodic drinking	14.4	19.8	15.1	5.6	12.9
<b>Latino Sample</b>					
Class prevalence (%)	24.4	29.6	12.9	33.0	100.0
Sample size (n)	319	386	169	432	1,306
Alcohol behaviors in past year (%) <sup>a</sup>					
No alcohol use	35.3	37.4	21.2	27.2	31.3
Used alcohol, but no monthly heavy episodic drinking	41.4	40.9	60.5	58.5	49.7
Monthly heavy episodic drinking	23.3	21.7	18.3	14.3	18.9

<sup>a</sup>Monthly heavy episodic drinking is defined as having at least four drinks for females or five drinks for males in one sitting on a monthly basis in the last 12 months.



**Table 6.9 Prevalence of Heavy Episodic Drinking by Human Capital Latent Classes among Asian Sample**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	
	<b>Persistently Low</b>	<b>Downwardly Mobile</b>	<b>Upwardly Mobile</b>	<b>Persistently High</b>	<b>TOTAL</b>
Class Prevalence (%)	21.4	26.5	26.3	25.8	100.0
Sample size (n)	128	158	157	154	596
Alcohol behaviors in past year (%) <sup>a</sup>					
No alcohol use	44.5	26.2	17.5	22.5	27.1
Used alcohol, but no monthly heavy episodic drinking	33.9	53.5	76.2	59.6	56.7
Monthly heavy episodic drinking	21.5	20.2	6.3	17.9	16.3

<sup>a</sup> Monthly heavy episodic drinking is defined as having at least four drinks for females or five drinks for males in one sitting on a monthly basis in the last 12 months.

**Table 6.10 Prevalence of Heavy Episodic Drinking by Social Capital Latent Classes among Asian Sample**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	
	<b>Persistently Low</b>	<b>Downwardly Mobile</b>	<b>Upwardly Mobile</b>	<b>Persistently High</b>	<b>TOTAL</b>
Class Prevalence (%)	30.3	34.6	5.9	29.2	100.0
Sample size (n)	181	206	35	174	596
Alcohol behaviors in past year (%) <sup>a</sup>					
No alcohol use	29.5	11.9	50.3	37.1	27.1
Used alcohol, but no monthly heavy episodic drinking	55.4	56.7	49.2	62.2	56.7
Monthly heavy episodic drinking	15.1	31.4	0.5	0.8	16.3

<sup>a</sup> Monthly heavy episodic drinking is defined as having at least four drinks for females or five drinks for males in one sitting on a monthly basis in the last 12 months.

## CHAPTER 7: DISCUSSION

### 7.1 INTRODUCTION

The overall goal of this dissertation was to ascertain the effects of life-course social status during the transition from adolescence to adulthood on the substance use behaviors of cigarette smoking and heavy episodic alcohol use in adulthood. The transition from adolescence (ages 12 to 17) into young adulthood (ages 18 to 29) is often characterized by the exploration and attainment of social roles that are physically, financially, and socially independent from parents or caretakers (Arnett 2000, Furstenberg et al 2005). These role changes and social influences in young adulthood have been linked to increase substance use (Staff et al 2010). Across the life course, the prevalence of cigarette smoking and heavy episodic alcohol use is highest in young adulthood in the U.S. (SAMHSA 2011, Windle et al 2005). The persistence of these health behaviors may trigger pre-disease pathways in adolescence and young adulthood that lead to poor health outcomes in later life. Smoking and heavy alcohol use are both associated with early morbidity and mortality due to chronic diseases and cancer (Ahern et al 2008, CDC 2008, Mokdad et al 2007). Although young people are in better health relative to their older counterparts, the transition to adulthood can mark a turning point in health trajectories. This period is an opportune time to the prevent onset of pre-disease pathways and target interventions and policies that encourage healthy lifestyles and behaviors among young adults.

This dissertation focused on the role of social status from adolescence into adulthood as a fundamental social determinant of smoking and alcohol behaviors. Research on socioeconomic inequalities in health outcomes have consistently documented that lower socioeconomic status (SES) groups (e.g., based on education, income, or occupation) possess worse health (e.g., chronic conditions, self-reported health, and mortality) than their higher SES counterparts (Adler

et al 2008, Adler & Stewart 2010, Marmot 2003). The role of SES on substance use behaviors are clearly evident but occur in opposite directions for smoking and alcohol behaviors. For cigarette smoking, lower SES is associated with higher smoking rates (Barbeau et al 2004a, Brook et al 2008, Chassin et al 2000, Jefferis et al 2004). In contrast, risky alcohol behaviors as assessed by heavy episodic drinking often occur at higher rates among higher SES groups (Chen et al 2004, Crosnoe & Riegle-Crumb 2007, Humensky 2010). This dissertation contributes to the literature by examining this divergent role of social status on substance use behaviors by merging social stratification theories and a life-course perspective.

An investigation of social inequalities in substance use behaviors would be incomplete without considering the role of race/ethnicity. Social status and race/ethnicity are deeply intertwined, and disentangling this relationship has been at the forefront of health disparities research. The social construction of race/ethnicity is grounded in the political, cultural, and structural forces that create norms of social hierarchy from disadvantages to advantages (Ford & Harawa 2010, Williams & Sternthal 2010). From this perspective, the role of social status may differ across racial/ethnic groups as a result of a group's shared history, social and cultural norms, and constraints in status attainment. This perspective motivated this research to take a closer look at the intersectionality of life-course social status and race/ethnicity during the transition into adulthood and how that affects substance use behaviors.

By taking a life-course perspective to better understand the determinants of substance use behaviors, life-course social status is conceptualized as a multidimensional construct that extends from adolescence into early adulthood. In this dissertation, social status was defined as the relative position of an individual in society as characterized by his/her economic capital, human capital, and social capital (Krieger et al 1997, Oakes & Rossi 2003). By deconstructing the

different forms of capital and how they may change during the transition to adulthood, this dissertation adds to the health disparities research in the substance use field.

This final chapter summarizes the key findings from this dissertation and highlights the theoretical contributions to the literature. With any study, there are both strengths and limitations that should be taken into account. After presenting these, this chapter concludes with the public health implications and considerations for future research.

## **7.2 DISCUSSION OF MAJOR FINDINGS**

Using data from three survey waves of the National Longitudinal Study of Adolescent Health (Add Health), this dissertation was guided by two specific study aims: (1) to examine the relationship of life-course social status on substance use behaviors of adult daily smoking and heavy episodic drinking (HED) and (2) to investigate how this relationship of social status and substance use varied by race/ethnicity. This section provides a discussion of the major findings.

### **7.2.1 Life-Course Social Status**

In this dissertation, life-course social status captured the ebb and flow of social status advantages and disadvantages across adolescence (ages 12-17), young adulthood (ages 18-26), and adulthood (ages 24-32). Life-courses social status also incorporated an element of intergenerational transmission of parent's social status to the respondent through economic capital in all three life stages, human capital primarily in adolescence, and social capital also in adolescence. Using a person-oriented framework with longitudinal data, findings from the latent class analyses confirmed the first hypothesis of study aim #1 that life-course social status has social mobility patterns that include persistent advantages and disadvantages as well as upward

and downward mobility. There were four latent classes for the domains of economic capital and social capital, and five latent classes for the domain of human capital.

Overall, patterns of social status (whether high or low) from adolescence into adulthood were stable across each domain. Economic capital included a most economically disadvantaged group and most economically advantaged group. Similarly, human capital encompassed a persistently low human capital group and persistently high human capital group. The social capital domain presented three stable groups of persistently low, high in social context, and high in religious context. Even during the first part of the life course, these stable patterns support previous studies of a cumulative build-up of social disadvantages and advantages that start early in the life course in adolescence and continue into adulthood (Dannefer 2003, Palloni 2006).

Furthermore, these stable patterns show that social origins matter, where parents' social status (regardless of domain) provides direct or indirect transmission of capital. Within the economic capital domain, the direct transmission of financial resources was most evident in the most economically advantaged group through high incomes in adolescence and help from family for living or housing costs in young adulthood and adulthood. Economic capital can also indirectly influence other social status domains where financial resources can be spent on human capital or social capital investments (Duncan et al 1998). For human and social capital, there is an indirect transfer of capital from parents to respondents through exposure to attitudes and values (e.g., towards education or civic participation), knowledge (e.g., information or skills), and behaviors (e.g., parental investments, work hours, and engagement in organizational or religious groups) (Grolnick & Slowiaczek 1994). The stickiness (or similarities between parents and adult respondents) associated with education may point to parents' transmission of values (whether negative or positive) toward educational attainment early in the life course or could

reflect parents' abilities (or lack of) to help their child achieve educational milestones. These findings could also be explained at a macro level where lower social status families tend to live and stay in areas with poor neighborhoods, low-quality schools, and inadequate resources which contribute to the cumulative disadvantages that build up over time (Clark 2005, Corcoran 1995, Wilson 1987). The stable pattern of cumulative advantages reflects a cycle of wealth, security, and resources that are passed down with each generation (Morgan & Scott 2007).

Experiences of social mobility from adolescence into adulthood also existed for each social status domain. The degree of mobility highlights the opportunities to move up the social status ladder for some, but also move down the social ladder for others. The economic capital domain included groups of downward and upward mobility from parents' status to adult respondents' status. There were three groups that possessed upward movements in human capital levels. However, the most prominent shift was in the upward mobility group which had the largest shifts in human capital levels from parents' to adult respondents' status. The low with continuing adult education group and high with early parental investment group had much smaller shifts, which was most evident with adult educational attainment. Finally, although all groups showed a degree of decline in social capital by adulthood, the social capital domain contained one group that exhibited largely downward social capital mobility, which was primarily in the context of religious participation. These trends represent an anomaly to the "stickiness" in social status development. Individual-level explanations for the upward or downward movement in social status could include psychological or personality characteristics of ambition, resiliency or problem behaviors where pathways to educational or financial success were altered (Breen & Jonsson 2005). In addition, opportunities and resources (e.g., after school programs, mentorships) during adolescence could boost a lower social status individual's future

chances. These patterns of mobility require a closer examination to pinpoint the key events or turning points that trigger the shift in social status during the transition to adulthood period.

On a final note, U.S. social inequalities are most evident in income and education markers (Alon 2009, Grusky & Ku 2008, Neckerman & Torche 2007). The patterns of cumulative advantages and disadvantages contribute to the growth in inequality (Keister & Moller 2000, Morgan & Scott 2007). In the economic capital domain, findings from this dissertation showed mean personal incomes in adulthood that were five times larger in the most advantaged group compared to the least advantaged. Furthermore, only 20% of the least advantaged group were home owners compared to 60% in the most advantaged group. Education has been one of the main routes for upward mobility in the U.S., yet this mobility has stagnated as the gaps widen between those who have a college degree and those who do not (Alon 2009). For three of the five human capital groups, there was a noticeable upward shift in adult's education level when compared to parents' education level, especially with the completion of high school or GED. Yet there are clearly disparities when comparing the two lower human capital groups (with mean education levels at a high school degree/GED) and the two higher human capital groups (with mean education levels at a college degree). Lastly, as evident by the descriptive analysis of each social status LCA model with key social status indicators from the other domain, it is important to keep in mind that all three domains tend to be highly correlated thus compounding the degree of inequality between the low and high social status groups.

To conclude, the transition to adulthood period marks a time when social status is evolving across each economic, human, and social capital domain. These changes indicate that social status trajectories are neither linear nor fixed as evident from the downward and upward

shifts. Therefore, it is important to capture this process of accruing (or losing) capital during this transition period of the life course.

### **7.2.2 Life-Course Social Status and Substance Use Behaviors**

The descriptive findings of substance use behaviors from this dissertation mirrored the national trends of increased smoking and alcohol use from adolescence into adulthood. Current smoking in the past month increased during this transition period. Heavy episodic drinking (HED) peaked in young adulthood, but fell slightly in adulthood. By adulthood, 24% and 22% engaged in daily smoking in the past month and monthly HED in the past year, respectively.

For the first study aim, findings from the latent class analysis supported the hypothesis that lower life-course social status has a higher association with adult smoking than higher social status. For each of the social status domains, the most economically disadvantaged and the downwardly mobile groups (37% and 33%, respectively), the two lowest human capital groups (42% and 30%, respectively), and the persistently low and downwardly low social capital groups (37% and 32%, respectively) had the highest daily smoking prevalences. Furthermore, these findings confirmed previous studies of an association between low social status and high smoking (Barbeau et al 2004a, Brook et al 2008, Chassin et al 2000, Ensminger et al 2009, Jefferis et al 2004, Rasmussen et al 2009). Lower life-course social status groups, whether it reflected a stable pattern or a downwardly mobile pattern from adolescence into adulthood, exhibited higher smoking rates in adulthood. This pattern appeared for all three social status domains. Having lower financial resources and higher economic hardships (economic capital), lower educational and occupational attainment (human capital), and lower organizational involvement and social networks (social capital) were all associated with more smoking.



Both the cumulative build-up of disadvantages as well as shifting from an advantaged to a disadvantaged status serve as risk factors for smoking that could operate at the individual level, social context, or the larger environment (Pampel et al 2010). Lower social status individuals (whether via cumulative disadvantage or downward mobility) may experience more stress, feel a loss of control, and engage in smoking as a coping behavior (Ansell et al 2012, Meyer et al 2008, Richards et al 2011). Disadvantaged neighborhoods and their social norms may create early exposure and less social stigma towards smoking (Ahern & Galea 2007, Peretti-Watel et al 2009, Stuber et al 2008). Furthermore, tobacco retail outlets and marketing tend to cluster in disadvantaged neighborhoods, further increasing access and availability as well as enforcing a social norm for smoking (Ahern et al 2009, Novak et al 2006). There have also been explicit marketing strategies directed at lower social status and working-class groups by tobacco companies (Barbeau et al 2004b, Jiang & Ling 2011). These all serve as potential mechanisms for explaining the relationship between low social status to smoking.

The second hypothesis that lower life-course social status was associated with lower engagement in HED in adulthood was only partially supported. There was no clear low-high social status relationship with HED. Rather, there was a different pattern of HED for each of the social status domains. Groups with high adolescent economic capital (i.e., the most economically advantaged group and the downwardly mobile group) have larger HED endorsements (27% and 24%, respectively) than the persistently low (14.8%), which confirms other research suggesting that economic capital measures in adolescence is particularly important in the development of risky alcohol behaviors in adulthood (Botticello 2009, Buchmann et al 2009, Fothergill & Ensminger 2006, McCambridge et al 2011). For human capital, all groups except for one have similar HED prevalences of 22% to 25%, possibly reflecting a normative pro-alcohol culture

across human capital groups for this age cohort. Finally, the role of social capital on HED may reflect religious participation more than social context of organizational memberships or civic participation. The high in religious context group reported the lowest drinking prevalence at 12%. All other social capital groups showed similar drinking prevalences (between 24-26%).

The economic capital results were consistent with previous studies that higher social status via income is associated with high HED prevalence (Chen et al 2004, Crosnoe & Riegle-Crumb 2007, Humensky 2010). With both the most advantaged and the downwardly mobile groups having high HED prevalences, the effects of higher economic capital may be reflective of the financial resources and social norms related to alcohol behaviors that were established in adolescence rather than in adulthood. Although other studies have reported stronger effects of past year social status measures on alcohol behaviors (Caldwell et al 2008, Cerda et al 2011), these findings highlight the importance of accounting for the changes in social status. The lifestyle and social norms experienced in adolescence may have lingering effects on health behaviors later in life. However, by adulthood, the reasons for engaging in HED may differ between the two groups such that the most advantaged group may participate as part of a social lifestyle (Lutfey & Freese 2005) and the downwardly mobile may participate to cope with stress as a result of economic hardships (Hart et al 2009). Additional research should explore HED influences between these two groups.

Within the human and social capital domains, there was no difference between the low and high social status groups. Regardless of education, occupation, organizational involvement (excluding religion), and social networks, HED behaviors were similar across groups which suggest a normative environment for alcohol use. In the human capital context, this finding is consistent with previous studies that reported HED behaviors going above and beyond the

college effect (Crosnoe & Riegle-Crumb 2007, Lanza & Collins 2006). While college is a setting that may encourage HED behaviors, findings from this study showed no difference between the lower human capital groups that did not attend college and higher human capital groups that did attend college. However, the lower HED prevalence among the low with continuing adult education group serves as an exception to the normative HED pattern across human capital groups. This anomaly may be explained by the lack of time due to combination of work and school among this lower social status group which serves as a protective factor against HED. Further research is required to explore this hypothesis.

The social capital findings show that low or high organizational/civic participation or small or large social networks have no effect on HED behaviors. Religious participation from adolescence into adulthood serves as a protective factor for HED behaviors (Michalak et al 2007). However, this finding may be heavily influenced by the values and social norms related to being religious rather than the social capital potentially access through religious participation. To conclude, no matter if it were patterns of stability or mobility, human capital and social capital findings revealed that there is little variation in HED behaviors across social status groups, thus reflecting a general norm for HED in adulthood. The relationship between social status and alcohol behaviors may be more apparent using a more assessment of alcohol abuse or dependence rather than HED or assessing later in the life course when alcohol behaviors may not be as normative for this age group.

### **7.2.3 Life-Course Social Status by Race/Ethnicity**

This dissertation also focused on the interplay of social status and race/ethnicity for the second study aim. The first hypothesis of the second study aim was confirmed in that the number of life-course social status patterns was similar across racial/ethnic groups, but the variation

within these classes differed by racial/ethnic groups such that the levels of social status (e.g., income, education) are higher in one racial/ethnic group than another. Due to small sample size and the lack of power to identify statistically significant differences, the interpretation of the social status groups for the Asian sample is discussed separately.

On a whole, the substantive patterns of economic capital, human capital and social capital were similar for Whites, Blacks, and Latinos. Within the economic capital domain, each possessed latent classes that represented the most disadvantaged, upwardly mobile, and most advantaged. Similarly, they shared groups characterized by persistently low human capital, low with continued adult education, high with early parental investments, and persistently high human capital groups. For the social capital domain, all three racial/ethnic groups included a persistently low social capital group, downwardly low group, high in social context group, and high in religious context group. These findings show a similar life-course social status development occurring during the transition to adulthood for Whites, Blacks, and Latinos.

Yet, there were key differences in social status patterns that distinguished each of the racial/ethnic groups. First, the White sample possessed an additional latent class within the economic capital (downwardly mobile) and human capital (upwardly mobile) domains. Neither the Black nor Latino samples encompassed this economically downward group or an upwardly mobile human capital group. This finding may be reflective of the lower starting economic positions for some Blacks and Latinos (Grusky & Ku 2008, Williams et al 2010), and thus there is little opportunity for economic downward mobility. Similarly, individual and institutional discrimination intertwined with poor quality of schools and limited job opportunities may limit education and job opportunities for upward human capital mobility for some Blacks and Latinos (Mare 1995, Pager et al 2009). These racial/ethnic inequalities reflect the existing social

stratification system that affect the social status development of Blacks and Latinos during this critical transition to adulthood period.

Second, although the social status groups are substantively similar across Whites, Blacks, and Latinos, the clustering of respondents between the social status groups differ within racial/ethnic groups. For economic capital, the majority of White respondents were categorized into the most advantaged (34%) and downwardly mobile (32%) groups. In contrast, 30% of Black respondents and 29% of Latino respondents were classified in the most advantaged group. Furthermore, the most common category for Blacks was in the most disadvantaged group (44%), and for Latinos, in the upwardly mobile group (45%). Within the human capital domain, Whites were more likely to be in the upwardly mobile human capital (29%) or in the lowest human capital group (23%). Yet the majority of Blacks were in the low with continuing adult education (40%) and one-third of Latinos were in the lowest human capital group. The differential clustering highlights the racial/ethnic differences in social status groupings. As a result of these differences, certain social status groups where a majority of individuals in a racial/ethnic group fall into can establish the norm and potentially shared experiences of social status within a specific racial/ethnic group. For example, a majority of Blacks was in the most economically disadvantaged or low human capital groups, which may reflect a normative experience of lower social status for this racial/ethnic group. However, higher social status among Black respondents in the economic and human capital domains was evident indicating a different shared experience of social status norms for this minority within the Black sample. There has been other studies exploring the experiences of upwardly mobile and higher social status Blacks which details both the costs and the benefits of being in a higher social status position (Cole & Omari 2003, Markovic et al 1998, Mossakowski 2012, Sellers et al 2009). For Latinos, the experiences of

economic upward mobility are promising but the low human capital attainment may hinder long-term social status attainment. Previous research has documented a segmented assimilation process where there is a social status bifurcation among Latino children of immigrants (Portes & Zhou 1993, Telles & Ortiz 2008, Waldinger & Feliciano 2004). Further research should qualitatively examine these experiences within specific racial/ethnic groups during the transition to adulthood period where social status trajectories are in flux.

Third, the content validity of the social capital constructs has the potential to vary across racial/ethnic groups. While most of the economic, human and social capital indicators are traditional social status measures used in public health research, these measures may have a different meaning for each racial/ethnic group (Ford & Harawa 2010). This notion is best exemplified through the social capital domain. Many of these indicators reflect formal participation in organizations that may have been initiated or have large memberships among a particular racial/ethnic group. For example, racial/ethnic composition of parent-teacher organizations, labor unions, voluntary organizations, and religious organizations could influence whether or not an individual of a different race/ethnicity decided to participate. In addition, certain racial/ethnic groups may engage in informal mechanisms of community involvement or “volunteering” (i.e., extended family gatherings, ethnic-specific organizations) that were not captured through the formal organizations listed in the survey (Telles & Ortiz 2008, Zhou & Bankston 1998). Qualitative research could be useful in further examining the meaning and implications of economic, human, and social capital indicators by racial/ethnic groups.

Social status patterns and their interpretations were quite different for Asians, compared to all other racial/ethnic groups. First, only two significant latent classes emerged for the economic capital domain, and the majority of respondents (80%) were categorized into the

advantaged category compared to the disadvantaged category. Second, four distinct latent classes were evident in the human capital domain. However, Asians were the only racial/ethnic group to have a downwardly mobile human capital group. Almost one-quarter of respondents belonged to this group where parent education levels were much higher than adult respondents. This finding in the Asian subsample could reflect the educational and occupational history of Asian immigrants. Highly educated Asians who immigrate to the U.S. may find themselves in more working-class occupations with little upward movement (Portes & Zhou 1993, Zhou & Bankston 1998). As a result, immigrant children may be forced to enter the workforce early while postponing post-secondary schooling. Finally, the anomaly in the social capital groups was through the presence of an upwardly mobile group in the Asian subsample. Both organizational and religious involvement increased substantially from adolescence to adulthood in this group. This finding could be due to heavy investment in education during adolescence which leaves little time for other activities. In a separate descriptive analysis, this upwardly mobile group had the highest mean education levels. With completion of schooling by adulthood, there may be more free time to be involved in formal organizational networks. These findings provide an interesting portrayal of social status during the transition to adulthood among Asians, however, these results from the Asian subsample should be taken with caution due to small sample size. Although other studies have used LCA for smaller samples than this sample of 596 respondents (Collins & Lanza 2010), the potential homogeneity among this Asian sample may have precluded any significant findings for social status groups.

#### **7.2.4 Life-Course Social Status and Substance Use Behaviors by Race/Ethnicity**

Substance use behaviors varied by race/ethnicity. By adulthood, White respondents had the highest prevalence of daily smoking at 28% followed by Blacks (15%), Asians (14%) and

Latinos (12%). For heavy episodic drinking (HED), White respondents also reported the highest proportion of HED at 25% followed by Latinos (19%), Asians (16%), and Blacks (13%). Also, racial/ethnic minorities were more likely to abstain from any alcohol use in the past year. These differences set the stage for the second study aim of social status and substance use behaviors stratified by racial/ethnic groups.

For the smoking outcome, the main hypothesis was that patterns of overall social disadvantage among each racial/ethnic group are linked to higher smoking in adulthood. This hypothesis was confirmed for each social status domain. With the interplay of social status and race/ethnicity, there was a relationship of low social status and high smoking prevalence for each racial/ethnic group. The lowest social status group for economic capital (e.g., most disadvantaged), human capital (e.g., persistently low and low with continuing adult education), and social capital (e.g., persistently low) had higher smoking prevalences among Whites, Blacks, Latinos, and Asians. Furthermore, the economically downward group and the downwardly low social capital group both had the second highest smoking prevalence after the most disadvantaged group in the corresponding domain. These findings indicate that above and beyond racial/ethnic composition, the experiences of persistently low and downwardly social status promote smoking behaviors regardless of economic, human or social capital domains.

Although the overall smoking trend was similar across racial/ethnic groups, Whites exhibited the greatest degree of smoking variation between social status groups. For example, the prevalence of smoking among all White respondents was 28%. Yet the economically disadvantaged group had a smoking prevalence that was almost six times as high (53%) as the least economically advantaged group (7%). The degree of smoking variation was not as stark for the Black or Latino samples such that the smoking prevalences across social status groups were



more similar to that of the smoking prevalence of the total sample. For example, the total Black sample had a smoking prevalence of 15%. The most economically advantaged group had a smoking prevalence of 10% compared to the least economically disadvantaged group which had a prevalence of 19%. Similarly, the total Latino sample had a smoking prevalence of 12%. The most advantaged group had a prevalence of 13% compared to the least advantaged group with a prevalence of 24%. Using a national sample of U.S. adults, Barbeau and colleagues reported steep social status gradients of smoking for Whites and Blacks, but less so for Latinos and Asians (2004). The findings in this dissertation supported those of Barbeau and colleagues for the White sample, but not for the Black sample which resembled that of the Latino sample.

Other studies have reported a convergence of smoking rates by race/ethnicity in older age groups where smoking rates for Whites become more similar if not lower than that of non-White minorities (Gundersen et al 2009, Pampel 2008). This convergence is largely due to higher cessation rates among Whites compared to their racial/ethnic counterparts. Despite the findings of lower smoking prevalences among racial/ethnic minorities compared to Whites, the convergence phenomena may still occur where racial/ethnic minorities show higher smoking rates compared to Whites later in the life course. As new waves of Add Health are collected, this relationship should be investigated further.

For the outcome of heavy episodic drinking (HED), I hypothesized that life-course social status patterns among Blacks, Latinos, and Asians would have a divergent association with adult HED than life-course social status-HED patterns among Whites. This hypothesis was only partially confirmed depending on the social status domain. Whites and Latinos had the most similar findings across social status domains, so they are discussed first. Then a discussion of the

findings for Blacks is presented. Due to low sample size and lack of power to statistically test for significant differences, the findings for Asians are not discussed.

Higher life-course social status groups for Whites were expected to engage in HED more than their lower social status counterparts, but this hypothesis was only supported in the economic capital domain. Furthermore, Latinos followed this same pattern of higher social status and higher HED. For Whites and Latinos, the economically advantaged groups reported the highest HED. Early HED exposure may have occurred in a higher social status environment in adolescence that created a norm for HED behaviors in adulthood (Chartier et al 2009, Humensky 2010). Within the human capital domain, the HED results did not fully support the proposed hypothesis. In this study, human capital had little effect for Whites and Latinos where HED behaviors were fairly similar across human capital groups. This similarity points to a normative environment for HED among this age group regardless of education level or occupation type (Chartier et al 2011, Gilman et al 2008). With social capital, the common thread was that the high in religious context group had the lowest HED prevalence across racial/ethnic groups which supports previous studies (Michalak et al 2007, Theall et al 2009). Among Whites and Latinos, HED prevalence was fairly similar across the three other social capital groups. This supports the idea of normative alcohol behaviors for Whites and Latinos.

The HED findings for the Black sample are more complex in that each social status domain uncovers a different pattern with HED. The hypothesis that low social status groups would exhibit higher HED behaviors compared to higher social status groups among Blacks was only partially supported. An anomaly appeared for the economic capital domain where the upwardly mobile group experienced the highest HED prevalence. For human capital, the hypothesis was confirmed where lower human capital groups had higher HED prevalences

compared to the higher human capital groups. The social capital findings provided mixed support for the hypothesis. The highest prevalence of HED was found in the downwardly mobile social capital group. One explanation for the economic and social capital findings among Blacks could indicate that a change in social status (whether from low to high or high to low) create a context that encourages HED behaviors among Blacks (Chartier et al 2011, Cole & Omari 2003). For the human capital findings, previous literature has reported a link between educational and occupational disadvantages and alcohol-related problems among Blacks (Gilman et al 2008, Godette et al 2009, Mulia et al 2008). Although HED behaviors are less severe than dependence, this finding could foreshadow future problems associated with alcohol behaviors among lower human capital groups among Blacks.

To summarize, social status and smoking have a clear pattern across racial/ethnic groups in that low social status groups have higher smoking rates. The relationship between social status and alcohol is more complicated by racial/ethnic groups. Economic capital plays a significant role with HED among Whites and Latinos where experiences of social advantage may provide the financial resources or the social context/lifestyle that encourages higher HED behaviors. The complex picture of HED behaviors among Blacks warrants further investigation as to whether it is the economic, human, or social capital domains that influence HED behaviors. If it is a subgroup of Blacks who are upwardly mobile in economic terms, but with low human and social capital, then the experiences of this group should be investigated further as to what promotes HED.

### **7.3 THEORETICAL IMPLICATIONS OF KEY FINDINGS**

The conceptual framework and findings of this dissertation offered new theoretical insights for public health and substance use research in three ways. First, by bridging the life-

course perspective and social stratification theories, social status was conceptualized to capture the ebb and flow of social disadvantages and advantages during the transition from adolescence to adulthood. Furthermore, to capture the multidimensionality of social status, three separate domains of social status were examined: economic, human, and social capitals. Second, to contribute to the health disparities literature, this life-course social status construct was developed separately for Whites, Blacks, Latinos, and Asians. Third, this dissertation added to the literature on social disparities by examining the divergent effects of social status on smoking and alcohol behaviors during the peak period of these risky health behaviors in early adulthood.

Within the public health literature, there have been critiques of social status measures including the difficulties of capturing social status over time, poor conceptualization using single measures, and an over emphasis on economic indicators (Braveman et al 2005, Krieger et al 1997, Oakes & Rossi 2003). By utilizing a person-oriented framework of latent class analysis (LCA), this dissertation capitalized on an opportunity to merge the life course perspective and social stratification theories into conceptualizing a life-course, multidimensional social status construct. Few studies in the public health and social stratification fields have utilized a person-oriented approach to model social status development (Hallerod & Gustafsson 2011, Osgood et al 2005, Scharoun-Lee et al 2011), but this person-oriented approach is gaining ground.

The life course perspective provides a nuanced lens to examine social status development during the transition from adolescence to adulthood. During this time when individuals are accruing, maintaining, or losing their economic, human or social capital, the timing and sequencing of key events for social status development (e.g., continuing higher education and entry into the workforce) have long-term effects on status attainment. The LCA groups captured these characteristics of social status changes as evident from the patterns of stability and mobility.

The social attainment model posits the effects of intergenerational transmission (social status gained across generations) and intragenerational transmission (social status gained within an individual's lifetime) as a mechanism for creating socially stratified groups (Grusky & Ku 2008). Following the viewpoints of Bourdieu and others, one's ranking and position in society extend beyond measures of material capital to encompass political, cultural, and social capital (Abel 2008, Bourdieu 1986, Forbes & Wainwright 2001). These other non-economic factors may especially be pertinent during the transition to adulthood when traditional social status markers (e.g., education, income, occupation) are still in flux.

By using longitudinal data from Add Health, the LCA findings showed that both intergenerational and intragenerational markers at key life stages of adolescence, young adulthood, and adulthood played a defining role in life-course social status. These findings support the social status attainment model. There were distinct groups that represent stable and fluid characteristics of social status during the transition to adulthood period. Across each domain of economic, human, and social capitals, patterns of persistently low and persistently high social status represent the phenomena of cumulative disadvantages and advantages even during this early part of the life course that could have been elevated by intergenerational transfers. Furthermore, by early adulthood (where respondents were in their late twenties and early thirties), the LCA results captured group characteristics of downward and upward mobility for each domain of economic, human, and social capitals. These social status groupings contribute to both the public health and social stratification field by presenting a more nuanced understanding of the evolving role of social status during the transition from adolescence to adulthood.

The interplay of social status and race/ethnicity has been a complex issue to tackle in health disparities research. Critiques of traditional social status measures cite “nonequivalence of socioeconomic indicators” across racial/ethnic groups (Kaufman et al 1997, Williams et al 2010), where social status measures may not have the same meaning or effect across racial/ethnic groups. Going beyond a measurement issue, Dressler and colleagues point to a theoretical issue where race/ethnicity and social status are deeply intertwined in the U.S. society such that the social construction of both terms and political/cultural forces create norms of hierarchy from disadvantaged to advantaged statuses (Dressler et al 2005). From this theoretical perspective along with cumulative dis/advantage theory, the role of social status may differ across racial/ethnic groups based on the group’s shared history, racial/ethnic experiences and structural constraints of status attainment. Using a stratified analytic approach, this dissertation developed life-course social status constructs for each racial/ethnic group to reflect the shared experiences of disadvantages and advantages that each racial/ethnic group may encounter during the transition to adulthood. Although this dissertation could not statistically test for between-group differences, there were commonalities of life-course social status across racial/ethnic groups. When using the same economic, human and social capital indicators in the LCA models, substantively similar latent classes for Whites, Blacks, and Latinos were found.

However, as predicted by the cumulative dis/advantage theory, racial/ethnic inequalities were clearly evident in that there were qualitative disparities when examining the mean levels of these social status indicators at each life stage of adolescence, young adulthood and adulthood. This finding, especially in the economic and human capital domains, supports the cumulative dis/advantaged theory where racial/ethnic minorities experience different opportunities and access to resources (Dannefer 2003, DiPrete & Eirich 2006). For the most disadvantaged groups,

starting at a lower social position creates a more difficult pathway to a more advantaged status. Yet as guided by the life-course perspective, key turning points or events could shift the pathway as evident with the upwardly mobile social status groups for Blacks and Latinos within the economic and human capital domains.

Finally, this dissertation focused on the role of social status from adolescence into adulthood as a fundamental social determinant of smoking and alcohol behaviors. Research on socioeconomic inequalities in health outcomes have consistently documented a relationship of lower socioeconomic status (SES) groups (e.g., typically based on education, income, or occupation) and worse health (e.g., chronic conditions, self-reported health, and mortality) (Adler et al 2008, Adler & Stewart 2010, Marmot 2003). The differentials in substance use behaviors by SES are evident but occur in opposition for smoking and alcohol behaviors where smoking is associated with lower SES (Barbeau et al 2004a, Brook et al 2008, Chassin et al 2000, Jefferis et al 2004) and HED is higher among higher SES groups (Chen et al 2004, Crosnoe & Riegle-Crumb 2007, Humensky 2010).

By using single-item or single-point-in-time measures of social status, these nuances of life-course and multidimensional social status during the transition to adulthood period would be lost. In relation to the outcome of smoking, when using adolescent indicators, we can identify those with persistently low social status as being at risk for smoking, but misidentify others who may have started high in adolescence but moved down the social hierarchy in adulthood. Study results showed that despite having high social status in adolescence, the downwardly mobile group was more likely to smoke and engage in HED compared to the upwardly mobile group.

The multidimensionality of social status provides further insight to our understanding of substance use behaviors. The evolving role of social status during the transition into adulthood

period elucidates the potential pathways to smoking and HED. Possessing persistently low economic capital, human capital, and social capital all contributed to a higher likelihood of smoking in adulthood which supports Link and Phelan's (1996) theory of fundamental causes for poor health. However, even further, the earlier life-course experiences that led to a lower social status in adulthood (regardless of low or high adolescent social status) may not be a pertinent factor for smoking in adulthood. This was evident with the downward mobility groups in the economic and social capital domains which had the second highest smoking after the persistently low groups. These findings show that the movement from high to low social status in the transition to adulthood period is a risk factor for smoking.

Overall, the main results of persistently low social status and smoking supported the cumulative dis/advantage theory and the fundamental cause theory for all three social status dimensions and across racial/ethnic groups, however, there is a lack of support for the diminishing returns hypothesis. Few studies in the public health literature have found support for the diminishing returns hypothesis (Farmer & Ferraro 2005). Due to the inability to test across racial/ethnic groups, this study may be limited in detecting whether racial/ethnic groups that occupied higher social status positions have differential returns than Whites, and whether these differential returns create a context for engaging in poor health behaviors.

For the alcohol outcome, there was no clear pattern of life-course social status on HED behaviors in adulthood. Rather, social status groups had similar HED prevalences despite social status changes during the transition to adulthood. These findings point to a general engagement of HED in adulthood regardless of life-course social status. The multidimensional aspect of social status provided some insight to better understand HED behaviors. The findings of higher HED among the economically advantaged group provide some support to Lutfey and Freese's



(2005) counter mechanisms to Link and Phelan's theory of fundamental causes. In their model, status attainment, especially higher social status, encourages poor health behavior in order to maintain a level of prestige or certain lifestyle accompanied by the higher social status (Lutfey & Freese 2005). However, there was no evidence for this model in the other two social status domains which showed similar HED patterns across social status groups.

#### **7.4 STRENGTHS AND LIMITATIONS**

With any research study, there are both strengths and limitations. Two of the main strengths of this dissertation are the availability of longitudinal data (via Add Health) and application of a person-oriented framework (via latent class analysis (LCA)) to develop a life-course, multidimensional social status construct. Through this conceptualization, the dissertation findings provide a nuanced understanding of social status during the transition from adolescence to adulthood. Previous studies are often limited to cross-sectional data or lack the richness of social status measures. Furthermore, the large sample size of Add Health provided the opportunity to further stratify the analysis by race/ethnicity to reveal informative insights of life-course social status for Whites, Blacks, Latinos, and Asians.

However, the dissertation findings should be couched within several key methodological and theoretical/conceptual limitations. For the methodological limitations, Add Health respondents were selected from a school-based sample and the longitudinal nature of the study includes non-response bias. Although weights were used to adjust for attrition, the findings could be biased with non-response from respondents who are disproportionately male, non-White, older as well as those with lower social status. Similarly, the smoking results could be underestimated due to a significant lost-to-follow-up of respondents who were more likely to smoke. With these caveats of non-response bias, these findings are only generalizable to U.S.

adolescents enrolled in school during the 1994-95 academic year and further limited by the racial/ethnic groups of Whites, Blacks, Latinos, and Asians. In addition, LCA involves a degree of subjectivity in the interpretation of latent classes and a degree of misclassification error of classes (Collins & Lanza 2010). Future research should apply the same analytical methods to other longitudinal datasets that capture the transition to adulthood period to validate the findings. Finally, the most current version of Mplus software lacks the ability to run and statistically test multiple latent class models or multiple outcomes at the same time (Muthen & Muthen 1998-2011). As new statistical methods are developed, we can further investigate the interaction of social status domains within multiple latent class models or conceptualize multiple outcomes in one model.

This dissertation has several theoretical and conceptual limitations. First, it is difficult to tease out whether the relationship between social status and substance use is due to social selection, social causation, or spuriousness. Early substance use behaviors can affect later health and social status outcomes (social selection). Alternatively, health behaviors and outcomes may result from an individual's position within the social structure and the circumstances of exposure to social disadvantages or advantages (social causation). Or another factor altogether may be influencing both social status and substance use (spuriousness). The longitudinal data and the modeling approach used in this dissertation provide support for the social causation interpretation, but other factors could be important players that were overlooked in the model.

Second, although this dissertation modeled social status dimensions of economic, human and social capitals separately, these dimensions are highly correlated. Individuals who have higher education and skills (human capital) are likely to have better incomes and lower experiences of economic hardships (economic capital). The social capital connection is not as

direct, but the same idea applies where individuals with more cohesive social ties and network (social capital) are also likely to have similar education (human capital) and financial backgrounds (economic capital) as those in their social network. These relationships were especially evident among the lowest and highest social status groups in the descriptive findings presented in Chapter 3. It is important to account for these strong correlations between economic, human, and social capitals. However, as mentioned earlier, there is an analytical limitation in combining multiple LCA models in Mplus. Separate analyses (not presented) were conducted to develop a “mega” life-course social status LCA model that combined a subset of the observed variables of economic, human, and social capitals. A four-class LCA model was found to be the best-fitting model for the total sample. However, this mega construct lacked some of the nuances of social mobility patterns that were offered by the individual LCA models of economic, human, and social capital. The mega social status construct did show comparable results of low social status-high smoking as well as similar HED prevalences across social status groups.

Third, the outcomes of smoking and HED were modeled separately in this dissertation to examine the divergent role of social status on these health behaviors. However, smoking and HED are also likely to be highly correlated. In this analytic sample, approximately 7% of the respondents reported engaged in both daily smoking and HED. This high-risk group could be substantively different from those who only smoked or only engaged in HED.

An endogeneity issue arises for both situations of correlated social status constructs and substance use behaviors where there are omitted variables in the analytic model. As a result of excluding the correlated social capital dimensions or one of the substance use behaviors, the estimates are likely to be biased. The omitted variable creates unobserved heterogeneity in the model which is captured in the error term. As a result, the observed social status variable or

substance use variable included in the model is correlated with the error term which leads to biased estimates (Wooldridge 2006). In variable-oriented analyses, there are strategies to address the omitted variable bias such as instrumental variable or fixed effects model methods. Similarly, in person-oriented analyses, there has been promise for modeling techniques that can simultaneously analyze two dependent variables in growth mixture modeling via Mplus or SAS PROC TRAJ. Despite these limitations, the dissertation findings do have important implications for public health research and practice.

## **7.5 PUBLIC HEALTH IMPLICATIONS AND FUTURE RESEARCH DIRECTIONS**

The findings from this dissertation can be used to inform both future public health research and prevention/intervention practices. This dissertation highlights four important public health implications for research and practice: (1) better conceptualization of social status using the life-course perspective, (2) application of person-oriented analytical frameworks, (3) tailored public health prevention/intervention programs for smoking and HED, and (4) a focus on the transition to adulthood period.

As described earlier, by applying a life-course perspective to social status, we can gain a better understanding of the impact of social disparities on health behaviors and outcomes over the life-course. Findings from this study showed that not only the persistently disadvantaged individuals engaged in smoking, but also individuals with downward social status trajectories. However, to apply the life-course perspective, more longitudinal data are needed to capture the timing of events and key turning points.

Variable-oriented analytic frameworks provide insights into the relationship between demographic or other characteristics and health outcomes. Application of this framework through regression analyses has helped public health researchers identify individual risk and

protective factors in which we can intervene to reduce poor health outcomes. Yet, a person-oriented framework offers a different perspective on health outcomes. These techniques examine individuals based on shared patterns or characteristics of a particular topic of interest. Person-oriented analytic frameworks are common in the substance use literature where researchers have identified common group characteristics of substance use behaviors. This technique could especially be fruitful for complex constructs in public health such as conceptualizing key constructs from theories (e.g., one construct that captures the stages of change from precontemplation to action); developing a holistic health construct (e.g., one that captures the different elements of physical, mental, and overall well-being); or capturing health service delivery (e.g., trajectories of health care or emergency room visits).

Public health interventions already tailor their programs to target specific drugs such as smoking and alcohol. However, these interventions should also consider the evolving role of social status over the life-course. This dissertation showed that smoking behaviors are highly influenced by factors of life-course economic disadvantage, low human capital, and low social capital levels across racial/ethnic groups. As a result, further investigation is needed to better understand the social and cultural context in which these smoking behaviors occur. It is not due to the lack of information that smoking is bad for you. Rather there are other larger social and cultural factors related to low social status that create an environment that encourages smoking behaviors. Future research could benefit from qualitative studies that examine social norms and cultural expectations that may encourage smoking among lower social status groups.

Furthermore, the social capital findings point to smoking as common among individuals with smaller social networks and low organizational participation during the transition to adulthood. At the individual level, smoking has become a stigmatizing behavior that could enforce a more

solitary lifestyle in adulthood. At the environmental level, smoke-free public policies discourage the social aspect of smoking in public or even in large social settings. Future public health interventions, especially cessation programs, could tackle the solitary nature of smoking as a means to reduce the behavior.

For the alcohol outcome, in general, social status groups had similar HED prevalences despite social status changes during the transition to adulthood. These findings point to a general engagement of HED in adulthood regardless of life-course social status. Future studies should consider measures of problematic alcohol use which may have a different relationship with social status. With similar HED patterns across social status groups for this age cohort, prevention and intervention strategies can be broad in scope across social status groups such as environmental policies of reducing alcohol sales after a certain time. However, the complex picture of HED behaviors among Blacks warrant further investigation as to whether it is the economic, human, or social capital domains that influence HED behaviors. Higher HED prevalence was found among the economically upward group in the economic capital domain, the two lowest human capital groups, and the downwardly mobile group in the social capital domain. This research could follow the conceptual framework outlined by Godette and colleagues to examine multiple levels of influence to examine alcohol behaviors among Blacks (Godette et al 2006).

Future research should also take into consideration the transition from adolescence to adulthood period. Although young people are in better health relative to their older counterparts, the transition to adulthood can mark a turning point in health trajectories. It is important to gain a better understanding of the influences that set the stage for positive health trajectories as well as risk factors for negative health trajectories. Again, this implication requires longitudinal data to

explore the pathways and processes that occur during this transition period. Furthermore, young adulthood is often a period where there are less institutional safety nets (compared to adolescence with school settings). Public health interventions should target young adults through innovative campaigns on healthy lifestyles and behaviors.

## **7.6 CONCLUSION**

The most important finding to emerge from this research is the contrasting relationship between life-course social status and the substance use behaviors of smoking and alcohol. Individuals with low or downwardly life-course social status during the transition to adulthood are more likely to engage in daily smoking in adulthood regardless of race/ethnicity. In contrast, there was no clear pattern of life-course social status with heavy episodic drinking (HED) in adulthood. Being persistently advantaged and downwardly mobile in the economic capital domain were associated with higher HED behaviors among Whites and Latinos. Similar HED behaviors were found across human capital and social capital domains. However, there was a complex pattern for Blacks where economically upward, low human capital and downwardly social capital each had a distinct link with higher HED behaviors. These findings emphasize the importance of examining social status as a life-course construct that evolves from adolescence to early adulthood and as a multidimensional construct that plays different roles on health behaviors. The transition to adulthood is an opportune time to prevent onset of pre-disease pathways and target interventions and policies that encourage healthy lifestyles and behaviors among young adults.

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