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**Exploring Gender Differences in the Early Life Origins of Three
Health Behaviors**

by

Lynn M. Fahey

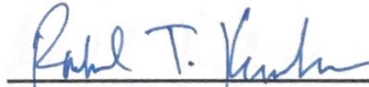
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ABSTRACT

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Health behaviors are an important contributing aspect of physical health and well-being, yet the structural conditions that may shape health behaviors differ across socio-demographic groups, including between men and women and across SES groups. Prior work on the gender gap in health behaviors has several limitations, including a focus on gender disparities in adult circumstances only; failure to account fully for gender gaps in participation in a variety of behaviors, including smoking, drinking, and weight status; a focus on outcomes in mid or late life, with less attention given to how participation in health behaviors emerges and unfolds across earlier stages of the adult life course; and a reliance on retrospective, self-reported measures of early youth that are somewhat limited in scope. This dissertation responds to these limitations by using a life-course epidemiological framework and employs longitudinal data from across the early life course to explore how gender conditions the relationship between early life circumstances and health behaviors—specifically alcohol use, tobacco use, and weight status using a nationally representative longitudinal dataset: The National Longitudinal Study of Adolescent to Adult Health (Add Health). Generally, results show that the features of early life which are predictive of health behaviors differ based on the particular outcome examined, and that gender does interact with early life circumstances to produce health behaviors. For example, in terms of smoking behavior, the results support that women who had access to cigarettes or had peer smokers during youth are at a lower risk of being a current smoker than their male counterparts with similar youth exposures.

Additionally, with respect to drinking behavior, the results of this study suggest that gender moderates the relationship between youth circumstances and heavy episodic drinking only at the earlier time points in young adulthood. The results for weight status transitions in this study do not suggest that gender operates as a moderator in the relationship between youth circumstances and adulthood weight status transitions. Taken together, this body of work extends and provides links between the prior literature on early life circumstances, gender differences in health across the life course, and gender differences in health behaviors.

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Nomenclature

Terminology	Meaning in This Document
BMI	Body Mass Index
CI	Confidence Interval
HED	Heavy Episodic Drinking
N	Sample Size
OR	Odds Ratio
RRR	Relative Risk Ratio
SD	Standard Deviation
SES	Socioeconomic Status
SRH	Self Rated Health
YA	Young Adulthood
“Youth”	Under age 18

Chapter 1

Motivation and Introduction

ABSTRACT

This chapter introduces the general problem which guides this dissertation. Namely, that while women, on average, enjoy longer lifespans than men they also face the burden of a higher incidence of chronic disease. Further, the chapter suggests that one set of contributing factors to this gender-health paradox are the health behaviors that men and women perform across their life course that may reduce or elevate their risk of poor health with aging. Four theoretical frameworks are introduced that are relevant to understanding the differential health behaviors of men and women.

First, gender socialization and culture is discussed. Here, the discussion focuses on how as a product of differential socialization, men and women may perform different health behaviors without consciously thinking about it as a way of performing masculinity or femininity.

Next, the social stress perspective is introduced. Here, the chapter describes that consistent with theory, women are more likely to experience negative health outcomes than members of high status groups, largely because lower status individuals have fewer resources to confront stress and may be more harmed by stressors due to differences in resources.

Following this, a discussion of fundamental cause theory notes that socioeconomic status (SES) is a powerful independent predictor of health status and behavior because it is linked to a number of risk factors and health outcomes as well as the ability to use and access resources that protect health. Finally, the life course framework is discussed, noting that events that occur across the life course accumulate to produce health outcomes and behaviors.

Gaps in the knowledge base are identified as motivations of the key project aim, which is broadly to identify how gender impacts the link between early life circumstances and young adulthood health behaviors. The chapter concludes with an outline of the empirical chapters and an overview of the data source used in this dissertation.

INTRODUCTION

While women, on average, enjoy longer lifespans than men, they also face the burden of a higher incidence of chronic disease (Rieker and Bird 2005). One set of contributing factors to this gender-health paradox are the health behaviors that men and women perform across their life course that may reduce or elevate their risk of poor health with aging. For example, women perform more salubrious health behaviors than men in terms of a reduced likelihood to smoke cigarettes (Barbeau, Krieger, and Soobader 2004; Wallace et al. 2003), lower alcohol intake (Johnson et al. 1998; York, Welte, and Hirsch 2003), and decreased likelihood of being overweight (Galuska et al. 1996; Verbrugge 1989). However, in terms of physical activity, men outperform women as they more often participate in exercise (Ross and Bird 1994; Trost et al. 2002). This variation in health behavior participation by gender sets men and women up differentially for subsequent health risks.

The majority of the scholarship investigating the gender gap in health behaviors has focused on differences in adult circumstances for men and women. For example, some theoretical work describes why health behaviors might be meaningful shapers of health outcomes for men, specifically that males of all ages are more likely than females to engage in behaviors that increase the risk of disease and injury. This work argues that “doing masculinity” is the causal mechanism leading to adverse health behaviors (Courtenay 2000). Thus, participating in behaviors that are associated with power and masculinity are risk producing. At the same time, men’s avoidance of performing femininity in terms of health behaviors (such as seeking health care) can also undermine their health.

Other work suggests that it is the differential social position of women and men that explains their different behaviors. For example, Padvic and Reskin (2002) champion a social

perspective on gender differences, arguing that social forces throughout history have created circumstances which allow for differential opportunities provided to men and women and, as such, differential socialization processes experienced by men and women. Coupled with the work of other scholars who note that men and women have variable access to health-relevant resources including education, income, and areas to exercise (Reiker and Bird 2005), the literature suggests differential behavioral trajectories are developed and constrained in adulthood among men and women.

THEORETICAL FRAMEWORK: GENDER SOCIALIZATION AND CULTURE

Despite this, it is important to recognize that constraints on men's and women's behavior do not begin in adulthood but rather develop across the life course. Specifically, gender socialization plays an important role in the way men and women behave. Practices and routines become institutionalized, leading to a cycle of reproducing gender routines (Ridgeway 2011). Features such as habitus, or "systems of schemes of perception, thought, and action" (Bourdieu 2001: 8), transcend the physical, moral, and behavioral and expand beyond one's taste preferences. Specifically, Bourdieu argues that as applied to gender, habitus is defined in terms of the other group and that while the mechanisms to develop habitus are the same for boys and girls, the gender rituals boys and girls perform are different. So, while boys and girls experience similar mechanics of socialization, they are socialized differently and thus perform gender in different ways, which impacts their behaviors. In other words, while the experiences of boys and girls might not differ substantially the meanings of these experiences and the attached consequences might differ.

Additionally, while all boys may not have been taught explicitly to perform particular health behaviors in masculine ways, their gender socialization in other contexts allows them to

form schemas that structure their behaviors. Because schemas are “generalizable procedures applied in the enactment/reproduction of social life” (Giddens [In Sewell 1992]), schemas do not just apply to the context of interaction in which they were learned but rather can be generalized, applied, or transposed to new contexts of interaction.

The application of gender socialization is not a one-time phenomenon but rather gender becomes a background identity that is always present (Ridgeway and Correll 2004). In this way, gender is developed and learned in youth and continues to matter in a social relational context across the life course. For example, people find themselves in situations all the time with others where there are gendered expectations (which may be more or less salient depending on the situation). Within these situations, gender expectations are important because this impacts people’s behaviors. Ultimately, people often behave in a gendered manner not necessarily because they want to but because they are expected to, based on the situation (Ridgeway and Correll 2004). Applied to health behaviors specifically, gender socialization theory posits that men and women may perform different health behaviors without consciously thinking about it as a way of performing masculinity or femininity.

THEORETICAL FRAMEWORK: THE SOCIAL STRESS PERSPECTIVE

Among the social situations that men and women find themselves in which come with gendered expectations of behaviors are stressful life situations. Differential experiences with stressful life circumstances are a well theorized explanation for gender based health disparities. According to the social stress perspective, one’s position in the social hierarchy facilitates differential exposure to stress as factors including economic class and gender shape social experiences (Pearlin 1999). Overall, differential stress exposure partially explains why lower status social groups experience higher rates of physical health problems (Dohrenwend and

Dohrenwend 1974; Pearlin 1999). With specific respect to gender, prior evidence supports gender differences in exposure to stress (Denton, Prus, and Walters 2004; McDonough and Walters 2001; Turner 2003; Turner and Avison 2003). Members of low status groups (i.e., women) are more likely to experience negative health outcomes than members of high status groups, largely because lower status individuals have fewer resources to confront stress and may be more harmed by stressors due to differences in resources (Adler et al. 1994; Almeida et al. 2005). Additionally, groups with greater resources of social support and those who have a sense of greater autonomy and personal control are better able to buffer the health effects of stress (Thoits 2010).

THEORETICAL FRAMEWORK: FUNDAMENTAL CAUSE THEORY

The gender socialization process and stressful life circumstance are critical components to understanding status based health disparities. However, socioeconomic status (SES) is a powerful independent predictor of health status, operating as a “fundamental cause” of health and illness (Link and Phelan 1995) that must be considered in any analysis of health inequalities. Fundamental cause theory argues that social conditions are the starting point that shape subsequent risks for poor health. SES is considered a fundamental cause not only because it is linked to a number of risk factors (including harmful health behaviors) and health outcomes but also because SES is linked to the ability to use and access resources that protect health. An impressive body of work supports SES as a fundamental cause of poor health. For example, in terms of education, studies find that having higher levels of education helps stave off morbidity (Beckett 2000) and that level of education is predictive of the onset of functional limitations (Herd, Goesling and House 2007). There is good reason to believe that the connection between

SES and health is related to SES as a fundamental cause: the role of resources¹. For example, Pampel and colleagues (2010) find that one key reason disparities exist in health behaviors by status group is due to the lack of resources experienced by lower status groups. While the literature notes a relationship between SES resources and health across gender groups, there is evidence that physical health status and certain SES resources differ in importance for health by gender. Specifically, education is more strongly linked to health among women than men (Cutler and Lleras-Muney 2006, Ross, Masters, and Hummer 2012, Ross and Mirowsky 2010, Thurston et al. 2005, Ostrove and Adler 1998). Supporting this finding is the resource substitution model, which posits that SES resources can substitute for one another. In other words, in the absence of a given feature of SES, other features comprising SES become more important or meaningful in shaping outcomes and can help buffer or reduce the negative impacts of those features which are missing (Ross and Mirowsky 2010). Taken in the context of gender and education, because women typically have fewer SES resources as compared to men, women “substitute” their education for financial aspects of SES, making education a more meaningful shaper of their outcomes.

THEORETICAL FRAMEWORK: THE LIFE COURSE

Developing alongside work that focuses on gender differences in health and health disparities more broadly are life course and early life origins studies which seek to explain how a host of early life circumstances are related to a range of later life health conditions (e.g. Hayward and Gorman 2004; Haas 2008; Montez and Hayward 2014). Several of these works note that

¹ As discussed by Link (2008), there is some evidence that so called countervailing mechanisms are at work (situations in which high SES persons do not, for example, participate in healthy behaviors in order to achieve cosmetic outcomes rather than health outcomes). In general, however, research demonstrates that access to resources that protect health is the driving force that creates the enduring link between SES and health outcomes (Link and Phelan 1995).

young adulthood may be a particularly critical time to observe health due to the initiation of health behaviors in adolescence and the cumulative impact of life events on overall health status (U.S. Department of Health and Human Services 2012; Ben-Schlomo and Kuh 2002). Taken together, these works suggest that health behaviors in young adulthood are likely a contributing factor to gender differences in health and mortality in later life. As such, detailing gender differences in the early life origins of health behaviors has the potential to inform broader scholarship that seeks to understand the extent to which the health status of men and women differentially unfolds across the life course.

While early life origins studies represent a fast-growing field of accumulating knowledge that contributes to our understanding of the social determinants of health, questions remain regarding whether and how these connections vary for members of different socio-demographic groups. In terms of gender, many prior studies rely exclusively on single-gender samples (e.g., Beebe-Dimmer et al 2004; Hayward and Gorman 2004) or use samples with both men and women but treat gender merely as a control rather than as a key focus of the study (e.g., O’Rand and Hamil-Luker 2005). Additionally, much of the work in this area relies on datasets of older adults (e.g., Haas 2008; Brandt, Deindi, and Hank 2012), potentially missing out on an opportunity to capture how early life origins have already shaped health behaviors by young adulthood. In light of these limitations, a gap remains about whether and how early life origins and gender might interact to shape how health behaviors unfold from adolescence into adulthood. Few existing studies examine early life origins of health outcomes by gender, particularly when health behaviors are the focus.

PROJECT AIMS

This dissertation draws on the theoretical frameworks discussed above to guide the integration of two larger streams of empirical research – gender differences in adult health behaviors and early life origins of adult health. The goal of this project is to explore how gender intersects with circumstances in early life to shape health behaviors. Because this study aims to uncover the impacts of early life circumstances on health behaviors and focuses on behaviors in young adulthood (acknowledging the importance of the timing of events) a life course framework is critical for answering these questions relating to early origins of gender difference in health behaviors, and exploring the associated processes and mechanisms.

Put most simply, a life course approach is the study of the long-term effects of physical and social health risks that take place over the life course, from gestation onward (Ben-Schlomo and Kuh 2002). Life course theory generally acknowledges that historical circumstances shape the life trajectories of individuals and that the timing of life transitions are meaningful for determining outcomes (Elder 1998). Additionally, the life course approach recognizes the importance of time and timing of events that influence health. The approach acknowledges that there may be lags between health risk exposure and health outcomes, and that early life factors may predispose individuals to risk factors in adulthood, including unhealthy behaviors (Lynch and Davey Smith 2005). Specifically, those early life factors related to SES disadvantage are especially important considerations, as these circumstances are fundamental causes of health disparities. In general, access to resources that protect health is the driving force that creates the enduring link between SES and health outcomes (Luftey and Freese 2005; Link 2008). And with specific respect to health behaviors, one key reason disparities exist is due to the lack of resources experienced by lower status groups (Pampel et al 2010).

That said, experiences in early life are not all inherently marked by hardship. As discussed above, gender socialization plays an important role in shaping beliefs and behaviors of individuals (Ridgeway 2011; Ridgeway and Correll 2004). Further, these cultural beliefs and learned behaviors can easily be translated to contexts that are different than the context in which they were learned (Giddens [In Sewell 1992]). Evidence about the gender socialization process reveals that even with exposure to similar circumstances, health behaviors can differ between boys and girls because of the ways they have been socialized to behave (Bourdieu 2001). A manifestation of this is seen in gender differences in coping responses to stress. Although there are documented gender differences in exposure to stress with women experiencing greater stress (Denton, Prus, and Walters 2004; McDonough and Walters 2001; Turner 2003; Turner and Avison 2003), coupling these findings with gender socialization theory shows us that even if men and women were to experience comparable amounts of stress, their health behavior outcomes may differ. This notion is empirically supported by work which concludes that men are more likely to externalize psychological distress, making them more prone to smoke or drink as stress exposure increases (Bird & Rieker 1999). Combining this with work that suggests performing masculinity is linked to increased health risk (Courtenay 2000), indicates that gender socialization and the experiences of stressful life circumstances combine to produce behavioral disparities between men and women which set these two groups up differentially for health risks.

Specifically, the present studies aim to answer two overarching research questions. First, does gender moderate the link between early life circumstances and young adulthood health behaviors? This pathway is illustrated in Figure 1 below. **Second**, does gender moderate the link between early life circumstances and young adulthood health behaviors via the indirect relationship via young adulthood circumstances? This pathway is illustrated in Figure 2 below.

OUTCOMES OF INTEREST

The analyses in this dissertation centers on three health behavioral outcomes: alcohol use, cigarette smoking, and weight status². These outcomes were chosen based on documented gender differences in alcohol use and cigarette use in adulthood (Greaves 2007; National Center for Health Statistics [NCHS] 2008) as well as the profound implications that alcohol use, cigarette use, and weight status can have for later life health (Healthy People 2020). While health behaviors alone do not explain the entirety of physical health disparities, there is evidence that they account for some 25% of health disparities via a variety of mechanisms (Pampel et al 2010). Indeed, studies that have focused on alternate explanations of health disparities (e.g., socioeconomic status) do not fully account for disparities in health (e.g. Geronimus 2006), and researchers have more generally concluded that health behaviors are an important contributing factor to gender differentiated health profiles (Read and Gorman 2010; Courtenay 2000). Further, health behaviors can seriously undermine overall health status and pose increased risk for chronic illness and other long-term consequences such as heart disease, diabetes, and cancer (U.S. Department of Health and Human Services 2000; Calle et al. 1999; Escobedo et al. 1990; Marmot et al. 1987; Marmot et al. 1991; Winkleby et al. 1990). Similarly, positive health behaviors such as exercise and drinking in moderation have been linked to good health status (Tanasescu et al. 2002; Ellison 2002). As such, it is important to understand how health behaviors are initiated because they are a precursor to disease or wellness. Further, because health behaviors are constrained and shaped by access to resources and cultural beliefs, (such as

² Although weight status is not a health behavioral in and of itself, prior work has documented that both social and physiological factors contribute to weight status, meaning that social background, diet, and physical activity are all contributing factors to weight status outcomes (see Healthy People 2020 for review). As such, many of the social influences that impact the initiation of cigarette smoking or alcohol use are present in shaping weight status outcomes. For this reason, weight status is treated theoretically as a health behavior outcome in the present dissertation.

the availability of cigarettes to low SES persons or the pressure for men to behave in particular ways because of expectations to perform masculinity in the social relational context) disparities by group develop and will persist if the root causes are not examined and eventually address through social policy efforts.

The analysis in this dissertation measures health behaviors as outcomes in young adulthood and looks to youth circumstances as potential explanations for the initiation of these behaviors which set men and women on risky or salubrious health trajectories. Focusing on these time points in the life course is backed by prior empirical work noting that cigarette smoking and alcohol use are often initiated during adolescence (Green and Palfrey 2000) and that the early life environment is predictive of obesity (Reilly et al 2005). Additionally, studies show variability in how gender patterns health behaviors across stages of the life course. For example, while men are more likely to smoke than women among middle aged adults, this difference is much smaller at the younger ages (Barbeau, Krieger, and Soobader 2004; Wallace et al. 2003), underscoring the importance of analyzing circumstances across multiple time points.

DESCRIPTION OF THE CHAPTERS

This dissertation aims to fill in the gaps in the research discussed above in three separate, though related, chapters. Chapter Two of this dissertation explores the relationship between early life circumstances and cigarette smoking in young adulthood, and attempts to trace whether and how the pathways to smoking differ between men and women. Analytically, the chapter uses multinomial regression models to determine the likelihood of being a smoker, quitter, or life time cigarette abstainer.

Chapter Three of this dissertation examines the link between early life and heavy episodic alcohol use, and explores how heavy episodic drinking differs by gender at three

distance time points (ages 19-22, 22-25, and 25 and older) in the early life course. This chapter estimates logistic regression models for each time point and calculates predicted probabilities of heavy episodic drinking behavior.

Chapter Four of this dissertation is an analysis of weight status transition, which links circumstances in early life to the likelihood of being persistently obese, never obese, becoming obese, or becoming healthy. Analytically, multinomial regression compares the weight status transition group and calculated predicted probabilities demonstrated the likelihood of being in each weight status category by gender.

OVERVIEW OF THE DATA SOURCE: THE NATIONAL LONGITUDINAL STUDY OF ADOLESCENT TO ADULT HEALTH (ADD HEALTH)

To answer research questions involving gender's role in the link between early life circumstances and health behaviors, the present study draws on data from The National Longitudinal Study of Adolescent to Adult Health (Add Health). This is a nationally representative sample of U.S. adolescents who were in grades 7-12 during the 1994-1995 school year. Four waves of in-home interviews have been conducted with the Add Health cohort, with the most recent interview taking place in 2008 when the sample was aged 24-32 (with the exception of 52 respondents who were 33-34 years old at the time of the Wave IV interview). Add Health pools longitudinal survey data on respondents including aspects of their social, economic, psychological and physical well-being with data including information about their family, friendships and peer groups. This broad range of topics and variables allows for analyses that couple how a host of social and behavioral elements of youths' lives are linked to outcomes in young adulthood.

This data is most suitable for my life course guided inquiry because scholars have suggested that longitudinal data is the most desirable for life course studies, especially when it contains measures of contextual factors (Braveman and Barclay 2009; Ben-Schlomo and Kuh 2002; Montez 2010). Additionally, longitudinal data addresses the concern that if exposure affects an outcome through accumulation, there is a need for multiple time point measurements to properly assess relationships (Lynch and Davey Smith 2005).

Figure 1.0 Conceptual Model of Research Question 1

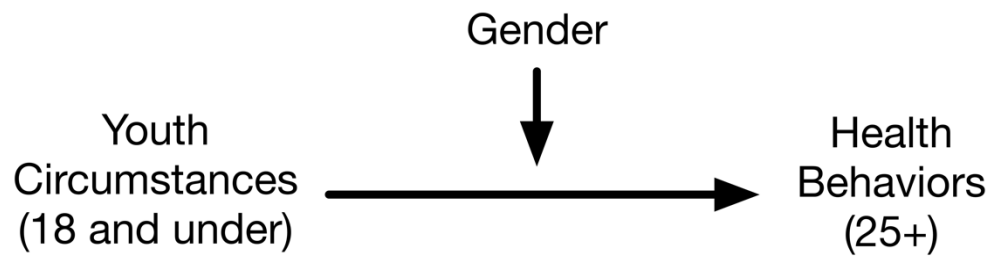
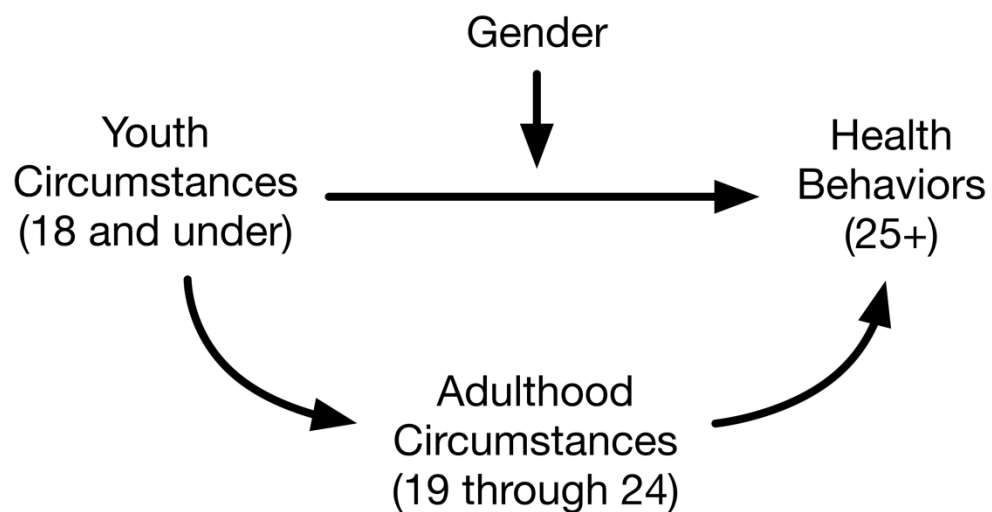


Figure 1.1 Conceptual Model of Research Question 2



**Gender Differences in the Early Life Origins of Cigarette
Smoking Behavior**

CHAPTER ABSTRACT

It is well established that cigarette smoking can undermine health and have long reaching impacts on the cardiovascular and respiratory systems of those exposed to cigarette smoke. Given the consequences of cigarette smoking, considering what factors predict this behavior is critical to adult and youth population health alike. While prior work has documented differences in smoking behavior by gender, and other work has uncovered a link between SES disadvantage, peer influence, and exposure to adversity and smoking, a relative dearth of research has focused on how gender conditions the relationship between early life disadvantage and subsequent smoker status.

With these gaps in mind, this chapter expands the knowledge base and explores how gender conditions the relationship between a wide a range of factors in youth and smoker status using data from the National Longitudinal Study of Adolescent Health (Add Health) public use sample, a longitudinal nationally representative sample of adolescents. This chapter measures a wide range of features of respondents' lives that are theoretically relevant to their smoker status, including demographic characteristics, SES characteristics, general youth disadvantage, exposure to smoking and social influences, and features of young adult life. I estimate multinomial regression models comparing current smokers and non-smokers to quitters, and build models which interact gender with every measure of youth circumstances to determine whether and how gender conditions the relationship between predictor variables and smoker status.

Specifically, the chapter found that gender moderates the relationship between low self-rated health, peer smoking, and availability of cigarettes in the home during early life and subsequent smoker status. In the case of self-rated health, gender conditioned the relationship such that women who experience low SRH in early life experienced lower risk of never having smoked than their male counterparts with comparable youth health status. In the cases of both peer smoking and access to cigarettes, the study found that women who were exposed to smoking had lower risk of being current smokers than their male peers who experience comparable exposures.

INTRODUCTION

It is well established that cigarette smoking can undermine health and has long reaching impacts on the cardiovascular and respiratory systems of those exposed to cigarette smoke (Doll et al. 2004; Mokdad et al., 2004; Preston, Gleit and Wilmoth 2010; Rogers et al., 2005). Because of the deleterious impacts of cigarette smoking, much research has been dedicated to discovering factors associated with smoking behaviors. Among other risk factors, gender has been recognized as a status characteristic that shapes smoking behaviors, as men have historically had a higher prevalence of smoking as compared to women (Mermelstein et al. 1999; Piko et al. 2007; Waldron 1991). In addition to gender, other features of social life are linked to smoking behaviors, including SES disadvantage and smoking among youths (Hiscock et al 2012; US Department of Health and Human Services 2012), and the continuation of smoking behavior among adults (Pampel et al 2010). Additionally, peer smoking is a well-established correlate of youth smoking (Hoffman et al 2007) and exposure to adversity in youth has been linked to smoking behavior (Anda et al 1999).

Although smoking behavior in general is worrisome, there is evidence that cigarette smoking is addictive and that those who initiate cigarette use sooner fare worse in terms of health outcomes. Indeed, the harmful impacts of cigarette smoke have the most dramatic effect on long-term and heavy smokers, meaning that those exposed to smoking early in the life course, such as during youth or adolescence, may suffer inextinguishable insults to the functioning of their vital systems (Lariscy 2012). Additionally, cigarettes are addictive and research documents that individuals who smoke at younger ages may become addicted, setting them up on a life-long trajectory of continued use and prolonged exposure to associated risks (US Department of Health and Human Services 2014). Further, those who begin smoking earlier in life smoke more

throughout their lifetime and face greater difficulty with smoking cessation as compared to smokers who delay initiation (Chassin, Presson, Pitts, & Sherman, 2000). Gender plays a role in shaping these risks as prior research has noted that more males use tobacco than their female counterparts, suggesting that the long-term consequences of cigarette smoking may be worse for men than women (Centers for Disease Control and Prevention 2016).

Recent estimates show that young people are exhibiting no decline in their cigarette use (U.S. Department of Health and Human Services 2012). Specifically, some 25% of U.S. high school students reported smoking in the past 30 days. What is perhaps more startling from this report is that the overwhelming majority of adult smokers (about 88% of daily smokers) reported initiating cigarette smoking before their 18th birthday (Azagba, Baskerville, Minaker 2015). Other related work has concluded that smoking at younger ages is predictive of a number of subsequent smoking patterns including daily smoking, smoking intensity, nicotine dependence, and difficulty quitting (Everett et al. 1999; Fernandez et al. 1999; Hu et al. 2006; Hwang and Park 2014; Reidpath et al. 2013; Reidpath et al. 2014; Wilkinson et al. 2007).

Given the consequences of cigarette smoking, considering what factors predict status as a cigarette smoker is critical. Unfortunately, a recent meta-analysis conducted by the CDC found that although many studies have been conducted on young adult smoking behavior, a relative dearth of studies have focused on smoking behavior among younger people specifically (Freidman 2012). Studies that have examined smoking among relatively younger populations still leave gaps in the knowledge base. Many are based on cross-sectional data (e.g. Frohlich et al 2002), focus on an international sample (e.g. Chang et al 2006), or focus on a single key predictor of smoking initiation, such as television advertising viewing (Gidwani et al 2002; DeCicca et al 2008). Additionally, while some studies have reported cigarette use by gender at

discrete time points, I could find no published studies which use data from early life to explore differences in cigarette smoking by gender in young adulthood. With these gaps in mind, the goal of this paper is to explore how gender conditions the relationship between a wide range of factors in youth and smoker status using nationally representative longitudinal data.

THEORY AND EVIDENCE

As noted above, the harmful impact of cigarette smoking on population health is well documented. Accounting for some 18% of U.S. deaths in 2000, cigarette use has historically earned a spot as a leading cause of preventable death in the United States (Mokdad et al. 2004). While damage to the respiratory system and lung cancer are key concerns related to cigarette smoking, causes of death linked to smoking also include damage to the cardiovascular and cerebrovascular systems, as well as cancers occurring in sites other than the lungs (Doll et al., 2004; Hummer, Nam and Rogers 1998). Given the health consequences of cigarette smoking, it is important to focus on the processes that predict smoker status. While health consequences may not manifest until later, looking to youth for explanations of cigarette use is important, particularly in light of a recent U.S. Surgeon General's Report which revealed that nearly 9 out of 10 smokers started smoking by age 18 (DHHS 2012). Estimates from 2015 indicate that about 2.3% of middle schoolers and 9.3% of high schoolers smoke cigarettes regularly³, with evidence that these rates vary by gender: among high schoolers 10.7% of males compared to 7.7% of females smoke cigarettes (CDC 2015). Given these rates, there is reason to believe that circumstances that occur during youth may be salient predictors of status as a cigarette smoker.

³ Estimates are even higher when electronic cigarettes are considered in the calculations (CDC 2015).

Gender and Smoking

Although cigarette smoking and tobacco use are harmful to men and women alike, use patterns can vary widely by gender. In terms of historical trends in the United States, men have consistently had a higher prevalence of smoking as compared to women (Mermelstein et al. 1999; Piko et al. 2007; Waldron 1991). Currently in the U.S., about 18.8% of males report using tobacco compared to 14.8% of females (Centers for Disease Control and Prevention 2016). Even among smokers, the specific preferences and habits related to smoking behaviors vary by gender with women smoking fewer cigarettes per day, preferring cigarettes with lower nicotine content, and inhaling less deeply as compared to men who smoke (National Institute on Drug Abuse 2012). Findings such as these map on to theories of masculinity and health behaviors which suggest that males of all ages are more likely than females to engage in behaviors that increase the risk of disease and injury, and that it is the doing of masculinity that sets men up for health risks (Courtenay 2000). In other words, males may be more likely to be current smokers and to struggle with smoking cessation because participating in these adverse health behaviors are seen as normative and masculine.

Additionally, this gender pattern in smoking may be linked to gendered stress coping patterns more broadly (Umberson et. al 2008). Smoking is often framed as a way of coping with stress (Mermelstein 1999), such that engagement in adverse health behaviors, like smoking, reflects both prior efforts to cope with stress as well as ongoing stressful events (Pearlin et al. 2005). This notion bolsters the idea that circumstances which occurred during early life may be relevant to predicting smoker status at later time points. Although prior work has documented that experiencing stress has been linked to cigarette smoking in general (O'Loughlin et al 2009; Nichter, et al., 1997) stress process theory suggest that this link may differ between men and

women. Specifically, stress process studies have found that gender shapes the likelihood to engage in behavioral coping strategies: although both men and women report greater psychological distress when faced with high stress (Turner & Lloyd 1999), men are more likely to externalize psychological distress, making them more prone to smoke as stress exposure increases (Bird & Rieker 1999). So, while women may experience greater life stress and be more harmed by these stressors, men may still have a higher likelihood of coping with the stress they do face by participating in smoking behaviors. Because behaviors like smoking are not typically discrete but rather habit forming, adult health behaviors like smoking may reflect not only a way to cope with current burdens, but also the lingering effects of circumstances and stressors experienced in youth and adolescence.

Dovetailing with theories of masculinity and stress process, which suggest men may be at greater risk of smoking as compared to women, empirical work shows that smoking is patterned by gender. For example, prior research has noted that young men, as compared to young women, are more likely to smoke in young adulthood (Freidman 2012). While this pattern for smoking behavior is supported by theory, patterns of cessation buck the expected trend. In terms of cessation behavior, women are less likely than men to quit smoking (National Institute on Drug Abuse 2012) and earlier smoking for women is linked to prolonged smoking trajectories (Kristman-Valente, Brown, and Herrenkohl 2013; Barnett et al. 1987; Miller and Kirsch 1987; Ptacek, Smith, and Zanas, 1992) -- meaning that for women, although they may be less likely to initiate smoking than men, starting at all may lead to more long-term harm.

SES and Smoking

Alongside evidence of gendered patterns in smoking, empirical studies document a clear link between adult SES and health behaviors, including smoking (Pampel et al 2010). Cigarette

use prevalence is higher among groups with SES disadvantages (see Hiscock et al 2012 for review) and multiple aspects of SES appear to be independently related to smoking status. Studies have shown that parental education and occupational prestige are linked to offspring smoking (Fagan et al 2005), and poverty increases the odds of being a current smoker (Flint and Novonty 1997).

Yet, while the SES-smoking relationship is well established among adults, the relationship between smoking and SES among youth is less clear (Brown, Platt, and Amos 2014). While some studies have found null or reverse patterns in the smoking-SES relationship among adolescents as compared to adults (see Hanson and Chen 2007), other studies have found that SES disadvantage is a determinant of smoking initiation in young people (Hiscock et al 2012; US Department of Health and Human Services 2012). Further, some work does suggest that the SES-smoking relationship for youths may be gendered. Jefferis et al. (2014) showed that for women but not men, youth socioeconomic circumstances are predictive of smoking in adulthood, even after controlling for adulthood circumstances. Other work by Power and colleagues (2004) found that disadvantaged social origins are linked to a reduction in the probability of smoking cessation, particularly among women. These studies indicate that, consistent with the stress process perspective, women and young girls may be more vulnerable to the impacts of low SES in youth than their male counterparts. Additionally, these studies note that using SES measures from respondents' youth context may produce different results than using measures of SES taken from adulthood.

Smoking Exposures

While major social structures such as gender and SES are critical to understanding smoking behavior, other factors, such as aspects of one's social network, are relevant

considerations as well. Studies of social networks and health have established broadly that simply being around people influences health outcomes (House, Umberson, and Landis 1988). For young people, those who are exposed to smoking by family and friends are more likely to become smokers themselves compared to those not exposed to smoking (Freidman 2012).

Life course theory argues that specific points in the life course are meaningful to the structure of one's social network. For children, networks mostly consist of family and parents, but during adolescence people are increasingly able to choose their friend groups, and peers begin to influence health outcomes to a greater degree (Umberson, Crosnoe, Reczek 2010). Consistent with this, adolescents typically have their cigarette smoking debut in the presence of peers (Johnson and Hoffmann 2000) and are likely to achieve access to cigarettes from social contacts such as siblings or friends (Forster 2003). Further, having friends who smoke cigarettes is an identified risk factor for adolescent smoking (O'Loughlin et al 2009; Conrad et al. 1992; Flay et al. 1994) as well as future likelihood of accepting a cigarette to smoke (Bauman et al. 2001; Gritz, et al.; 2003, Miller et al. 2006). Despite the role of peers, parental smoking behaviors also influence smoking outcomes. There is an established link between parental smoking and their children's subsequent status as a smoker (Bauman 1990; Vuolo and Staff 2013). Additionally, studies show that living with a household smoker increases smoking risk for youths (O' Loughlin et al 2009; Gritz 2003).

Other Youth Disadvantages and Smoking

Adverse relationships with social network members are also linked to smoking risk. In particular, experiences of violence in and outside the home are predictive of smoking. Among family members, there is an established link between physical abuse in youth and smoking frequency in adolescence (Kristman-Valente, Brown, and Herrenkohl 2013; Simantov et al

2000). Violence within peer groups is also a salient predictor of smoking behavior, with research showing that being involved in a physical fight increases risk of daily smoking among adolescents (Perra et al 2012).

Evidence also suggests that both health status and status characteristics are impactful in shaping the tobacco use trajectories of individuals. The link between poor physical health and smoking status is well established (US Surgeon General's Report 2012; Saules et al 2004; Cawley, Markowitz, and Tauras 2004; Scal, Ireland, and Borowsky 2003; Potter et al 2004). Additionally, the link between mental health problems and smoking status is also strong (US Surgeon General's Report 2012), as studies have documented correlations between cigarette smoking and anxiety, mood disorders, major depressive disorders, bipolar disorder, and psychiatric comorbidity (Kandel et al 1997; Upadhyaya et al 2002; Wilens et al 2008).

Demographic Characteristics and Smoking

Tobacco use also differs by racial/ethnic identity (US Surgeon General 2012). Smoking prevalence is higher among American Indians/Alaska Natives and Whites, and lowest among Asian and Black youths (CDC 2011c; Simantov et al 2000). In terms of timing of initiation, patterns by race indicate that nonwhites are more likely to initiate smoking as young adults than as youth (Freidman 2012). Overall, despite the documented role that these features play, more research is needed to identify the factors that contribute to tobacco use initiation among boys and girls. Using the Add Health data, Blum and colleagues (2000) found that only 4.1% of the variation in cigarette smoking among younger teens and 7.2% of the variation in smoking among older teens was collectively explained by race/ethnicity, income, and family structure -- indicating that other features must be explored for their potential role in shaping smoking outcomes for youths.

Adulthood Factors and Smoking

Across the life course, the composition of social networks and the importance of economic resources shift. Thus, similar to early life, features of one's social context are important to shaping health behaviors. For example, rates of current and former smoking are high among the unemployed, a finding likely related to both financial and social factors (Lee et al 1991) and consistent with the well-established social-economic gradient in health (Marmot 2004). Beyond employment, while adults with low educational attainment typically have the highest prevalence of smoking (CDC 2009), young adults who experimented with smoking in youth are more likely to progress in their smoking behavior while in college (Freidman 2012). Furthermore, attendance at certain college events and the perception that one's college peers' approval of smoking increases student's risk of smoking initiation (Freidman 2012).

Although the relationship between these adulthood factors and smoking status is clear, prior research has not teased apart whether youth factors operate indirectly through these adult factors to influence smoking. Additionally, it remains to be explored whether and how these established associations may differ by gender.

THE PRESENT STUDY

The goal of this project is to use the above discussed theoretical and empirical findings as a starting point and to fill gaps of previous research by identifying what factors in early life are the most salient predictors of smoker status in young adulthood – and whether gender conditions these links to produce differential smoking outcomes for men and women.

Data and Measures

This chapter draws on data from the National Longitudinal Study of Adolescent Health (Add Health) public use sample (6,405), a longitudinal nationally representative sample of adolescents who were in grades 7-12 during the 1994-1995 school year. Four waves of in-home interviews have been conducted with the Add Health cohort, with the most recent interview taking place in 2008 when the sample was aged 24-32. Add Health pools longitudinal survey data on respondents, including aspects of their social, economic, psychological and physical well-being with contextual data, including information about their family and friendships or peer groups. This broad range of topics and variables allows for analyses that show how a host of social and behavioral elements of youths' lives are linked to outcomes in young adulthood. Key to this study is information included in the Parent Questionnaire and the In-Home Interview. The Parent Questionnaire, preferably completed by the resident mother of each adolescent respondent interviewed in Wave I, contains information on topics such as health-affecting behaviors, household income, and economic assistance. A key strength of drawing on data from the Parent Questionnaire is that a parent provided this information – thereby reducing measurement error associated with questions about key predictors on youth circumstances (e.g., household income, which many youths are unlikely to know). Further, given the established link between family structure and parental cigarette use behaviors, having information provided by the parent is critical to this study.

The In-Home Interview occurred in the respondent's home and took approximately 1-2 hours to complete. As a means to protect the confidentiality of the respondents the interview data was recorded on laptops. Based on the sensitivity of the topic, questions were either read out loud to respondents or were pre-recorded and fed into headphones, and respondents were given

the opportunity to directly enter their answers, minimizing parental or interviewer influence. The In-Home Interview covered a broad range of topics including health status, family composition and dynamics, peer networks, and substance use.

Dependent Variable (Waves 1, 2, 3, and 4)

There is one dependent measure with three levels for this analysis: smoker status (1=never smoked, 2=quitter, 3=current smoker). This was constructed based on the respondent's smoker status at each of the Wave 1-Wave 4 interviews. Those who smoked *at any wave* but were *not* smokers at the final interview were coded as quitters. Those who reported smoking at Wave 4, regardless of time of initiation, were coded as current smokers. Those who reported never having smoked *at all waves (Waves 1, 2, 3, and 4)* were coded as never smokers.

Youth Circumstances Measures (Wave 1 Characteristics)

Demographic characteristics include gender, measured as a binary indication (1=female, 0=male) as well as racial identity (white, black, or other), and US Born status (1=US Born, 0=Foreign Born). These measures are considered time invariant and are measured only at Wave 1. Additionally, I include a control for the respondent's age to account for the variability in age range within the Add Health Sample. For a full breakdown of the age ranges by wave, refer to the appendix of this dissertation.

Variables intended to develop a general baseline profile of the respondent's circumstances in youth are all drawn from the Wave 1 in-home interview and Parent Questionnaire. From the parent questionnaire, I include parent's education level (less than college=1, college degree or more=0)⁴. A measure of household income is included and measured continuously based on parent reported household income, and parent reported public

⁴ The highest level of parental education of a resident parent was used in this study (Needham and Crosnoe 2005).

assistance receipt is measured as 0=no assistance receipt and 1=received assistance.

Additionally, I include a binary indicator parent reported difficulty paying bills (where 0=no difficulty receipt and 1=difficulty).

Other measures, drawn from the Wave 1 in-home interview include reporting low self-rated health (measured as a binary indicator where fair/poor/good (low)=1 and very good or excellent (high)=0)⁵. Also included is an index of depressive symptomology (measured continuously where scores range from 0-38; here respondents were asked if they agree with statements such as “You felt that you could not shake off the blues, even with help from your family and your friends” or “You felt depressed.”). A measure of having experienced violence either in their home or another setting (measured as a binary indicator where 1=respondent experienced violence and 0=did not experience) was included.

Measures of exposures to smoking included whether the respondent has friends or siblings who smoke cigarettes (1=has any friends who smoke, 0=has no friends who smoke), a measure of whether cigarettes are available in the home (0=no 1=yes), and a binary indicator of if the respondent has a parent who smoked (based on parent report of smoking behavior) (1=parent smoked, 0=parent did not smoke). These measures were drawn from Waves 1 and 2 of Add Health and thus represent smoking exposures from ages 10-21 years of age. If a respondent was exposed to smokers at either wave they were coded with a “1” on these variables.

Young Adulthood Characteristics (Wave 3)

Characteristics used to develop a basic profile of respondents as they transition to young adulthood are drawn from the in-home questionnaire at Wave 3 and represent a profile of the

⁵ Consistent with prior work measuring self-rated health among youths (Bramlett and Blumberg 2007), this study considers “poor/fair/good” as one category and “very good or excellent” as the other category in the binary variable rather than the “poor/fair” and “good/very good/excellent” measure which is more common in studies measures SRH in adulthood (e.g. Idler and Benyamini 1997).

respondent's life from ages 18-26. Characteristics measured during young adulthood include whether the respondent is currently employed (1=employed, 0= otherwise), and the number of years of schooling the respondent has completed (measured continuously).

Data Preparation: Missing Cases

For this analysis, I merged data from each wave of the In-Home Interview (Waves 1 through 4). At Wave 1, the Public Use sample included 6,504 respondents. However, like all longitudinal studies, sample attrition occurred over time: by wave 4 only 5,114 of the respondents from Wave 1 were surveyed, representing approximately a 21% attrition rate. Studies conducted to determine differences between the Wave 1 sample and the subsequent waves do indicate that there are higher response rates for certain demographic groups (namely those respondents who are female, white, and native-born) as well as by SES levels. That said, analysis of the differences between the sample at the different waves has determined that the total relative bias is small in magnitude when the appropriate sampling weights are applied (Mullan Harris 2013). Pregnant women were excluded from the sample as well as those who did not have a valid parent questionnaire, resulting in an analytic sample of 5,002.

Due to attrition and item non-response, some missing data was present on variables included in this study across the waves. Most items were missing at less than 10%, but some were higher. Specific levels of missingness on each predictor variable can be seen in Appendix Table A.1. I assume that all variables are missing at random or missing completely at random (Little and Rubin 2002) and make use of ICE commands in Stata 14 to conduct the imputation by chained equations to generate 10 multiply imputed datasets ($m=10$). To allow information from all 4 waves to inform missing data imputation, the waves were merged prior to imputing the data (Allison 2001). Additionally, the Add Health data includes sampling weight incorporating a non-

response adjustment to compensate for data missing at a given time point due to a subject not being interviewed. The use of these weights nullifies the need to consider the effect of item non-response and make survey non-response the only concern (Chen 2014). The weighted and imputed data was used for all reported descriptive statistics and regression models.

Analytic Strategy

The analysis is divided into two sections, beginning with a descriptive analysis of the data that includes distributions of early-life circumstances and adult circumstances both for the full sample and stratified by gender. I report means and standard deviations for interval data and percent values for categorical items and results of Chi-square and t-tests to indicate significant differences by gender. I also include a second table that reports the means and standard deviations stratified by smoker status and by gender. Here I report results of Chi-square and t-tests to indicate significant differences between smokers and non-smokers, female smokers and female non-smokers, and male smokers and male non-smokers.

For the second part of my analysis, I employed multinomial regression models to estimate the relative risk of being either a smoker, a quitter, or someone who never smoked. First, I estimated pooled models to explore the main effect of gender. Next, I estimated additional models with gender interacted against all early life covariates to interrogate whether and how gender conditions the relationship between early life circumstances and smoking initiation. Following this, I generated predicted probabilities of being in each smoker status category using the information from the interacted models to display differences within groups by youth circumstances and gender.

RESULTS

Table 2.1 displays the sample characteristics for the study, with mean or percent values for the full sample in the first column, and the values broken down for men and women in the subsequent columns. The top portion of the table shows the percent of respondents who are smokers, quitters, and those who never smoked. Overall, 34.6% of respondents are current smokers, 15.9% of respondents used to smoke but have now quit, and 49.4% of respondents never smoked at all. While the percent of quitters is similar across gender, percent of current smokers and those who never smoked does differ significantly by gender, with 32.3% of women and 36.9% of men being current smokers and 51.6% of women and 47.3% of men never smoking.

The second portion of Table 2.1 shows demographic characteristics. The sample is relatively evenly distributed by gender (51.1% female) and is predominantly white (69.6%). While a substantial minority of the sample is foreign born, the overwhelming majority of the sample was born in the US (74.4% US born). Moving to the third section of Table 2.1 we see the SES characteristics of the sample. It shows that about 6.3% of the sample had parents who reported receiving public assistance at Wave 1. Approximately 47% of respondents had parents who achieved a high school diploma or less, while about 15% of respondents had parents who reported difficulty paying their bills.

The next section of Table 2.1 displays other measures of disadvantage that occurred at Wave 1. Youths who self-reported their health as good, fair, or poor comprised 27.8% of the sample. This measure did differ significantly by gender with more women reporting bad health (30.6%) as compared to men (25.0%). Experiences of violence also differed by gender. While 33.4% of women reported experiencing violence during their youth, more than half of boys

(57.4%) reported this. Reports of depressive symptomology were comparable across gender, with the mean score being 12.9. The percent of youths who grew up in a single parent household was 24.8%, with more boys (27.0%) than girls (22.7%) experiencing this family structure.

Looking at measures of exposure to cigarettes and smoking, the table shows that 42.8% of youths (40.6% of girls and 45.1% of boys) had smokers in their household while growing up. Despite this, only 28.3% of respondents reported that cigarettes were easily accessible to them in their youth homes. Again, this measure varied only marginally by gender with slightly more girls (29.8%) than boys (26.8%) reporting access to cigarettes. The majority of respondents had friends or siblings who smoked during their youth, comprising 77.7% of boys and 74.2% of girls. The final portion of Table 2.1 shows the young adulthood circumstances controlled for in this study. The mean number of years of education completed by the sample was 13.4 and about 72.5% of the sample reported current employment.

Table 2.2 also displays sample characteristics, but stratified by smoker status and gender. Significant differences are denoted by gender within smoker status category. Among smokers, a higher percentage of women were white, in the worse health category, expressed higher levels of depressive symptomology, reported availability of cigarettes, had peers who smoked, and learned about smoking in school as compared to their male-smoker counterparts. And for male smokers, a significantly higher percentage were other race, had parents who received public assistance, had parents with difficulty paying their bills, experienced violence, grew up in a single parent household, had household smokers in their youth home, and were employed during young adulthood as compared to their female-smoker counterparts.

Table 2.3 shows relative risk ratios and confidence intervals from a multinomial regression comparing quitters with those who never smoked and those who currently smoke. The

goal of this portion of the analysis was to explore first if there is a main effect of gender in predicting smoker status using youth circumstances. Looking first to Panel A, which compares quitters with those who never smoked, we see that in Model 1 (controls only for demographic characteristics) there is no main effect of gender. However, in Model 2, when measures of socioeconomic status are included, gender emerges as significant. In this model, female gender significantly reduces the risk of having never been a smoker as compared to a quitter. Put another way, while gender did not significantly predict smoker status when only demographic characteristics were included in the model, adding in measures of SES (public assistance receipt, parental education, household income, and difficulty paying bills) revealed that the relationship between gender and smoking status was being suppressed in the original model.

This significant main effect of gender persists across the models that follow in Table 2.3. In Model 3, where measures of other youth disadvantages are included, female gender continues to be associated with a reduced risk of never having smoked. Further in both Models 2 and 3 several measures of SES characteristics and other youth disadvantage are shown to be significant predictors of smoker status. In Model 4, which adds measures of smoking exposures, the main effect of gender remains, as it does in Model 5 (the full additive model). In Model 5, only the main effect of gender, aspects of demographic characteristics and adulthood circumstances are significant.

Turning to Panel B of Table 2.3, we see the model building sequence that compared quitters to current smokers. Here, the story is quite different than the comparison discussed above. In Model 1, the baseline model, gender does not significantly predict smoker status. Similarly, regardless of what controls are added through the model building sequence, gender

never rises to a level of significance. Taken together, the results of Table 2.3 suggest that gender does appear to be a predictor of only certain categories of smoker status but not others.

Following this exploration of the main effect of gender in predicting smoking status, I built interacted models which included interactions between gender and the predictor variables collected at Wave 1. The models in Table 2.4-2.6 build off of the full additive models included in Table 2.3 by adding interactions between gender and each measure of youth. Specifically, they test a different interaction term, one at a time, to explore how gender operates in tandem with each measure of youth. The interacted models are displayed in Tables 2.4 (interactions with gender and SES characteristics), 2.5 (interactions with gender and other measures of youth disadvantage) and 2.6 (interactions with gender and smoking exposures).

Table 2.4 shows that neither in the models comparing those who never smoked to quitters, nor in the models comparing those who currently smoke to quitters, were any interactions between gender and measures of SES significant. In Table 2.5, while no interactions are significant in Panel B, in Panel A the interaction of gender and low self-rated health is significant, indicating that gender moderates the relationship between low self-rated health and smoking status when comparing quitters to those who never smoked. Specifically, this interaction term demonstrates that women who had low self-rated health during youth experience a lower risk of never having smoked (relative to quitting) than men who had low self-rated health during youth. This interaction can be visualized in Figure 2.1

In Table 2.6 there are no significant interactions displayed in Panel A but two interactions are significant in Panel B that compares current smokers to quitters. The first interaction (gender*having a peer who smoked during youth) shows that women who had peers who smoked during youth have a lower risk of being a current smoker than men who had peers who

smoked during youth. The second significant interaction term (gender*having cigarettes available during youth) shows that women who had access to cigarettes in their homes during youth have a lower risk of being a current smoker than men who had access to cigarettes during youth. In both cases, these interactions show evidence that gender moderates the relationship between early exposure to cigarette smoking and being a current smoker in adulthood. Each of these terms illustrates that men who experience exposure to cigarettes early in the life course have a higher risk of being a current smoker than their female counterparts. These interactions can be visualized in Figure 2.2 and 2.3 respectively.

The above discussed interaction models provided evidence that gender does shape the relationship between aspects of youth circumstances and smoker status. Following this analysis of group differences by gender, I generated predicted probabilities (calculated in Stata 14.0 using the margins command). The goal of these predicted probabilities was to look within groups by gender and youth characteristics to further observe whether any gender differences exist in these relationships. For example, in considering whether gender moderates the association between parental education and smoking in adulthood, these predicted probabilities allow for comparison between men and women *among* those who had parents with low education, as well as between men and women *among* those who had parents with higher levels of education. This differs from the findings that can be drawn from the more traditional interactions approach detailed in Tables 2.4 through 2.6 – those tests explored whether gender changes the parental education and smoking relationship, but it does not distinguish between specific subgroups (e.g. men with parents who had high education and women whose parents had high education). Within this chapter, probabilities which varied significantly between men and women within a category are

shown in both table and figure form. Probabilities which did not vary significantly between men and women are tabled as well and can be found in the appendix of this dissertation for reference.

Predicted probabilities that showed significant difference in the effect of gender on smoking status by early life circumstances include differences by gender and public assistance receipt and gender and having friends or siblings who smoked during youth. Table 2.7 displays the predicted probabilities of being in each smoker status category explored in this chapter (smoker, quitter, and never smoker) by gender and public assistance receipt status. Among those whose families received public assistance at Wave 1 (when they were in middle or high school), men have a significantly higher predicted probability of being a smoker (0.44) as compared to women who received public assistance (0.27). Among those who did not receive public assistance, the predicted probability of being a smoker does not vary significantly by gender. Within gender comparisons also reveal that, among only women, those who did not receive public assistance have a higher predicted probability of being a smoker than those who did receive public assistance. There is no significant difference among men in predicted probability of being a smoker.

Table 2.7 shows that there are no significant differences by gender or by public assistance receipt status in the predicted probability of being a quitter. However, the information does reveal differences in those who never smoked. Here, the results show that among those who did not receive public assistance, men have a significantly higher predicted probability of never having never smoked than women (0.55 vs. 0.43, respectively). The results show that there are no significant differences within gender in terms of predicted probability of never having smoked.

Table 2.8 shows the predicted probabilities of being in each smoker status category by gender and having friends or siblings who smoked during youth. At the bottom of Table 2.8 we see the predicted probabilities of having never smoked. This comparison represents the only significant difference between men and women by peer smoker status. Here, the results show that among those who did not have smoker peers, women are significantly more likely than men to have never smoked (0.79 vs. 0.68, respectively).

DISCUSSION

This study contributes to a growing body of literature documenting how gender impacts the link between early life circumstances and later life health outcomes by predicting young adulthood smoker status using measures from early life. Overall, the present study found that the way in which gender interacts with youth life circumstances to produce smoking outcomes in young adulthood is complex and identified a number of factors that contribute to smoking status which can be used to help improve health and target interventions.

The descriptive results of this study showed that more men than women smoke and similarly more women than men never smoked. This finding is compatible with historical (Mermelstein et al. 1999; Piko et al. 2007; Waldron 1991) and current (Centers for Disease Control and Prevention 2016) trends which document that men consistently have a higher prevalence of smoking than do women. Additionally, the descriptive results of this study found that quitting smoking occurred at comparable rates by gender, which on its face appears to contradict the theoretical assertions made in the introduction of this chapter and prior empirical work, which suggests that women are less likely than men to quit smoking (National Institute on Drug Abuse 2012). Perhaps this finding represents a cohort effect and future studies making use of data from contemporary cohorts will replicate this comparable quitting rate by gender.

Moving past the exploratory and descriptive findings, the chief goal of this analysis was ultimately to determine if gender conditions the relationship between youth circumstances and smoker status. To this end, interacted models showed that in the comparison of those who never smoked to quitters, gender moderates the relationship between low self-rated health and smoker status such that women who had low self-rated health in early life were at lower risk of being never having smoked than men with low self-rated health in early life. In other words, low self-rated health was shown to be associated with not smoking more among men than among women in this study. Perhaps this finding is an outcome of standards of masculinity placed on boys: boys are only reporting poor health in situations where they are experiencing severely low health (Read and Gorman 2011; Gorman and Read 2006; Read and Gorman 2006; Courtenay 2000). Dovetailing with this, prior literature has shown that boys in poor health are more likely to engage in health behaviors such as athletics as a way to compensate for their poor health and to socially establish themselves as masculine and socially distance themselves from the feminine label of “sickly” (Williams 2000). Perhaps this finding in terms of smoking abstention is an extension of that phenomenon: boys in poor health are more likely to abstain from cigarette smoking as a way to increase their health status and socially distance themselves from the feminine label of sickly.

Additionally, in the comparison with current smokers and quitters, the results showed that gender moderates the relationship between exposures to smoking during youth (such as having peers who smoked or cigarettes in the home) and young adulthood smoker status such that men who were exposed to cigarettes early in life experience a higher risk of being a current smoker as compared to women with similar exposures. Specific to findings for peer influence, results of the multinomial regression in this study found that having peers who smoked in youth increases

the risk of being a current smoker in young adulthood. This finding is consistent with prior literature, which has found that peer smoking behavior is an identified risk factor for smoking (Freidman 2012; O'Loughlin et al 2009; Conrad et al. 1992; Flay et al. 1994). With respect to gender difference in peer influence, this study found that women who didn't have peers that smoked during youth were more likely to never smoke than men who didn't have peers who smoked during youth, which mirrors expected gender findings (Mermelstein et al. 1999; Piko et al. 2007; Waldron 1991; Centers for Disease Control and Prevention 2016). However, among those who had peers that smoked, men and women experienced comparable likelihoods of being either a smoker, quitter, or never smoker. Put another way, this study shows that the expected gender patterns in smoker status can be altered when considered alongside peer influence: influence of peer smoking behavior appears to close the expected gap between men's and women's likelihood of smoking. As suggested in the introduction of this chapter, findings such as these map on to theories of masculinity and health behaviors which suggest that males of all ages are more likely than females to engage in behaviors that increase the risk of disease and injury, and that it is the doing of masculinity that sets men up for health risks (Courtenay 2000). In other words, males may be more likely to smoke because participating in these adverse health behaviors are seen as normative and masculine – and the normative-ness of smoking behavior for boys is further solidified when they see peers smoking. Although girls may have peers who smoke, because smoking does not conform to normative ideas of femininity, this may explain their lower likelihood to initiate the behavior. So, while boys and girls experience similar mechanics of socialization (having peers who smoke), they are socialized differently and thus perform gender in different ways, which impacts their behaviors (Bourdieu 2001). In other

words, while the experiences of boys and girls might not differ substantially, the meanings of these experiences and the attached consequences might differ.

Providing a different angle for interpreting the data, the calculated predicted probabilities in this chapter demonstrated that differences do appear between men and women in the likelihood of being a smoker or having been a lifetime abstainer from cigarettes – relative to quitting. In general, the trends reported by the predicted probabilities show that men are more likely to be smokers than women. However, the predicted probabilities of having never smoked show a complication to the story. This study found that men and women have similar likelihoods of never having smoked when faced with economic disadvantage. However, results also revealed that women are less likely to have never smoked than men only among those who did not receive public assistance in middle or high school (when Wave 1 data was collected). In other words, when faced with grave economic disadvantage while growing up, men and women are equally likely to have never smoked (relative to quitting). However, with the absence of this form of economic disadvantage during childhood, women are less likely to never have smoked than men. Although on its face this finding that women are less likely to never have smoked than men presents a puzzling inconsistency with the prior literature, when considering its context as a finding of a comparison with those who quit, the results make more sense. Further, this odd pattern is not reflected among current smokers. In general, the results show that men are more likely to be smokers than women and that in the presence of economic disadvantage (public assistance receipt), this gender difference only becomes more pronounced. Thus, this set of findings is consistent with studies showing that men have a higher prevalence of smoking than do women (Mermelstein et al. 1999; Piko et al. 2007; Waldron 1991; Centers for Disease Control and Prevention 2016).

Despite the descriptive results of this study showing gender difference in the percent of men and women who experienced violence during childhood, the results of this study showed no gender difference in the impact of this disadvantage on smoking status. In terms of violence, in none of the multinomial regressions did experience with violence emerge as a predictor of smoker status and there was no significant interaction between violence and gender in any comparison. This is inconsistent with prior literature which found that experiences with violence in youth are correlated with smoking (Kristman-Valente, Brown, and Herrenkohl 2013; Simantov et al 2000). However, these studies differ from the present study in a few important ways. First, Simantov and colleagues (2000) used cross sectional data and measured family violence with a binary indicator of if the respondent has *ever* experienced violence that made them want to leave the home, while the present study considered any violence that occurred in the home or elsewhere within 12 months of the interview to be an experience of violence. Kristman-Valente and colleagues (2013) used longitudinal data but measured experiences of abuse retroactively and measured these experiences at a much earlier time point in the life course than the present study. Taken together, these discrepancies indicate that either measurement differences or timing of experience of violence are salient in predicting smoking status. Given the differences found in the present study and prior work, future studies should interrogate whether the type of violence considered and the method of measurement is a determining factor in the relationship between violence and smoker status.

Self-rated health status differed between men and women in the descriptive findings of the present study, with more women than men reporting worse health in youth. In the multinomial models, worse self-rated health was a significant predictor of smoker status initially, but was reduced to non-significance once exposures to smoking were controlled for.

Additionally, there was a significant interaction between being female and being in worse health, such that women in worse health had lower risk of having never smoked than men who reported low self-rated health in early life (however this interaction was non-significant in the comparison between current smokers and quitters). These findings corroborate that disadvantage is not only more common among women (as in more women than men reporting worse health in youth) but also that women are more vulnerable to this disadvantage (as in women who experienced poor health in youth may experience worse smoker status outcomes than men who experienced the same early health disadvantages) (Denton, Prus, and Walters 2004; McDonough and Walters 2001; Turner 2003; Turner and Avison 2003).

Like all studies, this one is not without its limitations. Despite the wealth of information collected over time in Add Health, only 4 waves of data are available at this time and thus I do not have data spanning past young adulthood and don't know what the trajectory of the smokers in this sample will be in the future. For example, some of the smokers may not yet have completed their educational attainment, entered into a stable romantic relationship, or achieved stability in the labor force -- and as such it is difficult to draw conclusions about how these adulthood measures matter for their smoker status. Future research should make use of forthcoming data from Add Health as well as other data sources to attempt to understand the role of young adulthood circumstances further.

As a starting point for interventions I provide the following recommendations based on the empirical findings of this study. While in general the patterns of likelihood to smoke by gender are well established, this study finds that the intersection of gender and early life circumstances can change these patterns. Thus, I recommend first that interventions designed to prevent smoking or encourage cessation be tailored not only to gender, but also take into account

the role that gender and youth circumstances combined play. For example, given that this study demonstrated that gender moderates the relationship between low self-rated health in youth and smoker status in adulthood (with women who experienced low SRH being at lower risk to never smoking than their male counterparts) interventions should pay specific attention to gender and health status in youth. Additionally, the results of study found that men who had exposure to cigarette smoking (via peer influence or availability of cigarettes) had a higher risk of smoking as adults as compared to women with similar exposures. Thus, interventions should take into account that boys exposed to cigarette smoking might be particularly vulnerable to life-long smoking trajectories. Taking these approaches to address the root causes of smoking initiation is a step towards combatting the negative impacts faced by smokers across the life course.

Table 2.1 Sample Characteristics, Mean and Percent Values (SD)			
	Full Sample (n=5,002)	Women (n=2,582)	Men (n=2,416)
Smoking Outcomes <i>(Age 25 and older)</i>			
Current Smoker	34.6%	32.3%	36.9%
Quitter	15.9%	16.1%	15.8%
Never Smoked	49.4%	51.6%	47.3%
Demographic Characteristics			
Female	51.7%	---	---
<i>Racial Identity</i>			
Non-Hispanic White	69.6%	69.7%	69.5%
Non-Hispanic Black	18.3%	19.3%	17.3%
Other	8.2%	6.9%	9.6%
US Born	74.4%	74.0%	74.9%
SES Characteristics <i>(Under age 18)</i>			
Public Assistance Receipt	6.3%	5.9%	6.8%
Some College or Less	47.7%	48.7%	46.6%
Household Income	\$53,260 (57,161)	\$54,663 (56,842)	\$51,795 (57,467)
Difficulty Paying Bills	15.9%	16.4%	15.3%
Other Youth Disadvantages <i>(Under age 18)</i>			
Low SRH	28.2%	31.2%	25.0%
Experienced Violence	44.9%	33.2%	57.5%
Depression Index	12.9 (6.4)	13.2 (6.7)	12.6 (6.1)
Single Parent Household	24.8%	23.3%	27.0%
Smoking Exposures <i>(Under age 18)</i>			
Household Smoker	42.8%	40.6%	45.1%
Cigarettes Available	28.3%	29.8%	26.8%
Friends or Siblings who Smoke	75.9%	74.2%	77.7%
Learned About Smoking	94.5%	95.2%	93.7%
YA Circumstances <i>(Age 19-24)</i>			
Years of Education	13.4 (1.9)	13.6 (1.9)	13.2 (1.9)
Employed	72.5%	71.3%	73.6%
NOTE: Bolded values represent those which differ significantly between men and women at the .05 level			

Table 2.2 Sample Characteristics, Mean and Percent Values (SD)

	Women Smokers (n=835)	Men Smokers (n=892)	Women Quitters (n=416)	Men Quitters (n=382)	Women Never Smoked (n=1,332)	Men Never Smoked (n=1,142)
Demographic Characteristics						
<i>Racial Identity</i>						
Non-Hispanic White	79.7%	75.9%	73.3%	72.8%	60.6%	61.2%
Non-Hispanic Black	11.7%	11.6%	12.1%	14.1%	27.8%	25.0%
Other	5.3%	8.3%	9.7%	11.0%	7.1%	10.0%
US Born	74.9%	74.8%	72.3%	76.4%	74.1%	74.3%
SES Characteristics						
<i>(Under age 18)</i>						
Public Assistance Receipt	5.6%	8.6%	4.4%	4.2%	6.9%	6.1%
Some College or Less	52.5%	52.5%	45.1%	39.3%	46.5%	43.7%
Household Income	50,771 (56,674)	47,345 (49,969)	69,782 (52,698)	63,215 (57,914)	51,571 (37,450)	51,167 (62,894)
Difficulty Paying Bills	16.3%	15.4%	14.4%	13.9%	16.3%	15.9%
Other Youth Disadvantages						
<i>(Under age 18)</i>						
Low SRH	35.7%	32.2%	31.6%	18.8%	26.1%	20.4%
Experienced Violence	36.0%	60.9%	32.0%	60.2%	31.2%	52.4%
Depression Index	14.2 (6.9)	12.9 (6.3)	13.3 (5.9)	12.3 (5.5)	12.4 (6.8)	12.4 (6.1)
Single Parent Household	24.8%	29.2%	18.4%	18.8%	22.9%	28.4%
Smoking Exposures						
<i>(Under age 18)</i>						
Household Smoker	50.1%	53.2%	35.0%	36.1%	35.5%	40.8%
Cigarettes Available	38.4%	33.1%	31.1%	17.8%	22.7%	24.3%
Friends or Siblings who Smoke	92.8%	89.8%	89.8%	85.9%	53.3%	61.2%
Learned About Smoking	96.5%	93.5%	95.1%	93.2%	94.1%	94.2%
YA Circumstances						
<i>(Age 18-24)</i>						
Years of Education	13.1 (2.0)	12.7 (1.9)	14.1 (1.9)	13.6 (1.9)	13.9 (1.9)	13.4 (1.9)
Employed	70.4%	72.0%	75.7%	80.6%	70.4%	71.8%

NOTE: Bolded values in women's columns represent those which differ significantly between men and women within each smoker category at the .05 level

Table 2.3 Comparison with Quitters Multinomial Regression Models

PANEL A: Never Smoked

	Model 1		Model 2		Model 3		Model 4		Model 5	
Demographic Characteristics	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
Female	0.88	(0.76-1.02)	0.82*	(0.69-0.97)	0.78*	(0.64-0.95)	0.76*	(0.60-0.95)	0.85*	(0.65-0.99)
Ref: Non-Hispanic White										
Non-Hispanic Black	0.86	(0.71-1.06)	0.89	(0.70-1.14)	0.78	(0.59-1.03)	0.73	(0.53-1.03)	0.66*	(0.45-0.98)
Other Race	0.62***	(0.48-0.80)	0.53***	(0.39-0.71)	0.57**	(0.40-0.83)	0.62*	(0.41-0.93)	0.48**	(0.31-0.76)
US Born	1.33**	(1.12-1.58)	1.24*	(1.02-1.51)	1.22	(0.97-1.51)	1.02	(0.79-1.32)	0.87	(0.65-1.16)
SES Characteristics										
Public Assistance Receipt			0.89	(0.63-1.26)	0.96	(0.63-1.47)	0.97	(0.59-1.59)	1.02	(0.56-1.86)
Parents Some College or Less			1.45***	(1.21-1.74)	1.31**	(1.07-1.60)	1.22	(0.96-1.54)	1.06	(0.81-1.38)
Household Income			1.00***	(1.00-1.00)	1.00***	(1.00-1.00)	1.00**	(1.00-1.00)	1.00	(1.00-1.00)
Difficulty Paying Bills			0.76*	(0.59-0.97)	0.81	(0.60-1.07)	0.91	(0.65-1.27)	0.93	(0.64-1.36)
Other Youth Disadvantages										
Low SRH					1.38**	(1.10-1.72)	1.25	(0.97-1.62)	1.21	(0.91-1.61)
Experienced Violence					1.13	(0.93-1.39)	1.01	(0.80-1.28)	1.00	(0.77-1.30)
Depressive Symptomology Index					1.02*	(1.00-1.04)	1.02	(1.00-1.03)	1.01	(0.99-1.03)
Single Parent Household					1.33*	(1.00-1.77)	1.34*	(1.00-1.78)	1.33	(0.96-1.85)
Smoking Exposures										
Household Smokers							1.41*	(1.07-1.85)	1.34	(0.98-1.82)
Cigarettes Available							1.29	(0.96-1.73)	1.16	(0.84-1.61)
Friends or Siblings who Smoked							1.12	(0.84-1.51)	1.22	(0.82-1.81)
Young Adulthood Circumstances										
Number of Years of Schooling Completed									0.79***	(0.73-0.84)
Currently Employed									0.67**	(0.50-0.90)

Note: * p< .05, ** p<.01, *** p< .001

Table 2.3 Comparison with Quitters Multinomial Regression Models Continued

PANEL B: Current Smokers

	Model 1		Model 2		Model 3		Model 4		Model 5	
Demographic Characteristics	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
Female	1.09	(0.94-1.26)	1.07	(0.91-1.26)	0.98	(0.81-1.19)	1.00	(0.80-1.26)	1.04	(0.80-1.35)
Ref: Non-Hispanic White										
Non-Hispanic Black	2.20***	(1.83-2.65)	2.13***	(1.70-2.66)	1.98***	(1.54-2.54)	1.59**	(1.16-2.16)	1.79**	(1.24-2.58)
Other Race	1.33*	(1.07-1.66)	1.17	(0.89-1.53)	1.29	(0.93-1.79)	1.16	(0.79-1.70)	0.96	(0.62-1.48)
US Born	0.98	(0.84-1.16)	1.01	(0.84-1.22)	1.01	(0.82-1.25)	0.87	(0.68-1.11)	0.94	(0.71-1.26)
SES Characteristics			0.99	(0.71-1.38)	1.06	(0.71-1.59)	1.21	(0.74-1.96)	1.31	(0.72-2.40)
Public Assistance Receipt			1.27**	(1.07-1.51)	1.16	(0.95-1.40)	1.17	(0.93-1.47)	1.07	(0.82-1.41)
Parents Some College or Less			1.00**	(1.00-1.00)	1.00**	(1.00-1.00)	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)
Household Income			0.73*	(0.57-0.93)	0.77	(0.59-1.02)	0.87	(0.63-1.21)	0.86	(0.59-1.26)
Difficulty Paying Bills										
Other Youth Disadvantages					1.01	(0.81-1.25)	0.90	(0.69-1.16)	0.88	(0.65-1.18)
Low SRH					0.80*	(0.66-0.98)	0.81	(0.64-1.02)	0.79	(0.60-1.03)
Experienced Violence					1.00	(0.99-1.02)	1.01	(0.99-1.03)	1.00	(0.97-1.02)
Depressive Symptomology Index					1.30	(0.99-1.71)	1.36	(0.99-1.80)	1.17	(0.84-1.63)
Single Parent Household					1.32	(0.89-1.77)	1.32	(0.89-1.78)	1.33	(0.96-1.85)
Smoking Exposures										
Household Smokers							1.15	(0.88-1.50)	1.21	(0.88-1.65)
Cigarettes Available							0.99	(0.74-1.34)	0.87	(0.62-1.22)
Friends or Siblings who Smoked							1.25***	(1.20-1.33)	1.18***	(1.13-1.26)
Young Adulthood Circumstances										
Years of Schooling Completed									0.96	(0.89-1.03)
Currently Employed									0.72*	(0.54-0.97)

Note: * p< .05, ** p<.01, *** p< .001

Table 2.4 Comparison with Quitters Multinomial Regression Models with Interactions with SES Characteristics

Panel A: Never Smoked

	<i>Female X Public Assistance Receipt</i>		<i>Female X Parental Education</i>		<i>Female X Household Income</i>		<i>Female X Difficulty Paying Bills</i>	
Demographic Characteristics	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
Female	0.88	(0.68-1.15)	0.96	(0.68-1.36)	0.91	(0.66-1.27)	0.80	(0.41-1.59)
Ref: Non-Hispanic White								
Non-Hispanic Black	0.66*	(0.45-0.98)	0.66*	(0.45-0.98)	0.66*	(0.45-0.98)	0.66*	(0.45-0.98)
Other Race	0.48**	(0.30-0.75)	0.48**	(0.31-0.76)	0.48**	(0.31-0.76)	0.48**	(0.31-0.76)
US Born	0.87	(0.65-1.16)	0.87	(0.65-1.16)	0.87	(0.65-1.16)	0.87	(0.65-1.16)
SES Characteristics								
Public Assistance Receipt	1.36	(0.60-3.10)	1.02	(0.56-1.86)	1.02	(0.56-1.86)	1.03	(0.56-1.86)
Parents Some College or Less	1.06	(0.81-1.38)	1.21	(0.83-1.75)	1.06	(0.81-1.38)	1.06	(0.81-1.38)
Household Income	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)
Difficulty Paying Bills	0.93	(0.64-1.36)	0.94	(0.64-1.36)	0.93	(0.64-1.36)	0.91	(0.54-1.54)
Other Youth Disadvantages								
Low SRH	1.21	(0.90-1.61)	1.21	(0.91-1.61)	1.21	(0.91-1.61)	1.21	(0.91-1.61)
Experienced Violence	1.00	(0.77-1.30)	1.01	(0.77-1.31)	0.99	(0.76-1.29)	1.00	(0.77-1.30)
Depressive Symptomology Index	1.01	(0.99-1.03)	1.01	(0.99-1.03)	1.01	(0.99-1.03)	1.01	(0.99-1.03)
Single Parent Household	1.33	(0.96-1.85)	1.33	(0.96-1.84)	1.33	(0.96-1.84)	1.33	(0.96-1.85)
Smoking Exposures								
Household Smokers	1.34	(0.99-1.83)	1.34	(0.98-1.82)	1.34	(0.98-1.82)	1.34	(0.98-1.82)
Cigarettes Available	1.16	(0.84-1.61)	1.17	(0.84-1.62)	1.17	(0.84-1.62)	1.16	(0.84-1.62)
Friends or Siblings who Smoked	1.22	(0.82-1.81)	1.22	(0.82-1.81)	1.21	(0.81-1.80)	1.21	(0.82-1.81)
Young Adulthood Circumstances								
Number of Years of Schooling Completed	0.79***	(0.73-0.84)	0.79***	(0.73-0.84)	0.78***	(0.73-0.84)	0.79***	(0.73-0.85)
Currently Employed	0.67**	(0.50-0.90)	0.67**	(0.50-0.90)	0.67**	(0.50-0.90)	0.67**	(0.50-0.90)
Interactions								
Female X Public Assistance	0.52	(0.17-1.65)						
Female X Parents Some College Or Less			0.77	(0.47-1.27)				
Female X Household Income					1.00	(0.99-1.00)		
Female X Difficulty Paying Bills							1.07	(0.52-2.22)

Note: * p< .05, ** p<.01, *** p< .001

Table 2.4 Comparison with Quitters Multinomial Regression Models with Interactions with SES Characteristics Continued

Panel B: Current Smokers

	<i>Female X Public Assistance Receipt</i>		<i>Female X Parental Education</i>		<i>Female X Household Income</i>		<i>Female X Difficulty Paying Bills</i>	
Demographic Characteristics	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
Female Ref: Non-Hispanic White	1.02	(0.78-1.33)	1.09	(0.77-1.53)	1.20	(0.86-1.67)	1.25	(0.63-2.48)
Non-Hispanic Black	1.79**	(1.25-2.58)	1.79**	(1.25-2.58)	1.79**	(1.24-2.58)	1.79**	(1.25-2.58)
Other Race	0.96	(0.62-1.49)	0.96	(0.62-1.48)	0.96	(0.62-1.48)	0.96	(0.63-1.49)
US Born	0.94	(0.71-1.26)	0.94	(0.71-1.26)	0.94	(0.71-1.26)	0.94	(0.71-1.26)
SES Characteristics								
Public Assistance Receipt	1.21	(0.51-2.85)	1.32	(0.72-2.40)	1.32	(0.72-2.40)	1.32	(0.72-2.40)
Parents Some College or Less	1.07	(0.82-1.41)	1.14	(0.78-1.67)	1.07	(0.82-1.40)	1.08	(0.82-1.41)
Household Income	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)	1.00	(1.00-1.00)	1.00*	(1.00-1.00)
Difficulty Paying Bills	0.87	(0.60-1.26)	0.87	(0.59-1.26)	0.87	(0.59-1.26)	0.97	(0.57-1.68)
Other Youth Disadvantages								
Low SRH	0.88	(0.65-1.18)	0.88	(0.65-1.18)	0.88	(0.65-1.18)	0.88	(0.65-1.18)
Experienced Violence	0.79	(0.61-1.03)	0.79	(0.61-1.03)	0.78	(0.60-1.02)	0.79	(0.60-1.03)
Depressive								
Symptomology Index	0.99	(0.97-1.02)	1.00	(0.97-1.02)	1.00	(0.97-1.02)	0.99	(0.97-1.02)
Single Parent Household	1.17	(0.84-1.62)	1.17	(0.84-1.62)	1.16	(0.83-1.62)	1.17	(0.84-1.62)
Smoking Exposures								
Household Smokers	1.20	(0.88-1.65)	1.21	(0.88-1.65)	1.20	(0.88-1.65)	1.21	(0.88-1.66)
Cigarettes Available	0.87	(0.62-1.23)	0.87	(0.62-1.23)	0.87	(0.62-1.23)	0.87	(0.61-1.22)
Friends or Siblings who Smoked	0.18***	(0.13-0.26)	0.18***	(0.13-0.26)	0.18***	(0.13-0.26)	0.19***	(0.13-0.26)
Young Adulthood Circumstances								
Number of Years of Schooling Completed	0.96	(0.89-1.03)	0.96	(0.89-1.03)	0.96	(0.89-1.03)	0.96	(0.89-1.03)
Currently Employed	0.72*	(0.54-0.97)	0.72*	(0.54-0.97)	0.72*	(0.54-0.97)	0.72*	(0.54-0.97)
Interactions								
Female X Public Assistance	1.17	(0.37-3.67)						
Female X Parents Some College Or Less			0.89	(0.54-1.48)				
Female X Household Income					1.00	(0.99-1.00)		
Female X Difficulty Paying Bills							0.80	(0.39-1.67)
Note: * p< .05, ** p<.01, *** p< .001								

Table 2.5 Comparison with Quitters Multinomial Regression Models Interactions with Other Youth Disadvantages

Panel A: Never Smoked

	<i>Female X Low SRH</i>		<i>Female X Depressive Symptomology</i>		<i>Female X Single Parent Household</i>		<i>Female X Violence</i>	
Demographic Characteristics (W1)	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
Female	1.00	(0.73-1.35)	0.94	(0.52-1.69)	0.87	(0.65-1.17)	0.82	(0.58-1.17)
Ref: Non-Hispanic White								
Non-Hispanic Black	0.67*	(0.45-0.99)	0.66*	(0.45-0.98)	0.66*	(0.45-0.98)	0.66*	(0.44-0.98)
Other Race	0.48**	(0.31-0.76)	0.48**	(0.31-0.76)	0.48**	(0.31-0.76)	0.48**	(0.31-0.76)
US Born	0.87	(0.65-1.16)	0.87	(0.65-1.16)	0.87	(0.65-1.16)	0.87	(0.65-1.16)
SES Characteristics (W1)								
Public Assistance Receipt	1.02	(0.56-1.84)	1.02	(0.56-1.86)	1.02	(0.56-1.85)	1.02	(0.56-1.86)
Parents Some College or Less	1.05	(0.81-1.38)	1.06	(0.81-1.38)	1.06	(0.81-1.38)	1.05	(0.81-1.38)
Household Income	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)
Difficulty Paying Bills	0.94	(0.64-1.37)	0.94	(0.64-1.36)	0.93	(0.64-1.36)	0.94	(0.64-1.36)
Other Youth Disadvantages (W1)								
Low SRH	1.67*	(1.08-2.58)	1.21	(0.91-1.61)	1.21	(0.91-1.61)	1.21	(0.90-1.61)
Experienced Violence	1.01	(0.77-1.31)	1.00	(0.77-1.30)	1.00	(0.77-1.31)	0.97	(0.68-1.40)
Depressive Symptomology Index	1.01	(0.99-1.03)	1.01	(0.98-1.04)	1.01	(0.99-1.03)	1.01	(0.99-1.03)
Single Parent Household	1.33	(0.96-1.85)	1.33	(0.96-1.85)	1.45	(0.93-2.27)	1.33	(0.96-1.85)
Smoking Exposures (W1)								
Household Smokers	1.35	(0.99-1.85)	1.34	(0.98-1.82)	1.34	(0.98-1.83)	1.34	(0.98-1.82)
Cigarettes Available	1.15	(0.83-1.60)	1.17	(0.84-1.62)	1.16	(0.83-1.61)	1.16	(0.83-1.61)
Friends or Siblings who Smoked	1.22	(0.82-1.82)	1.22	(0.82-1.81)	1.22	(0.82-1.81)	1.22	(0.82-1.81)
Young Adulthood Circumstances (W3)								
Number of Years of Schooling Completed	0.78***	(0.53-1.50)	0.78***	(0.73-0.84)	0.79***	(0.73-0.85)	0.78***	(0.73-0.84)
Currently Employed	0.67**	(0.50-0.90)	0.67**	(0.50-0.90)	0.67**	(0.50-0.90)	0.67**	(0.50-0.90)
Interactions								
Female X Low SRH	0.56*	(0.32-0.99)						
Female X Depressive Symptomology			0.99	(0.95-1.03)				
Female X Single Parent					0.85	(0.46-1.56)		
Female X Violence							1.07	(0.63-1.80)

Note: * p<.05, ** p<.01, *** p<.001

Table 2.5 Comparison with Quitters Multinomial Regression Models Interactions with Other Youth Disadvantages, Continued

Panel B: Current Smokers

	<i>Female X Low SRH</i>		<i>Female X Depressive Symptomology</i>		<i>Female X Single Parent House Hold</i>		<i>Female X Violence</i>	
Demographic Characteristics (W1)	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
Female	1.14	(0.84-1.54)	1.34	(0.74-2.41)	1.13	(0.84-1.51)	1.04	(0.73-1.47)
Ref: Non-Hispanic White								
Non-Hispanic Black	1.80**	(1.25-2.59)	1.79**	(1.25-2.58)	1.80**	(1.25-2.59)	1.79**	(1.24-2.58)
Other Race	0.96	(0.62-1.48)	0.96	(0.62-1.48)	0.96	(0.62-1.48)	0.96	(0.62-1.48)
US Born	0.94	(0.71-1.26)	0.94	(0.71-1.26)	0.94	(0.70-1.25)	0.94	(0.71-1.26)
SES Characteristics (W1)								
Public Assistance Receipt	1.31	(0.72-2.39)	1.32	(0.72-2.40)	1.31	(0.72-2.39)	1.31	(0.72-2.40)
Parents Some College or Less	1.07	(0.82-1.41)	1.07	(0.82-1.41)	1.07	(0.82-1.41)	1.08	(0.82-1.41)
Household Income	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)
Difficulty Paying Bills	0.87	(0.59-1.26)	0.86	(0.59-1.26)	0.86	(0.59-1.26)		(0.59-1.26)
Other Youth Disadvantages (W1)								
Low SRH	1.09	(0.68-1.73)	0.88	(0.65-1.18)	0.87	(0.65-1.18)	0.88	(0.65-1.18)
Experienced Violence	0.79	(0.61-1.03)	0.79	(0.61-1.03)	0.79	(0.61-1.03)	0.79	(0.55-1.14)
Depressive Symptomology Index	0.99	(0.97-1.02)	1.01	(0.97-1.04)	1.00	(0.97-1.02)	1.00	(0.97-1.02)
Single Parent Household	1.17	(0.84-1.62)	1.17	(0.84-1.63)	1.40	(0.89-2.22)	1.17	(0.84-1.62)
Smoking Exposures (W1)								
Household Smokers	1.22	(0.89-1.67)	1.20	(0.88-1.65)	1.21	(0.88-1.66)	1.21	(0.88-1.65)
Cigarettes Available	0.86	(0.61-1.22)	0.87	(0.62-1.23)	0.86	(0.61-1.21)	0.87	(0.62-1.23)
Friends or Siblings who Smoked	0.18***	(0.13-0.26)	0.19***	(0.13-0.26)	0.18***	(0.13-0.26)	0.18***	(0.13-0.26)
Young Adulthood Circumstances (W3)								
Number of Years of Schooling Completed	0.96	(0.89-1.03)	0.96	(0.89-1.03)	0.96	(0.89-1.03)	0.96	(0.89-1.03)
Currently Employed	0.72*	(0.54-0.97)	0.72*	(0.54-0.96)	0.72*	(0.54-0.96)	0.72*	(0.54-0.97)
Interactions								
Female X Low SRH	0.69	(0.38-1.25)						
Female X Depressive Symptomology			0.98	(0.94-1.02)				
Female X Single Parent Household					0.69	(0.37-1.28)		
Female X Household Smoker								
Female X Violence							1.00	(0.59-1.69)

Note: * p< .05, ** p<.01, *** p< .001

Table 2.6 Comparison with Quitters Multinomial Regression Models Interactions With Smoking Exposures

Panel A: Never Smoked

	<i>Female X Friend or Sibling Who Smokes</i>		<i>Female X Cigarettes Available</i>		<i>Female X Household Smoker</i>	
Demographic Characteristics	RRR	95% CI	RRR	95% CI	RRR	95% CI
Female	0.95	(0.44-2.03)	0.95	(0.70-1.29)	0.88	(0.63-1.24)
Ref: Non-Hispanic White						
Non-Hispanic Black	0.66*	(0.45-0.98)	0.67*	(0.45-0.99)	0.66*	(0.45-0.98)
Other Race	0.48**	(0.31-0.76)	0.48**	(0.30-0.75)	0.48**	(0.31-0.76)
US Born	0.87	(0.65-1.16)	0.86	(0.65-1.15)	0.87	(0.65-1.16)
SES Characteristics						
Public Assistance						
Receipt	1.02	(0.56-1.85)	1.03	(0.57-1.88)	1.02	(0.56-1.86)
Parents Some College or Less	1.06	(0.81-1.38)	1.06	(0.81-1.39)	1.06	(0.81-1.38)
Household Income	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)
Difficulty Paying Bills	0.94	(0.64-1.36)	0.93	(0.64-1.35)	0.94	(0.64-1.36)
Other Youth Disadvantages						
Low SRH	1.21	(0.90-1.61)	1.20	(0.90-1.61)	1.21	(0.91-1.61)
Experienced Violence	1.00	(0.77-1.30)	1.01	(0.78-1.32)	1.00	(0.77-1.31)
Depressive						
Symptomology Index	1.01	(0.99-1.03)	1.01	(0.99-1.03)	1.01	(0.99-1.03)
Single Parent						
Household	1.33	(0.96-1.85)	1.31	(0.94-1.82)	1.33	(0.96-1.85)
Smoking Exposures						
Household Smokers	1.34	(0.98-1.82)	1.35	(0.99-1.84)	1.41	(0.95-2.09)
Cigarettes Available	1.16	(0.84-1.61)	1.56	(0.98-2.48)	1.17	(0.84-1.63)
Friends or Siblings who Smoked	1.33	(0.79-2.25)	1.21	(0.81-1.80)	1.22	(0.82-1.81)
Young Adulthood Circumstances						
Number of Years of Schooling Completed	0.79***	(0.73-0.85)	0.79***	(0.73-0.85)	0.79***	(0.73-0.84)
Currently Employed	0.67**	(0.50-0.90)	0.67**	(0.50-0.89)	0.67**	(0.50-0.90)
Interactions						
Female X Friend or Sibling Who Smokes	0.87	(0.39-1.94)				
Female X Cigarettes Available			0.61	(0.34-1.08)		
Female X Household Smoker					0.90	(0.54-1.49)

NOTE: * p< .05, ** p< .01, *** p< .001

Table 2.6 Comparison with Quitters Multinomial Regression Models Interactions With Smoking Exposures

Panel B: Current Smoker

	<i>Female X Friend or Sibling Who Smokes</i>		<i>Female X Cigarettes Available</i>		<i>Female X Household Smoker</i>	
Demographic Characteristics	RRR	95% CI	RRR	95% CI	RRR	95% CI
Female	1.81	(0.98-3.36)	1.31	(0.97-1.77)	1.08	(0.78-1.50)
Ref: Non-Hispanic White						
Non-Hispanic Black	1.76**	(1.22-2.54)	1.83**	(1.27-2.63)	1.79**	(1.25-2.58)
Other Race	0.95	(0.62-1.47)	0.95	(0.61-1.46)	0.96	(0.62-1.48)
US Born	0.94	(0.71-1.26)	0.93	(0.69-1.24)	0.94	(0.71-1.25)
SES Characteristics						
Public Assistance						
Receipt	1.31	(0.72-2.39)	1.33	(0.73-2.43)	1.32	(0.72-2.40)
Parents Some College or Less	1.07	(0.82-1.40)	1.08	(0.82-1.41)	1.08	(0.82-1.41)
Household Income	1.00*	(0.99-1.00)	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)
Difficulty Paying Bills	0.88	(0.60-1.28)	0.85	(0.58-1.25)	0.87	(0.59-1.26)
Other Youth Disadvantages						
Low SRH	0.87	(0.65-1.18)	0.87	(0.64-1.17)	0.88	(0.65-1.18)
Experienced Violence	0.78	(0.60-1.02)	0.81	(0.62-1.05)	0.79	(0.61-1.03)
Depressive						
Symptomology Index	1.00	(0.98-1.02)	1.00	(0.97-1.02)	1.00	(0.97-1.02)
Single Parent						
Household	1.17	(0.84-1.63)	1.13	(0.81-1.57)	1.17	(0.84-1.62)
Smoking Exposures						
Household Smokers	1.21	(0.89-1.66)	1.23	(0.89-1.68)	1.28	(0.85-1.92)
Cigarettes Available	0.86	(0.61-1.22)	1.49	(0.92-2.42)	0.88	(0.62-1.23)
Friends or Siblings who Smoked	0.26***	(0.17-0.42)	0.18***	(0.13-0.26)	0.18***	(0.13-0.26)
Young Adulthood Circumstances						
Number of Years of Schooling Completed	0.96	(0.89-1.03)	0.96	(0.89-1.03)	0.96	(0.89-1.03)
Currently Employed	0.72*	(0.54-0.97)	0.71*	(0.53-0.96)	0.72*	(0.54-0.96)
Interactions						
Female X Friend or Sibling Who Smokes	0.49*	(0.25-0.97)				
Female X Cigarettes Available in Home			0.38**	(0.21-0.69)		
Female X Household Smoker					0.89	(0.53-1.50)

NOTE: * p< .05, ** p< .01, *** p< .001

Table 2.7 Predicted Probability of Smoker Status by Gender and Public Assistance Receipt Status

		Predicted Probability	95% CI
<i>Smokers</i>			
<i>Gender</i>			
Women	Did not Receive	0.37*	(0.37-0.43)
Men	Did not Receive	0.40	(0.34-0.40)
Women	Received Public Assistance	0.27*	(0.17-0.36)
Men	Received Public Assistance	0.44	(0.37-0.55)
<i>Quitters</i>			
<i>Gender</i>			
Women	Did not Receive	0.19	(0.17-0.22)
Men	Did not Receive	0.19	(0.08-0.29)
Women	Received Public Assistance	0.19	(0.16-0.21)
Men	Received Public Assistance	0.15	(0.06-0.25)
<i>Never Smokers</i>			
<i>Gender</i>			
Women	Did not Receive	0.43	(0.41-0.46)
Men	Did not Receive	0.55	(0.47-0.66)
Women	Received Public Assistance	0.41	(0.39-0.44)
Men	Received Public Assistance	0.41	(0.30-0.52)

NOTE: Bolded probabilities are those that differ between men and women within a smoker status category and public assistance receipt category. Probabilities marked with a * are those that differ among men or among women by public assistance receipt status within a smoker status category.

Table 2.8 Predicted Probability of Smoker Status by Gender and Having Smoked with Friends or Siblings During Youth

<i>Smokers</i>		Predicted Probability	95% CI
<i>Gender</i>			
Women	Has Smoker Peers	0.43*	(0.40-0.47)
Men	Has Smoker Peers	0.46*	(0.43-0.49)
Women	Does Not have Smoker Peers	0.13	(0.09-0.18)
Men	Does Not have Smoker Peers	0.21	(0.15-0.26)
<i>Quitters</i>			
<i>Gender</i>			
Women	Has Smoker Peers	0.23*	(0.21-0.26)
Men	Has Smoker Peers	0.21*	(0.18-0.24)
Women	Does Not have Smoker Peers	0.08	(0.04-0.11)
Men	Does Not have Smoker Peers	0.12	(0.08-0.16)
<i>Never Smoked</i>			
<i>Gender</i>			
Women	Has Smoker Peers	0.33*	(0.30-0.37)
Men	Has Smoker Peers	0.33*	(0.30-0.36)
Women	Does Not have Smoker Peers	0.79	(0.74-0.84)
Men	Does Not have Smoker Peers	0.68	(0.62-0.74)

NOTE: Bolded probabilities are those that differ between men and women within a smoker status category and peer smoker status. Probabilities marked with a * are those that differ among men or among women by peer smoker status within a smoker status category.

Figure 2.1

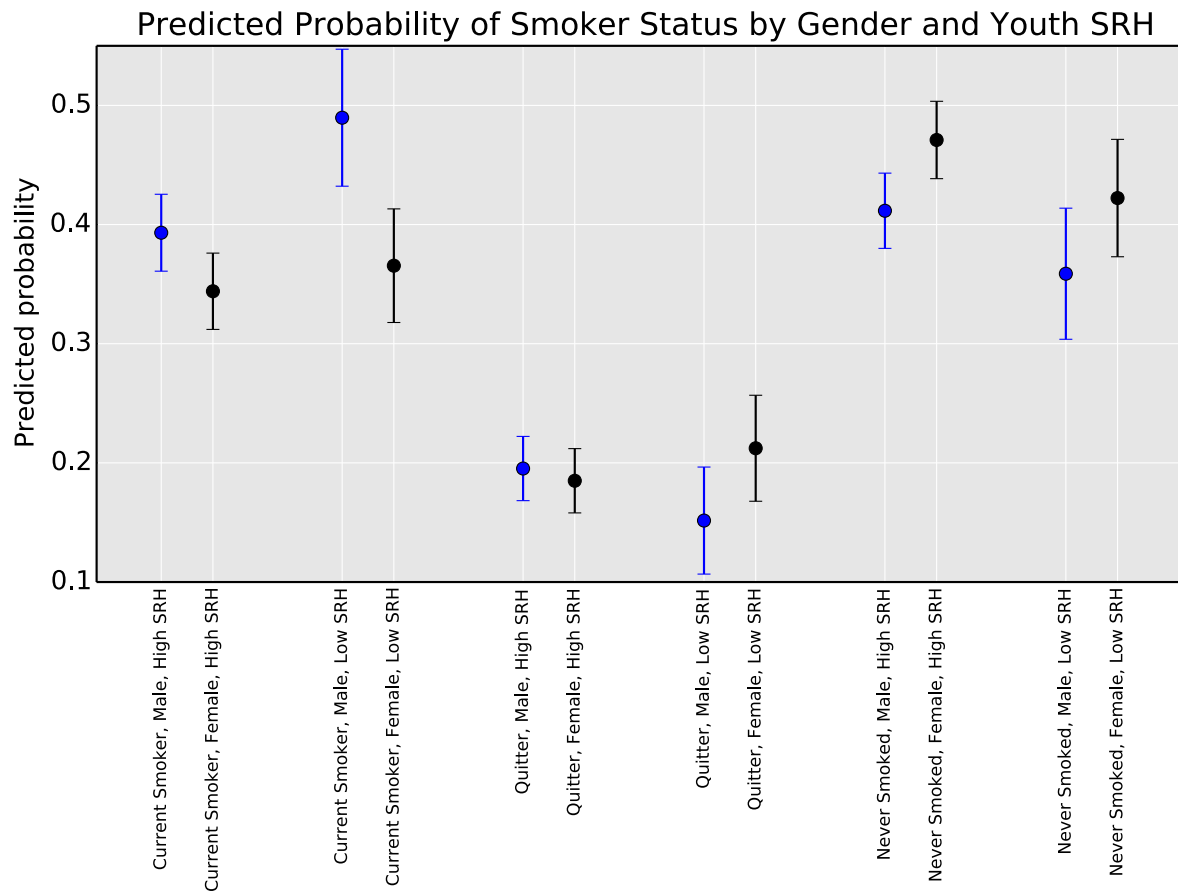


Figure 2.2

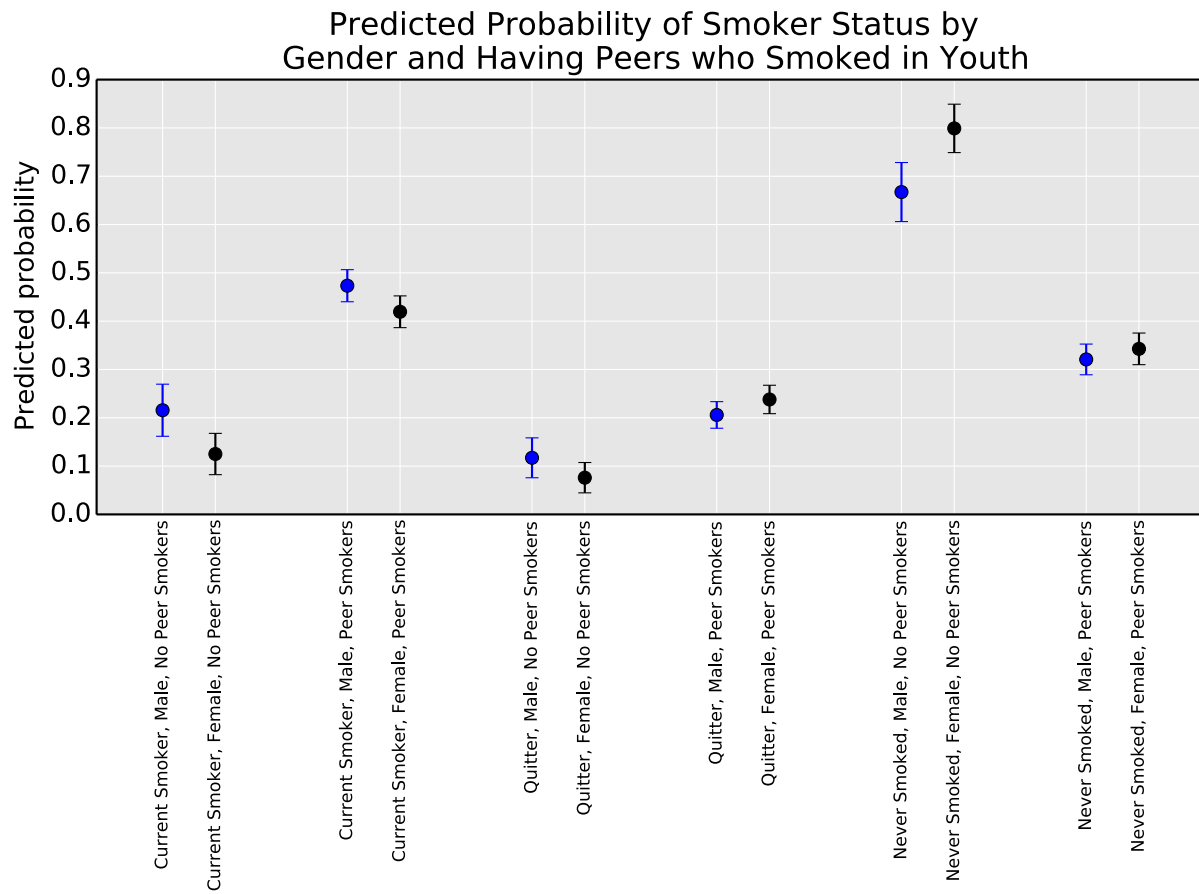
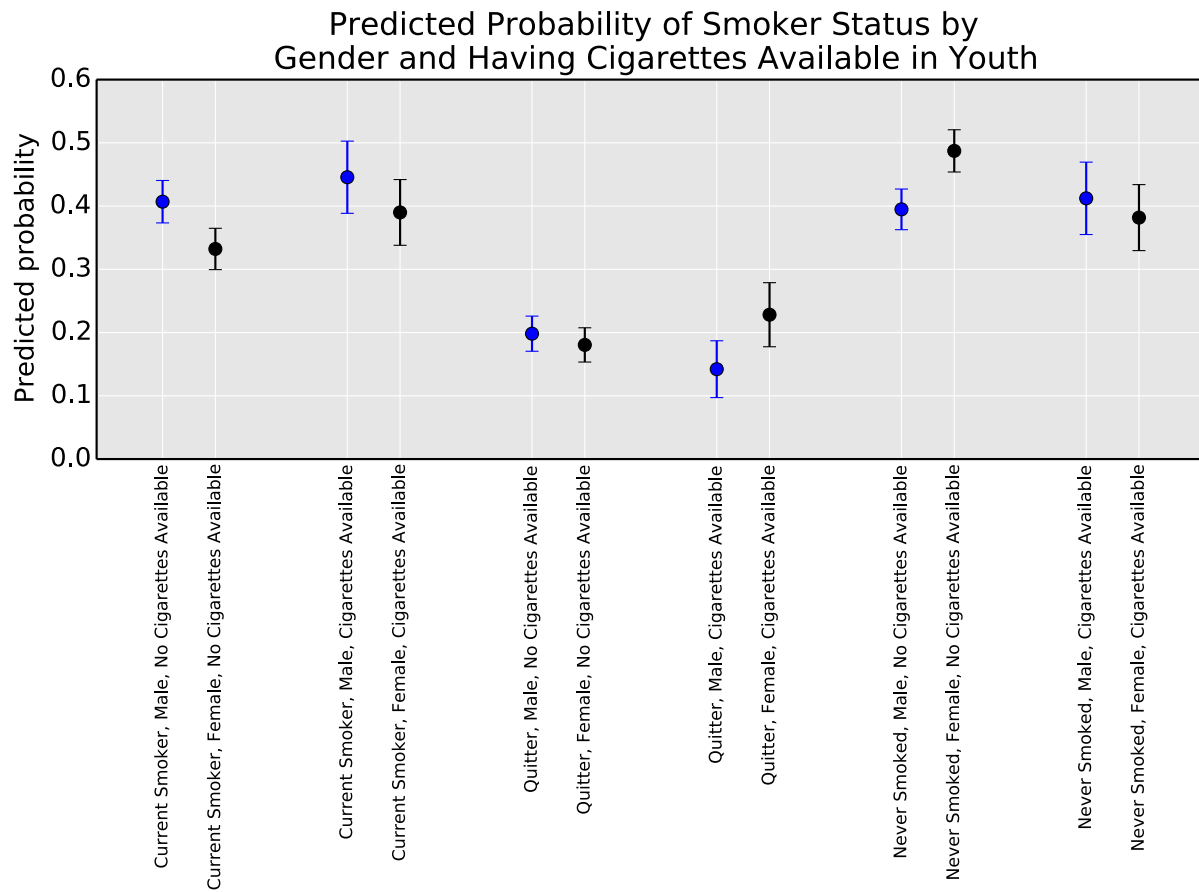


Figure 2.3



Chapter 3

Gender Differences in Early Life Origins of Heavy Episodic Drinking Across the Early Life Course

ABSTRACT

Heavy episodic drinking, or participating in binge-style alcohol use at least one time per month, has negative effects on health and is a problem with wide-reaching impacts. However, not all groups are impacted by problem drinking in the same way. It has been long established that young adult males experience more problems with alcohol than young women do. Further, previous works have noted that a higher percentage of male adolescents are drinking as compared to females, and that men initiate alcohol use at earlier ages than women. In seeking to explain this gender difference in problematic drinking, life course theory suggests that at every point in the life course events occur and accumulate which set up members of social groups for differential health risk trajectories. Considering the link between adult life circumstances and alcohol use and the apparent gender differences in alcohol use frequency, this chapter aims to identify whether and how gender impacts the direct relationship between a host of circumstances in youth and heavy episodic drinking behavior at multiple time points across the early life course.

This chapter extends the knowledge base and explores how gender conditions the relationship between a wide range of factors in youth and heavy episodic drinking using data from the National Longitudinal Study of Adolescent Health (Add Health) public use sample, a longitudinal nationally representative sample of adolescents. This chapter measures a wide range of features of respondents lives that are theoretically relevant to drinking behaviors including demographic characteristics, SES characteristics, general youth disadvantage, exposure to alcohol and social influences, and features of young adulthood life. Logistic regression models at three time points across the early life course and models which interact gender with youth circumstances are used to determine whether and how gender conditions the relationship between early life circumstances and heavy episodic drinking behaviors.

The study ultimately found that evidence of gender moderation is limited to early young adulthood. During this early stage of young adulthood, gender moderates the relationship between availability of alcohol in the home and heavy episodic drinking. However, results revealed that although gender moderates the relationship between certain aspects of youth disadvantage and heavy episodic drinking during early young adulthood (with women having lower odds of heavy episodic drinking at this time period than men), this moderating effect may attenuate over time. In addition to the evidence of gender moderation discussed above, the results provided additional evidence of gender difference in likelihood to participate in heavy episodic drinking. The results showed evidence that in the presence of disadvantage, boys and girls participate in heavy episodic drinking at comparable rates. However, in the absence of disadvantage, boys participate in heavy episodic drinking at higher rates than do girls. Implications of these findings are discussed and include recommendations for interventions and future research.

INTRODUCTION

Early life has been identified as a sensitive period of the life course (Ben-Schlomo and Kuh 2002) and studies have documented how youth health and social circumstances have been linked to a variety of health outcomes in adulthood (e.g. Hayward and Gorman 2004; Haas 2008; Montez and Hayward 2014). Several of these works note that young adulthood may be a particularly critical time to observe health due to the initiation of health behaviors in adolescence and the cumulative impact of life events on overall health status (U.S. Department of Health and Human Services 2012; Ben-Schlomo and Kuh 2002). Taken together, these works suggest that health behaviors in adolescence and young adulthood are likely contributing factors to gender differences in health and mortality in later life. As such, detailing gender differences in health behaviors across the early life course has the potential to inform broader scholarship that seeks to understand the extent to which the health status of men and women differentially unfolds across the life course.

While early life origins studies represent a fast-growing area of research, questions remain regarding whether and how these connections vary by gender. Many prior studies that use measures from youth to predict adulthood outcomes rely exclusively on single-gender samples (e.g., Beebe-Dimmer et al 2004; Hayward and Gorman 2004) or use samples with both men and women but treat gender merely as a control rather than as a key focus of the study (e.g., O’Rand and Hamil-Luker 2005). More recently, however, studies have begun to explore how gender impacts the relationship between early life circumstances and later life health (e.g. Khlat, Jusot, and Ville 2009; O’Rand and Hamil-Luker 2007). In light of evidence that there is a relationship between early life circumstances and health outcomes more broadly, exploring the link between early life circumstances and alcohol use is warranted. Additionally, there is benefit to

specifically looking at socializing structures within youth, such as gender (Bourdieu 2005). A substantial body of literature describes gender differences in general frequency of alcohol use, wherein boys generally drink alcohol earlier in their life course and drink more heavily than girls (Johnston et al., 2011; Robins, 1992; Johnson 1992).

Uniting with literature on how early life social circumstances impact later life health is research that pinpoints how specific social circumstances impact health across the life course, particularly the connection between SES and poor health outcomes. Decades of population health research has established SES as a fundamental cause of health and disease. That is, one's SES is linked to health status via multiple risk factors and to the ability to use and access resources that protect health (Link and Phelan 1995). In line with this theoretical perspective, empirical work has documented a link between SES disadvantage and alcohol use (e.g., Patrick et al 2012; Hanson and Chen, 2007; Huckle et al., 2010). This line of research is important to investigate since certain types of drinking behaviors are harmful to health status across the life course. While light-to-moderate drinking has been associated with health benefits among adults, heavy episodic drinking poses a serious insult to health (O'Keefe et al 2014). Indeed, the Center for Disease Control and Prevention has found that more than 75,000 deaths each year can be attributed to excessive alcohol intake (Centers for Disease Control and Prevention 2001).

Considering the link between adverse life circumstances and alcohol use, and the apparent gender differences in alcohol use frequency, this chapter aims to identify whether and how gender impacts the relationship between adverse circumstances in youth and heavy episodic drinking behavior at multiple time points across the early life course. A life course framework posits that early-life exposure to hardship will shape the risk of heavy episodic alcohol use cumulatively across the life course, and that emerging social networks and new resources will

shape outcomes at different time points. Longitudinal survey data, with baseline records beginning in late youth/early adolescence and a final follow up wave in young adulthood allows for the study of early life circumstances among a nationally-representative sample of men and women.

THEORY AND EVIDENCE

Heavy episodic drinking is a term that reflects large amounts of alcohol consumed in a single occasion but has more relaxed time boundaries than other measures of problematic drinking. Specifically, heavy episodic drinking is defined as consuming five or more drinks for men or four or more drinks for women in a single occasion at anytime during a given month (WHO 2017; National Institute on Alcohol Abuse and Alcoholism 2017). In other words, those who participate in heavy episodic drinking may not be binge drinkers on a daily or weekly basis but may participate in binge style drinking behavior at least one time per month. In addition to the general consequences to health that drinking alcohol can bring, heavy episodic drinking poses the most acute risk to health as compared to other types of problematic drinking behaviors (WHO 2017).

Heavy alcohol use more broadly has negative effects on health and is a problem with wide-reaching impacts. Illustrating this, the cost of excessive drinking in the United States in 2006 was estimated at \$223.5 billion (Bouchery et al 2011). However, not all groups are impacted by problem drinking in the same way. In work done with older cohorts, it has been established that young adult males experience more problems with alcohol than young women (Newcomb and Bentler 1988). Further, previous works have noted that a higher percentage of male adolescents are drinking as compared to females (Johnston et al 1992), and that men initiate alcohol use at earlier ages than women (Johnston 2011; Okwumabua and Duryea, 1987;

Okwumabua et al., 1989; Robins, 1992). However, more recent studies have noted that young women in particular are drinking more alcohol than documented in previous cohorts, perhaps a sign of changing gender norms (Lyons and Willott 2008). Additionally, recent qualitative work has suggested that this increase in young adult women's binge drinking behavior might be related to the pressure women feel to make a favorable impression on male peers by "drinking like a guy" (Young et al 2009).

In seeking to explain this gender difference in problematic drinking, life course theory suggests that at every point in the life course events occur and accumulate which set members of social groups up for differential health risk trajectories (Elder, Johnson, and Crosnoe 2003; Elder 1998). For example, studies have shown that in youth, boys are in poorer health than girls – but that by adolescence, health patterns have changed and young women experience emerging excess in chronic morbidities (e.g. Maclean et al 2012; Sweating 1995).

With this evidence that the transition to adolescence marks an important time for health, the literature documenting adolescent alcohol use is even more significant to explore. Despite drinking alcohol being illegal for persons under the age of 21, some youths do initiate alcohol use earlier. Some estimates have suggested that people aged 12 to 20 years drink 11% of all alcohol consumed in the United States, and what is perhaps more concerning is the way in which this alcohol is drunk: more than 90% is consumed through heavy drinking (Office of Juvenile Justice and Delinquency Prevention 2005). In terms of gender difference, in early adolescence, males drink more frequently and heavily than do females (Johnson et al 2011) and males exhibit greater changes overtime with higher levels of use in mid-adolescence and early adulthood (Chen and Jacobson 2012).

Although in late adolescence heavy drinking patterns don't tend to differ much between males and females (e.g. Windle and Windle, 2005; Dawson et al., 2004), by young adulthood prevalence rates by gender bifurcate sharply, with males experiencing higher risk for drinking disorders and problematic use (Young et al., 2005). Additionally, men experience double the likelihood of engaging in chronic heavy episodic drinking as compared to women (e.g. Meyer et al., 2000), and face higher likelihood of recurrent alcohol intoxication (e.g. Rehm et al., 2001). These findings are consistent with earlier work showing that persons with trajectories of increased heavy drinking from age 18 to 24 were more likely to be male (Bennett, McCrady, Johnson, and Pandina 1999). More recent research has confirmed that drinking trajectory types differ by gender (Windle, Mind, and Windle 2015), although scholarship also shows that drinking behavior tends to escalate into young adulthood for both men and women (Patrick et al 2012).

SES and Alcohol Use

Developing alongside life course theory are those that focus on SES as another factor shaping health behavior development. Fundamental cause theory holds that SES is a root cause of health status and behavior, meaning that SES is linked not only to risk factors and health outcomes, but also inextricably linked to the flexible resources that protect health (Link and Phelan 1995). As such, those who face SES disadvantage are more likely to have a greater risk of health problems and to participate in adverse health behaviors. Yet, studies also show that the relationship between SES and alcohol use is complicated and perhaps not uniform across the life course. For example, a review of published studies concluded that alcohol use in youth is not significantly patterned by SES (Hansen and Chen 2007). Further, among the markers of SES, studies have not shown a clear pattern regarding the relationship between family income and

adolescent drinking. For example, findings from the Youth Risk Behavior Surveillance Study indicate that income is negatively associated with heavy episodic drinking (Lowry et al., 1996), while projects using the Add Health data document a positive relationship between family income and alcohol use (Goodman and Huang 2002). And when parental education is the measure of family SES, lower education level of adults in the home is associated with a greater risk of heavy drinking among adolescents (Conley 1999). While most prior work has not specifically explored how gender impacts the relationship between youth SES and subsequent alcohol use, prior studies have consistently demonstrated that women have lower levels of both SES and alcohol use than men do (Census 2012; SAMHSA 2011). Additional research is needed to further understand how SES in youth is related to alcohol behaviors at later time points.

By adulthood, when drinking patterns have further developed, SES continues to be influential, underscoring the importance of measuring SES in both youth and young adulthood when studying alcohol use. That said, the relationship between SES and alcohol use in adulthood is complicated. While some work finds that lower SES groups consume more alcohol in total (Elliot and Lowman 2015), other studies point out that higher SES groups are more likely to consume alcohol and tend towards more frequent alcohol use than their lower SES counterparts (e.g. Marmot, 1997; Van Oers et al., 1999; Bloomfield et al., 2000).

Although discussed distinctly above, life course and fundamental cause perspective are often intertwined. Scholars have noted how the differential organization of men's and women's lives set them up for differential health behavioral trajectories. Among men, social structures like labor impact their health and safety (e.g., lower SES men are more likely to work in physically dangerous jobs and higher SES men may be protected from negative outcomes because they are more likely to work in an office setting (Courtenay 2000)). For women, those who have higher

educational attainment and labor force participation enjoy better health than their lower SES counterparts (Schnittker 2007). Indeed, studies tracing health gaps between men and women have found that the gaps decrease with increased education among women -- and disappear altogether when women attain a college degree (Ross and Mirowsky 2010).

Exposures to Alcohol

Several characteristics of youth's lives have been shown to contribute to their drinking behavior. Family access to alcohol is one important consideration. Because it is illegal for youths to purchase alcohol, family over the age of 21 years is a common source of alcohol among underage youth (Wagenaar and Toomey et al. 1996; Jones-Webb and Toomey et al. 1997). This is particularly true for younger adolescents who frequently access alcohol from family or parties that take place in their household (Harrison et al 2000).

As social networks in early life are primarily comprised of family members, it is unsurprising that the majority of early alcohol use takes place in the presence of family (parents or other relatives) who provide youths with alcohol (Casswell 1996; Donovan and Molina 2008; Fossey 1994; Jahoda and Cramond 1972; Strycker et al. 2003). Although parental disapproval of alcohol use is not associated differentially with alcohol use among adolescent males and females (Elek, Miller-Day, & Hecht, 2006), evidence indicates that males do perceive greater parental approval of alcohol use than do females in late adolescence (Wood et al., 2004), although this trend is not true in early adolescence (Griffin et al., 2000).

Despite the importance of family access to alcohol, as youths transition to adolescence, peer influence emerges as a salient predictor of alcohol use, with adolescent drinking being linked to changes in the drinking status of peers (Bray et al 2003). Studies have consistently demonstrated that adolescents see alcohol use as a pathway to high status when their peers are

involved in drinking alcohol and that friendships are opportunities to expose adolescents to alcohol (Osgood et al 2013). Similar to patterns observed with family relationships, findings by gender indicate that young men report higher levels of peer approval for drinking than young women in both early and late adolescence (Chawla, Neighbors, Logan, Lewis, & Fossos, 2009; Griffin, Scheier, Botvin, & Diaz, 2000).

Other Youth Disadvantages and Alcohol

While access in the home or via peers in general is a predictor of drinking, sometimes it is the darker side of relationships that lead to drinking behaviors among young people. Studies have shown that relationships that are characterized by violence are predictive of youth drinking. For example, being involved in a physical fight with peers increases the risk of weekly drunkenness among adolescents by 31% (Perra et al 2012). Family violence is also important, as youths who experience abuse or family violence report higher rates of drinking, compared to their peers who have not faced these circumstances (Simantov et al 2000). However, while stressful experiences, including exposure to violence, appear to heighten the risk of unhealthy drinking across groups, more recent studies have demonstrated that among teens, experiences of violence have been linked to heavy episodic drinking among females but not males (Exner-Cortens, Eckenrode, and Rothma 2013).

Mental and physical health status have also been linked to alcohol use. In particular, while moderate drinking is not related to poor mental health (El-Guebaly 2007; Saarni et al 2008) depression has been linked to excessive alcohol intake in a number of studies (e.g. Van Dijk, Toet, and Verdurmen 2004; Paljarvi et al 2009; Gea et al 2012). In terms of physical health, prior research has linked a host of adverse health outcomes to excessive alcohol use

(Centers for Disease Control and Prevention 2011), however the directionality of the relationship has not been fully interrogated.

Demographic Characteristics and Alcohol

In addition to the above noted disparities by gender in alcohol use, drinking behaviors also vary by race and nativity status. Studies have documented that Whites have a greater risk for alcohol use disorders relative to Blacks and Hispanics. However, Blacks and Hispanics experience higher rates than Whites of recurrent or persistent dependence (Chartier and Caetano 2009). In general, research has suggested that the foreign-born experience increasing risk of alcohol use as they become more acculturated in the United States (Iwamoto et al 2012).

THE PRESENT STUDY

As noted above, a dynamic range of factors contribute to drinking behaviors across the early life course, but questions remain about the role of gender in shaping the relationship between early youth circumstances and heavy episodic drinking across adolescence and young adulthood. The goal of this project is to fill gaps of previous research by examining whether gender conditions the relationship between early life disadvantage and subsequent heavy episodic drinking behavior across the life course. I explore how gender operates on the direct relationship between baseline youth circumstances and heavy episodic drinking at multiple time points across the early life course (including early adolescence, late adolescence, and young adulthood). The National Institute on Alcohol Abuse and Alcoholism (NIAAA)'s five-year strategic plan separates its objectives to target distinct time points in the life course. Specifically, the NIAAA recognizes "youth/adolescence", and "young adulthood" as distinct time points which demand special consideration. The NIAAA defines youth/adolescence as the time period between 12-18 years old. The NIAAA recognizes the time period between 19-29 as young

adulthood but further breaks this time period into ages 19-24, and 25 and up (NIAAA 2016). Additionally, the NIAAA notes the importance of the role of college, which may influence alcohol use behaviors (typically taking place between the beginning of young adulthood and age 22). The analysis in this chapter approximates these age cutoffs and predicts heavy episodic drinking at 3 distinct time points: (1) the earliest point in young adulthood when respondents are age 19-22, (2) the middle time point in young adulthood when respondents are aged 22-25, and (3) and the latest time point in young adulthood when respondents are ages 25 or older.

Data and Measures

This chapter draws on data from the National Longitudinal Study of Adolescent Health (Add Health) public use sample, a longitudinal nationally representative sample of adolescents who were in grades 7-12 during the 1994-1995 school year. Four waves of in-home interviews have been conducted with the Add Health cohort, with the most recent interview taking place in 2008 when the sample was aged 24-32. For a complete table, which lists the participants ages at each wave, see the appendix of this dissertation. Add Health pools longitudinal survey data on respondents, including aspects of their social, economic, psychological, and physical well-being with contextual data including information about their family and peer groups. This broad range of topics and variables allows for analyses that show how a host of social and behavioral elements of youths' lives are linked to outcomes across the early life course. Key to this study is information included in the Parent Questionnaire (W1 only) and the In-Home Interview (all waves). The Parent Questionnaire, preferably completed by the resident mother of each adolescent respondent interviewed in Wave I, contains information on topics such as health-affecting behaviors, household income, and economic assistance. A strength of drawing on data from the Parent Questionnaire is that a parent provided this information – thereby reducing

measurement error associated with questions about key predictors on youth circumstances (e.g., household income, which many youths are unlikely to know).

The In-Home Interview occurred in the respondent's home and took approximately 1-2 hours to complete. As a means to protect the confidentiality of the respondents, the interview data was recorded on laptops. Based on the sensitivity of the topic, questions were either read out loud to respondents or were pre-recorded and fed into headphones and respondents were given the opportunity to directly enter their answers, minimizing parental or interviewer influence. The In-Home Interview covered a broad range of topics including health status, peer networks, and substance use.

Dependent Variable (Waves 2, 3, and 4)

The dependent measures for this analysis are being a heavy episodic drinker at 3 time points. These variables are constructed based on the number of drinks the respondent typically consumes when they do drink alcoholic beverages⁶. Unlike binge drinking and other measures of alcohol use which are bound by strict time cut offs, heavy episodic drinking can take place at any time (WHO 2017) and is measured as a binary variable, with those who typically drink 5 or more drinks for men or 4 or more drinks for women being heavy episodic drinkers and those who consume fewer than 5 or 4 drinks respectively coded as non-heavy episodic drinkers (National Institute on Alcohol Abuse and Alcoholism 2017). I constructed a measure of heavy episodic drinking in early young adulthood, when respondents were between the age of 19-22 (drawn from Wave 2), in mid young adulthood, when the respondents were between the ages of 22-24 (drawn from Wave 2 and 3), and late young adulthood, when the respondents were 25 and older

⁶ Specifically, the question asked respondents "Think of all the times you have had a drink during the past 12 months. How many drinks did you usually have each time? A "drink" is a glass of wine, a can of beer, a wine cooler, a shot glass of liquor, or a mixed drink."

(drawn exclusively from Wave 4).

Youth SES Circumstances Measures (Wave 1)

Variables intended to develop a general baseline profile of the respondent's SES circumstances in youth are all drawn from the Parent Questionnaire taken from Wave 1 of the data. This includes parent's education level (less than college=1, college degree or more=0)⁷. A measure of household income is included and measured continuously based on parent reported household income. I also examine parent reported public assistance receipt (where 0=no assistance receipt and 1=received assistance) and a binary indicator of parent reported difficulty paying bills (where 0=no difficulty and 1=difficulty).

Youth Controls (Wave 1)

Demographic characteristics were also measured and included in this study. These characteristics included the primary marker of difference in this study, gender, measured as a binary indicator (1=female, 0=male) as well as racial identity (white, black, or other), and US Born Status (1=US Born, 0= Foreign Born).

Other measures captured at Wave 1 include reporting low self-rated health (measured as a binary indicator where fair/poor/good=1 and all very good or excellent=0)⁸ and an index of depressive symptomology (measured continuously where scores range from 0-38; here respondents were asked if they agree with statements such as “You felt that you could not shake off the blues, even with help from your family and your friends” or “You felt depressed.”). A measure of having experienced violence either in their home or another setting (measured as a

⁷ Consistent with prior work, this study measured parental education using the highest level of education of any parent (Needham and Crosnoe 2005).

⁸ Consistent with prior work measuring self-rated health among youths, this study considers “poor/fair/good” as one category and “very good or excellent” as the other category in the binary variable rather than the “poor/fair” and “good/very good/excellent” measure which is more common in studies measures SRH in adulthood.

binary indicator where 1=respondent experienced violence and 0=did not experience) was included.

Exposures to alcohol included whether the respondent has friends who drink alcohol (1=has any friends who drink, 0=has no friends who drink), a measure of whether alcohol is available in the home (0=no 1=yes), and a binary indicator of if the respondent has parents who drank heavily (based on parent report of alcohol consumption) (1=parent drank heavily, 0=parent did not drink heavily).

Adulthood Controls (Wave 4)

Characteristics used to develop a basic profile of respondents as they transition to young adulthood are drawn from the In-Home Questionnaire and are captured at the latest time point available prior to the respondent's 25th birthday. Characteristics measured during young adulthood include whether the respondent is currently employed (1=employed, 0= otherwise) and the number of years of schooling the respondent has completed (measured continuously).

Data Preparation: Missing Cases and Weights

Data from the Wave 1 In-Home Interview was merged with the Waves 2, 3, and 4 In-Home Interviews for this analysis. At Wave 1, the Public Use sample included 6,504 respondents. However, like all longitudinal studies, sample attrition was a factor in sample size over time. By Wave 4, the final follow-up wave, 5,114 of the respondents from Wave 1 were surveyed, representing approximately a 21% attrition rate. Studies conducted to determine differences between the Wave 1 sample and the subsequent waves do indicate that there are higher response rates for certain demographic groups (namely those respondents who are female, white, and native-born) as well as by SES levels. That said, analysis of the differences between the sample at the different waves has determined that the total relative bias is small in magnitude

when the appropriate sampling weights are applied (Mullan Harris 2013). Pregnant women were excluded from the sample as well as those who did not have a valid parent questionnaire, resulting in an analytic sample of 5,002.

Due to attrition and item non-response, some missing data was present on variables included in this study across the 4 waves. Most items were missing at well less than 10% and Table A.1 in the appendix lists the specific amount of cases missing by variable. I assume that all variables are missing at random or missing completely at random (Little and Rubin 2002) and make use of ICE commands in Stata 14 to conduct the imputation by chained equations to generate 10 multiply imputed datasets ($m=10$). To allow information from all 4 waves to inform missing data imputation, the waves were merged prior to imputing the data (Allison 2001). Additionally, the Add Health data includes sampling weight incorporating a non-response adjustment to compensate for data missing at a given time point due to a subject not being interviewed. The use of these weights nullifies the need to consider the effect of item non-response and make survey non-response the only concern (Chen 2014). The weighted and imputed data was used for all reported descriptive statistics and regression models.

Analytic Strategy

The analysis is organized into two sections. First, I present output from a descriptive analysis of the sample. I report means and standard deviations for interval variables and percent values for categorical variables. Also included are significance tests for difference by gender (either t-tests or chi-square tests, as appropriate). Next, I use logistic regression models to examine how gender shapes the relationship between early life circumstances and heavy episodic drinking in young adulthood. I conduct three sets of models: the first predicting heavy episodic drinking in early young adulthood, when the respondents are between 19-22; the second

predicting heavy episodic drinking in mid young adulthood, when respondents are ages 22-25; and the last predicting heavy episodic drinking at late young adulthood, when respondents are 25 or older. I include only measures in each model that would have occurred by the time the outcome was measured (example: models predicting heavy episodic drinking in mid young adulthood do not include predictors from when the respondent is older than 22-25). Following this, I include interactions between gender and each youth predictor variable to build interacted models and predict probabilities of heavy episodic drinking at each time point.

RESULTS

Table 3.1 displays the sample characteristics for the present study for the full sample and stratified by gender. Bolded values on the table indicate those that differ significantly between men and women. The top portion of the table summarizes the percent of respondents who were heavy episodic drinkers at each measured time point. Here we see that in early young adulthood and late young adulthood, the percent of heavy episodic drinkers differs significantly between men and women. In early young adulthood, 41.2% of women were heavy episodic drinkers as compared to 34.8% of men. In mid young adulthood, 24.6% of the full sample reports heavy episodic drinking. Finally, by late young adulthood 33.5% of women were heavy episodic drinkers as compared to 27.1% of men⁹.

The sample is 51.7% female and predominantly white (69.6%). While many respondents are foreign born, the overwhelming majority (74.4%) were born in the United States. The next section of variables displayed summarize the SES characteristics of the sample. In this section,

⁹ As elaborated upon in the discussion section of this chapter, these percent values represent a discrepancy with the generally well-established pattern that men participate in drinking behaviors at higher rates than their female peers. However, these values do line up with results seen from studies with younger cohorts including studies making use of the National Longitudinal Survey of Youth and the Add Health Cohort (Wells et al 2007; Ramos et al 2004). Additionally, footnote 10 elaborates on supplemental analysis which explain this finding in the context of the present study.

no variables differ significantly between men and women. Looking to the table, we see that only 6.5% of the sample had parents who reported receiving public assistance. Additionally, in terms of parental education, 47.6% of respondents had parents who completed some college or less.

The next section of the table displays other measures of youth disadvantage. Here, we see that while 28.2% of the full sample reported low self-rated health during youth, the percentages varied by gender with 31.2% of women and 25.0% of men in this category. Experiences of violence also varied by gender with more men (57.5%) than women (33.2%) reporting having experienced violence. Scores on the depressive symptomology index were consistent across gender. However, the percent of respondents who grew up in a single parent household did vary slightly, with 27.0% of men and 23.3% of women growing up with this family structure.

Several measures of exposures to alcohol differ between men and women. First, while 10% of women had parents who were heavy drinkers, this figure is slightly higher 12.2% for men. Similarly, 53.3% of men had friends who drank alcohol during their youth compared to only 41.9% of women. Access to alcohol in the home is the only measure where women (29.2%) had a slightly higher percentage than men (26.2%). The final portion of the table summarizes young adulthood circumstances. Here we see that the mean number of years of schooling completed was 13.4% and that about 72.4% of the full sample is currently employed.

Table 3.2 presents odds ratios from logistic regression models predicting heavy episodic drinking in early young adulthood. The goal of this portion of the analysis was to explore first if there is a main effect of gender in predicting heavy episodic drinking using youth circumstances. Model 1, the baseline model, includes measures of demographic characteristics. Here, we see that being female significantly decreases the odds of heavy episodic drinking. This finding

persists across all models, even as controls are included for youth SES characteristics and other youth circumstances¹⁰.

Following this exploration of the main effect of gender in the logistic regression models predicting heavy episodic drinking in early young adulthood, additional models were built which interacted gender with each key predictor measured at Wave 1. Interactions were added to the model one at a time and are displayed in Table 3.3. Only one interaction emerged as significant: gender * access to alcohol in youth. It shows that women who had access to alcohol in their home have significantly lower odds of participating in heavy episodic drinking in early young adulthood compared to men who had access to alcohol in their homes during youth. This interaction can be visualized in Figure 3.1

Following the interacted models, predicted probabilities of heavy episodic drinking were calculated using the margins command in Stata 14.0. The goal of these predicted probabilities was to look within groups by gender and youth characteristics to observe any differences, as opposed to the interactions above which explored potential differences between groups. The probabilities that showed significant difference by gender can be seen in tabular form on the following pages. The probabilities which displayed no difference by gender can be viewed in tabular format in the appendix of this dissertation.

A pattern emerged in the results of the calculated predicted probabilities. In general, men and women experienced similar likelihoods of participating in heavy episodic drinking when disadvantage was present. However, the differentiating role of gender appeared in the *absence* of

¹⁰ Supplemental analysis was performed which suggested that this apparent reverse in the pattern from the pattern displayed in table 3.1 and the findings from the regression in Table 3.2 are a Simpson's Paradox. That is, the relationship illustrated in Table 3.1 makes it appear that women are at elevated risk of heavy episodic drinking than men. However, because this information is merely descriptive and does not account for lurking variables it is misleading. The true relationship between gender and heavy episodic drinking is revealed in the inferential models which account for race. Supplemental analysis was conducted to confirm this hypothesis and found that black women and other race women have elevated odds of participating in heavy episodic drinking while white women have lower odds of participating in heavy episodic drinking.

disadvantage – in these situations across each of the five measures described (see Tables 3.4 through 3.8), men were significantly more likely than women to participate in heavy episodic drinking. More specifically, at Wave 1, if respondents lived in a home where their parents received public assistance or engaged in binge drinking, or if they lived with a single parent, rated their health low, or if alcohol was available in the home, then the predicted probability of heavy episodic drinking did not differ significantly by gender. But, if they lived in a home that did not receive public assistance, if their parents did not binge drink, if they did not live with a single parent, if they rated their health highly, or if alcohol was not available in the home – in each instance, the predicted probability of heavy episodic drinking is significantly higher for men.

Table 3.9 presents odds ratios and confidence intervals from logistic regression models predicting heavy episodic drinking in mid-young adulthood. The goal of this portion of the analysis was to explore first if there is a main effect of gender in predicting heavy episodic drinking in mid-young adulthood. Here, Model 1 includes measures of demographic characteristics, Model 2 adds measures of SES characteristics, Model 3 incorporates measures of other youth disadvantages, and Model 4, the full model, measures of alcohol exposures are accounted for. There is no main effect of gender in any of the 4 models. That said, in the full model several other measures of youth circumstances do predict heavy episodic drinking. Here, the effect of being black re-emerges and predicts increased odds of heavy episodic drinking. Additionally, the effect of family income persists in predicting increased odds of heavy episodic drinking. Experiences of violence, higher scores on the depressive symptomology index, and alcohol being available in the home all significantly decrease the odds of heavy episodic drinking in the full additive model.

Similar to the procedure discussed above for early young adulthood, models which interacted gender with each measure of youth were built. However, the results revealed no significant interactions. Nevertheless, the interacted models are presented in tabular format and appear in the appendix section of this dissertation under the Chapter 3 Supplemental Analysis and Tables heading, Table A.16. The lack of significant interaction between gender and measures of youth indicate that gender does not moderate the impact of youth circumstances on heavy episodic drinking in mid-young adulthood.

Similar to the procedure described above for early and mid-young adulthood, the next section of the analysis built logistic regression models predicting heavy episodic drinking in late young adulthood. The goal of this portion of the analysis was to serve only as a starting point for subsequent interaction tests. Odds ratios and confidence intervals from these models can be seen in Table 3.10. Here, findings mirror the patterns discussed above for mid young adulthood: there is no main effect of gender present despite several measures of youth emerging as significant predictors of heavy episodic drinking in late young adulthood. Following this (and similar to the procedures discussed above for early young adulthood and mid young adulthood), models which interacted gender with each measure of youth were built with the goal of answering the chief research question of this study: does gender moderate the relationship between early life circumstances and subsequent heavy episodic drinking. However, the results revealed no significant interactions. The lack of significant interaction terms indicates that gender does not moderate the impact of youth measures on heavy episodic drinking in late young adulthood. Nevertheless, the interacted models are presented in tabular format and appear in the appendix section of this dissertation under the Chapter 3 Supplemental Analysis and Tables heading, Table A.16.

DISCUSSION

The aim of this study was to identify whether and how gender conditions the link between early life disadvantage and heavy episodic drinking behavior across the early life course. In terms of the outcome of interest, heavy episodic drinking, results from the descriptive analysis showed that in general women participated in heavy episodic drinking at higher rates than their male peers. However, as discussed in the results section of this study, this relationship appears to have been driven by racial differences in drinking behavior. This Simpson's Paradox is corroborated by other studies conducted with younger cohorts which have found similar results such as results from the National Longitudinal Survey of youth (e.g. Wells et al 2007) and studies conducted with the Add Health Cohort which have found that with certain samples, females are more likely to participate in heavy episodic drinking than their male counter parts (Guilamo-Ramos et al 2004). Additional results from the descriptive analysis showed that in general, boys and girls started off with similar backgrounds in terms of parental SES but differed in terms of their health, exposure to violence, friends who drank alcohol during youth, and depressive symptomology in youth.

Results from the logistic regression models show that in early young adulthood there is a main effect of gender such that being female is protective against heavy episodic drinking (both in a bivariate model and after adjustment for demographic characteristics). This finding is consistent with prior work which documents higher levels of problematic drinking among young adult males as compared to females (Young et al 2005) but extends the literature by noting that it is not only binge drinking and recurrent intoxication (Rehm et al 2001; Meyer et al 2000) that men are at higher risk of, but also heavy episodic drinking behavior. Given that heavy episodic drinking does not contain strict time boundaries like binge drinking, these results show that men

are not just at higher risk for more regular problem drinking but also face higher risk of transient problem drinking. Given that heavy episodic drinking poses the most acute risk to health as compared to other types of problematic drinking behaviors (WHO 2017), this addition to the knowledge base underscores the need to address men's elevated risk urgently.

Further, this study found that disadvantage is predictive of heavy episodic drinking in that public assistance receipt and low parental education increase the odds of heavy episodic drinking. Here, a number of measures also varied by gender, in that women who were US born, did not receive public assistance, grew up in a two-parent family, and did not have parents who drank heavily were less likely than their male counterparts to be heavy episodic drinkers in early young adulthood. However, in many cases women were less likely to drink than men regardless of which marker of disadvantage was explored (including parental education, health status, and experience with violence). Taken together, these results show that in early young adulthood women are overall less likely to be heavy episodic drinkers than men but that this finding is exaggerated when comparing the most advantaged women to the most advantaged men. Put another way, disadvantaged women and disadvantaged men are difficult to distinguish, but women demonstrate healthier drinking behaviors than do men among the more advantaged. One way of interpreting these findings is to conclude that because women's drinking behaviors are impacted the most by disadvantage (they transition from healthier than men when advantage but indistinguishable from men in the face of disadvantage), these findings corroborate prior work, which has concluded that girls suffer worse impacts from youth disadvantage than do boys (e.g. Khlat et al 2009; Hamik-Luker and O'Rand 2007). Alternatively, these findings could be interpreted as higher SES corresponding with healthier drinking behaviors among women but not men – an interpretation which maps onto theories of masculinity that suggest men are more

likely to assume health risks irrespective of SES (Courtenay 2000). Whether because of differences in vulnerability to hardship or gender norms in risk behaviors, this finding presents a call to arms for future early life origins studies: given that disadvantage impacts both boys and girls, focusing only on gender differences in how early life disadvantage shapes health behaviors may unduly mask the injurious role of early life hardship, and the gender dynamics of these relationships.

In mid young adulthood, no evidence of gender moderation was found. Perhaps this finding is consistent with prior scholarship, which has shown that drinking behaviors in general tend to escalate in young adulthood among both men and women (Patrick et al 2012). Further, the study found that family income predicts increased odds of heavy episodic drinking but depression and alcohol availability protect against heavy episodic drinking. Perhaps here between the ages of 22-25 respondents are only continuing to be heavy episodic drinkers if it is a relative novelty (such as among those who haven't always had access to alcohol), if they come from a family with means and can afford transient nights of heavy drinking (higher family income), or if they enjoy better mental health and are more likely to be sociable and go out drinking with peers. However, at this stage it does not appear that disadvantage or gender predict heavy episodic drinking.

Finally, in late young adulthood, again there was no evidence of gender moderation, and the SES characteristics that were initially significant were explained away once additional controls were added in to account for young adulthood circumstances. In other words, it appears that the initially pernicious effect of early life disadvantage attenuates over time in terms of heavy episodic drinking consequences for both men and women.

This study emphasizes the importance of exploring the early life origins of adverse health outcomes with a specific gender focus. Although there has been some research that has explored gender differences (e.g. Hamil-Luker and O'Rand 2007; Khlat et al. 2009; O'Rand, Hamil-Luker, and Elman 2009), the bulk of the literature on the link between early life health and later life circumstances have largely focused their attention on single gender samples or have not explicitly focused on gender difference. The present study joins a growing amount of evidence that gender is an important status characteristic that determines the way early life circumstances matter for later life health. Additionally, this study extends the literature by demonstrating that the impact of early life circumstances on health can be observed in young adulthood by focusing on a behavioral health outcomes (as opposed to chronic disease), building upon prior qualitative and theoretical work (e.g. Courtenay 2000, Bourdieu 2005). Further, this study represents a unique contribution to the early life origins literature with its focus on an outcome in young adulthood, as much of the work in this area relies on datasets of older adults (e.g., Haas 2008; Brandt, Deindi, and Hank 2012), which are potentially missing out on an opportunity to capture how early life origins have already shaped health behaviors by young adulthood.

Despite the contributions, like all research, this study does not come without limitations. Among them are that the outcome variable is self-reported. However, there is research that suggests self-report is a valid and reliable method to measure alcohol consumption (Del Boca and Darkes 2003). Additionally, while this study controlled for many factors in youth, adolescence, and young adulthood, the participants in the data source are not yet in mid or late adulthood. As such, it remains to be seen if these patterns of alcohol use persist into later life. Future research should continue to examine how gender conditions the link between early life circumstances and alcohol use by relying on older samples.

The ultimate goal of this study is to inform future research and policy alike. To that end, I provide the following recommendations: First, given the results of this study that gender moderates the relationship between early life circumstances and heavy episodic drinking only among the youngest aged adults, studies that aim to explore drinking outcomes among young adults should be mindful about the age groups their populations fall into and should strive to measure gender differences where possible. Second, in light of the specific results of this study which imply that heavy episodic drinking risk is impacted by different factors across the early life course, interventions should start early but must be tailored to specific age groups even within late adolescence and young adulthood. The results of this study imply that the initially pernicious impacts of early disadvantage on heavy episodic drinking may attenuate over time. Thus, interventions that take place early in the life course would do well to consider the role of disadvantage. However, interventions that are taking place in mid-young adulthood or late young adulthood would do well to focus on other features of participants' social lives. Finally, given that all those who face disadvantage are at risk for heavy episodic drinking but among those who are free from disadvantage men fare worse in terms of drinking outcomes, future studies should be careful in making assumptions about gender being a marker of difference in problematic drinking behavior. Taken together, focusing on drinking behavior at different time points and approaching research and interventions with a gendered-dynamic life course lens should be an auspicious way to continue efforts at understanding and addressing problematic alcohol use.

Table 3.1 Sample Characteristics, Mean and Percent Values (SD)

	Full Sample (n=5,002)	Women (n=2,586)	Men (n=2,416)
Heavy Episodic Drinking Outcomes (W2-4)			
Early Young Adulthood <i>age 19-22</i>	38.5%	41.2%	34.8%
Mid Young Adulthood <i>age 22-24</i>	24.6%	25.2%	24.1%
Late Young Adulthood <i>age 25 & up</i>	30.3%	33.5%	27.1%
Demographic Characteristics (W1)			
Female	51.7%	---	---
<i>Racial Identity</i>			
Non-Hispanic White	69.6%	69.7%	69.5%
Non-Hispanic Black	18.3%	19.3%	17.3%
Other	8.2%	6.9%	9.6%
US Born	74.4%	74.0%	74.9%
SES Characteristics (W1)			
Public Assistance Receipt	6.5%	6.1%	6.9%
Some college or less	47.6%	48.7%	46.5%
Household Income	\$53,021(56,997)	\$54,210(56,518)	\$51,751(57,467)
Difficulty Paying Bills	15.9%	16.4%	15.3%
Other Youth Disadvantages (W1)			
Low SRH	28.2%	31.2%	25.0%
Experienced Violence	44.9%	33.2%	57.5%
Depression Index	12.9(6.4)	13.2(6.7)	12.6 (6.1)
Single Parent Household	25.1%	23.3%	27.0%
Alcohol Exposures (W1)			
Heavy Drinker Parent	11.1%	10.0%	12.2%
Alcohol Available	27.7%	29.2%	26.2%
Friends or Siblings who Drink	51.1%	49.1%	53.3%
Learned About Alcohol in School	94.5%	95.3%	93.7%
YA Circumstances (Age 19-24)			
Years of Education	13.4 (1.9)	13.6 (1.9)	13.2 (1.9)
Employed	72.4%	71.3%	73.6%

NOTE: **Bolded** values represent those which differ significantly between men and women at the .05 level

Table 3.2 Odds Ratios From Logistic Regression Predicting Heavy Episodic Drinking in Early YA age 19-22

	Model 1		Model 2		Model 3		Model 4	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Demographic Characteristics (W1)								
Female	0.74***	(0.67-0.82)	0.75***	(0.66-0.84)	0.71***	(0.62-0.81)	0.70***	(0.60-0.82)
<i>Racial Identity</i>								
Non-Hispanic White (Ref)								
Non-Hispanic Black	1.21**	(1.07-1.37)	1.17*	(1.00-1.35)	1.13	(0.95-1.34)	1.07	(0.86-1.32)
Other	1.48***	(1.25-1.75)	1.23	(1.00-1.51)	1.08	(0.84-1.38)	1.06	(0.80-1.41)
US Born	1.05	(0.93-1.18)	1.03	(0.90-1.19)	1.03	(0.89-1.21)	1.01	(0.85-1.21)
SES Characteristics (W1)								
Public Assistance Receipt			1.70***	(1.32-2.18)	1.55**	(1.16-2.08)	1.43*	(1.02-2.00)
Some College or Less			1.70***	(1.50-1.92)	1.56***	(1.36-1.79)	1.66***	(1.41-1.95)
Household Income			1.00*	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)
Difficulty Paying Bills			0.90	(0.77-1.06)	0.85	(0.71-1.03)	0.96	(0.77-1.20)
Other Youth Disadvantages (W1)								
Low SRH					1.15	(0.99-1.34)	1.03	(0.86-1.23)
Experienced Violence					1.02	(0.89-1.18)	1.00	(0.85-1.18)
Depression Index					1.01**	(1.00-1.03)	1.02**	(1.00-1.03)
Single Parent Household							1.34**	(1.11-1.63)
Alcohol Exposures (W1)								
Heavy Drinker Parent							1.26	(0.98-1.63)
Alcohol Available							0.72***	(0.61-0.86)
Note: * p< .05, ** p< .01, *** p<.001								

Table 3.3 Odds Ratios and Confidence Intervals from Interacted Models Predicting Binge Drinking in Early YA + Interactions

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Demographic Characteristics												
Female	0.69**	(0.53-0.91)	0.70	(0.44-1.11)	0.67**	(0.53-0.85)	0.60**	(0.44-0.83)	0.47**	(0.27-0.82)	0.68**	(0.52-0.89)
<i>Racial Identity</i>												
Ref: Non-Hispanic White												
Non-Hispanic Black	1.22	(0.78-1.90)	1.08	(0.79-1.49)	1.08	(0.79-1.49)	1.07	(0.78-1.48)	1.09	(0.79-1.51)	1.08	(0.79-1.49)
Other Race	0.90	(0.52-1.56)	0.94	(0.64-1.38)	0.94	(0.64-1.38)	0.94	(0.64-1.38)	0.93	(0.63-1.38)	0.94	(0.64-1.38)
US Born	0.88	(0.68-1.15)	0.91	(0.62-1.33)	0.88	(0.68-1.15)	0.89	(0.68-1.15)	0.88	(0.68-1.15)	0.88	(0.68-1.15)
SES Characteristics (W1)												
Public Assistance Receipt	1.26	(0.79-2.03)	1.27	(0.79-2.04)	1.23	(0.67-2.29)	1.27	(0.79-2.04)	1.26	(0.79-2.03)	1.27	(0.79-2.03)
Parents Some College or Less	1.76***	(1.40-2.23)	1.77***	(1.40-2.23)	1.77***	(1.41-2.23)	1.57**	(1.14-2.17)	1.77***	(1.40-2.22)	1.77***	(1.41-2.23)
Household Income	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)
Difficulty Paying Bills	1.12	(0.82-1.52)	1.12	(0.82-1.53)	1.12	(0.82-1.53)	1.12	(0.82-1.52)	0.91	(0.59-1.40)	1.12	(0.82-1.53)
Youth Disadvantages (W1)												
Low SRH	1.09	(0.85-1.40)	1.09	(0.85-1.40)	1.09	(0.85-1.40)	1.09	(0.85-1.40)	1.09	(0.85-1.40)	1.10	(0.76-1.58)
Experienced Violence	1.15	(0.91-1.45)	1.14	(0.91-1.44)	1.14	(0.90-1.44)	1.14	(0.90-1.44)	1.15	(0.91-1.45)	1.14	(0.91-1.44)
Depressive Symptomology Index	1.00	(0.99-1.02)	1.00	(0.99-1.02)	1.00	(0.99-1.02)	1.00	(0.99-1.02)	1.00	(0.99-1.02)	1.00	(0.99-1.02)
Single Parent Household	1.58***	(1.21-2.08)	1.59***	(1.21-2.08)	1.59***	(1.21-2.08)	1.59***	(1.21-2.08)	1.60***	(1.22-2.10)	1.59***	(1.21-2.09)
Alcohol Exposures (W1)												
Heavy Drinker Parent	1.31	(0.93-1.86)	1.31	(0.92-1.85)	1.31	(0.92-1.85)	1.31	(0.92-1.85)	1.31	(0.93-1.86)	1.31	(0.92-1.85)
Alcohol Available in Home	0.80	(0.62-1.02)	0.80	(0.62-1.02)	0.80	(0.62-1.02)	0.80	(0.62-1.02)	0.80	(0.63-1.03)	0.80	(0.62-1.02)
Any Friend Who Drank	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)
Interactions												
Non-Hispanic Black X Female	0.79	(0.42-1.47)										
Other Race X Female	1.09	(0.51-2.34)										
US Born X Female			0.95	(0.56-1.60)								
Public Assistance Receipt X Female					1.06	(0.44-2.60)						
Parents Some College or Less X Female							1.26	(0.81-1.96)				
Difficulty Paying Bills X Female									1.53	(0.84-2.80)		
Low SRH X Female											0.99	(0.61-1.61)
Note: * p< .05, ** p< .01, *** p<.001												

Table 3.3 Odds Ratios and Confidence Intervals from Interacted Models Predicting Binge Drinking in Early YA + Interactions Continued

	Model 7		Model 8		Model 9		Model 10		Model 11	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Demographic Characteristics										
Female	0.78	(0.56-1.08)	0.65**	(0.49-0.84)	0.66***	(0.51-0.84)	0.8	(0.61-1.04)	0.68***	(0.54-0.85)
<i>Racial Identity</i>										
Ref: Non-Hispanic White										
Non-Hispanic Black	1.1	(0.80-1.51)	1.09	(0.79-1.50)	1.08	(0.78-1.49)	1.09	(0.79-1.50)	1.08	(0.79-1.49)
Other Race	0.94	(0.64-1.38)	0.94	(0.64-1.39)	0.94	(0.64-1.39)	0.95	(0.65-1.40)	0.94	(0.64-1.38)
US Born	0.89	(0.68-1.15)	0.89	(0.68-1.15)	0.88	(0.68-1.15)	0.86	(0.66-1.12)	0.88	(0.68-1.15)
SES Characteristics										
Public Assistance Receipt	1.26	(0.79-2.03)	1.27	(0.79-2.03)	1.26	(0.79-2.02)	1.29	(0.81-2.08)	1.27	(0.79-2.03)
Parents Some College or Less	1.77***	(1.41-2.23)	1.77***	(1.41-2.23)	1.77***	(1.40-2.23)	1.77***	(1.40-2.22)	1.77***	(1.41-2.23)
Household Income	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1	(1.00-1.00)	1	(1.00-1.00)	1	(1.00-1.00)
Difficulty Paying Bills	1.11	(0.82-1.52)	1.13	(0.83-1.53)	1.12	(0.83-1.53)	1.11	(0.81-1.51)	1.12	(0.82-1.53)
Other Youth Disadvantages										
Low SRH	1.09	(0.85-1.41)	1.09	(0.85-1.40)	1.09	(0.85-1.40)	1.1	(0.86-1.42)	1.09	(0.85-1.40)
Experienced Violence	1.31	(0.95-1.82)	1.14	(0.90-1.43)	1.14	(0.91-1.44)	1.13	(0.90-1.43)	1.14	(0.91-1.44)
Depressive Symptomology Index	1.00	(0.99-1.02)	1.00	(0.99-1.02)	1.00	(0.99-1.02)	1.00	(0.99-1.02)	1.00	(0.99-1.02)
Single Parent Household	1.59***	(1.21-2.09)	1.46*	(1.01-2.12)	1.60***	(1.22-2.10)	1.58**	(1.20-2.07)	1.59***	(1.21-2.09)
Alcohol Exposures										
Heavy Drinker Parent	1.31	(0.92-1.85)	1.31	(0.93-1.86)	1.16	(0.72-1.85)	1.32	(0.93-1.87)	1.31	(0.92-1.85)
Alcohol Available in the Home	0.8	(0.62-1.02)	0.8	(0.62-1.02)	0.8	(0.62-1.02)	1.08	(0.76-1.55)	0.8	(0.62-1.02)
Any Friend Who Drank	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)
Interactions										
Experienced Violence X Female	0.76	(0.48-1.20)								
Single Parent Household X Female			1.18	(0.71-1.95)						
Parents Binge Drank X Female					1.3	(0.65-2.61)				
Alcohol Available in the Home X Female							0.55*	(0.34-0.91)		
Any Friend Who Drank X Female									1.00	(0.99-1.00)
Note: * p< .05, ** p< .01, *** p<.001										

Table 3.4 Predicted Probabilities of Heavy Episodic Drinking in Early YA by Gender and Public Assistance Receipt

		Predicted Probability	95% CI
<i>Gender</i>			
Women	Received Public Assistance	0.59	(0.48-0.70)
Men	Received Public Assistance	0.68	(0.58-0.78)
Women	Did Not Receive Public Assistance	0.54	(0.50-0.57)
Men	Did Not Receive Public Assistance	0.63	(0.59-0.66)

NOTE: **Bolded** probabilities are those that differ significantly between men and women

Table 3.5 Predicted Probabilities of Heavy Episodic Drinking in Early YA by Gender and Having Parents who Drank Heavily

		Predicted Probability	95% CI
<i>Gender</i>			
Women	Parents Binge Drink	0.62	(0.51-0.68)
Men	Parents Binge Drink	0.70	(0.61-0.75)
Women	Parents Do Not Binge Drink	0.51	(0.49-0.57)
Men	Parents Do Not Binge Drink	0.60	(0.59-0.66)

NOTE: **Bolded** probabilities are those that differ significantly between men and women

Table 3.6 Predicted Probabilities of Heavy Episodic Drinking in Early YA by Gender and Growing up in a Single Parent Household

		Predicted Probability	95% CI
<i>Gender</i>			
Women	Single Parent	0.62	(0.56-0.68)
Men	Single Parent	0.70	(0.65-0.76)
Women	Two Parent Family	0.51	(0.47-0.55)
Men	Two Parent Family	0.60	(0.56-0.64)

NOTE: **Bolded** probabilities are those that differ significantly between men and women

Table 3.7 Predicted Probabilities of Heavy Episodic Drinking in Early YA by Gender and Self Rated Health

		Predicted Probability	95% CI
<i>Gender</i>			
Women	Low SRH	0.55	(0.50-0.61)
Men	Low SRH	0.64	(0.59-0.70)
Women	High SRH	0.53	(0.49-0.58)
Men	High SRH	0.63	(0.59-0.66)

NOTE: **Bolded** probabilities are those that differ significantly between men and women

Table 3.8 Predicted Probabilities of Heavy Episodic Drinking in Early YA by Gender and Having Access to Alcohol During Youth

		Predicted Probability	95% CI
<i>Gender</i>			
Women	Alcohol Available	0.50	(0.44-0.56)
Men	Alcohol Available	0.59	(0.54-0.65)
Women	Not Available	0.55	(0.51-0.60)
Men	Not Available	0.65	(0.61-0.68)

NOTE: **Bolded** probabilities are those that differ significantly between men and women

Table 3.9 Odds Ratios from Logistic Regression Predicting Heavy Episodic Drinking at In Mid YA age 22-25

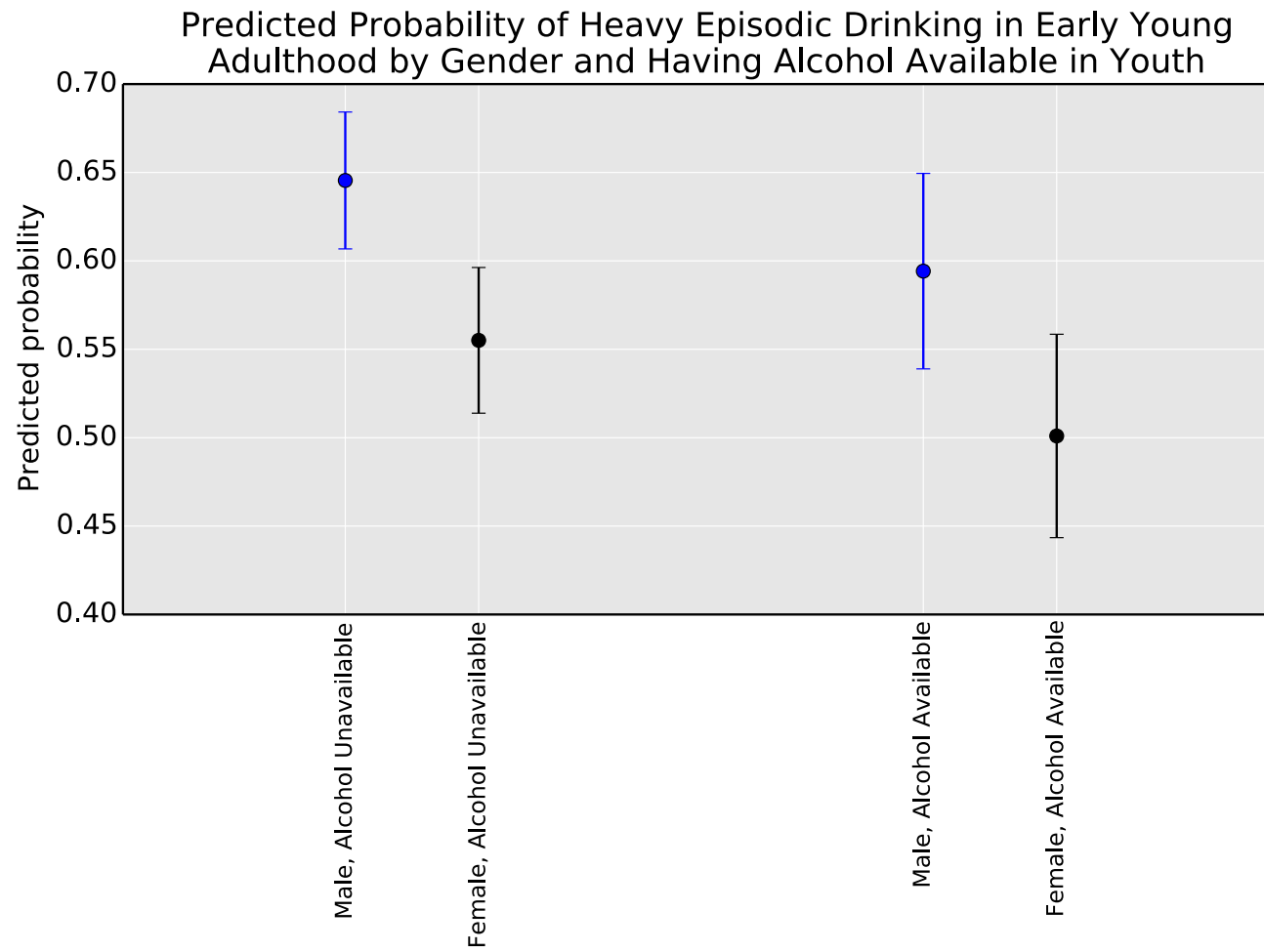
	Model 1		Model 2		Model 3		Model 4	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Demographic Characteristics								
Female	0.95	(0.84-1.06)	0.93	(0.81-1.06)	0.92	(0.79-1.08)	0.99	(0.82-1.18)
<i>Racial Identity</i>								
Non-Hispanic White (Ref)								
Non-Hispanic Black	1.17*	(1.01-1.34)	1.16	(0.98-1.38)	1.16	(0.95-1.41)	1.29*	(1.01-1.64)
Other	1.01	(0.84-1.22)	0.90	(0.72-1.13)	0.89	(0.68-1.15)	0.82	(0.61-1.11)
US Born	0.99	(0.87-1.13)	0.97	(0.83-1.13)	1.00	(0.84-1.19)	1.01	(0.82-1.23)
SES Characteristics (W1)								
Public Assistance Receipt			1.35	(0.99-1.77)	1.35	(0.99-1.86)	1.29	(0.90-1.85)
Some College or Less			1.05	(0.91-1.21)	1.04	(0.89-1.21)	1.09	(0.91-1.31)
Household Income			1.00**	(1.00-1.00)	1.00**	(1.00-1.00)	1.00**	(1.00-1.00)
Difficulty Paying Bills			1.15	(0.96-1.37)	1.16	(0.95-1.42)	1.11	(0.88-1.42)
Other Youth Disadvantages (W1)								
Low SRH					0.93	(0.79-1.10)	0.87	(0.71-1.05)
Experienced Violence					0.84*	(0.72-0.99)	0.80*	(0.66-0.95)
Depression Index					0.97***	(0.96-0.98)	0.97***	(0.95-0.98)
Single Parent Household							0.83	(0.67-1.03)
Alcohol Exposures (W1)								
Parents Heavy Drinkers							0.85	(0.66-1.12)
Alcohol Available							0.80*	(0.66-0.97)
Note: * p< .05, ** p< .01, *** p<.001								

Table 3.10 Odds Ratios From Logistic Regression Predicting Heavy episodic Drinking in Late YA (age 25 and older)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Demographic Characteristics										
Female	0.95	(0.84-1.06)	0.93	(0.81-1.06)	0.99	(0.82-1.18)	0.88	(0.70-1.10)	0.96	(0.74-1.25)
<i>Racial Identity</i>										
Non-Hispanic White (Ref)										
Non-Hispanic Black	1.17*	(1.01-1.34)	1.16	(0.98-1.38)	1.29*	(1.01-1.64)	0.90	(0.66-1.23)	0.88	(0.62-1.27)
Other	1.01	(0.84-1.22)	0.90	(0.72-1.13)	0.82	(0.61-1.11)	0.73	(0.50-1.06)	0.81	(0.52-1.27)
US Born	0.99	(0.87-1.13)	0.97	(0.83-1.13)	1.01	(0.82-1.23)	1.08	(0.84-1.39)	1.00	(0.75-1.34)
SES Characteristics (W1)										
Public Assistance Receipt			1.35*	(1.03-1.77)	1.29	(0.90-1.85)	1.03	(0.67-1.58)	1.09	(0.65-1.83)
Some College or Less			1.05	(0.91-1.21)	1.09	(0.91-1.31)	1.13	(0.90-1.41)	1.12	(0.86-1.46)
Household Income			1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)
Difficulty Paying Bills			1.15	(0.96-1.37)	1.11	(0.88-1.42)	0.96	(0.71-1.29)	0.96	(0.68-1.36)
Other Youth Disadvantages (W1)										
Low SRH					0.87	(0.71-1.05)	0.90	(0.71-1.15)	0.86	(0.65-1.13)
Experienced Violence					0.80*	(0.66-0.95)	1.08	(0.86-1.36)	1.14	(0.88-1.49)
Depression Index					0.97***	(0.95-0.98)	0.99	(0.98-1.01)	0.99	(0.97-1.01)
Single Parent Household					0.83	(0.67-1.03)	0.93	(0.72-1.21)	1.05	(0.77-1.42)
Alcohol Exposures (W1)										
Parents Heavy episodic Drink							0.97	(0.70-1.35)	0.81	(0.56-1.18)
Alcohol Available							0.97	(0.76-1.24)	1.01	(0.77-1.34)
Any Friends who Drink							1.00	(0.86-1.20)	1.01	(0.79-1.23)
Learned About Alcohol in School							1.42	(0.82-2.47)	1.21	(0.61-2.41)
Adulthood Characteristics (Waves 2&3)										
Number of Years of School Completed									0.95	(0.89-1.02)
Employed									1.15	(0.86-1.53)

Note: * p< .05, ** p< .01, *** p<.001

Figure 3.1



Chapter 4

Gender Differences in Early Life Origins of Obesity

Transitions

ABSTRACT

Obesity poses a serious concern to population health across the life course, and rates of obesity are on the rise in the United States. Historically, much of the literature on obesity has focused only at a single time point (such as during youth or adulthood). More recently, however, studies have shown strong relationships between early life circumstances and adulthood obesity suggesting that the vestiges of early disadvantage may manifest in adverse weight status outcomes later in the life course. Despite these breakthroughs, most published work in this area does not focus on gender as a key marker of difference in how early life conditions relate to health. The present study fills this gap in the research by focusing on how gender conditions the relationship between early life circumstances and weight status in young adulthood.

This chapter draws on the Add Health data and estimates multinomial regression models predicting weight status transitions across the early life course. Overall, this study found no evidence that gender moderates the relationship between early life circumstances and weight status transitions across the life course. That said, the chapter does discuss findings from predicted probabilities showed gender difference in likelihood of weight status transition categories based on early life characteristics such as parental difficulty paying bills, parental education, self-rated health, family structure, and experiences with violence -- and thus serves as a spring board for future research to more fully explicate the relationship between gender and weight status transitions.

INTRODUCTION

Obesity poses a serious concern to population health across the life course, given that about a third of U.S. adults and 17% of children are obese (Ogden, Carroll, and Flegal 2012). Historically, much of the literature on obesity has focused only on a single time point in the life course (such as during youth *or* adulthood) (e.g. French et al 1995 Etelson et al 2003; Ogden et al 2014). More recently, however, studies have shown strong relationships between early life circumstances and adulthood obesity (Hamil-Luker & O’Rand, 2007; Heraclides, Witte, & Brunner, 2008; Langenberg, Hardy, Kuh, Brunner, & Wadsworth, 2003), suggesting that the vestiges of early life circumstances may manifest in adverse weight status outcomes later in the life course. Despite these breakthroughs, most published work in this area does not focus on gender as a key marker of difference in how early life conditions relate to obesity (e.g. Lee, Mullan Harris and Gordon-Larsen 2009; Wang & Zhang 2006; Drewnowski & Specter 2004; Haas 2003; Wang 2001). This is a surprising omission, given the robust gender socialization literature, which notes that while the gender socialization process is uniform, it can produce different outcomes. In other words, it is well established that while boys and girls experience similar mechanics of socialization, they are socialized differently and thus exposed to different resources with different meanings, which impacts their outcomes (Bordeui 2001; Ridgeway 2011). Coupled with theories of stress process, which hold that men and women are differentially exposed and vulnerable to hardships and stressors, such as disadvantage beginning in youth, theory suggests that men and women may experience differences in their weight status outcomes.

With these research gaps and theoretical frameworks in mind, this chapter seeks to understand how gender conditions the relationship between early life disadvantage and weight status in young adulthood. To assess this aim, this chapter uses longitudinal data with baseline

records beginning in youth and a final follow up wave in young adulthood to study weight status transitions across the early life course among a nationally-representative sample of young men and women.

THEORY AND EVIDENCE

Obesity is linked with several adverse physical health outcomes (Swallen et al 2005), and excess body weight is among the leading causes of death and disability in the United States (Mozaffarian et al 2016). As such, weight status transitions are a critical concern for population health. While recent reports showed no significant gender difference in overall obesity prevalence in the United States (Ogden et al 2013), in the last two decades the prevalence of obesity increased significantly among men, but not women. During this same time period, there was an increase in prevalence of obesity among boys, but not girls. So, while adult men and women have nearly the same prevalence rates of obesity (35.5% and 35.8% respectively) and boys have higher but similar prevalence rates to girls (18.6% and 15.0%) (Ogden et al 2013), it appears that among all age groups changes are taking place that may be putting men at greater risk for weight status transition problems than women.

Perhaps due to the modest observed differences in weight status by gender that marked previous cohorts, prior work has not treated gender as a key independent variable in studies exploring the link between early life circumstances and obesity risk. That said, a small handful of studies have explored the impacts of gender and SES disadvantage in early life. What is known from these studies is that there is a stronger relationship between early life SES disadvantage and obesity among females as compared to males (Khlat et al 2009; McLaren 2007; Zhang and Wang 2003; Wang 2001). McLaren (2007) conducted a meta-analysis which summarized that lower SES (in terms of education and occupation) was associated with larger body size for women in

highly developed countries, while lower SES in terms of income and material possession was associated with larger body size among women in low-development countries. This study summarized not only the general importance of economic resources on weight status but also implies that the level of disadvantage in general changes which SES resources matter. More specifically, Khlat and colleagues (2009) found that father's occupational prestige was linked to the odds of adulthood obesity among women but not men among a French sample of adults. Despite this emerging evidence, it has not been fully teased apart whether and how gender conditions the relationship between a broad range of early life circumstances and obesity. Additionally, in the above studies, sample populations are older than early adulthood, further complicating researchers' ability to determine the relative importance of youth and young adulthood factors.

SES and Weight Status

Consistent with fundamental cause theory, research has consistently shown that obesity rates vary across SES groups (McLaren 2007), with the highest rate of obesity seen among low education and high poverty populations (Drewnowski & Specter 2004). Additionally, differences in the SES-weight status relationship also appear among children and adolescents, as poverty is associated with lower rates of overweight among adolescents and higher rates of obesity among youths (Haas et al 2003). Findings like this suggest that the relationship between disadvantage and weight status transitions may differ across the life course and that the way resources matter differs as youth transition into new life stages. Building upon this, prior literature documents that the type of SES measure used in studies impacts the link between SES and obesity among youths (Lee, Mullan Harris and Gordon-Larsen 2009). For example, despite the above evidence that poverty is impactful in shaping weight status outcomes, Gibson (2004) found that long-term food

stamp participation does not impact obesity risk among adolescents. These results dovetail with life course studies more broadly that show how distinct measures of SES have differential effects on health throughout the life course (Herd et al 2007; Beckett 2000).

The notion that the type of SES considered and the stage of the life course focused on both have implications for the presence and directionality of the SES-obesity relationship underscores the importance of measuring obesity transitions longitudinally and avoiding measuring SES as a unitary construct. Further, theoretical and empirical work suggests that resource type and resource timing matter differently by gender. Specifically, studies have shown that education is more strongly linked to health among women than men (Cutler and Lleras-Muney 2006, Ross, Masters, and Hummer 2012, Ross and Mirowsky 2010, Thurston et al. 2005, Ostrove and Adler 1998). This link is thought to exist largely because women typically have fewer SES resources as compared to men and as such women are able to “substitute” their education for financial aspects of SES, making education a more meaningful shaper of their outcomes (Ross and Mirowsky 2010).

In the context of SES resources across the life course, these theories suggest that each type of SES resource may be more important for women than men. In this way, being low SES in youth may be more impactful for the weight status outcomes of women than for the weight status outcomes of men. While most studies have not focused specifically on gender differences in the relationship between early life SES and weight status outcomes, a small body of work exists that supports the above hypothesis. For example, father’s social class was related inversely with adulthood obesity only among women (but not men) in a sample of adults, a finding that persisted even after accounting for adulthood factors such as educational attainment or healthy lifestyle (Heraclides, Witte and Brunner 2007). This finding was bolstered by a study, which

found that retrospective report of youth economic hardship and having a father with a low prestige job increased the odds of obesity among women but were not salient predictors of obesity among men (Khlat et al 2009). Other work has shown that among women, but not men, adult social class is inversely related to obesity after controlling for retrospective report of youth circumstances (Langenberg et al 2003), implying that across the life course SES resources matter differentially for men and women. Despite this evidence, results of a meta-analysis revealed that lower socioeconomic position was related to increased risk of adulthood obesity, with some evidence that this effect was weaker among men but in the same direction (Power et al 2005), perhaps suggesting that the ways in which SES disadvantage matter for men's weight status outcomes are different than for women. In sum, the lion's share of the literature suggests that parent's class and economic hardship in youth are damaging to cross-sectionally measured weight status outcomes of adult women but not adult men.

Contributing to this body of evidence are results from a study using early waves of the Add Health Data, which found a significant effect of poverty in youth on adolescent obesity outcomes for females, but not for males. However, this same study found that other measures of socioeconomic disadvantage such as neighborhood poverty and low parental education are related to obesity in both males and females (Lee et al 2009). The addition of this study demonstrates that gender may operate via the direct relationship between SES disadvantage and weight status to shape outcomes as well as underscore the notion that time in the life course matters significantly for obesity outcomes.

Other Youth Disadvantages and Weight Status

Alongside literature suggesting a link between SES and weight status is work linking other features of youth life to obesity. For example, prior research shows that experiences of

violence (Felitti et al. 1998; Lynch, Kaplan, and Salonen 1997; Repetti, Taylor, and Seeman 2002) are related to obesity in youth. While these empirical studies do not specifically interrogate if this link varies by gender, theory is a potential starting point for hypothesizing gender difference. Experiences of violence could be conceptualized as inherently stressful and an application of the stress process theory to these circumstances suggests that women may be more harmed by violence due to differences in amount and meaning of resources available to cope (Adler et al. 1994; Almeida et al. 2005). However, theories of masculinity suggest that men may be more exposed to violence (Courtenay 2000) potentially leading us to assume that they may face more severe health impacts by extension (Denton, Prus, and Walters 2004; McDonough and Walters 2001; Turner 2003; Turner and Avison 2003). Despite this, gender socialization theory more broadly reminds us that even at comparable levels of exposure to stressors, the produced impacts can differ widely (Bordeui 2001; Ridgeway 2011). So while it is likely that early experiences with violence may have an impact on weight status, the way in which gender conditions this relationship remains to be determined.

Other features of youth life that are not objectively marked by disadvantage can also have an impact of obesity. For example, studies have documented a link between worse self-rated health and increased BMI among children and adolescents (Herman et al 2014). Mental health may also play a role in weight status outcomes as prior work has noted a link between depression and obesity (Goldfield et al 2010).

While studies of the social determinants of health focus on the more distal causes of health behaviors (such as SES and gender), proximal factors such as level of physical activity and general health knowledge have been linked to weight status. For example, higher levels of physical activity are negatively related to obesity (Belcher et al 2010).

Demographic Characteristics and Weight Status

Additionally, prior work has documented that weight status also varies by race/ethnicity and gender. Among adults and youths, the prevalence of obesity is highest for non-white women and girls (Flegal, Carroll, and Ogden 2010; Ogden, Carroll, and Curtin 2010). In terms of nativity, prior studies have shown that among the foreign born, obesity risk increases with greater amounts of time spent in the US (Kaplan et al 2004).

Adulthood Circumstances and Weight Status

Other research has explored how circumstances in adulthood impact weight status. Prior literature has also documented links between adulthood SES and weight status, however, many of the details of these relationships remain to be parsed out. For example, several empirical and theoretical studies have demonstrated that obesity is a risk factor for exiting paid employment due to disability (e.g. Robroek et al 2013) and that discrimination against obese candidates may result in difficulty securing employment in the first place (Caliendo and Lee 2013) – all of which is bolstered by findings that suggest the obese (especially women) face stigma in a variety of daily encounters (e.g; King, Shapiro, Hebl, Singletary, and Turner 2006; Hebl and Heatherton 1998). Studies like these imply that obesity may be partially causal of employment status. However, other work, such as that which has linked work-place sitting time to obesity (Pedisic et al 2014), opens the door for the possibility that employment in adulthood might be partially responsible for obesity status. Educational attainment is also a salient predictor of weight status, a finding that is true across gender and racial groups (Zhang and Wang 2004). In general, in the United States, adults with lower levels of education have higher probabilities of suffering obesity than those who completed a college degree (Ljungvall and Zimmerman 2012).

THE PRESENT STUDY

This project aims to build upon the literature discussed above by exploring how gender conditions the relationship between early life disadvantage and weight status transitions across the early life course. To address this aim, longitudinal data beginning in youth and ending in young adulthood is used to model how a host of factors across the early life course impact weight status transitions among a nationally representative sample of both young men and women.

Data and Measures

This chapter draws on the first and fourth waves of Add Health, a longitudinal nationally representative sample of adolescents who were in grades 7-12 during the 1994-1995 school year (Wave 1). Four waves of in-home interviews have been conducted with the Add Health cohort, with the most recent interview (Wave IV) taking place in 2008 when the sample was aged 24-32 (with the exception of 52 respondents who were 33-34 years old at the time of the Wave IV interview). In this study, I make use of the data to trace differences in the experiences of respondents over time and to map experiences of disadvantage on to their weight status transition category.

Add Health pools longitudinal survey data on respondents, including aspects of their economic and physical well-being with information about their family and relationships. This broad range of topics and variables allows for analyses that reveal how a host of elements of youths' lives are linked to outcomes in young adulthood. Key to this study are the Parent Questionnaire and the In-Home Interview. The Parent Questionnaire, preferably completed by the resident mother of each adolescent respondent interviewed in Wave I, contains information on topics such as household income, economic assistance, and parental education. A major

strength of drawing on data from the Parent Questionnaire is that a parent provided this information – thereby reducing measurement error associated with questions about key predictors on youth circumstances (e.g., household income, which many youths are unlikely to know).

The In-Home Interview took place in respondents' homes and took approximately 1-2 hours. As a means to protect the confidentiality of the respondents the interview data was recorded on laptops. Based on the sensitivity of the topic, questions were either read out loud to respondents or were pre-recorded and fed into headphones and respondents were given the opportunity to directly enter their answers, minimizing parental or interviewer influence. The In-Home Interview covered a broad range of topics including health status, measured height and weight, SES, and relationships.

Dependent Variable (Waves 1 & 4)

The dependent variable for this study is weight status transition category: persistently not obese, persistently obese, became obese, and became healthy. These categories were constructed in the following manner: First, height and weight information was used to calculate continuous BMI at each wave. Using total height in inches and total weight in pounds, BMI was calculated by the following formula for each respondent at each wave:

$$BMI = 703 \times \frac{weight(lbs)}{height(in)^2}$$

After calculating continuous BMIs for each respondent at Wave 1 and Wave 4, respondents were coded into a binary indicator of obesity (1=obese and 0=non-obese) at each included wave. Consistent with prior research, guidelines for youth obesity cut points were used for respondents at Wave 1 and guidelines for adult obesity were used for Wave 4 (Lee, Mullan Harris and Gordon-Larsen 2009). At Wave 1, boys and girls were considered obese if their BMI

was greater than or equal to the 95th percentile for gender specific weight-for-height for age (CDC 2015). For specific values see CDC BMI-for-age percentile growth charts in the appendix of this dissertation. At Wave 4, respondents were considered obese if their continuous BMI was greater than or equal to 30kg/m² (CDC 2015). Following this, respondents were coded into mutually exclusive weight status transition categories. Those who were obese at Wave 1 (obesity==1) and remained obese at Wave 4 (obesity==1) were coded as persistently obese. Those who were not obese at Wave 1 (obesity==0) and remained not obese at Wave 4 (obesity==0) were coded as persistently non-obese. Those who were not obese at Wave 1 (obesity==0) but were coded as obese at Wave 4 (obesity==1) were coded as became obese. Next, those who were obese at Wave 1 (obesity==1) and were non-obese at W4 (obesity==0) were coded as became healthy weight.

Youth Circumstances Measures (Wave 1)

First, demographic characteristics were measured and included in this study. All are time-invariant and measured at Wave 1. These characteristics included the primary marker of difference in this study, gender, measured as a binary indicator (1=female, 0=male), as well as racial identity (white, black, or other), and US Born Status (1=US Born, 0= Foreign Born).

Variables intended to develop a general baseline profile of the respondent's circumstances in youth are all drawn from the In-home Interview and Parent Questionnaire. Here, all measures are taken from Wave 1. From the parent questionnaire I include parent's education level (less than college=1, college degree or more=0)¹¹. A measure of household income is included and measured continuously based on parent reported household income. Parent reported public assistance receipt (where 0=no assistance receipt and 1=received

¹¹ Consistent with prior work, this study measured parental education using the highest level of education of any parent (Needham and Crosnoe 2005).

assistance) is also measured. Additionally, I include a binary indicator parent reported difficulty paying bills (where 0=no difficulty receipt and 1=difficulty).

Other measures of youth disadvantage include reporting fair, poor, or good self-rated health (measured as a binary indicator where fair/poor/good=1 and all very good or excellent=0)¹² and an index of depressive symptomology (measured continuously where scores range from 0-38; here respondents were asked if they agree with statements such as “You felt that you could not shake off the blues, even with help from your family and your friends” or “You felt depressed.”). A measure of having experienced violence either in their home or another setting (measured as a binary indicator where 1=respondent experienced violence and 0=did not experience) was included.

Young Adulthood Characteristics (Wave 3)

Characteristics used to develop a basic profile of respondents as they transition to young adulthood are drawn from the Wave 4 In-Home Questionnaire. Characteristics measured during young adulthood include whether the respondent is currently employed (1=employed, 0=otherwise), and the number of years of schooling the respondent has completed (measured continuously). Finally, I include a measure of if the respondent exercises weekly (1=exercises weekly, 0=does not).

Data Preparation and Missing Cases

For this analysis, I merged data from each wave of the In-Home Interview (Waves 1 and 4). At Wave 1, the Public Use sample included 6,504 respondents. However, like all longitudinal studies, sample attrition occurred over time: by wave 4 only 5,114 of the respondents from Wave

¹² Consistent with prior work measuring self-rated health among youths, this study considers “poor/fair/good” as one category and “very good or excellent” as the other category in the binary variable rather than the “poor/fair” and “good/very good/excellent” measure which is more common in studies measures SRH in adulthood.

1 were surveyed, representing approximately a 21% attrition rate. Studies conducted to determine differences between the Wave 1 sample and the subsequent waves do indicate that there are higher response rates for certain demographic groups (namely those respondents who are female, white, and native-born) as well as by SES levels. That said, analysis of the differences between the sample at the different waves has determined that the total relative bias is small in magnitude when the appropriate sampling weights are applied (Mullan Harris 2013). Pregnant women were excluded from the sample¹³ as well as those who did not have a valid parent questionnaire, resulting in an analytic sample of 5,002.

Due to attrition and item non-response, some missing data was present on variables included in this study across the waves. Most items were missing at less than 10%, but some were higher. Specific levels of missingness on each predictor variable can be seen in Table A.1 in the appendix of this dissertation. I assume that all variables are missing at random or missing completely at random (Little and Rubin 2002) and make use of ICE commands in Stata 14 to conduct the imputation by chained equations to generate 10 multiply imputed datasets (m=10). To allow information from all 4 waves to inform missing data imputation, the waves were merged prior to imputing the data (Allison 2001). The imputed data was used for all reported descriptive statistics and regression models.

Analytic Strategy

First, I provide the distributions of youth circumstances and young adult circumstances, for the full sample and by gender. I report means and standard deviations and percent values where relevant and display significance tests for gender difference (either t-tests or chi-square tests as appropriate). Following, I explored what measures of youth and adulthood predict weight

¹³ Perhaps unsurprisingly, the transition to motherhood is a salient predictor of maintained weight gain for women as both pregnancy (e.g., Amorim et al., 2007) and parity (Weng et al., 2004) have been linked to increases in weight.

status transition categories. Here, I used multinomial logistic regression model building sequences comparing the persistently obese, those who became obese, and those who became a healthy weight to the never obese. Additionally, I ran models that interacted gender with all youth predictor variables and calculated predicted probabilities of being in each weight status category based on the models.

RESULTS

Table 4.1 displays the sample characteristics for the present study for the full sample and stratified by gender. Percentages are shown for categorical and binary measures, and for continuous measures, means with standard deviations are shown in parentheses. The bolded values on the table represent those that differ significantly between men and women.

The top portion of the table summarizes the percent of respondents who comprise each weight status transition category. Overall, the table shows that significantly different percentages of men and women comprise each weight status transition category. While 26.5% of women became obese, only 20.7% of men comprise this category. Similarly, a higher percentage of women (23.5%) as compared to men (19.9%) were persistently obese. Men comprised higher percentages in the categories that represent maintaining healthy weight or transitioning to a healthy weight. Here, 46.5% of men and only 40.3% of women were persistently non-obese and 12.9% of men and 9.7% of women became a healthy weight during the study period.

The second portion of Table 4.1 displays information about demographic characteristics of the sample. Results show that the sample is slightly skewed female with 51.7% of the respondents being female. Additionally, the sample is predominantly white comprising 63.4% of the full sample. The sample is also predominantly born in the US (74.2%). The next portion of the table summarizes the SES characteristics of the sample. The table shows that some measures

varied between men and women. First, while 5.3% of women had parents who received public assistance, a slightly higher 7.3% of men did. The table also shows that on average, women had parents who earned a higher income than did men. That said, 15.7% of the sample had parents with difficulty paying bills, and 47.9% of the sample had parents who completed some college or less – neither of which varied significantly by gender.

Looking to the next portion of the table we see other youth characteristics summarized. Here, all of the included measures were shown to differ significantly between men and women. While 31.7% of women reported bad health during youth, this was true for only 23% of men. An opposite gender pattern is shown for experiences with violence: 57.7% of men reported experiencing violence compared to only 34.0% of women. More men (28.5%) than women (23.0%) grew up in a single parent household. Despite this, depressive symptomology did not differ significantly between men and women with a sample mean of 12.9 on the index.

The final portion of the table shows characteristics from young adulthood. The results reveal that the mean number of years of schooling completed by the sample was 13.5 and that the majority of respondents (73.5%) were employed, with a slight but significant difference in employment between women (71.7%) and men (75.7%). Finally, Table 4.1 shows that the majority of the sample exercises weekly (65.6%).

Table 4.2 displays relative risk ratios and confidence intervals from multinomial regression models predicting weight status transition categories. The goal of this analysis was to explore preliminarily if a main effect of gender exists. Panel A compares those who became obese to those who were never obese. Here, in Model 1, which includes only controls for demographic characteristics, women experience a significantly higher risk of becoming obese than do men. This finding persists in Model 2, where measures of youth SES characteristics are

added in. However, by Model 3 and 4, where measures of other youth circumstances and young adulthood circumstances are incorporated, respectively, the main effect of gender is absent (reduced to non-significance).

In Panel B of Table 4.2, we see models that compare the persistently obese to the never obese. Here, in the base line model women experience increased risk of being persistently obese. This finding persists across all included models as SES characteristics, other youth circumstances, and young adulthood exposures are each added.

Finally, in Panel C, we see the models that compare those who became a healthy weight with those respondents who were never obese. These models show that while in Models 1, 2, and 3, women experience an increased risk of becoming a healthy weight, this effect is reduced to non-significance once adulthood exposures were accounted for in the final model.

Moving forward from this initial exploration, I build interacted models that individually interacted gender with each youth variable in the multinomial models discussed above to explore if gender moderates the relationship between youth circumstances and weight status transitions. However, no interaction was significant in the models. This lack of significant interaction indicates that gender does not moderate the relationship between youth circumstances and weight status transitions (despite the lack of significant interaction these models appear in tabular form in the appendix of this dissertation under the “Chapter 4 supplemental analysis” heading in Table A.19).

Following the interacted models, I calculated predicted probabilities of being in each weight status transition category using the margins commands in Stata 14.0. The goal of these predicted probabilities was to look within groups by gender and youth characteristics to observe any differences (as opposed to the between groups analysis seen in the interacted models). I

display the predicted probabilities that differed significantly between men and women in tabular format below. Calculated probabilities that did not differ significantly between men and women are also tabled and appear in the appendix of this dissertation. The 5 significant relationships are discussed below.

The first two predicted probabilities discussed in this chapter deal with measures of SES. Table 4.3 shows the predicted probabilities of being in each weight status transition category by gender and parent reported difficulty paying bills. The results presented here show that among those who had parents with difficulty paying bills, men have a significantly higher likelihood of being never obese than women. Additionally, these results show that among those with parents who reported no difficulty paying bills, women had a higher likelihood of being persistently obese than did men.

The next set of predicted probabilities that showed significant difference between men and women are displayed in Table 4.4. Here, we see the predicted probabilities of being in each weight status transition category by gender and parent education. The results show that among those whose parents were in the lower education category, men had a higher likelihood than women of being never obese. Additionally, the results show that regardless of parental education level, women had a higher likelihood than men of becoming a healthy weight.

Next, I display predicted probabilities involving other measures of youth disadvantage. Looking to Table 4.5, I present the predicted probabilities of being in each weight status category by gender and family structure. Here, significant gender difference is only seen among those who became a healthy weight. The results show that there is no significant difference by gender among those who lived in single parent families, however, among those who live in two parent families, women are significantly more likely than men to become a healthy weight. Table 4.6

presents another measure of youth disadvantage: low self-rated health. Here, among those who had low self-rated health, there is no difference by gender in the likelihood of being in any weight status transition category. However, among those who had high self-rated health in youth, gender difference is seen in the likelihood of being never obese, persistently obese, and becoming healthy. Specifically, the results show that among those who rated their health highly, women are more likely than men to become a healthy weight by young adulthood. Additionally, among those who rated their health highly in youth, men are more likely to be never obese and are more likely to be persistently obese than women.

Finally, Table 4.7 shows the predicted probabilities of being in each weight status transition category by gender and experience with violence. Here, the differentiating role of gender appears when considered in tandem with experiences of violence. Women are less likely than men to be never obese and women are more likely than men to become healthy only among those who did not experience violence.

DISCUSSION

The aim of this study was to explore whether and how gender conditions the link between early life circumstances and weight status transitions into young adulthood. Overall, the study found modest differences in descriptive analysis, main effects of gender in regression models, no evidence that the effect of youth circumstances on weight status transitions differs between men and women in the interaction models, but evidence generated from evaluating predicted probabilities did show that within group differences do exist between men and women.

This study began with descriptive analysis, which revealed that in general, a higher percentage of women than men became obese or were persistently obese. Corresponding with this, the results of this study also show that a higher percentage of men than women were

persistently a healthy weight or became a healthy weight by young adulthood. While the differences presented in this study are not dramatic, they do present a potential discrepancy in recent reports which indicate that there is no significant gender difference in overall obesity prevalence in the United States among adults, and support findings that suggest changes are taking place in the prevalence of obesity among men and women in younger cohorts (Ogden et al 2013).

In general, the descriptive analysis of this study also showed that men and women had many similarities in their backgrounds, but a higher percentage of men than women experienced violence and a higher percentage of women than men reported low self-rated health. This is consistent with prior work that demonstrates that in adolescence, girls are in poorer health than boys (e.g. Maclean et al 2012; Sweating 1995) and theories of masculinity, which suggest boys may be more exposed to violence than girls (Bourdieu 2005).

As summarized above, regression models found main effects of gender in this study. In the comparison for the persistently obese to the never obese, the results show that being female was the only measure that significantly increased the risk of being persistently obese. Again, this contradicts prior work which suggests that there are not significant differences in rates of obesity between men and women (Ogden 2013) and shows that taking a dynamic life course perspective and tracking changes in weight status may be the key to unlocking gender differences. That is, while prior literature shows no evidence of gender difference in prevalence of obesity among adults, this study shows that being female predicts chronic obesity from youth to young adulthood, suggesting that gender differences may only be apparent in longitudinal contexts.

The comparison of those who became a healthy weight to the never obese revealed that while being female increased the risk of becoming a healthy weight initially, after accounting for all

covariates, only having low self-rated health predicted increased risk of becoming a healthy weight as compared to being never obese. In other words, the models showed that women have a higher risk of suffering obesity in youth and then becoming healthy (as compared to never being obese) but this risk is overshadowed once features from adulthood like employment and education are accounted for. This finding seems to show some support for a resource substitution framework where education is a more meaningful shaper of health outcomes for women than men due largely to women's relative shortage of SES resources (Ross and Mirowsky 2010)

In the present study, no interactions between youth characteristics and gender were significant, indicating that gender did not moderate the relationship between youth circumstances and weight status transitions. Despite these null findings in terms of gender moderation, calculated predicted probabilities do reveal that there are differences in the likelihood of being in a given weight status transition category by gender and measures of youth. Specifically, the results of this study showed that among those who had parents with difficulty paying bills and low education, men had a higher likelihood of being never obese than women. Dovetailing with this, results showed that in the absence of SES disadvantage women still faced a higher likelihood of suffering obesity or becoming obese than did men. These findings present an extension of the prior literature. While other studies have found that youth economic hardship is predictive of obesity among women but not men (Khlat et al 2009; Heraclides, Witte and Brunner 2007) the present study demonstrates that women still face greater obesity risk even in the absence of SES disadvantage.

However, the findings from the predicted probabilities that consider gender and other (non-SES) measures of youth disadvantage present more nuanced findings. Here, among those who live in two parent families and among those who rated their health highly, only women (but

not men) were significantly more likely than men to become a healthy weight. Thus, while the descriptive findings of this study showed that in general men were more likely to become a healthy weight than women, these results show that in the absence of disadvantage, this pattern is reversed. Further, the results of this study show that among those who rated their health highly in youth, men were more likely to be persistently obese than women, representing yet another contradiction to the expected trend in the absence of disadvantage. These findings not only add an interesting wrinkle to the expected gender trend in the relationship between weight status and physical health, they also present an extension of the prior literature. Prior studies have found a link between worse self-rated health and increased BMI among children and adolescents (Herman et al 2014), while the present study finds a link between better self-rated health and becoming a healthy weight overtime, especially among women.

Like all projects, this study is not without limitations. First, this study explores obesity transitions as its sole outcome and does not look at overweight status or subcategories within obesity. Further, this study does not explore severe underweight as an outcome. While uncovering information about gender and the early life origin of obesity transitions is certainly important, there is a need for future studies to replicate this methodology with different weight status outcomes. Additionally, at the present time, the Add Health cohort has not been followed up with for a fifth wave and thus any additional changes to the respondents' weight status after late young adulthood cannot be measured with this data at this time. As additional waves of data do become available, scholars should continue to trace transitions in weight status with the Add Health cohort to further untangle how gender conditions the relationship between early life and obesity.

Ultimately, this study is meant to be applied to improve population health and to that end, I provide recommendations for future research. First, given that the results of this study did show that being female is predictive of increased risk of being in a weight status transition category that includes ever being obese, future studies should continue to explore weight status transitions longitudinally (especially since these findings differ from studies that utilize cross-sectional data). Specifically, studies would do well to trace weight status transitions between childhood and adulthood or young adulthood and older adulthood as a means to fully interrogate the role of gender. Next, while prior work has linked worse self-rated health to increased BMI (Herman et al 2014), this study finds that better self-rated health is connected to becoming a healthy weight overtime, especially among women. While this finding does not directly contradict prior work, it does indicate that those who rate their health more highly may still suffer obesity initially but may be able to overcome this and achieve a healthy weight. Future studies should explore the link between BMI and self-rated health in a longitudinal framework at different time points in the life course to more finely determine how self-rated physical health impacts the risk of ever suffering obesity and of transitioning to a healthy weight by gender. Finally, while other studies have found that youth economic hardship is predictive of obesity among women but not men (Khlat et al 2009), the present study demonstrates that women still face greater obesity risk even in the absence of SES disadvantage. In light of this, it is important for researchers and practitioners aiming to understand obesity risk see all women as at risk for adverse weight status outcomes and to not simply see only the most disadvantaged women as carrying high risk. Taken together, by using a longitudinal approach and a dynamic life course framework that considers the role of gender and disadvantage in tandem overtime, population health scholars can make great strides in understanding weight status outcomes.

Table 4.1 Sample Characteristics, Percent Values or Means and Standard Deviations			
	Full Sample (n=5,002)	Women (n=2,586)	Men (n=2,416)
Outcomes (W1&W4)			
Became Obese	23.6%	26.5%	20.7%
Persistently Obese	21.7%	23.5%	19.9%
Persistently Healthy Weight	43.4%	40.3%	46.5%
Became Healthy Weight	11.3%	9.7%	12.9%
Demographic Characteristics (W1)			
Female	51.7%	---	---
Racial Identity			
Non-Hispanic White	63.4%	63.2%	63.7%
Non-Hispanic Black	19.3%	20.0%	18.5%
Other Race	17.3%	16.8%	17.8%
US Born	74.2%	75.0%	73.2%
SES Characteristics (W1)			
Public Assistance Receipt	6.2%	5.3%	7.3%
Some College or Less	47.9%	47.8%	48.0%
Household Income	\$52,083 (55,270)	\$55,348 (60,929)	\$48,137 (48,633)
Difficulty Paying Bills	15.9%	16.4%	15.3%
Other Youth Characteristics			
Low SRH	27.7%	31.7%	23.0%
Experienced Violence	44.7%	34.0%	57.7%
Depressive Symptomology	12.9 (6.3)	13.1 (6.6)	12.7 (5.9)
Single Parent Household	25.5%	23.0%	28.5%
Young Adulthood Exposures (W3)			
Number of School Years Completed	13.5 (1.9)	13.8 (1.9)	13.2 (1.9)
Currently Employed	73.5%	71.7%	75.7%
Exercises Weekly	65.6%	64.3%	66.4%
NOTE: Bolded values are those that differ significantly between men and women			

Table 4.2 Comparison With the Never Obese Multinomial Regression

Panel A: Became Obese Compared to the Never Obese

	Model 1		Model 2		Model 3		Model 4	
	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
Demographic Characteristics								
Female	1.47***	(1.20-1.80)	1.37**	(1.08-1.73)	0.99	(0.75-1.30)	0.99	(0.70-1.40)
<i>Racial Identity</i>								
Non-Hispanic Black	1.69***	(1.35-2.12)	1.79***	(1.37-2.34)	1.86***	(1.34-2.57)	1.57*	(1.04-2.37)
Other	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)
US Born	1.01	(0.81-1.28)	0.95	(0.73-1.23)	0.89	(0.65-1.20)	0.86	(0.59-1.25)
SES Characteristics (W1)								
Public Assistance Receipt			1.06	(0.68-1.64)	1.08	(0.64-1.82)	0.98	(0.51-1.89)
Some College or Less			1.08	(0.84-1.38)	0.98	(0.74-1.30)	1.15	(0.80-1.66)
Household Income			0.99**	(0.99-1.00)	0.99**	(0.99-1.00)	0.99**	(0.98-1.00)
Difficulty Paying Bills			1.04	(0.77-1.42)	1.06	(0.74-1.52)	1.13	(0.72-1.77)
Other Youth Characteristics (W1)								
Low SRH					4.26***	(3.19-5.69)	4.60***	(3.19-6.65)
Experienced Violence					0.96	(0.72-1.26)	0.96	(0.68-1.35)
Depressive Symptomology					0.99	(0.97-1.01)	0.98	(0.96-1.01)
Single Parent Household					0.83	(0.60-1.16)	0.82	(0.54-1.25)
Young Adulthood Exposures (W3)								
Number of School Years Completed							1.01	(0.92-1.10)
Currently Employed							0.63*	(0.43-0.92)
Exercises Weekly							1.00	(0.99-1.00)

NOTE: * p< .05, ** p< .01, *** p <.001

Panel B: Persistently Obese Compared to the Never Obese

	Model 1		Model 2		Model 3		Model 4	
	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
Demographic Characteristics								
Female	1.72***	(1.48-1.99)	1.76***	(1.48-2.10)	1.80***	(1.47-2.20)	1.68***	(1.30-2.16)
<i>Racial Identity</i>								
Non-Hispanic Black	0.87	(0.72-1.04)	0.93	(0.74-1.16)	0.81	(0.62-1.05)	0.67*	(0.48-0.94)
Other	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)
US Born	1.04	(0.88-1.24)	0.99	(0.81-1.21)	1.02	(0.82-1.28)	0.96	(0.73-1.26)
SES Characteristics (W1)								
Public Assistance Receipt			1.17	(0.82-1.67)	1.20	(0.78-1.85)	1.20	(0.70-2.05)
Some College or Less			0.86	(0.71-1.02)	0.84	(0.69-1.03)	0.92	(0.71-1.19)
Household Income			1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)
Difficulty Paying Bills			1.16	(0.91-1.47)	1.27	(0.95-1.68)	1.33	(0.93-1.90)
Other Youth Characteristics (W1)								
Low SRH					1.03	(0.81-1.31)	1.10	(0.82-1.50)
Experienced Violence					0.74**	(0.60-0.91)	0.76*	(0.59-0.98)
Depressive Symptomology					0.99	(0.98-1.01)	0.98	(0.97-1.00)
Single Parent Household					1.00	(0.78-1.29)	1.11	(0.82-1.52)
Young Adulthood Exposures (W3)								
Number of School Years Completed							1.01	(0.94-1.08)
Currently Employed							0.66**	(0.50-0.87)
Exercises Weekly							1.00	(0.99-1.00)
NOTE: * p< .05, ** p< .01, *** p <.001								

Panel C: Became Healthy Weight Compared to the Never Obese								
	Model 1		Model 2		Model 3		Model 4	
	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
Demographic Characteristics								
Female	1.31***	(1.12-1.53)	1.32**	(1.11-1.58)	1.23*	(1.00-1.51)	1.14	(0.88-1.47)
<i>Racial Identity</i>								
Non-Hispanic Black	1.16	(0.97-1.40)	1.16	(0.93-1.45)	1.09	(0.84-1.42)	1.07	(0.78-1.47)
Other	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)
US Born	1.09	(0.92-1.31)	1.04	(0.85-1.28)	1.07	(0.85-1.35)	1.13	(0.85-1.51)
SES Characteristics (W1)								
Public Assistance Receipt			1.08	(0.76-1.55)	0.90	(0.59-1.39)	0.74	(0.43-1.26)
Some College or Less			0.94	(0.78-1.14)	0.96	(0.78-1.18)	1.03	(0.79-1.34)
Household Income			1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)
Difficulty Paying Bills			1.02	(0.80-1.29)	1.07	(0.81-1.41)	0.99	(0.71-1.40)
Other Youth Characteristics (W1)								
Low SRH					1.42**	(1.12-1.80)	1.59**	(1.18-2.14)
Experienced Violence					1.05	(0.85-1.29)	1.12	(0.86-1.45)
Depressive Symptomology					0.99	(0.98-1.01)	0.99	(0.97-1.01)
Single Parent Household					1.22	(0.95-1.55)	1.30	(0.96-1.77)
Young Adulthood Exposures (W3)								
Number of School Years Completed							0.96	(0.89-1.03)
Currently Employed							0.99	(0.74-1.33)
Exercises Weekly							1.00	(0.99-1.00)
NOTE: * p< .05, ** p< .01, *** p<.001								

Table 4.3 Predicted Probability of Weight Status Category by Gender and Parent Reported Difficulty Paying Bills

		Predicted Probability	95% CI
<i>Never Obese</i>			
<i>Gender</i>			
Women	Difficulty	0.22	(0.19-0.24)
Men	Difficulty	0.28	(0.25-0.31)
Women	No Difficulty	0.25	(0.18-0.31)
Men	No Difficulty	0.31	(0.24-0.38)
<i>Persistently Obese</i>			
<i>Gender</i>			
Women	Difficulty	0.40	(0.37-0.43)
Men	Difficulty	0.30	(0.27-0.32)
Women	No Difficulty	0.35	(0.28-0.42)
Men	No Difficulty	0.23	(0.16-0.29)
<i>Became Healthy</i>			
<i>Gender</i>			
Women	Difficulty	0.11	(0.09-0.12)
Men	Difficulty	0.13	(0.11-0.15)
Women	No Difficulty	0.09	(0.06-0.13)
Men	No Difficulty	0.14	(0.09-0.19)
<i>Became Obese</i>			
<i>Gender</i>			
Women	Difficulty	0.28	(0.25-0.31)
Men	Difficulty	0.30	(0.27-0.33)
Women	No Difficulty	0.31	(0.24-0.38)
Men	No Difficulty	0.32	(0.25-0.40)
Note: Bolded probabilities are those that differ significantly between men and women within weight status transition category.			

Table 4.4 Predicted Probability of Weight Status Category by Gender and Parent Education

		Predicted Probability	95% CI
<i>Never Obese</i>			
<i>Gender</i>			
Women	Parent Some College or Less	0.23	(0.19-0.26)
Men	Parent Some College or Less	0.30	(0.27-0.34)
Women	Parent College or More	0.22	(0.19-0.25)
Men	Parent College or More	0.26	(0.23-0.30)
<i>Persistently Obese</i>			
<i>Gender</i>			
Women	Parent Some College or Less	0.11	(0.09-0.13)
Men	Parent Some College or Less	0.13	(0.10-0.16)
Women	Parent College or More	0.09	(0.07-0.12)
Men	Parent College or More	0.13	(0.10-0.16)
<i>Became Healthy</i>			
<i>Gender</i>			
Women	Parent Some College or Less	0.37	(0.33-0.41)
Men	Parent Some College or Less	0.28	(0.24-0.32)
Women	Parent College or More	0.41	(0.37-0.45)
Men	Parent College or More	0.29	(0.26-0.33)
<i>Became Obese</i>			
<i>Gender</i>			
Women	Parent Some College or Less	0.29	(0.25-0.33)
Men	Parent Some College or Less	0.29	(0.25-0.33)
Women	Parent College or More	0.28	(0.24-0.32)
Men	Parent College or More	0.31	(0.27-0.35)
Note: Bolded probabilities are those that differ significantly between men and women within weight status transition category.			

Table 4.5 Predicted Probability of Weight Status Category by Gender and Growing up in a Single Parent Family

		Predicted Probability	95% CI
<i>Never Obese</i>			
<i>Gender</i>			
Women	Single Parent Family	0.22	(0.17-0.27)
Men	Single Parent Family	0.27	(0.22-0.32)
Women	Two Parent Family	0.22	(0.20-0.25)
Men	Two Parent Family	0.28	(0.25-0.31)
<i>Persistently Obese</i>			
<i>Gender</i>			
Women	Single Parent Family	0.08	(0.05-0.10)
Men	Single Parent Family	0.11	(0.08-0.15)
Women	Two Parent Family	0.12	(0.09-0.14)
Men	Two Parent Family	0.14	(0.11-0.16)
<i>Became Healthy</i>			
<i>Gender</i>			
Women	Single Parent Family	0.36	(0.30-0.42)
Men	Single Parent Family	0.31	(0.26-0.37)
Women	Two Parent Family	0.40	(0.37-0.43)
Men	Two Parent Family	0.28	(0.25-0.31)
<i>Became Obese</i>			
<i>Gender</i>			
Women	Single Parent Family	0.35	(0.29-0.40)
Men	Single Parent Family	0.30	(0.25-0.36)
Women	Two Parent Family	0.26	(0.23-0.29)
Men	Two Parent Family	0.30	(0.27-0.33)
Note: Bolded probabilities are those that differ significantly between men and women within weight status transition category.			

Table 4.6 Predicted Probability of Weight Status Category by Gender and Self Rated Health

		Predicted Probability	95% CI
<i>Never Obese</i>			
<i>Gender</i>			
Women	Low SRH	0.19	(0.15-0.23)
Men	Low SRH	0.19	(0.15-0.24)
Women	High SRH	0.24	(0.21-0.27)
Men	High SRH	0.32	(0.28-0.35)
<i>Persistently Obese</i>			
<i>Gender</i>			
Women	Low SRH	0.21	(0.16-0.25)
Men	Low SRH	0.23	(0.18-0.28)
Women	High SRH	0.06	(0.04-0.07)
Men	High SRH	0.09	(0.08-0.11)
<i>Became Healthy</i>			
<i>Gender</i>			
Women	Low SRH	0.31	(0.26-0.36)
Men	Low SRH	0.25	(0.20-0.31)
Women	High SRH	0.42	(0.39-0.46)
Men	High SRH	0.30	(0.27-0.33)
<i>Became Obese</i>			
<i>Gender</i>			
Women	Low SRH	0.30	(0.25-0.34)
Men	Low SRH	0.32	(0.27-0.38)
Women	High SRH	0.28	(0.25-0.31)
Men	High SRH	0.30	(0.26-0.33)
Note: Bolded probabilities are those that differ significantly between men and women within weight status transition category.			

Table 4.7 Predicted Probability of Weight Status Category by Gender and Experience with Violence

		Predicted Probability	95% CI
<i>Never Obese</i>			
<i>Gender</i>			
Women	Experience Violence	0.26	(0.22-0.31)
Men	Experienced Violence	0.29	(0.25-0.32)
Women	Did Not Experience Violence	0.20	(0.17-0.23)
Men	Did Not Experience Violence	0.28	(0.24-0.33)
<i>Persistently Obese</i>			
<i>Gender</i>			
Women	Experience Violence	0.11	(0.08-0.13)
Men	Experienced Violence	0.13	(0.10-0.15)
Women	Did Not Experience Violence	0.10	(0.08-0.12)
Men	Did Not Experience Violence	0.13	(0.10-0.17)
<i>Became Healthy</i>			
<i>Gender</i>			
Women	Experience Violence	0.31	(0.27-0.36)
Men	Experienced Violence	0.27	(0.24-0.31)
Women	Did Not Experience Violence	0.44	(0.41-0.47)
Men	Did Not Experience Violence	0.28	(0.24-0.32)
<i>Became Obese</i>			
<i>Gender</i>			
Women	Experience Violence	0.32	(0.27-0.36)
Men	Experienced Violence	0.32	(0.28-0.35)
Women	Did Not Experience Violence	0.26	(0.23-0.29)
Men	Did Not Experience Violence	0.30	(0.25-0.34)
Note: Bolded probabilities are those that differ significantly between men and women within weight status transition category.			

Discussion and Conclusions

While the general trend tends towards women enjoying longer lifespans than men, women also face the burden of a higher incidence of chronic disease (Rieker and Bird 2005). One set of contributing factors to this gender-health paradox are the health behaviors that men and women perform across their life course that may reduce or elevate their risk of poor health with aging. For example, women perform more salubrious health behaviors than men in terms of a reduced likelihood to smoke cigarettes (Barbeau, Krieger, and Soobader 2004; Wallace et al. 2003), lower alcohol intake (Johnson et al. 1998; York, Welte, and Hirsch 2003), and decreased likelihood of being overweight (Galuska et al. 1996; Verbrugge 1989). However, in terms of physical activity, men outperform women as they more often participate in exercise (Ross and Bird 1994; Trost et al. 2002). This variation in health behavior participation by gender sets men and women up differentially for subsequent health risks.

Prior studies have noted that the way boys and girls are socialized can produce differential outcomes even when their life circumstances do not differ substantially (Ridgeway 2001; Bordeui 2001). Similarly, stress process studies have noted that men and women have differential exposure and vulnerability to and coping strategies for stress – which leads to differences in participation in health behaviors (Denton, Prus, and Walters 2004; McDonough and Walters 2001; Turner 2003; Turner and Avison 2003). Fundamental cause studies have shown that even over and above gender differences in health and health behaviors, SES disadvantage is a critical shaper of health outcomes and behaviors (Link and Phelan 1995). Developing alongside these theories, life course studies that focuses on gender differences in health and health disparities more broadly seek to explain how a host of early life circumstances are related to a range of later life health conditions (e.g. Hayward and Gorman 2004; Haas 2008; Montez and Hayward 2014). While prior research has taken each of these approaches to studying

health disparities and behaviors, this dissertation drew on all four frameworks in tandem to guide the integration of two larger streams of empirical research – gender differences in adult health behaviors and early life origins of adult health. Specifically, this dissertation explored how gender conditions the relationship between early life disadvantage and health behaviors across the early life course. In summary, the findings of the current project suggest that gender does play a role in conditioning the relationship between early life circumstances and health behaviors but that the relationships vary over time and differ based on which health behavior is considered.

Chapter 2, which explored the impact gender has on the relationship between early life circumstances and smoker status, found support that gender moderates the relationship between selected early life circumstances and subsequent smoking behaviors. Specifically, the chapter found that gender moderates the relationship between low self-rated health, peer smoking, and availability of cigarettes in the home during early life and subsequent smoker status. In the case of self-rated health, gender conditioned the relationship such that women who experienced low SRH in early life experienced lower risk of never having smoked than their male counterparts with comparable youth health status. Perhaps this finding is an outcome of standards of masculinity placed on boys: boys are only reporting poor health in situations where they are experiencing severely low health (Read and Gorman 2011; Gorman and Read 2006; Read and Gorman 2006; Courtenay 2000). Dovetailing with this, prior literature has shown that boys in poor health are more likely to engage in health behaviors such as athletics as a way to compensate for their poor health and to socially establish themselves as masculine and socially distance themselves from the feminine label of “sickly” (Williams 2000). Perhaps this finding in terms of smoking abstention is an extension of that phenomenon: boys in poor health are more

likely to abstain from cigarette smoking as a way to increase their health status and socially distance themselves from the feminine label of sickly.

In the cases of both peer smoking and access to cigarettes, the study found that women who were exposed to smoking had lower risk of being current smokers than their male peers who experience comparable exposures. Put another way, this study shows that the expected gender patterns in smoker status can be altered when considered alongside peer influence: influence of peer smoking behavior appears to close the expected gap between men's and women's likelihood of smoking. As suggested in the introduction of this chapter, findings such as these map on to theories of masculinity and health behaviors which suggest that males of all ages are more likely than females to engage in behaviors that increase the risk of disease and injury, and that it is the doing of masculinity that sets men up for health risks (Courtenay 2000). In other words, males may be more likely to smoke because participating in these adverse health behaviors are seen as normative and masculine – and the normative-ness of smoking behavior for boys is further solidified when they see peers smoking. Although girls may have peers who smoke, because smoking does not conform to normative ideas of femininity, this may explain their lower likelihood to initiate the behavior. So, while boys and girls experience similar mechanics of socialization (having peers who smoke), they are socialized differently and thus perform gender in different ways, which impacts their behaviors (Bourdieu 2001). In other words, while the experiences of boys and girls might not differ substantially, the meanings of these experiences and the attached consequences might differ.

Chapter 3, which explored gender difference in the early life origins of heavy episodic drinking at several time points in young adulthood, ultimately found that evidence of gender moderation is limited to early young adulthood. During this early stage of young adulthood,

gender moderates the relationship between availability of alcohol in the home and heavy episodic drinking. However, results revealed that the impacts of gender on the relationship between youth disadvantage and heavy episodic drinking may attenuate over time.

In addition to the evidence of gender moderation discussed above, the results showed evidence that in the presence of disadvantage, boys and girls participate in heavy episodic drinking at comparable rates. However, in the absence of disadvantage, boys participate in heavy episodic drinking at higher rates than do girls. One way of interpreting these findings is to conclude that because women's drinking behaviors are impacted the most by disadvantage (they transition from healthier than men when advantage but indistinguishable from men in the face of disadvantage), these findings corroborate prior work, which has concluded that girls suffer worse impacts from youth disadvantage than do boys (e.g. Khlat et al 2009; Hamik-Luker and O'Rand 2007). Alternatively, these findings could be interpreted as higher SES corresponding with healthier drinking behaviors among women but not men – an interpretation which maps onto theories of masculinity that suggest men are more likely to assume health risks irrespective of SES (Courtenay 2000). Whether because of differences in vulnerability to hardship or gender norms in risk behaviors, this finding presents a call to arms for future early life origins studies: given that disadvantage impacts both boys and girls, focusing only on gender differences in how early life disadvantage shapes health behaviors may unduly mask the injurious role of early life hardship, and the gender dynamics of these relationships.

The last empirical chapter of this dissertation, Chapter 4, explored gender differences in the early life origins of obesity transitions across the early life course. Results from this chapter revealed no evidence of gender moderating the relationship between early life circumstances and weight status transitions. That said, the result of this chapter did provide some evidence of

gender difference in weight status transitions within groups who experienced particular early life disadvantages and thus serves as a spring board for future research to more fully explicate the relationship between gender and weight status transitions. For example, the results of this study showed that among those who had parents with difficulty paying bills and low education, men had a higher likelihood of being never obese than women. Dovetailing with this, results showed that in the absence of SES disadvantage women still faced a higher likelihood of suffering obesity or becoming obese than did men. These findings present an extension of the prior literature. While other studies have found that youth economic hardship is predictive of obesity among women but not men (Khlat et al 2009; Heraclides, Witte and Brunner 2007) the present study demonstrates that women still face greater obesity risk even in the absence of SES disadvantage.

Implications for Future Research and Health Interventions

The results of these empirical chapters are rife with recommendations for interventions and future research. While prior literature had concluded that the patterns of likelihood to smoke by gender are well established (CDC 2016; Mermelstein et al. 1999; Piko et al. 2007; Waldron 1991), this study found that the intersection of gender and early life circumstances can complicate these patterns. Thus, in light of these results future interventions designed prevent smoking or encourage cessation must be tailored not only to gender but also take into account the role that gender and early life circumstances combined play. Given the findings that gender moderates the relationships between youth circumstances (namely health status, youth peer smoking exposure, and youth access to cigarettes) and adult smoker status, interventions targeted at youths should consider that these factors have different impacts on boys and girls. Additionally, this study demonstrated the differential impact by gender that family public

assistance receipt can have on adult smoking outcomes, with women having a lower probability of being a current smoker than men among those who received public assistance and women having a lower probability of never smoking than men among those who did not receive public assistance. In both the case of economic disadvantage and peer influence, this dissertation showed that gender in tandem with other features of early life are linked to smoking outcomes that can be surprising. Taken together, the results of this dissertation demand that interventions look to address the dynamic life contexts of youths and tailor interventions to specifically target those with identified risk factors while also taking care to understand the impact of having more than one risk factor.

In light of the findings that the impacts of gender on the relationship between early disadvantage and heavy episodic drinking may attenuate over time, interventions meant to address problematic drinking would do well to tailor their approach based on time point in the life course of target participants, (a consideration may be particularly important for boys). That said, overtime, this type of gender-tailored approach may no longer be necessary. Additionally, given that all those who face disadvantage are at risk for heavy episodic drinking but among those who are free from disadvantage men fare worse in terms of drinking outcomes, future studies should be careful in making assumptions about gender alone being a marker of difference in problematic drinking behaviors. In other words, future studies and interventions should consider the dynamic interactions between structures across the life course including status characteristics like gender and economic status.

In terms of next steps on weight status focused interventions, given that the results of this study did not show evidence that gender moderates the relationship between early life and weight status transitions, there may be little need to tailor interventions separately for men and women.

That being said, given the evidence from this study there are gender differences in the likelihood of being in a given weight status transition category, additional research is needed to fully understand the role gender plays over time. Specifically, studies would do well to trace weight status transitions between childhood and adulthood or young adulthood and older adulthood as a means to fully interrogate the role of gender.

Overall, this dissertation is meant not only to extend prior empirical findings but also to be a starting point for projects that meld together theories from distinct corners of the sociological knowledge base. As discussed in each empirical chapter, evidence of gender moderating the relationship between various features of early life and subsequent health behaviors is mixed and depends on the behavior explored. That said, in each chapter themes such as the potential role of differential vulnerability to disadvantage by gender, differential gender socialization linked to health behaviors, and differential access to resources emerged as explanatory mechanisms. These recurrent themes show that while gender may not change the strength or direction of the relationship between early life and health behaviors in all cases, features of individuals lives that are inextricably linked to gender do influence health behaviors across the life course. Taken together, this work demonstrates that expected trends by gender in health behaviors can differ based on SES, timing in the life course, outcome considered, and circumstances from youth. Ultimately, this represents solid evidence that studies exploring gender difference must take a dynamic life course approach incorporating not only measures from across time points but also measures from across spheres of social life.

APPENDIX

Table A.1 Table of Percent Missing Values

Variable	Percent Missing	Number Missing
<i>Weight Status Variables</i>		
Youth BMI	2.9%	141
Adulthood BMI	0.3%	13
Exercises Weekly	16.1%	786
<i>Smoking Variables</i>		
Smoker Category	6.5%	408
Household Smoker	13.0%	811
Cigarettes Available	13.0%	811
Friends or Siblings who Smoke	0.2%	12
Learned About Smoking	0.2%	12
<i>Heavy episodic Drinking Variables</i>		
Heavy episodic Drinking Measure	0.02%	1
Parents Heavy episodic Drink	6.5%	408
Alcohol Available	13.1%	814
Friends or Siblings who Drink	0.1%	6
Learned About Alcohol in School	0.2%	12
Demographic Characteristics		
Female	0.02%	1
Racial Identity	5.0%	325
US Born	8.0%	380
SES Characteristics		
Public Assistance Receipt	13.7%	891
Some College or Less	13.7%	891
Household Income	26.1%	1603
Difficulty Paying Bills	13.7%	891
SES Characteristics		
Public Assistance Receipt	0.0%	0
Some College or Less	0.0%	0
Household Income	12.68%	712
Difficulty Paying Bills	0.0%	0
Other Youth Characteristics		
Poor, Fair, or Good SRH	0.09%	5
Experienced Violence	0.18%	10
Depressive Symptomology	21.6%	1,213
Single Parent Household	0.2%	11
Young Adulthood Exposures		
Number of School Years Completed	13.1%	775
Employed	1.2%	65

Table A.1.1 Respondent Ages by Wave

Wave	Years Collected	Respondent Age Ranges
1	1994-1995	10-20
2	1996	11-21
3	2001-2002	18-26
4	2008	24-32

Chapter 2 Supplemental Analysis and Tables

Table A.2 Comparison with Never Smokers Multinomial Regression

Smokers Compared to Never Smokers

	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
	Model 1		Model 2		Model 3		Model 4		Model 5	
Demographic Characteristics										
Female	0.81***	(0.72-0.91)	0.77***	(0.67-0.87)	0.79**	(0.68-0.92)	0.75**	(0.63-0.91)	0.82	(0.65-1.02)
<i>Racial Identity (Ref: Non-Hispanic White)</i>										
Non-Hispanic Black	0.39***	(0.34-0.45)	0.42***	(0.35-0.49)	0.40***	(0.32-0.48)	0.46***	(0.36-0.60)	0.37***	(0.27-0.50)
Other	0.47***	(0.39-0.56)	0.45***	(0.36-0.57)	0.45***	(0.34-0.59)	0.53***	(0.38-0.74)	0.51***	(0.34-0.75)
US Born	1.35***	(1.19-1.54)	1.22**	(1.05-1.42)	1.20*	(1.01-1.42)	1.18	(0.96-1.45)	0.92	(0.72-1.18)
SES Characteristics (Under age 18)										
Public Assistance Receipt			0.90	(0.70-1.15)	0.91	(0.67-1.22)	0.80	(0.56-1.15)	0.78	(0.50-1.21)
Some College or Less			1.14	(0.99-1.31)	1.13	(0.97-1.32)	1.04	(0.86-1.26)	0.98	(0.78-1.23)
Household Income			1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)
Difficulty Paying Bills			1.04	(0.87-1.24)	1.04	(0.85-1.28)	1.04	(0.81-1.34)	1.08	(0.80-1.46)
Other Youth Disadvantages (Under age 18)										
Fair, Poor, or Good SRH					1.37***	(1.16-1.61)	1.40**	(1.14-1.72)	1.38**	(1.08-1.76)
Experienced Violence					1.41***	(1.21-1.65)	1.25*	(1.03-1.51)	1.27*	(1.01-1.59)
Depression Index					1.01*	(1.00-1.03)	1.01	(0.99-1.02)	1.01	(0.99-1.03)
Single Parent Household							0.98	(0.79-1.22)	1.14	(0.88-1.49)
Smoking Exposures (Under age 18)										
Household Smoker							1.23	(0.99-1.52)	1.11	(0.86-1.44)
Cigarettes Available							1.30*	(1.03-1.64)	1.34*	(1.02-1.76)
Friends or Siblings who Smoke							4.45***	(3.59-5.50)	6.57***	(4.93-8.74)
Learned About Smoking							1.14	(0.77-1.67)	1.05	(0.65-1.69)
YA Circumstances (Age 19-24)										
Years of Education									0.82***	(0.77-0.87)
Employed									0.93	(0.73-1.18)

Table A.2 Comparison with Never Smokers Multinomial Regress Continued
Quitters Compared to Never Smokers

	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
	Model 1		Model 2		Model 3		Model 4		Model 5	
Demographic Characteristics										
Female	0.92	(0.80-1.06)	0.94	(0.79-1.10)	1.02	(0.84-1.23)	1.00	(0.80-1.25)	0.96	(0.74-1.25)
<i>Racial Identity (Ref: Non-Hispanic White)</i>										
Non-Hispanic Black	0.45***	(0.38-0.55)	0.47***	(0.38-0.59)	0.51***	(0.39-0.65)	0.63**	(0.46-0.86)	0.56**	(0.39-0.80)
Other	0.75*	(0.60-0.94)	0.86	(0.66-1.12)	0.78	(0.56-1.07)	0.86	(0.59-1.26)	1.04	(0.68-1.61)
US Born	1.02	(0.86-1.19)	0.98	(0.82-1.19)	0.99	(0.80-1.22)	1.15	(0.90-1.48)	1.06	(0.80-1.42)
SES Characteristics										
<i>(Under age 18)</i>										
Public Assistance Receipt			1.01	(0.73-1.41)	0.94	(0.63-1.41)	0.83	(0.51-1.34)	0.76	(0.42-1.39)
Some College or Less			0.79**	(0.66-0.94)	0.86	(0.71-1.05)	0.86	(0.68-1.08)	0.93	(0.71-1.22)
Household Income			1.00**	(1.00-1.00)	1.00**	(1.00-1.00)	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)
Difficulty Paying Bills			1.37*	(1.08-1.75)	1.29	(0.98-1.70)	1.15	(0.83-1.59)	1.16	(0.79-1.69)
Other Youth Disadvantages										
<i>(Under age 18)</i>										
Fair, Poor, or Good SRH					0.99	(0.80-1.23)	1.11	(0.86-1.44)	1.14	(0.85-1.54)
Experienced Violence					1.24*	(1.02-1.51)	1.24	(0.98-1.56)	1.27	(0.97-1.65)
Depression Index					0.99	(0.98-1.01)	0.99	(0.97-1.01)	1.00	(0.98-1.03)
Single Parent Household							0.73*	(0.55-0.97)	0.86	(0.62-1.19)
Smoking Exposures										
<i>(Under age 18)</i>										
Household Smoker							0.87	(0.67-1.14)	0.83	(0.60-1.14)
Cigarettes Available							1.01	(0.75-1.36)	1.15	(0.82-1.62)
Had Friends or Siblings who Smoke							3.95***	(3.05-5.13)	5.40***	(3.85-7.57)
Learned About Smoking							0.83	(0.54-1.29)	0.83	(0.48-1.42)
YA Circumstances										
<i>(Age 19-24)</i>										
Years of Education									1.04	(0.97-1.12)
Employed									1.39*	(1.03-1.86)

Table A.3 Predicted Probability Estimates of Smoker Status by Gender and Racial Identity

Predicted Probability of Smoker Status						
	White		Black		Other Race	
Never Smoked						
Gender						
Female	0.41	(0.38-0.44)	0.26	(0.20-0.33)	0.24	(0.15-0.33)
Male	0.45	(0.41-0.48)	0.27	(0.20-0.33)	0.32	(0.23-0.40)
Quitters						
Gender						
Female	0.19	(0.16-0.22)	0.15	(0.10-0.21)	0.27	(0.17-0.37)
Male	0.18	(0.16-0.21)	0.18	(0.12-0.24)	0.23	(0.14-0.31)
Current Smoker						
Gender						
Female	0.40	(0.36-0.43)	0.58	(0.51-0.65)	0.49	(0.38-0.59)
Male	0.37	(0.34-0.40)	0.56	(0.49-0.63)	0.46	(0.36-0.55)

Table A.4 Predicted Probabilities of Smoker Status by Gender and Difficulty Paying Bills

<i>Smokers</i>		Predicted Probability	95% CI
<i>Gender</i>			
Women	Difficulty	0.37	(0.34-0.40)
Men	Difficulty	0.40	(0.37-0.43)
Women	No Difficulty	0.34	(0.27-0.41)
Men	No Difficulty	0.42	(0.34-0.49)
<i>Quitters</i>			
<i>Gender</i>			
Women	Difficulty	0.20	(0.17-0.22)
Men	Difficulty	0.19	(0.16-0.21)
Women	No Difficulty	0.18	(0.12-0.24)
Men	No Difficulty	0.18	(0.11-0.24)
<i>Never Smoked</i>			
<i>Gender</i>			
Women	Difficulty	0.44	(0.41-0.47)
Men	Difficulty	0.41	(0.38-0.44)
Women	No Difficulty	0.48	(0.41-0.55)
Men	No Difficulty	0.41	(0.34-0.48)

Table A.5 Predicted Probabilities of Smoker Status by Gender and Parental Education

<i>Smokers</i>		Predicted Probability	95% CI
<i>Gender</i>			
Women	Some College or Less	0.37	(0.33-0.41)
Men	Some College or Less	0.41	(0.37-0.45)
Women	College Graduate or More	0.36	(0.32-0.39)
Men	College Graduate or More	0.39	(0.35-0.43)
<i>Quitters</i>			
<i>Gender</i>			
Women	Some College or Less	0.19	(0.16-0.22)
Men	Some College or Less	0.19	(0.16-0.23)
Women	College Graduate or More	0.20	(0.16-0.23)
Men	College Graduate or More	0.17	(0.14-0.21)
<i>Never Smoked</i>			
<i>Gender</i>			
Women	Some College or Less	0.44	(0.40-0.47)
Men	Some College or Less	0.41	(0.38-0.45)
Women	College Graduate or More	0.45	(0.41-0.49)
Men	College Graduate or More	0.42	(0.37-0.46)

Table A.6 Predicted Probabilities of Smoker Status by Gender and Self Rated Health

<i>Smokers</i>		Predicted Probability	95% CI
<i>Gender</i>			
Women	Low SRH	0.38	(0.33-0.43)
Men	Low SRH	0.47	(0.41-0.53)
Women	High SRH	0.36	(0.33-0.39)
Men	High SRH	0.38	(0.34-0.41)
<i>Quitters</i>			
<i>Gender</i>			
Women	Low SRH	0.21	(0.17-0.26)
Men	Low SRH	0.15	(0.11-0.20)
Women	High SRH	0.19	(0.16-0.21)
Men	High SRH	0.20	(0.17-0.22)
<i>Never Smoked</i>			
<i>Gender</i>			
Women	Low SRH	0.41	(0.36-0.46)
Men	Low SRH	0.38	(0.32-0.43)
Women	High SRH	0.46	(0.42-0.49)
Men	High SRH	0.43	(0.40-0.46)

Table A.7 Predicted Probabilities of Smoker Status by Gender and Availability of Cigarettes in Youth

<i>Smokers</i>		Predicted Probability	95% CI
<i>Gender</i>			
Women	Available	0.41	(0.35-0.46)
Men	Available	0.43	(0.37-0.49)
Women	Unavailable	0.35	(0.31-0.38)
Men	Unavailable	0.39	(0.36-0.42)
<i>Quitters</i>			
<i>Gender</i>			
Women	Available	0.23	(0.18-0.28)
Men	Available	0.14	(0.10-0.19)
Women	Unavailable	0.18	(0.15-0.21)
Men	Unavailable	0.20	(0.17-0.23)
<i>Never Smoked</i>			
<i>Gender</i>			
Women	Available	0.37	(0.31-0.42)
Men	Available	0.43	(0.37-0.49)
Women	Unavailable	0.47	(0.44-0.51)
Men	Unavailable	0.41	(0.38-0.44)

Table A.8 Predicted Probabilities of Smoker Status by Gender and Growing Up with a Smoker in the Household

<i>Smokers</i>		Predicted Probability	95% CI
<i>Gender</i>			
Women	Smoker Present	0.38	(0.34-0.43)
Men	Smoker Present	0.42	(0.38-0.47)
Women	No Smokers Present	0.35	(0.31-0.39)
Men	No Smokers Present	0.39	(0.35-0.42)
<i>Quitters</i>			
<i>Gender</i>			
Women	Smoker Present	0.18	(0.14-0.22)
Men	Smoker Present	0.16	(0.12-0.20)
Women	No Smokers Present	0.20	(0.17-0.24)
Men	No Smokers Present	0.20	(0.17-0.24)
<i>Never Smoked</i>			
<i>Gender</i>			
Women	Smoker Present	0.44	(0.39-0.49)
Men	Smoker Present	0.42	(0.37-0.46)
Women	No Smokers Present	0.44	(0.41-0.48)
Men	No Smokers Present	0.41	(0.38-0.45)

Table A.9 Predicted Probabilities of Smoker Status by Gender and Growing Up in a Single Parent Household

		Predicted Probability	95% CI
<i>Smokers</i>			
<i>Gender</i>			
Women	Single-Parent Family	0.40	(0.34-0.46)
Men	Single- Parent Family	0.43	(0.37-0.48)
Women	2-Parent Family	0.35	(0.32-0.38)
Men	2-Parent Family	0.40	(0.36-0.43)
<i>Quitters</i>			
<i>Gender</i>			
Women	Single-Parent Family	0.18	(0.13-0.24)
Men	Single- Parent Family	0.15	(0.10-0.19)
Women	2-Parent Family	0.20	(0.17-0.22)
Men	2-Parent Family	0.20	(0.17-0.22)
<i>Never Smoked</i>			
<i>Gender</i>			
Women	Single-Parent Family	0.42	(0.36-0.48)
Men	Single- Parent Family	0.43	(0.37-0.48)
Women	2-Parent Family	0.45	(0.42-0.48)
Men	2-Parent Family	0.41	(0.38-0.44)

Table A.10 Predicted Probabilities of Smoker Status by Gender and Experience of Violence in Youth

<i>Smokers</i>		Predicted Probability	95% CI
<i>Gender</i>			
Women	Experienced Violence	0.39	(0.34-0.43)
Men	Experienced Violence	0.42	(0.38-0.45)
Women	Did not Experience Violence	0.35	(0.32-0.38)
Men	Did not Experience Violence	0.39	(0.35-0.43)
<i>Quitters</i>			
<i>Gender</i>			
Women	Experienced Violence	0.20	(0.16-0.24)
Men	Experienced Violence	0.19	(0.16-0.23)
Women	Did not Experience Violence	0.19	(0.16-0.21)
Men	Did not Experience Violence	0.18	(0.14-0.21)
<i>Never Smoked</i>			
<i>Gender</i>			
Women	Experienced Violence	0.41	(0.37-0.46)
Men	Experienced Violence	0.39	(0.35-0.43)
Women	Did not Experience Violence	0.47	(0.43-0.50)
Men	Did not Experience Violence	0.43	(0.39-0.47)

Chapter 3 Supplemental Analysis and Tables

Table A.11 Predicted Probabilities of Heavy Episodic Drinking in Early YA by Gender and Having Peers who Drank

		Predicted Probability	95% CI
<i>Gender</i>			
Women	Had Peers Who Drank	0.63	(0.60-0.67)
Men	Had Peers Who Drank	0.54	(0.50-0.58)
	Did Not Have Peers Who		
Women	Drank	0.63	(0.60-0.67)
	Did Not Have Peers Who		
Men	Drank	0.54	(0.50-0.58)

Table A.12 Predicted Probabilities of Heavy Episodic Drinking in Early YA by Gender and Difficulty Paying Bills

		Predicted Probability	95% CI
<i>Gender</i>			
Women	Difficulty Paying Bills	0.54	(0.51-0.58)
Men	Difficulty Paying Bills	0.64	(0.57-0.67)
Women	No Difficulty Paying Bills	0.52	(0.45-0.59)
Men	No Difficulty Paying Bills	0.61	(0.54-0.68)

Table A.13 Predicted Probabilities of Heavy Episodic Drinking in Early YA by Gender and Experiences of Violence During Youth

		Predicted Probability	95% CI
<i>Gender</i>			
Women	Experienced Violence	0.56	(0.51-0.61)
Men	Experienced Violence	0.65	(0.62-0.68)
	Did Not Experience		
Women	Violence	0.52	(0.48-0.57)
	Did Not Experience		
Men	Violence	0.62	(0.58-0.66)

Table A.14 Predicted Probabilities of Heavy Episodic Drinking in Early YA by Gender and Parental Education

		Predicted Probability	95% CI
<i>Gender</i>			
Women	Parents Some College or Less	0.61	(0.56-0.65)
Men	Parents Some College or Less	0.69	(0.66-0.74)
Women	Parents College or More	0.47	(0.42-0.52)
Men	Parents College or More	0.56	(0.53-0.61)

Table A.15 Odds Ratios and Confidence Intervals from Interacted Models Predicting Heavy Episodic Drinking at Late YA												
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Demographic Characteristics												
Female	0.71*	(0.54-0.94)	0.97	(0.60-1.57)	0.71**	(0.55-0.91)	0.78	(0.56-1.09)	0.51*	(0.29-0.91)	0.69*	(0.52-0.92)
Non-Hispanic Black	0.62*	(0.40-0.97)	0.63**	(0.45-0.86)	0.63**	(0.45-0.86)	0.63**	(0.46-0.87)	0.63**	(0.46-0.87)	0.63**	(0.45-0.86)
Other Race	1.12	(0.60-2.08)	1.10	(0.73-1.67)	1.10	(0.72-1.67)	1.10	(0.73-1.67)	1.09	(0.72-1.66)	1.10	(0.72-1.66)
US Born	0.90	(0.68-1.18)	1.12	(0.75-1.66)	0.90	(0.68-1.18)	0.89	(0.68-1.17)	0.90	(0.68-1.18)	0.90	(0.68-1.18)
SES Characteristics												
Public Assistance Receipt	1.18	(0.72-1.92)	1.21	(0.74-1.97)	1.24	(0.65-2.36)	1.18	(0.72-1.93)	1.19	(0.73-1.94)	1.19	(0.73-1.94)
Parents Some College or Less	1.06	(0.83-1.35)	1.03	(0.81-1.32)	1.04	(0.82-1.33)	1.16	(0.82-1.64)	1.04	(0.82-1.32)	1.04	(0.82-1.33)
Household Income	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)
Difficulty Paying Bills	1.10	(0.80-1.52)	1.12	(0.81-1.54)	1.12	(0.81-1.54)	1.12	(0.81-1.54)	0.92	(0.58-1.45)	1.12	(0.81-1.54)
Other Youth Disadvantages												
Bad SRH	0.96	(0.74-1.24)	0.96	(0.74-1.25)	0.96	(0.74-1.25)	0.96	(0.74-1.25)	0.96	(0.74-1.24)	0.93	(0.63-1.35)
Experienced Violence	1.36*	(1.07-1.73)	1.36*	(1.07-1.73)	1.35*	(1.06-1.72)	1.36*	(1.07-1.73)	1.36*	(1.07-1.74)	1.35*	(1.06-1.72)
Depressive Symptomology Index	1.00	(0.98-1.02)	1.00	(0.98-1.02)	1.00	(0.99-1.02)	1.00	(0.99-1.02)	1.00	(0.99-1.02)	1.00	(0.99-1.02)
Single Parent Household	1.57**	(1.17-2.09)	1.56**	(1.17-2.08)	1.56**	(1.17-2.09)	1.56**	(1.17-2.09)	1.57**	(1.18-2.10)	1.56**	(1.17-2.08)
Alcohol Exposures												
Heavy Drinker Parent	1.05	(0.73-1.50)	1.04	(0.73-1.49)	1.04	(0.73-1.49)	1.04	(0.73-1.49)	1.04	(0.73-1.49)	1.04	(0.73-1.49)
Alcohol Available in the Home	1.15	(0.89-1.50)	1.13	(0.87-1.47)	1.15	(0.88-1.49)	1.15	(0.88-1.49)	1.15	(0.89-1.50)	1.15	(0.88-1.49)
Any Friend Who Drank	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)
Interactions												
Non-Hispanic Black X Female	0.99	(0.54-1.84)										
Other Race X Female	0.94	(0.41-2.14)										
US Born X Female			0.66	(0.38-1.14)								
Public Assistance Receipt X Female					0.92	(0.36-2.31)						

Table A.15 Odds Ratios and Confidence Intervals from Interacted Models Predicting Heavy Episodic Drinking at Late YA continued

Parents Some College or Less X Female	0.81	(0.51- 1.29)			
Difficulty Paying Bills X Female			1.47	(0.79- 2.75)	
Bad SRH X Female					1.07 (0.65-1.78)

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Table A.15 Odds Ratios and Confidence Intervals from Interacted Models Predicting Heavy Episodic Drinking at Late YA Continued

	Model 7		Model 8		Model 9		Model 10		Model 11	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Demographic Characteristics										
Female	0.74	(0.53-1.03)	0.75*	(0.57-0.99)	0.69**	(0.53-0.89)	0.80	(0.61-1.06)	0.70**	(0.55-0.90)
Non-Hispanic Black	0.63**	(0.46-0.87)	0.62**	(0.45-0.86)	0.63**	(0.45-0.86)	0.63**	(0.46-0.87)	0.63**	(0.46-0.87)
Other Race	1.10	(0.73-1.67)	1.09	(0.72-1.65)	1.10	(0.73-1.67)	1.11	(0.73-1.68)	1.10	(0.73-1.67)
US Born	0.9	(0.68-1.18)	0.9	(0.68-1.18)	0.9	(0.68-1.18)	0.88	(0.67-1.16)	0.9	(0.68-1.18)
SES Characteristics										
Public Assistance Receipt	1.19	(0.73-1.94)	1.19	(0.73-1.95)	1.19	(0.73-1.93)	1.21	(0.74-1.98)	1.19	(0.73-1.94)
Parents Some College or Less	1.04	(0.82-1.33)	1.04	(0.82-1.33)	1.04	(0.82-1.33)	1.04	(0.81-1.32)	1.04	(0.82-1.33)
Household Income Difficulty Paying Bills	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)
	1.11	(0.81-1.54)	1.11	(0.81-1.54)	1.12	(0.81-1.54)	1.11	(0.80-1.53)	1.12	(0.81-1.54)
Other Youth Disadvantages										
Bad SRH Experienced	0.96	(0.74-1.25)	0.96	(0.74-1.25)	0.96	(0.74-1.25)	0.97	(0.75-1.26)	0.96	(0.74-1.25)
Violence	1.43*	(1.01-2.01)	1.36*	(1.07-1.73)	1.35*	(1.06-1.72)	1.34*	(1.06-1.71)	1.35*	(1.06-1.72)
Depressive Symptomology Index	1.00	(0.99-1.02)	1.00	(0.99-1.02)	1.00	(0.98-1.02)	1.00	(0.99-1.02)	1.00	(0.99-1.02)
Single Parent Household	1.56**	(1.17-2.09)	1.78**	(1.19-2.67)	1.57**	(1.18-2.09)	1.55**	(1.16-2.07)	1.56**	(1.17-2.08)
Alcohol Exposures										
Heavy Drinker Parent	1.04	(0.73-1.49)	1.03	(0.72-1.48)	0.95	(0.58-1.56)	1.05	(0.73-1.50)	1.04	(0.73-1.49)
Alcohol Available in the Home	1.15	(0.88-1.49)	1.15	(0.88-1.49)	1.15	(0.88-1.49)	1.50*	(1.01-2.23)	1.15	(0.88-1.49)
Any Friend Who Drank	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)

Table A.15 Odds Ratios and Confidence Intervals from Interacted Models Predicting Heavy Episodic Drinking at Late YA

Continued

Interactions

Experienced

Violence X

Female 0.9 (0.56-1.45)

Single Parent

Household X

Female 0.78 (0.46-1.33)

Parent Drank

Heavily X Female 1.2 (0.59-2.43)

Alcohol Available

in the Home X

Female 0.61 (0.36-1.03)

Any Friend Who

Drank X Female

1.00 (0.99-1.00)

Note: * p< .05, ** p< .01, *** p<.001

Chapter 4 Supplemental Analysis, Tables, and Charts

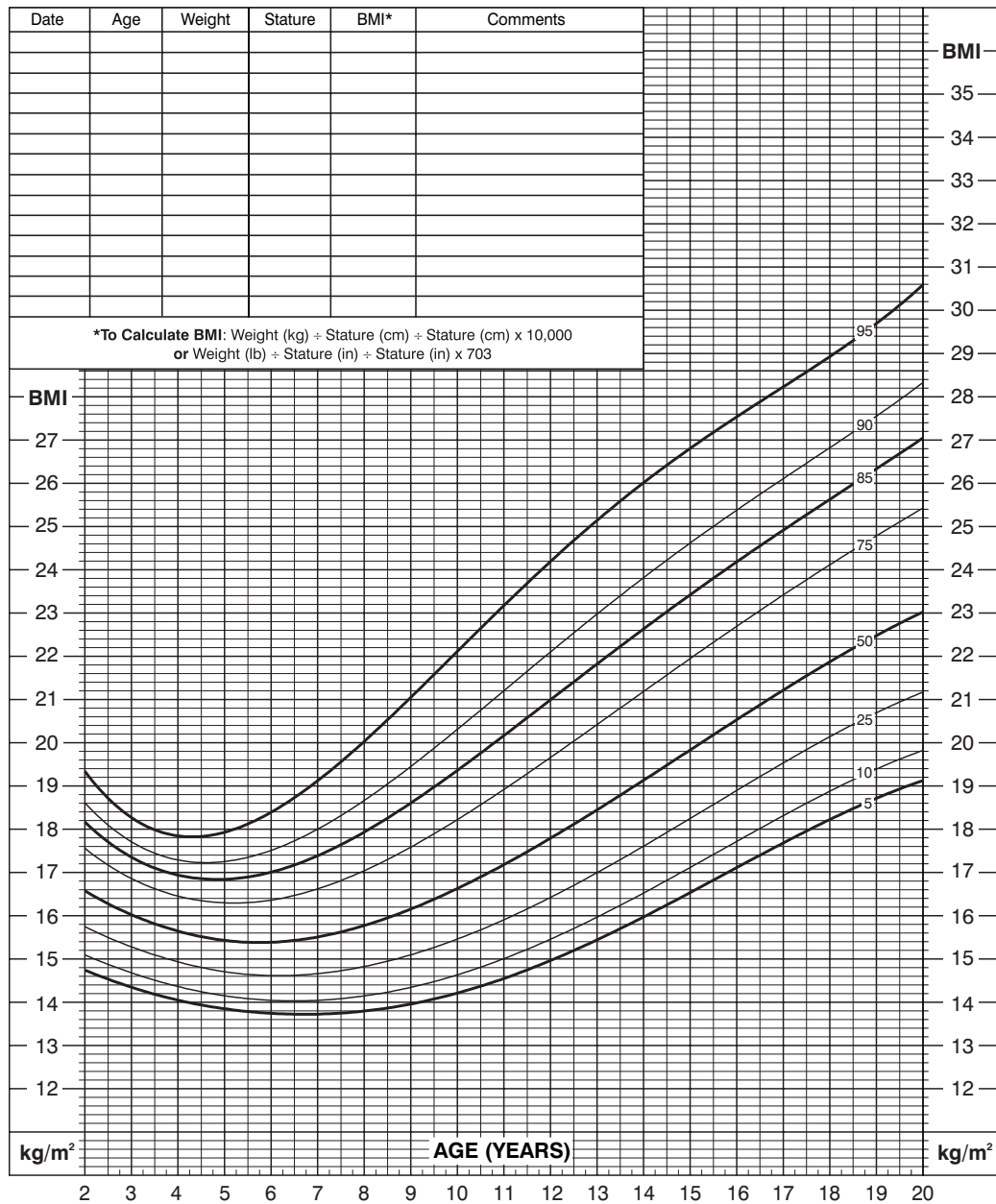
CDC Body Mass Index for Age Percentiles for Boys

2 to 20 years: Boys

Body mass index-for-age percentiles

NAME _____

RECORD # _____



Published May 30, 2000 (modified 10/16/00).

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000). <http://www.cdc.gov/growthcharts>



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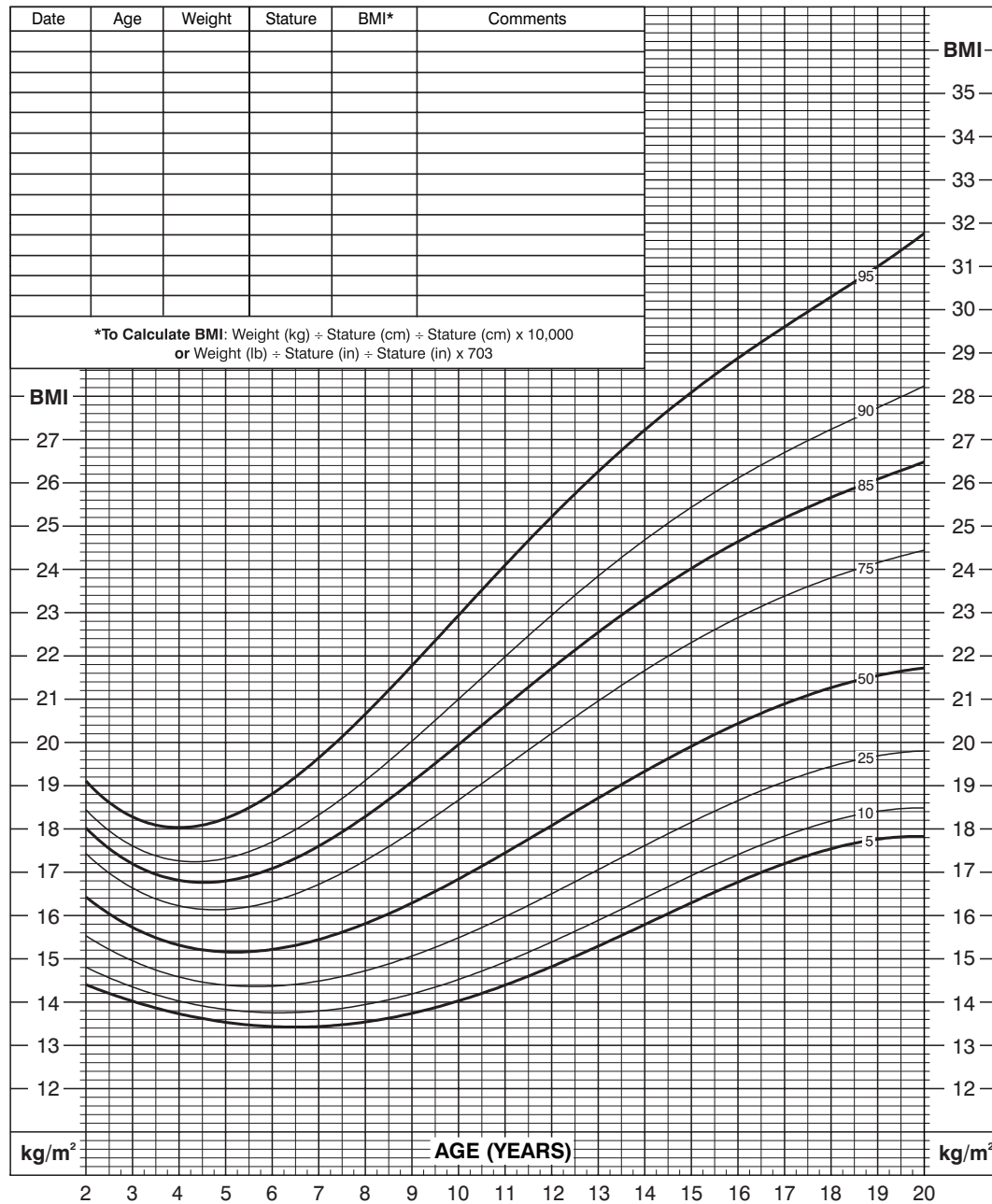
CDC Body Mass Index for Age Percentiles for Girls

2 to 20 years: Girls

Body mass index-for-age percentiles

NAME _____

RECORD # _____



Published May 30, 2000 (modified 10/16/00).

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
<http://www.cdc.gov/growthcharts>



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Table A.16 Weight Status Category Percentiles and Cut points	
<i>For Calculated BMI-for-age percentile (Under 18 years of age)</i> Adapted from the Centers for Disease Control Website 2016	
Weight Status Category	Percentile Range
Under Weight	Less than the 5 th percentile
Healthy Weight	5 th -85 th percentile
Overweight	85 th -95 th percentile
Obese	Greater than or equal to the 95 th percentile
<i>Calculated Adult BMI (Age 19 and over)</i> Adapted from the World Health Organization Website 2017	
Weight Status Category	BMI Cut Point
Under Weight	Less than 18.5
Healthy Weight	18.5-24.99
Overweight	25-29.99
Obese	Greater than or equal to 30

Table A.17 Predicted Probability of Weight Status Category by Gender and Public Assistance Receipt Status

		Predicted Probability	95% CI
<i>Never Obese</i>			
<i>Gender</i>			
Women	Did not Receive	0.16	(0.07-0.26)
Men	Did not Receive	0.34	(0.23-0.45)
Women	Received Public Assistance	0.23	(0.20-0.25)
Men	Received Public Assistance	0.28	(0.25-0.30)
<i>Persistently Obese</i>			
<i>Gender</i>			
Women	Did not Receive	0.10	(0.04-0.16)
Men	Did not Receive	0.13	(0.06-0.19)
Women	Received Public Assistance	0.10	(0.09-0.12)
Men	Received Public Assistance	0.13	(0.11-0.15)
<i>Became Healthy</i>			
<i>Gender</i>			
Women	Did not Receive	0.49	(0.36-0.61)
Men	Did not Receive	0.30	(0.19-0.42)
Women	Received Public Assistance	0.39	(0.36-0.41)
Men	Received Public Assistance	0.28	(0.26-0.31)
<i>Became Obese</i>			
<i>Gender</i>			
Women	Did not Receive	0.25	(0.15-0.35)
Men	Did not Receive	0.23	(0.13-0.32)
Women	Received Public Assistance	0.29	(0.26-0.31)
Men	Received Public Assistance	0.31	(0.28-0.34)

Table A.18 Comparison with the Never Obese + Interactions with Gender

	<i>Female X Public Assistance Receipt</i>		<i>Female X Parental Education</i>		<i>Female X household Income</i>		<i>Female X Difficulty Paying Bills</i>	
PANEL A: Became Obese Compared to the Never Obese								
Demographic Characteristics								
Female	0.95	(0.69-1.32)	0.84	(0.53-1.33)	1.30	(0.77-2.20)	0.83	(0.40-1.73)
<i>Racial Identity</i>								
Non-Hispanic Black	1.60*	(1.09-2.34)	1.60*	(1.10-2.34)	1.59*	(1.09-2.33)	1.61*	(1.10-2.35)
Other Race	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)
US Born	0.84	(0.60-1.18)	0.84	(0.60-1.19)	0.84	(0.60-1.19)	0.84	(0.59-1.18)
SES Characteristics								
Some College or Less	1.01	(0.73-1.41)	0.89	(0.57-1.37)	1.01	(0.73-1.40)	1.01	(0.73-1.41)
Household Income	0.99***	(0.98-1.00)	0.99***	(0.98-1.00)	0.99	(0.98-1.00)	0.99***	(0.98-1.00)
Public Assistance Receipt	0.82	(0.39-1.72)	0.96	(0.53-1.75)	0.98	(0.54-1.78)	0.96	(0.53-1.74)
Difficulty Paying Bills	1.17	(0.77-1.77)	1.17	(0.77-1.76)	1.18	(0.78-1.78)	1.07	(0.61-1.86)
Other Youth Disadvantages								
Poor, Fair, or Good SRH	4.67***	(3.35-6.50)	4.67***	(3.35-6.51)	4.67***	(3.35-6.50)	4.66***	(3.34-6.49)
Experienced Violence	0.89	(0.65-1.22)	0.89	(0.65-1.21)	0.88	(0.64-1.21)	0.89	(0.65-1.22)
Depressive Symptomology	0.99	(0.96-1.01)	0.99	(0.96-1.01)	0.99	(0.96-1.01)	0.99	(0.96-1.01)
Single Parent Household	0.77	(0.53-1.13)	0.77	(0.53-1.13)	0.77	(0.53-1.14)	0.77	(0.53-1.13)
Young Adulthood Characteristics								
Number of School Years Completed	0.97	(0.89-1.05)	0.97	(0.89-1.05)	0.97	(0.89-1.05)	0.97	(0.89-1.06)
Currently Employed	0.72	(0.51-1.02)	0.72	(0.51-1.02)	0.72	(0.51-1.01)	0.72	(0.51-1.02)
Interactions								
Female X Public Assistance Receipt	1.59	(0.50-5.05)						
Female X Parental Education			1.33	(0.72-2.44)				
Female X household Income					0.99	(0.98-1.00)		
Female X Difficulty Paying Bills							1.21	(0.55-2.69)

Table A.18 Comparison with the Never Obese + Interactions with Gender Continued
PANEL B: Persistently Obese Compared to
the Never Obese

Demographic Characteristics

Female	1.70***	(1.34-2.15)	1.70***	(1.25-2.33)	1.66**	(1.22-2.26)	1.98*	(1.09-3.61)
<i>Racial Identity</i>								
Non-Hispanic Black	0.72*	(0.53-0.98)	0.72*	(0.53-0.98)	0.72*	(0.53-0.98)	0.72*	(0.53-0.98)
Other Race	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)
US Born	0.96	(0.74-1.23)	0.96	(0.74-1.24)	0.96	(0.74-1.23)	0.96	(0.74-1.24)

SES Characteristics

Some College or Less	0.85	(0.67-1.07)	0.83	(0.60-1.16)	0.85	(0.67-1.08)	0.85	(0.67-1.08)
Household Income	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)
Public Assistance Receipt	0.86	(0.44-1.69)	1.17	(0.71-1.92)	1.17	(0.71-1.92)	1.17	(0.71-1.93)
Difficulty Paying Bills	1.34	(0.97-1.86)	1.34	(0.97-1.86)	1.34	(0.97-1.87)	1.46	(0.90-2.37)

Other Youth Disadvantages

Poor, Fair, or Good SRH	1.07	(0.81-1.40)	1.06	(0.81-1.40)	1.06	(0.81-1.40)	1.06	(0.81-1.40)
Experienced Violence	0.71**	(0.56-0.90)	0.71**	(0.56-0.90)	0.71**	(0.56-0.90)	0.71**	(0.56-0.90)
Depressive Symptomology	0.99	(0.97-1.01)	0.99	(0.97-1.01)	0.99	(0.97-1.01)	0.99	(0.97-1.01)
Single Parent Household	1.02	(0.77-1.35)	1.02	(0.77-1.36)	1.02	(0.77-1.36)	1.02	(0.77-1.35)

Young Adulthood Characteristics

Number of School Years Completed	0.99	(0.93-1.05)	0.99	(0.93-1.05)	0.99	(0.93-1.05)	0.99	(0.93-1.05)
Currently Employed	0.72*	(0.56-0.92)	0.71**	(0.55-0.92)	0.71**	(0.55-0.92)	0.71**	(0.55-0.92)

Interactions

Female X Public Assistance Receipt	2.02	(0.76-5.38)						
Female X Parental Education			1.07	(0.69-1.66)				
Female X household Income					0.99	(0.98-1.00)		
Female X Difficulty Paying Bills							0.88	(0.46-1.66)

Table A.18 Comparison with the Never Obese + Interactions with Gender
PANEL C: Became Healthy Weight
Compared to the Never Obese

Demographic Characteristics

Female	1.13	(0.89-1.44)	1.06	(0.77-1.47)	1.24	(0.89-1.73)	1.20	(0.69-2.10)
<i>Racial Identity</i>								
Non-Hispanic Black	1.14	(0.85-1.53)	1.14	(0.85-1.53)	1.14	(0.85-1.53)	1.14	(0.85-1.53)
Other Race	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)
US Born	1.07	(0.82-1.39)	1.08	(0.83-1.40)	1.07	(0.82-1.40)	1.07	(0.82-1.40)

SES Characteristics

Some College or Less	0.92	(0.72-1.17)	0.84	(0.61-1.16)	0.92	(0.72-1.17)	0.92	(0.72-1.17)
Household Income	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)
Public Assistance Receipt	0.60	(0.32-1.13)	0.78	(0.47-1.28)	0.78	(0.47-1.28)	0.78	(0.47-1.28)
Difficulty Paying Bills	1.02	(0.74-1.39)	1.02	(0.74-1.39)	1.02	(0.75-1.40)	1.04	(0.67-1.59)

Other Youth Disadvantages

Poor, Fair, or Good SRH	1.54**	(1.18-2.02)	1.54**	(1.18-2.01)	1.54**	(1.18-2.01)	1.54**	(1.18-2.01)
Experienced Violence	1.01	(0.80-1.27)	1.00	(0.80-1.27)	1.00	(0.79-1.27)	1.01	(0.80-1.27)
Depressive Symptomology	0.99	(0.97-1.01)	0.99	(0.97-1.01)	0.99	(0.97-1.01)	0.99	(0.97-1.01)
Single Parent Household	1.18	(0.90-1.56)	1.19	(0.90-1.57)	1.19	(0.90-1.57)	1.19	(0.90-1.57)

Young Adulthood Characteristics

Number of School Years Completed	0.95	(0.89-1.01)	0.95	(0.89-1.01)	0.95	(0.89-1.01)	0.95	(0.89-1.01)
Currently Employed	0.98	(0.75-1.28)	0.97	(0.75-1.27)	0.97	(0.74-1.27)	0.97	(0.74-1.27)

Interactions

Female X Public Assistance Receipt	1.97	(0.74-5.24)						
Female X Parental Education			1.22	(0.78-1.92)				
Female X household Income					1.00	(0.99-1.00)		
Female X Difficulty Paying Bills							0.97	(0.53-1.78)

Table A.18 Comparison with the Never Obese + Interactions with Gender, Continued

	<i>Female X Low SRH</i>		<i>Female X Depressive Symptomology</i>		<i>Female X Single Parent Household</i>		<i>Female X Experienced Violence</i>	
PANEL A: Became Obese Compared to the Never Obese								
Demographic Characteristics								
Female	0.47***	(0.31-0.72)	0.32**	(0.16-0.63)	1.03	(0.72-1.48)	1.06	(0.69-1.61)
<i>Racial Identity</i>								
Non-Hispanic Black	2.20***	(1.51-3.20)	2.23***	(1.53-3.26)	1.61*	(1.10-2.35)	1.62*	(1.11-2.37)
Other Race	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)
US Born	0.87	(0.63-1.21)	0.87	(0.63-1.21)	0.84	(0.60-1.18)	0.84	(0.60-1.18)
SES Characteristics								
Some College or Less	1.20	(0.87-1.65)	1.19	(0.87-1.64)	1.01	(0.73-1.41)	1.02	(0.73-1.41)
Household Income	0.99***	(0.98-0.99)	0.99***	(0.98-0.99)	0.99***	(0.98-1.00)	0.99***	(0.98-1.00)
Public Assistance Receipt	0.83	(0.46-1.50)	0.82	(0.46-1.47)	0.96	(0.53-1.75)	0.96	(0.53-1.75)
Difficulty Paying Bills	0.87	(0.57-1.31)	0.86	(0.57-1.30)	1.17	(0.77-1.77)	1.17	(0.77-1.77)
Other Youth Disadvantages								
Poor, Fair, or Good SRH	3.51***	(2.23-5.52)	4.40***	(3.20-6.03)	4.66***	(3.34-6.49)	4.66***	(3.35-6.49)
Experienced Violence	1.25	(0.92-1.70)	1.25	(0.92-1.70)	0.89	(0.65-1.22)	0.96	(0.63-1.46)
Depressive Symptomology	1.00	(0.97-1.02)	0.97	(0.94-1.01)	0.99	(0.96-1.01)	0.99	(0.96-1.01)
Single Parent Household	0.76	(0.52-1.10)	0.75	(0.52-1.09)	0.85	(0.52-1.38)	0.77	(0.53-1.13)
Young Adulthood Characteristics								
Number of School Years Completed	0.98	(0.91-1.07)	0.98	(0.91-1.07)	0.97	(0.89-1.06)	0.97	(0.89-1.06)
Currently Employed	1.01	(0.73-1.40)	1.02	(0.73-1.41)	0.72	(0.51-1.02)	0.72	(0.51-1.02)
Interactions								
Female X Low SRH	1.48	(0.80-2.73)						
Female X Depressive Symptomology			1.04	(1.00-1.09)				
Female X Single Parent Household					0.81	(0.41-1.63)		
Female X Experienced Violence							0.85	(0.46-1.57)

Table A.18 Comparison with the Never Obese + Interactions with Gender, Continued
PANEL B: Persistently Obese Compared to the Never Obese

Demographic Characteristics

Female	1.87***	(1.44-2.42)	1.87***	(1.44-2.42)	2.26***	(1.66-3.07)	2.26***	(1.66-3.07)
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Racial Identity

Non-Hispanic Black	0.73*	(0.53-0.99)	0.73*	(0.53-0.99)	0.74	(0.55-1.01)	0.74	(0.55-1.01)
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Other Race	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)
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US Born	0.96	(0.74-1.24)	0.96	(0.75-1.24)	0.96	(0.74-1.24)	0.96	(0.75-1.24)
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SES Characteristics

Some College or Less	0.85	(0.67-1.07)	0.86	(0.68-1.08)	0.85	(0.67-1.07)	0.86	(0.68-1.08)
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Household Income	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)
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Public Assistance Receipt	1.17	(0.71-1.92)	1.16	(0.70-1.91)	1.17	(0.71-1.92)	1.16	(0.70-1.91)
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Difficulty Paying Bills	1.34	(0.97-1.86)	1.34	(0.97-1.86)	1.34	(0.97-1.86)	1.34	(0.97-1.86)
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Other Youth Disadvantages

Poor, Fair, or Good SRH	1.06	(0.81-1.40)	1.07	(0.81-1.41)	1.06	(0.81-1.40)	1.07	(0.81-1.41)
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Experienced Violence	0.71**	(0.56-0.90)	0.71**	(0.56-0.90)	0.71**	(0.56-0.90)		
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Depressive Symptomology	0.99	(0.97-1.01)	0.99	(0.97-1.01)	0.99	(0.97-1.01)	0.99	(0.97-1.01)
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Single Parent Household	1.18	(0.81-1.73)	1.18	(0.81-1.73)	1.18	(0.81-1.73)	1.02	(0.77-1.36)
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Young Adulthood

Characteristics

Number of School Years								
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Completed	0.99	(0.93-1.05)	0.99	(0.93-1.05)	0.99	(0.93-1.05)	0.99	(0.93-1.05)
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Currently Employed	0.71**	(0.55-0.92)	0.71**	(0.55-0.92)	0.71**	(0.55-0.92)	0.71**	(0.55-0.92)
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Interactions

Female X Low SRH	1.48	(0.80-2.73)						
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Female X Depressive								
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Symptomology			1.04	(1.00-1.09)				
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Female X Single Parent								
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Household					0.77	(0.45-1.30)		
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Female X Experienced Violence							0.56*	(0.36-0.89)
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Table A.18 Comparison with the Never Obese + Interactions with Gender, Continued

PANEL C: Became Healthy Weight Compared to the Never Obese

Demographic Characteristics

Female	0.65**	(0.51-0.84)	0.45**	(0.28-0.74)	1.09	(0.83-1.43)	1.26	(0.91-1.73)
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Racial Identity

Non-Hispanic Black	1.57**	(1.18-2.11)	1.59**	(1.19-2.13)	1.14	(0.85-1.53)	1.15	(0.85-1.55)
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Other Race	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)	1.00	(0.99-1.00)
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US Born	1.12	(0.87-1.43)	1.12	(0.87-1.43)	1.07	(0.82-1.40)	1.07	(0.82-1.40)
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SES Characteristics

Some College or Less	1.08	(0.86-1.36)	1.08	(0.86-1.36)	0.92	(0.72-1.17)	0.92	(0.72-1.17)
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Household Income	1.00*	(1.00-1.00)	1.00*	(1.00-1.00)	1.00	(1.00-1.00)	1.00	(1.00-1.00)
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Public Assistance Receipt	0.67	(0.41-1.08)	0.66	(0.41-1.08)	0.78	(0.47-1.28)	0.78	(0.47-1.28)
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Difficulty Paying Bills	0.76	(0.56-1.04)	0.76	(0.55-1.03)	1.02	(0.75-1.40)	1.02	(0.74-1.40)
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Other Youth Disadvantages

Poor, Fair, or Good SRH	1.33	(0.91-1.94)	1.45**	(1.13-1.86)	1.53**	(1.17-2.01)	1.54**	(1.18-2.01)
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Experienced Violence	1.42**	(1.13-1.77)	1.42**	(1.13-1.77)	1.00	(0.79-1.27)	1.07	(0.78-1.47)
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Depressive Symptomology	1.00	(0.98-1.02)	0.98	(0.96-1.01)	0.99	(0.97-1.01)	0.99	(0.97-1.01)
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Single Parent Household	1.16	(0.89-1.52)	1.16	(0.89-1.51)	1.04	(0.72-1.51)	1.19	(0.90-1.57)
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Young Adulthood

Characteristics

Number of School Years								
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Completed	0.96	(0.91-1.02)	0.96	(0.91-1.02)	0.95	(0.89-1.01)	0.95	(0.89-1.01)
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Currently Employed	1.36*	(1.07-1.74)	1.37*	(1.07-1.75)	0.97	(0.74-1.27)	0.97	(0.74-1.27)
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Interactions

Female X Low SRH	1.12	(0.69-1.82)						
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Female X Depressive								
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Symptomology			1.03	(1.00-1.07)				
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Female X Single Parent								
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Household					1.30	(0.78-2.17)		
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Female X Experienced Violence							0.86	(0.54-1.36)
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