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**Adolescent Social Marginalization and Psychological Distress across the Transition to Adulthood**

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**Adolescent Social Marginalization and Psychological Distress across the  
Transition to Adulthood**

**by**

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## **Dedication**

For my writing companion. Someday, I will tell you all about this journey.

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# **Adolescent Social Marginalization and Psychological Distress across the Transition to Adulthood**

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Adolescence is a developmentally rich stage of the life course during which young people lay the foundation for future adjustment, functioning, health, and well-being. Adolescents experience profound changes to their brains and bodies, individuate from their parents, traverse the complex social systems of U.S. high schools, and ascribe increased importance to their relationships with peers. The confluence of these changes means that young people who become socially marginalized or disconnected from peers in high school face psychological distress in the short term. Moreover, the implications of adolescent marginalization for mental health may reverberate and cascade across the transition to adulthood, jeopardizing trajectories of psychological well-being. In this spirit, this dissertation asks: will adolescent social marginalization leave permanent scars on mental health, and if so, for whom? To explore these questions, I draw on a developmental life course framework and apply structural equation modeling techniques to longitudinal data from the National Longitudinal Study of Adolescent to Adult Health (Add Health;  $n = 10,869$ ). Results from my analyses revealed that adolescence is a sensitive period of the life course during which marginalization from peers triggers problematic mental health trajectories into adulthood regardless of post-high school experiences and despite accessing social resources in high school that would otherwise buffer youth from unhealthy

psychological trajectories. These patterns were more distinct among girls than boys. Additionally, trajectories of distress were closely connected with trajectories of binge drinking among marginalized youth in general, and particularly among boys. The bidirectionality of these trajectories suggests that the social ups and downs of high school affect adjustment, functioning, and behaviors well into adulthood. Overall, this dissertation informs theoretical understanding of risk and resilience by pointing to adolescence as a sensitive developmental moment during which social risks are particularly influential on long-term trajectories of health and well-being.

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## Chapter 1: Introduction

During adolescence, young people establish who they are and where they fit in the social world as they experience dramatic changes to their bodies and brains (Steinberg 2005; Steinberg 2014; Schulenberg, Sameroff, & Cicchetti 2004). During this relatively short stage of the life course, adolescents undergo institutional transitions that expand their social networks, navigate complex curricular structures at school with powerful consequences for their socioeconomic futures, experience profound physical changes with reproductive implications, and experience major brain developments that increase their tendencies for sensation-seeking without commensurate increases in cognitive control skills like self-regulation. The confluence of these changes creates the distinct plasticity of adolescence, which takes on greater importance in light of widespread perceptions of this life course stage as an unusually stressful time. After all, scholars have long used the German term *sturm und drang* (literally, storm and stress) to describe adolescence, and, although overblown, adolescents do face numerous social risks while being psychologically ill-equipped to deal with them (Casey, Jones, & Hare 2008). Such risks can then “stick” even when they are over, with negative experiences disrupting the transition to young adulthood and undermining health and well-being into adulthood.

This dissertation examines the potential stickiness of a particular adolescent social risk—marginalization from peers in high school—by drawing on a developmental life course perspective and applying statistical techniques in a structural equation modeling framework to longitudinal data from the National Longitudinal Study of Adolescent to Adult Health (Add Health). Social marginalization refers to the experience of being disconnected or isolated from others in a social context. The detriment of social marginalization to health and well-being throughout the life course has been documented

extensively in social science literature (House, Landis, and Umberson 1988; Kawachi and Berkman 2001; Cornwell and Waite 2009; Umberson and Montez 2010; Thoits 2011). During adolescence specifically, heightened sensitivity to peers and increasing importance ascribed to friendships—hallmarks of this life course stage—mean that social marginalization from peers may be particularly damaging for health and well-being. Indeed, poor integration into the vibrant social scene of high schools is not only detrimental to the mental health of young people in the short term (Hall-Lande et al. 2007; Joyce and Early 2014), but may also reverberate across the transition to adulthood.

Another distinct feature of adolescent social life and the navigation of adolescent peer groups is that these relationships are highly gendered. Adolescent girls tend to have smaller peer groups with close, intimate friendship ties, whereas boys have larger networks centered on shared activities (Clark and Ayers 1993; Lempers and Clark-Lempers 1993; Hartup 1993; Hussong 2000; Vigil 2007; Hall 2011). Additionally, compared to boys, girls invest more in their relationships and are more vulnerable to negative social evaluations (Cross and Madson 1997). Although these attributes might help girls to gain social and emotional support, heightened social-evaluative concerns are also associated with higher distress for girls (Rudolph and Conley 2005). As a result, the role of social marginalization in short- and long-term psychological trajectories can differ by gender.

In this spirit, this dissertation broadly explores whether and for whom social marginalization in high school derails trajectories of psychological distress into adulthood, paying particular attention to gender differences. With this general theme woven throughout, this dissertation is comprised of the following three stand-alone studies:

- *High School Social Marginalization, Young Adult Social Adjustment, and Trajectories of Psychological Distress*: Chapter 2 lays the conceptual and empirical groundwork for the associations between social marginalization

and long-term psychological distress. Juxtaposing different tenants of life course theory, this study evaluates whether the long-term psychological consequences of social marginalization are more in line with a sensitive period hypothesis (i.e., what happens in high school matters in the long run regardless of post-high school experiences) or an accumulation of risk hypothesis (i.e., what happens in high school matters in the long run by disrupting the transition into adulthood). The results generally suggest that social marginalization in high school is associated with long-term trajectories of problematic psychological health in a way that is more in line with a sensitive period explanation.

- *The Interplay of High School Social Risks and Resources on Trajectories of Psychological Distress into Adulthood:* Chapter 3 builds on Chapter 2 by investigating whether and how programmatic and relational aspects of high school contexts condition the links between peer marginalization and longitudinal trajectories of depressive symptomatology. The results generally suggest that factors such as extracurricular involvement, teacher attachment, and non-parental mentors in high school are associated with healthier trajectories of mental health into adulthood in general, but not for youth who are marginalized by peers.
- *Social Marginalization in High School and Trajectories of Psychological Distress and Binge Drinking into Adulthood:* Chapter 4 explores the interconnectedness of psychological distress and alcohol use across the transition to adulthood for youth who are marginalized in high school and youth who are not. The idea here is that socially disconnected youth will turn to binge drinking both as a coping mechanism and as a social activity.

In doing so, however, their increasingly problematic alcohol use will reinforce poor mental health trajectories in ways that disadvantage psychological well-being into adulthood. The results generally suggest heavy drinking among socially marginalized adolescent girls jeopardizes their mental health across the transition to adulthood. For marginalized boys, on the other hand, the linkages between depressive symptoms and binge drinking trajectories matter more over the long term.

All studies use longitudinal data from Add Health, an ongoing, nationally representative study following adolescents into adulthood through a series of four waves of data collection to date (Harris et al. 2009). Furthermore, each chapter applies structural equation modeling techniques, such as latent class analysis, growth mixture modeling, and latent growth curve modeling, to estimate—for a national representative sample and by gender—longitudinal pathways linking social marginalization in high school and psychological distress across the transition to adulthood.

By integrating these three studies—identifying heterogeneity in psychological responsiveness to social marginalization, considering social and institutional facets of schools, and evaluating the interplay of psychological and behavioral trajectories—this dissertation will identify adolescents who are most vulnerable to long-term mental health penalties following adolescent social risk. Such knowledge can then point to those most in need of help and how and when to help them. Indeed, because of the foundational role of adolescence in the overall life course, what happens during this period sets the stage for future trajectories into adulthood. Understanding how and why the psychological health of adolescents responds to social marginalization in the short and long term, therefore, can potentially provide key theoretical insights into risk and resilience. It may also inform programmatic efforts to reduce the immediate risks to mortality during the adolescent years

that are of such great concern and to break the translation of early disadvantages into long-term mental problems that is increasingly seen as crucial to promoting adult health.

## **Chapter 2: High School Social Marginalization, Young Adult Social Adjustment, and Trajectories of Psychological Distress**

### **ABSTRACT**

High school is a time of intense social activity, and some young people may become marginalized or disconnected from their peers in ways that undermine their psychological well-being. The degree to which such problems have cascading effects on their lives after high school is discussed more often than examined. To explore the potential long-term mental health disadvantages of social marginalization during high school, this study applied latent transition and growth mixture modeling to longitudinal data on dimensions of marginalization from peers (e.g., feelings of not fitting in, network isolation) and depressive symptomatology from the National Longitudinal Study of Adolescent to Adult Health (Add Health;  $n = 10,869$ ). Juxtaposing different tenets of life course theory, these analyses revealed that social marginalization during high school was associated with long-term trajectories of problematic psychological health into adulthood, a pattern more distinct among girls than boys. These long-term influences were more in line with a sensitive period explanation (i.e., what happens in high school matters in the long run regardless of post-high school experiences) than the accumulation of risk hypothesis (i.e., what happens in high school matters in the long run by disrupting the transition into adulthood). Efforts to inform theoretical understanding of risk and resilience should, therefore, account for sensitive developmental moments during which social risks are particularly influential on long-term trajectories of health and well-being.

## **INTRODUCTION**

Peer marginalization, social isolation, and bullying—all too common in U.S. high schools—present a profound social risk for adolescents (Hall-Lande et al. 2007). During a critical stage of their social development, adolescents ascribe increasing importance to peer networks (Larson and Richards 1991; Crosnoe 2000; Giordano 2003). Furthermore, social troubles in high school comes at a time when the still-developing cognitive capacities and emotional maturity of young people make effective coping difficult (Casey, Jones, and Hare 2008; Steinberg 2014). As such, social marginalization influences the well-being of adolescents in the short-term, with some evidence that girls are more vulnerable to the ups and downs of their adolescent social lives (Rudolph and Conley 2005). Are these risks something that adolescent girls and boys can “get over” after they leave high school, or is the legacy of these risks evident in enduring trajectories of psychological distress?

Life course theory offers competing lenses through which to view the potential long-term mental health responses of high school social marginalization. The first follows the theory’s tenet of sensitive periods. Due to the foundational role of adolescence in the overall life course, the lack of integration into the social scene of one’s high school has the potential to scar the psychological well-being of young people. That scarring would be reflected in diminished mental health well beyond the high school years even if young people eventually have more positive social experiences after high school. In other words, what happens in high school stays with them no matter what comes next. The second lens follows the tenet of cumulative trajectories and transitions. Here, the long-term influence of one life course stage may depend upon how individuals transition into the next stage, so that social marginalization in high school is manifested in poorer psychological health in adulthood by disrupting the transition from adolescence into adulthood. In other words, what happens in high school affects what happens after high school because a trajectory

becomes self-reinforcing. To the extent that post-high school experiences are more positive, therefore, high school social marginalization will not be manifested in poorer psychological well-being because that particular trajectory has been deflected in a more positive direction (Schulenberg and Maggs 2002; Crosnoe and Johnson 2011).

Using data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), this study evaluates which of these lenses more accurately characterizes the experiences of marginalized adolescents—for a nationally representative sample of high school students and by gender. Is adolescence a sensitive period during which social risks leave permanent scars? Or, will experiences in young adulthood mediate the association between adolescent social marginalization and mental health trajectories into adulthood? Building on theoretical and practical knowledge of life course processes and later life implications of early social risk, understanding how and why marginalized adolescents accumulate risk over the long term or recover from risk in the short term may help identify unique subsets of the adolescent population in need of support and/or intervention. The adjudication between sensitive periods and cumulative trajectories, moreover, can potentially provide key theoretical insights into risk and resilience.

## **BACKGROUND**

### **Social Marginalization in High School**

Social marginalization refers to the experience of being disconnected or isolated from others within a social context. This marginalization may materialize through withdrawal, rejection, or some combination of both; but, regardless of the process by which isolation occurs, the detriment of social marginalization to health and well-being throughout the life course has been documented extensively in social science literature (House, Landis, and Umberson 1988; Kawachi and Berkman 2001; Cornwell and Waite

2009; Umberson and Montez 2010; Thoits 2011). Poor integration into the vibrant social scene of high school is not only detrimental to the mental health of young people in the short-term (Hall-Lande et al. 2007; Joyce and Early 2014), but may also reverberate across the transition to adulthood.

Social marginalization in high school, furthermore, can be objective or subjective, each with consequences for behaviors, health, well-being, and even mortality risk (Uchino 2006; Holt-Lunstad et al. 2015). Whereas subjective marginalization matters because it influences the self-perceptions and positive identity development of young people, objective marginalization has bearing on social support and social stimulation, which are reduced among marginalized adolescents. As such, comparisons between objective and subjective indicators of marginalization can be helpful for determining the degree to which the psychological health of young people reacts more to what they think is happening to them than what actually is (Cacioppo and Hawkley 2009).

High school marginalization can be persistent or intermittent. A central feature of adolescent social networks is their fluidity (Cairns et al. 1995; Poulin and Chan 2010). As young people change and grow, their social relationships adjust and develop with them. Consequently, feelings or experiences of belonging—or conversely, feelings or experiences of marginalization—can come and go during high school. Although any isolation from peers during adolescence is likely detrimental to psychological health, persistent marginalization may have the longest reach.

Another unique feature of adolescent social life in general and the navigation of friendships during adolescence more specifically is that these relationships are highly gendered. Indeed, expectations for peer relationships differ by gender. For girls, intimacy and loyalty are prioritized (Clark and Ayers 1993; Lempers and Clark-Lempers 1993; Hartup 1993; Hussong 2000; Hall 2011). Adolescent girls tend to have smaller peer groups

with close, intimate friendship ties. Boys, on the other hand, prioritize shared activities in their adolescent friend groups and tend to have larger networks (Clark and Ayers 1993; Vigil 2007). Compared to boys, moreover, girls invest more in their relationships and are more in tune with social evaluation (Cross and Madson 1997). Although these attributes may allow girls to gain more social and emotional support from friendships, heightened social-evaluative concerns are also associated with higher depressive symptomatology for girls (Rudolph and Conley 2005). As a result, the effects of high school social marginalization likely differ by gender. Adolescent girls may be more negatively affected than adolescent boys when they are isolated from their peers.

With knowledge of the mental health disadvantage for social marginalization and the dynamics of adolescent social life as background, the key question of this study is whether the psychological difficulties of social marginalization (subjective or objective; persistent or intermittent) during high school are associated with more problematic trajectories of psychological well-being for girls and boys even after high school is over. To address this question, I draw on life course theory to adjudicate between two different models through which long-term mental health penalties are realized.

### **Adolescence as a Sensitive Period for Social Marginalization**

Adolescence is a critical developmental period during which young people establish who they are and where they fit in the social world as they experience dramatic changes to their bodies and brains (Schulenberg, Sameroff, and Cicchetti 2004; Steinberg 2005; Steinberg 2014). During this relatively short part of the life course, young people: undergo institutional transitions that expand their social networks and exposure to other people; experience profound physical changes; are tasked with individuating from their parents and establishing their own independent identities; navigate complex curricular

structures at school with powerful consequences for their socioeconomic futures; and, experience major brain developments that increase tendencies for sensation-seeking without commensurate increases in cognitive control skills like self-regulation. In the process, friendships gain new significance as teens spend increasing amounts of time with peers while expanding their social networks (Larson and Richards 1991; Giordano 2003). What is more, due to the physiological changes, social turbulence, and institutional transitions that are hallmarks of adolescence (Rindfuss 1991), experiences during this life course stage can trigger hormonal and neurological responses that have potential to leave a lasting impact on the brain, body, and psyche, perhaps even more than childhood or adult experiences (Romeo 2013; Steinberg 2014).

Consequently, feeling marginalized from peers during high school should be considered in relation to the intense personal and social growth of this life course stage (Crosnoe 2011). Friendships in adolescence promote socioemotional growth and provide opportunities for young people to develop the psychosocial skills they will need to forge long-lasting relationships. Without peer relationships and the development of these skills, socioemotional maturation may be blunted (Hall-Lande et al. 2007). Plus, adolescents are psychologically ill-equipped to deal with social risks (Casey, Jones, & Hare 2008), and their developing brains are sensitive to social traumas (Steinberg 2014). As such, being marginalized from peers during this particularly sensitive period of the life course may “stick” even when high school is over and regardless of what comes next.

### **Adolescent Social Marginalization as Accumulating Risk**

Another perspective is that feeling as though one does not fit in during high school is a point-in-time experience that should be positioned as part of a longer, more cumulative trajectory of adjustment and functioning. Early life social risks may compound and

accumulate across developmental time, potentially disrupting the transition to adulthood. In this way, by setting the stage for adult social functioning and long-term health and well-being, adolescent experiences of marginalization may have far-reaching effects because they lead directly to negative adult experiences. In other words, social risk in adolescence can disrupt the transition to adulthood. As a result, trajectories can be difficult to reverse once they have started.

When, for some reason, early social risks do not disrupt the transition to adulthood, then young people are able to recover. Certainly, not all people experience social risks in the same way, creating substantial variability in whether health penalties are short- or long-term (Schulenberg and Maggs 2002; McEwen 2002; Crosnoe and Johnson 2011). Some youth exposed to social risks may, therefore, experience only short-term disruptions in their mental health that are limited to adolescence and followed by gradual recovery. For these youth, successful transitions into young adulthood allow them to make connections and capitalize on opportunities to turn things around. At these turning points, they are able to leave the ups and downs of adolescence behind.

Whether adolescents can leave high school behind, therefore, may depend upon the pathways they take directly after high school. Mechanisms of accumulating risk—or recovery from early risk—likely include social pathways that stem from adolescence and promote young adult functioning and adjustment. With roots in adolescence and with continued development across during the transition to adulthood, these pathways influence the roles and statuses young people occupy in early adulthood. Successful transitions into these roles and statuses, thus, promote recovery, whereas poor transitions into these roles and statuses facilitate the accumulation of risk (Hogan and Astone 1986).

Two examples of such social pathways are postsecondary educational attainment and romantic relationships. As young people transition into adulthood, some will enter

college while others will transition directly to the labor force. The transition from high school to college and/or full-time employment is thus a change in status and setting that may deflect or intensify general trajectories of adjustment and functioning. Such changes then represent opportunities to shift directions (George 1993; Elder 1998). Going to college can promote a positive shift in the mental health trajectories of youth who were marginalized from peers in high school by offering a fresh start and exciting new opportunities. Previously disconnected high school students have a chance to meet new people, make new friends, and navigate a new social setting. Beyond the social benefits of a college education, the economic and health benefits of a college education are well-understood (Mirowsky and Ross 2003; Goldin and Katz 2008). Thus, marginalized high school students who do manage to overcome the odds and attend college (see Crosnoe 2011) may enjoy more positive psychological health when they enroll in (or graduate from) college. On the other hand, those marginalized youth who do not attend college, as the odds suggest, may miss opportunities for positive social experiences that they need to redirect their problematic trajectories of mental health.

Just as college-going adults are advantaged, so too are coupled adults advantaged compared to unpartnered adults. As adolescents mature, they seek more intimate, longer-lasting romantic relationships, and committed unions such as marriage and cohabitation become of great importance in adulthood (Collins and vanDulmen 2006; Collins, Welsh, and Furman 2009). Committed relationships also offer social and emotional support, promoting positive psychological well-being (Waite and Gallagher 2000; Williams 2003; Umberson, Thomeer, and Williams 2013). For adolescents who were disconnected from peers in high school, committed young adult relationships may step in to provide socioemotional relief and help declining mental health to rebound. Alternatively, disconnected youth may not be gaining relationship experience in adolescence that helps

them to form healthy committed relationships across the transition to adulthood. Research suggests that peer relationships set up adolescents for healthy romantic relationships. Peer networks support the formation of romantic ideals and encourage adolescent dating (Connelly, Furman, and Konarski 2000; Cavanagh 2007); moreover, positive peer experiences are associated with better quality romantic relationships as early as adolescence (Roisman et al 2009). Thus, adolescent peer groups help to socialize young people into their roles of romantic partners in adulthood. Without the support of peers, adolescents may not develop the necessary toolkit for relationship formation. As such, they may be ill-equipped to transition into healthy adult unions, and the problematic trajectories of mental health will continue.

Importantly, gender plays a critical role in this life course framework given the gendered social lives of adolescent girls and boys. Girls are more vulnerable to the ups and downs of adolescent social life, and high school social marginalization may, therefore, be more likely to stick for girls than for boys. During adolescence, a gender difference in mental health emerges, disadvantaging girls and persisting into young adulthood (Nolen-Hoeksema 1990; Cyranowski et al. 2000). Since girls are generally more sensitive to relationship dynamics in adolescence compared to boys (Rudolph and Conley 2005; Giordano 2003), the female disadvantage in mental health that persists well beyond adolescence suggests that getting off-track early on may be more detrimental to the psychological health of girls. As such, socially marginalized girls may be more likely than boys to follow patterns of accumulating risk.

Overall, the direction and intensity of life course trajectories can be deflected when young people transition into new settings or roles. Thus, education and romantic involvement in young adulthood may act as pathways that lead to more positive psychological well-being for disconnected adolescents. Still, life course trajectories are

often highly cumulative. Transitioning into positive young adult roles may be difficult without the foundation set in adolescence for academic and romantic success.

### **Study Aims and Hypotheses**

Working from a life course perspective, this study focuses on the potential long-term risk that follows high school social marginalization. Considering subjective and objective marginalization, intermittent and persistent experiences with not fitting in, and gender differences across aims, this study has two specific goals.

The first is to evaluate the linkages between social marginalization in high school and long-term trajectories of mental health. The hypothesis is that social marginalization—especially persistent and subjective—will be associated with risky trajectories of depressive symptoms across adolescence into adulthood, particularly for girls. The second aim is to adjudicate between the life course mechanisms (i.e., sensitive period or accumulating risk) by which social marginalization in high school is associated with long-term trajectories of psychological well-being by examining whether these associations are affected (accumulating risk) or not (sensitive period) by the consideration of young adult social adjustment.

## **METHOD**

### **Data and Sample**

The National Longitudinal Study of Adolescent to Adult Health (Add Health) is a school-based study of a nationally representative sample of adolescents in grades 7 through 12 in 1994-1995 (Harris et al. 2009). Schools included in the study were selected by region, urbanicity, school size, school type, and racial composition based on a stratified sampling design. In-school data collection launched in 1994 with a survey of 90,118 students in 132 middle and high schools across the U.S. This survey created a sampling frame for a

nationally representative sample of 20,745 adolescents, who were followed into young adulthood over the course of four waves. These respondents and their parents participated in an in-home interview in 1995 when respondents were ages 12 to 18. Additional interviews of the respondents were then conducted in 1996 (Wave II;  $n = 14,738$ ), 2001-2002 (Wave III;  $n = 15,197$ ), and 2007-2008 (Wave IV;  $n = 15,701$ ). The ages across waves were: 11 to 18 (Wave I), 12 to 18 (Wave II), 18 to 26 (Wave III), and 24 to 32 (Wave IV).

To distinguish developmental differences and to account for the fact that adolescents often make institutional transitions between middle and high school, the analytical sample for this study started with all adolescents who were in high school at Wave I, filtering out 5,434 respondents. The sample was further narrowed to respondents with valid longitudinal sampling weights (necessary to adjust for study design effects and correct for differential attrition across waves; another 4,436 respondents filtered out of the sample). Six additional respondents were missing on all measures of social marginalization, the dependent variable in analyses and were therefore excluded from the sample. Thus, the final analytical sample for this study included 10,869 adolescents.

## **Measurement**

*Depressive symptomatology.* Add Health included a modified Center for Epidemiologic Studies-Depression scale (CES-D) in all waves (Perreira et al. 2005). In each wave, youth reported the frequency of nine feelings in the past week (e.g., “You felt that you could not shake off the blues, even with help from your family and your friends,” “You felt sad”). Responses, which ranged from 0 (never or rarely) to 3 (most of the time or all of the time), were summed into a 27-point scale of increasing symptomatology. As described in the plan of analyses, CES-D measures across all four waves were combined through growth mixture modeling.

*Social marginalization in high school.* Five variables from the in-home interviews measured different aspects of not fitting in at school. At Waves I and II, adolescents were asked a series of questions including the degree to which they felt socially accepted, felt loved and wanted, got along with other students, felt close to people at their school, and felt like they were part of their school. The adolescents' responses ranged from 1 (strongly agree) to 5 (strongly disagree), such that higher values represented greater degree of not fitting in (Crosnoe 2011). Latent classes of marginalization experiences at Waves I and II were identified using these five continuous measures. To take advantage of longitudinal data, the latent classes for Waves I and II were combined using latent transition analysis (described in the Analytical Plan).

Importantly, feelings of not fitting in represent a subjective indicator of social marginalization. I also considered social network position as an objective indicator of social marginalization. Specifically, in Waves I and II, adolescents nominated up to 10 friends. A continuous indicator of number of male and female friends at Waves I and II (i.e., via adolescent self-report) was generated from this nomination data. Sensitivity analyses (not shown) used the number of friendship nominations an adolescent received as Wave I as an alternate, cross-sectional measure of objective marginalization. Results were consistent with those shown using the longitudinal measure.

*Young adult social adjustment.* Two indicators of young adult social adjustment were measured at Wave III, when respondents were ages 18 to 26 ( $M = 22.7$  years). First, a binary variable was created to measure whether the respondent was currently enrolled in or had graduated from a four-year college. Second, a categorical variable measured relationship status in young adulthood, with mutually exclusive categories dummy-coded to indicate whether the respondent was currently single, married, or cohabiting.

*Sociodemographic and school-level covariates.* Several controls were measured to account for sociodemographic position and possible spuriousness: gender (1 = female), age, race/ethnicity (non-Hispanic white, non-Hispanic black, non-Hispanic Asian, Hispanic, other/multi-racial), family structure (1 = lived with both biological parents at Wave I, 0 = other family form), student's grade point average at Wave I (conventional four-point scale), parent income at Wave I, and parent education (an ordinal variable ranging from 1, less than high school, to 5, post-college degree).

Additional school-level controls came from the school survey or were created by aggregating data across all respondents in a school, which was possible given that Add Health applied a census-like structure for each school. School-level controls included: school sector (1 = private school), region of school (South, West, Northeast, Midwest), school urbanicity (urban, suburban, rural), proportion of students in the school living below 185% of the Federal Poverty line, proportion of students in the school living with two-biological parents, proportion of white students in the school, school size, high school and feeder same school. A school-level "academic press" variable was also included to account for the emphasis on and pressure for achievement in schools. This measure was based on school means (aggregated from individual responses in the school on the in-school survey) of GPA (standard four-point scale), math/science enrollment, and educational expectations (likelihood the student will graduate from college) as well as the administrator report of the percentage of seniors who go to college (Crosnoe, Riegle-Crumb, and Muller 2007). Each item in the composite variable was standardized, and the final scale was the mean of the four z-scores.

## **Analytical Plan**

To proceed with analyses, I first identified social marginalization experiences and trajectories of depressive symptomatology in a structural equation modeling framework.

*Identifying socially marginalized youth.* Latent transition analysis (LTA) is an extension of latent class analysis (LCA), which identifies unobservable (i.e., latent) subgroups within a population. LTA has this same goal, but uses longitudinal data and identifies movement between subgroups over time. Here, LTA allowed me not only to identify groups of youth who felt marginalized in high school but also to see changes in social marginalization across two years of high school.

To identify subgroups and movement among them, I determined the appropriate number of latent classes at Wave I and also at Wave II using data on not fitting in at each wave. To do so, I ran LCAs for Wave I and Wave II separately, evaluating several criteria, including a loglikelihood-based test, Bayesian information criterion (BIC), and sample size adjusted BIC (ABIC), to determine the appropriate number of subgroups (or classes) in the study population. For log-likelihood, BIC, and ABIC measures of fit, smaller absolute values indicate better model fit. Thus, the relative change from the  $k$ -class to  $k-1$ -class is important. A Lo-Mendell Rubin (LMR) adjusted likelihood ratio test was also evaluated as a test of model fit. A significant  $p$ -value on the LMR test suggests that the  $k$ -class model is better-fitting than the  $k-1$ -class model. Here, I first present analyses for the subjective measures of marginalizing (i.e., not fitting in with peers). Per the relative changes in log-likelihood, BIC, and ABIC values and the LMR  $p$ -value, a two-class solution was the best fit of the data at Wave I. One class reported agreeing with the 5 measures of not fitting in (marginalized group; 16% of the sample), whereas the second class reported disagreeing with the 5 statements that captured not fitting in (integrated group; 84% of the sample). At Wave II, a two-class solution again fit the data best. The marginalized group comprised

21% of the sample, and the integrated group comprised 79% of the sample. The fit statistics that informed this determination are presented in Table 2.1. Figure 2.1 depicts means of the five measures of not fitting in across the Integrated and Marginalized groups resulting from LCA at Waves I and II.

Next, I used LTA to evaluate transition probabilities, or the likelihood of respondents to move from a given class at Wave I to another at Wave II. In doing so, LTA produced a categorical variable of four social marginalization categories: Integrated adolescents (felt they fit in at both waves; 76% of the sample) Marginalized adolescents (felt they did not fit in at both waves; 11% of the sample), Marginalizing adolescents (those who felt they fit in at Wave I but not at Wave II; 8% of the sample), and Integrating adolescents (those who felt they did not fit in at Wave I but did at Wave II; 5% of the sample). Figure 2.2 illustrates the proportion of respondents in the marginalized latent class at Waves I and II for each of the four categories of social marginalization. Transitions across classes are captured for the Marginalizing and Integrating groups, as shown in the crossover from high-to-low and from low-to-high proportions of marginalized respondents, respectively. These four categories of marginalization experiences were the independent variable in all analyses, and Integrated adolescents (as the most advantaged and majority) are the reference group. Sensitivity analyses were performed rotating the reference group.

This approach was then repeated for objective marginalization experiences. Given that marginalization experiences were measured with one continuous variable at Waves I and II, LCA was used to create a categorical variable of objective marginalization experiences over time. A four-class solution was the best fit of the data in terms of both relative decrease in fit statistics and substantively meaningful sample sizes in each class. The four groups were: marginalized youth (0 friends nominated at Wave I on average, 2 friends nominated at Wave II on average; 36% of the sample); adolescents in small

friendship groups (5 friends nominated at Wave I on average, 2 friends nominated at Wave II on average; 20% of the sample); adolescents in large friendship groups (9 friends nominated at Wave I on average, 8 friends nominated at Wave II on average; 5% of the sample); and, adolescents who transitioned from large to small groups (10 friends nominated at Wave I on average, 2 friends nominated at Wave II on average; 39% of the sample). Large friend groups were the reference category in subsequent analyses, although sensitivity analyses rotated the reference group, which was particularly important given that the Large friend group class was not the majority.

*Estimating trajectories of depressive symptomatology.* For the outcome, I needed to identify different types of depressive trajectories—the most common forms that trajectories took in the population rather than the specific trajectories experienced by each individual person. This approach called for growth mixture modeling (GMM), a technique that reflects the theory that several categories of trajectories may occur within a population. Thus, GMM identifies major heterogeneities in growth curves in a sample. Here, GMM produced a categorical variable of depressive symptomatology trajectories, grouping cases according to the various types of trajectories respondents followed from Waves I to IV. The appropriate number of categories (or classes) was determined through several statistics of model fit (i.e., loglikelihood, BIC, ABIC, and LMR  $p$ -value), which, moreover, were evaluated in conjunction with the usefulness of the model classes.

Table 2.2 provides the criteria used to determine how many types of trajectories of depressive symptomatology existed in the sample. In this case, the four-class model was the best fit of the data according to the LMR  $p$ -value and the relative changes in log-likelihood, BIC, and ABIC values. In addition to model fit, the four identified trajectories presented substantively meaningful and useful classes (see Figure 2.3). The four classes included: 1) adolescents with moderate levels of depressive symptoms that increased

slightly and then improved during the transition to young adulthood (labeled Tumultuous; 5% of the sample), 2) adolescents with moderate levels of depressive symptoms that increased more sharply during the transition to young adulthood (labeled Worsening; 7% of the sample), 3) adolescents with high levels of depressive symptoms that decreased sharply during the transition to young adulthood (labeled Improving; 9% of the sample), 4) and adolescents with low levels of depressive symptoms that decreased during the transition to young adulthood (labeled Steady). Steady was the majority group, accounting for nearly 80% of the sample. The dependent variable in subsequent analyses was the class of depressive trajectory, with the Steady trajectory as the reference group.

*Linking social marginalization to unhealthy trajectories.* Once social marginalization experiences and trajectories of depressive symptomatology were identified, analyses to address the study aims were completed in two steps. First, to address Aim 1 and determine whether social marginalization in high school was associated with problematic trajectories of psychological distress across the transition to adulthood, multinomial logistic analyses regressed trajectories of depressive symptomatology on categories of social marginalization. Second, to investigate Aim 2 and ascertain whether this association was mediated through young adult social adjustment, I tested for significant indirect pathways between marginalization and depressive trajectories by indicators of young adult social adjustment (educational attainment and relationship status). To do so, I ran multinomial regression analyses including markers of young adult social adjustment—specifically, educational attainment and relationship status—and assessing attenuation of the focal associations between marginalization and depressive trajectories. Finally, I tested for significant mediation using a model constraint technique, as described below.

Importantly, to evaluate gender differences in these pathways, multinomial logistic regression models were estimated for the full analytical sample and then separately by

gender. Gender differences were also formally tested by estimating interaction effects. I present results for gender-stratified models and discuss them in light of statistically significant gender differences.

All analyses were conducted in Mplus statistical software (Muthén and Muthén 2008). Full information maximum likelihood estimation (FIML) accounted for missingness, so that all cases in the analytical sample were retained even if they had missing data on individual variables. FIML fits the covariance structure model directly to the observed and available raw data, thereby specifying the variances of exogenous variables to avoid listwise deletion. The cluster function in Mplus adjusted standard errors to account for students being nested within schools per the Add Health sampling design. Longitudinal sampling weights were applied in all analyses to address differential probability of being sampled and differential attrition across waves. Traditional levels of statistical significance ( $p < .05$  or greater) will be used as the benchmark for identifying significant trends across analyses. Standardized beta coefficients are shown.

Given that the focal variables in all models were categorical and because I adjusted for Add Health's complex survey design in analyses, Mplus required the MLR estimator and Monte Carlo integration (Muthén and Muthén 2008). Monte Carlo integration is a technique that approximates estimates by relying on random sampling. With the use of Monte Carlo integration, however, path analysis (i.e., to address mediation by educational attainment and relationship status) was not possible. As a result, I used the model constraint command to test for significant indirect effects, which multiplied the coefficients for the pathway between the dependent and independent variables and that between the dependent and mediating variables. Then, I evaluated whether this indirect coefficient (i.e., marginalization on depressive trajectories via young adult social adjustment) was a significant predictor of the outcome.

## RESULTS

Table 2.3 presents descriptive statistics for the full sample and by subjective experiences of social marginalization. Integrated adolescents had the highest frequency of Steady trajectory members (85%), and the lowest frequency of Tumultuous (4%), Worsening (6%), and Improving (5%) trajectory members. Additionally, Integrated youth had the highest frequency of respondents who were currently enrolled in, or had graduated from, a four-year college (36%).

On the other hand, Marginalized adolescents had the lowest frequency of Steady membership (59%), but the highest frequency of Improving membership (25%), which was characterized by elevated depressive symptoms in adolescence. They also had the highest frequency of Worsening membership (10%), characterized by increasing depressive symptoms across the transition to adulthood.

The distribution of Integrating and Marginalizing adolescents in the Improving and Worsening trajectories was similar (13-16% and 9%, respectively), although Integrating adolescents had the highest frequency of Tumultuous trajectory members (nearly 7%), the lowest frequency of college-attendees or graduates (23%), and the highest frequency of young adults in cohabiting relationships (20%).

Table 2.4 presents descriptive statistics by objective experiences of social marginalization. Adolescents in Large to Small and consistently Large friend groups had the highest frequency of Steady trajectories (approximately 80%). Marginalized adolescents, on the other hand, had the lowest frequency of Steady trajectories (77%) and the highest frequency of Worsening (8%) and Improving (10%) trajectories. Aside from distinctions highlighting the advantage of large networks and the clear disadvantage of marginalization in high school, adolescents across the Small, Large to Small, and Large

friend groups had similar frequencies of Tumultuous and Improving trajectories (about 5% and 8%, respectively).

Similarly, objectively Marginalized adolescents stood out as having the lowest frequency of college attendance and/or graduation (26%) and the highest frequency of cohabitation (18%) compared to the other social experiences. Strong distinctions in young adult social adjustment among the remaining three classes of marginalization experiences were less apparent. Although Large to Small friend groups had the highest frequency of college attendance or graduation (42%), this group was similar to Small friend groups in terms of young adult relationship status. Additionally, although the Large Friend groups had the lowest frequency of young adult cohabiting unions (13%), they also compared to the Small friend groups in terms of college attendance and graduation (nearly 35%).

Together, these descriptive means pointed to a clear advantage in the psychological trajectories of youth who felt consistently integrated into the social scenes of their high schools, particularly for subjective marginalization experiences. Youth who felt marginalized—and those who experienced changes in the degree to which they fit in with peers—appeared less likely to occupy advantageous young adult social roles and, furthermore, seemed more at risk for problematic trajectories of depressive symptoms across the transition to adulthood.

### **Social Marginalization and Trajectories of Depressive Symptoms**

Turning to the multivariate models, my first aim was to document the association between social marginalization experiences in high school and trajectories of depressive symptoms across the transition to adulthood. To this end, multinomial logistic models regressed classes of trajectories of depressive symptomatology on adolescent marginalization experience status and all individual- and school-level covariates. I begin

this discussion with the results for the subjective measures of social marginalization, which are presented in Table 2.5 for the full sample and separately by gender.

In general, relative to Integrated marginalization experiences, being Marginalized in high school was associated with greater risk for membership in Tumultuous ( $\beta = .311$ ;  $p < .01$ ), Worsening ( $\beta = .416$ ;  $p < .001$ ), and Improving ( $\beta = .597$ ;  $p < .001$ ) trajectories as compared to Steady trajectories. Exponentiation of the unstandardized regression coefficients suggested that Marginalized adolescents had greater than two times the risk of integrated adolescents of Tumultuous trajectories (compared to Steady trajectories), nearly three times the risk of Worsening trajectories, and greater than six times the risk of Improving trajectories. Patterns were similar for youth with less consistent experiences of marginalization. Integrating adolescents had significantly higher risk than Integrated youth of Tumultuous ( $\beta = .280$ ;  $p < .01$ ), Worsening ( $\beta = .227$ ;  $p < .001$ ), and Improving ( $\beta = .325$ ;  $p < .001$ ) trajectories compared to Steady trajectories. Compared to Integrated adolescents Marginalizing adolescents, also, had greater risk for Worsening ( $\beta = .225$ ;  $p < .001$ ), and Improving ( $\beta = .295$ ;  $p < .001$ ) trajectories than Steady trajectories.

Heightened risk for Tumultuous and Worsening trajectories compared to Steady trajectories suggested that the psychological well-being of adolescents who experienced marginalization in high school did not recover from this social risk. Importantly, however, adolescents who experienced marginalization showed greatest risk for Improving trajectories, those marked by heightened levels of depressive symptoms in adolescence. Still, these trajectories are characterized by improvement, suggesting that, although risks of being socially disconnected in high school were pronounced in the short term, marginalization did not uniformly place adolescents at risk in the long term.

When stratifying by gender, adolescent girls had similar results to the full sample with two exceptions. First, adolescent girls who became more integrated across Waves I

and II (Integrating) did not have significantly greater risk of Tumultuous trajectories compared to girls who felt consistently integrated. Second, compared to Integrated girls, adolescent girls who became less integrated across Waves I and II (Marginalizing) had significantly greater risk of Tumultuous trajectory membership ( $\beta = .216$ ;  $p < .05$ ) than Steady trajectory membership.

Adolescent boys also differed from the full sample in notable ways. Relative to Integrated boys, Marginalized boys were not at significantly greater risk for Tumultuous trajectories as compared to Steady trajectories (supported by a statistically significant interaction between gender and Marginalized experiences). Additionally, compared to Integrated boys, Integrating boys were not at greater risk for Worsening trajectories than Steady trajectories. Integrating boys, however, were significantly more likely to be members of the Tumultuous trajectory ( $\beta = .314$ ;  $p < .01$ ) than members of the Steady trajectory. Movement in and out of marginalization experiences, therefore, appeared to differentially impact the long-term psychological distress of girls and boys, although girls with experience of marginalization were more consistently disadvantaged. Whereas Marginalizing experiences were more detrimental to girls' long-term trajectories of depressive symptomatology, Integrating experiences placed boys at greater risk. For both genders, any marginalization experience (compared to consistent integration) was associated with significantly increased risk of Improving trajectories.

Turning to the objective measures of social marginalization, the latent classes for friendship nominations over time did not significantly predict depressive trajectory membership for the full sample or for girls. Among boys, consistently marginalized youth had significantly greater risk for Improving trajectories ( $\beta = 1.055$ ;  $p < .05$ ) than Steady trajectories compared to boys in consistently large friend groups.

Consistent with my first hypothesis, adolescent girls and boys who felt as though they did not fit in during high school were at greater risk for problematic trajectories of depressive symptoms across the transition to adulthood. These patterns differed slightly by gender. These patterns were slightly stronger for persistent marginalization during high school, and they were almost completely confined to subjective (rather than objective) experiences of social marginalization during high school.

### **The Role of Young Adult Social Adjustment**

To better understand the mechanisms by which social marginalization in high school was associated with depressive trajectories into adulthood, I turned to analyses addressing the second aim of this study. Here, my goal was to contrast life course mechanisms of sensitive periods and accumulating risk by testing mediation by young adult social adjustment. Specifically, I tested, by gender, whether young adult educational and relationship statuses were indirect paths through which marginalized adolescents experienced heightened (or reduced) risk for long-term mental health penalties. Given that only subjective experiences of social marginalization in high school were associated with longer-term trajectories of depressive symptoms, these analyses focused on the latent classes of feelings of not fitting in. I present regression models incorporating young adult social adjustment, and then discuss formal tests for mediation using model constraints.

Table 2.6 builds on the Aim 1 analyses (Table 2.5) by controlling for whether the respondent was currently enrolled in or had graduated from a four-year college at Wave III. For the full sample, the focal associations between social marginalization and depressive trajectories were only slightly attenuated, despite the fact that four-year college attendance was associated with reduced risk of Tumultuous and Worsening depressive trajectories ( $\beta = -.423, p < .001$ ; and  $\beta = -.249, p < .001$ , respectively) compared with

Steady trajectories. Notably, however, coefficients for the regressions of Tumultuous, Worsening, and Improving trajectories on marginalization experiences were reduced for all adolescents with peer experiences categorized as Marginalized and Marginalizing (for Integrating youth, attenuation was less apparent).

When stratified by gender, the association between Marginalized experiences in high school and Tumultuous trajectories among girls was attenuated ( $\beta$  reduced from .441 to .352; statistical significance dropped from  $p < .01$  to  $p < .05$ ). Indeed, for girls, college attendance was associated with lower risk of Tumultuous trajectory membership ( $\beta = -.589$ ,  $p < .001$ ) compared with Steady trajectory membership. Exponentiation of the unstandardized regression coefficient suggested that being enrolled in or having graduated from a four-year college reduced risk of Tumultuous trajectories for girls by 70%. Male-specific models showed that educational attainment did not attenuate the links between social marginalization and depressive trajectories for boys, nor was educational attainment associated with trajectories of depressive symptoms.

These findings suggested that, although the focal associations between social marginalization and depressive trajectories remained statistically significant, risk for problematic depressive trajectories was reduced among marginalized youth who attended college. To extrapolate on these regression models, I used model constraints to test for statistically significant indirect effects. Several significant indirect pathways emerged.

Marginalized adolescents who were enrolled in or had graduated from a four-year college at Wave III had significantly reduced risk of membership in Tumultuous and Worsening trajectories ( $p < .01$ ) compared with Steady trajectories. This pattern held true for the full sample and for girls ( $p < .01$  for Tumultuous trajectory membership;  $p < .05$  for Worsening trajectory membership). Marginalized adolescents with young adult college

enrollment or graduation also had significantly lower risk of Improving trajectories ( $p < .001$  for full sample and girls;  $p < .05$  for boys) compared with Steady trajectories.

Among Marginalizing youth, young adult educational attainment mediated risk for membership in problematic depressive trajectories, but with some variation by gender. For the full sample, Marginalizing youth who were enrolled in or had graduated from a four-year college had reduced risk of Worsening trajectories ( $p < .01$ ) relative to Steady trajectories. This was also true for girls ( $p < .01$ ) and, to a lesser extent, boys ( $p < .05$ ). For boys with Marginalizing experiences in high school, enrollment or graduation from four-year college also mediated risk for Tumultuous trajectory membership ( $p < .001$ ) compared with Steady trajectory membership. For the full sample and for boys and girls when considered separately, Marginalized and Marginalizing adolescents had significantly lower likelihood of membership in Improving trajectories ( $p < .001$  for Marginalized and Marginalizing adolescents in the full sample;  $p < .001$  for Marginalized girls;  $p < .01$  for Marginalizing girls;  $p < .05$  for Marginalized boys;  $p < .01$  for Marginalizing boys). The association between depressive trajectories and social marginalization for Integrating youth was not significantly mediated by enrollment or graduation from a four-year college.

Table 2.7 incorporates young adult relationship status into Aim 1 analyses. Results show little evidence of attenuation between social marginalization and depressive trajectories when Wave III relationship status was taken into account. Turning to models applying constraints to test for significant mediation, one significant indirect pathway emerged. Specifically, for Marginalized girls relative to Integrated girls, being in a married or cohabiting relationship at Wave III was associated with significantly reduced risk of Improving trajectory membership ( $p < .05$ ) compared with Steady trajectory membership.

In sum, I found partial support for my second hypothesis. Among Marginalized and Marginalizing adolescents, being enrolled in or having graduated from a four-year college

at Wave III significantly reduced the risk of problematic depressive trajectory membership. Specifically, when Marginalized girls and boys transitioned into four-year colleges after high school, their risk of Tumultuous and Improving trajectories was reduced. Marginalized girls, furthermore, experienced a reduced risk of Worsening trajectories. Similarly, when Marginalizing girls and boys transitioned to four-year colleges, their risk for Worsening and Improving trajectories declined. Marginalizing boys, additionally, had lower risk for Tumultuous trajectories when they transitioned into four-year colleges. On the other hand, relationship status at Wave III did little to mediate the link between marginalization in high school and depressive trajectories. The strong, significant direct links between social marginalization and depressive trajectories that withstand controls for young adult social adjustment, and the weak evidence of mediation by young adult social statuses, point to support for the sensitive period hypothesis, rather than the accumulating risk hypothesis.

## **DISCUSSION**

Social risks in high school may be particularly detrimental for the psychological well-being of young people given the developmental plasticity of adolescence (Steinberg 2005). To understand how adolescent social risks linger into adulthood, life course theory points us to two potential mechanisms. First, there may be sensitive periods during which individuals are particularly vulnerable to risks that can alter their paths and have lingering effects even when those risks fade (Ben-Shlomo and Kuh 2002). Second, trajectories and their embedded transitions may lead to the accumulation of risk (George 1993; Elder 1998). This model instead stresses that early risks may be maintained over time by disrupting subsequent transitions, and, conversely, that successful transitions out of risky periods can help individuals recover from earlier risks. In this study, I evaluate the long-term

trajectories of socially marginalized adolescents and analytically test longitudinal data on social marginalization during high school and depressive symptoms across the transition to adulthood to juxtapose these life course models.

The first hypothesis centered on documenting the long-term mental health penalties of social marginalization in adolescence. In line with this hypothesis, adolescents who felt as though they did not fit in during high school had a greater likelihood of displaying problematic trajectories of depressive symptoms across the transition to adulthood. Specifically, subjective (but not objective) marginalization experiences in high school were linked with long-term mental health penalties as evidenced in their association with Tumultuous and Worsening depressive trajectories. Perhaps, therefore, subjectively marginalized youth are also those likely to report feelings of psychological distress, indicating potential selection. Still, the null association between objective marginalization and depressive trajectories is consistent with previous research suggesting that a person's feelings or subjective experiences may matter more for health and well-being than their objective positions or experiences (e.g., Lyubomirsky, King, and Diener 2005; Diener and Chan 2011). Patterns of subjective experiences of marginalization and trajectories of depressive symptoms, furthermore, varied slightly by gender. As expected, the linkages between not fitting in with peers during high school and long-term mental health penalties disadvantaged girls more than boys. Still, the strongest association between having experience with marginalization and depressive trajectory among adolescents—for boys and girls—was for membership in the Improving trajectory. This finding suggests that the psychological well-being of some youth who were socially disconnected in high school improved as they transitioned to adulthood.

The second hypothesis focused on mechanisms by testing the mediatory role of young adult social adjustment and functioning. I found limited support for the

accumulating risk hypothesis and more support for the sensitive period hypothesis. Among Marginalized and Marginalizing adolescents, being enrolled in or having graduated from a four-year college at Wave III significantly reduced the risk of problematic depressive trajectory membership. At the same time, despite significant mediation, the direct effect between social disconnection in high school and depressive trajectories across the transition to adulthood remained strong, again suggesting that adolescence is indeed a sensitive period that can trigger long-term mental health trajectories even after the risks of adolescence are over. This pattern held for both boys and girls.

Together, these findings not only point to the potential for long-term scarring following social disconnection in high school, but also suggest recovery for some marginalized youth via the association between not fitting in and Improving trajectory membership. This link, however, was only modestly explained by the young adult statuses considered, which begs the question: why might education and relationships in young adulthood not account for the focal link between high school social disconnection and long-term psychological distress? To account for time ordering and ensure that young adult social adjustment was measured prior to the completion of depressive trajectories analytically, I captured young adult social statuses using data from Wave III of Add Health. At time of Wave III interview, respondents were in the age range of 18 to 26, with the average age of 22.7 years. The younger respondents in the sample, therefore, were still navigating the transition out of high school and only be beginning to navigate union formation. Indeed, young people are taking longer to move into employment and marriage than earlier cohorts of young adults (Furstenberg 2010). Possibly, then, those who were marginalized in high school that go on to complete college or form committed unions are not yet reaping the benefits of advantageous statuses that likely manifest later in adulthood.

This limitation of respondent's age when young adult statuses were measured may be particularly relevant for interpreting the lack of mediation by relationship status. The median age at marriage has been slowly rising for decades, a trend particularly relevant for college educated young adults who are finishing their educations and starting their careers in their early twenties (Cherlin 2010). The most advantaged women and men in my sample, then, would likely not be considering marriage at Wave III. Additionally, while median age of cohabitation has remained stable over the past several decades (Manning, Brown, and Payne 2014), cohabiting unions tend to be of shorter duration. Younger age at pre-marital cohabitation is also a significant predictor of marriage dissolution (Kuperberg 2014). Thus, although nearly 40% of my analytical sample reported being in a marriage or cohabiting union at Wave III, only about 20% of the young adults who report being married or currently cohabiting also report being enrolled in or having graduated from a four-year college (compared to 34% of the young adults in the full sample). These married and cohabiting young adults, furthermore, report lower average family incomes in adolescence than the average adolescent in the sample. As such, perhaps the young adults who marry and cohabit at younger ages are disadvantaged in other ways that hinder the recovery of their psychological trajectories.

The possibility remains, however, that committed unions in young adulthood simply cannot undo the stress resulting from isolation and disconnection experienced during high school, which is supported by previous research finding little evidence that marriage and cohabitation provide benefits over being single when it comes to social ties and social relationships (Musick and Bumpass 2012). Nevertheless, measuring relationships as current status in young adulthood likely overlooks relationship quality and relationship dynamics that are equally important to mental health (Umberson et al. 2006; Thomeer, Pudrovskaya, and Umberson 2013). Young people who have experienced social

marginalization, for example, may be less secure in their romantic relationships. In my sample, for example, nearly 80% of Integrated young people who reported being in a romantic relationship at Wave III were “very satisfied” in their relationship and 74% report thinking this relationship is permanent, compared to closer to 70% of Marginalized young people in relationships at Wave III who were satisfied and thought the relationship was permanent (t-tests indicated these were statistically significant differences). A deeper conceptualization of relationship experience in young adulthood may therefore provide a more complete illustration of how partnering after high school can influence the link between marginalization and mental health. Accordingly, future research should consider other pathways by which marginalized adolescents are able to follow healthy trajectories in adulthood. Perhaps, engaging in healthy behaviors or transitioning to parenthood might mediate the link between high school marginalization and long-term depressive symptoms.

A second question emerging from these results involves the degree to which not fitting in with peers during high school signifies a lack of resources in the school context. For example, are youth who feel socially disconnected from peers able to find other sources of social support and opportunities for socioemotional development in their school settings that promote recovery (e.g., as seen in downward pattern of depressive symptoms that characterizes the Improving trajectory)? To be sure, beyond controlling for individual- and school-level characteristics, this study does little to contextualize the environments where adolescents experience marginalization. Socially disconnected youth may be able to tap into resources in their school environments that aid improvement of psychological well-being. The heightened social orientation of adolescence means that young people are vulnerable to getting hurt when social problems occur, and social problems are common experience during high school (Larson & Richards 1991; Giordano 2003; Collins, Welsh, & Furman 2009; Crosnoe & Johnson 2011). High schools and the resources they provide

students—social and institutional—have long been understood to matter for the development of young people (Coleman 1961; Eccles and Roeser 2011). Different schools may provide different resources and opportunities for youth facing stressors such as marginalization, and these resources and opportunities have long been seen as amenable to intervention in educational policy. When school-based resources provide marginalized adolescents with the social support they lack in peer relationships, these youth may be better-suited to recover and display healthy psychological trajectories into adulthood. For example, extracurricular activities promote social integration (Schaefer et al. 2011) and having adult mentors during high school is associated with more positive psychological well-being (DuBois and Silverthorn 2005). Risks and resources within schools may interact, therefore, as when having an adult mentor at school can help adolescents cope with social disconnection.

To evaluate risk and consider resiliency, researchers often apply life course theory to understand how social conditions and risk in early life can have consequences that trickle across time and place, influencing health and well-being long after the risk has dissipated (Hayward and Gorman 2004). Here, by contrasting life course theory's models of sensitive periods and accumulating, this study identified adolescence as a sensitive time during which not fitting in with peers can deter the mental health of young people. The perils of high school social turbulence often portrayed in mainstream media, therefore, are not overstated. High school social risks have the capacity to stick, undermining well-being long after high school is left behind. By highlighting the long-term implications of social disconnection in high school, my conclusions support the necessity of positioning adolescent social risks as central to the tapestry of early life experiences that reach across the life course to shape population health disparities.

Table 2.1: LCA Criteria for Class Determination

	1 Class	2 Classes	3 Classes	4 Classes
<b>WAVE I</b>				
Loglikelihood	-70266	-63773	-53823	-36100
# parameters	10	16	22	28
BIC	140626	127695	107849	72460
ABIC	140594	127644	107780	72371
LMR <i>p</i> -value		0.000	0.204	1.000
Entropy		0.988	0.999	0.999
Distribution of respondents into identified classes		84.3%, 15.7%	59.3%, 15.7%	25.0%, 25.0%, 4.7%, 11.0%, 59.3%
<b>WAVE II</b>				
Loglikelihood	-44292	-41738	-37190	-36544
# parameters	10	16	22	28
BIC	88673	83619	74577	73338
ABIC	88641	83568	74508	73249
LMR <i>p</i> -value		0.000	0.157	0.124
Entropy		0.793	1.000	0.947
Distribution of respondents into identified classes		79.3%, 20.7%	50.3%, 40.2%, 44.8%, 40.2%, 9.5%	5.6%, 9.5%

Table 2.2: GMM Criteria for Class Determination

	1 Class	2 Classes	3 Classes	4 Classes	5 Classes
Loglikelihood	-105389	-104331	-103779	-103189	-103189
# parameters	10	14	18	22	26
BIC	210872	208792	207724	206583	206620
ABIC	210840	208748	207667	206543	206538
LMR <i>p</i> -value		0.000	0.000	0.001	0.500
Entropy		0.877	0.828	0.826	0.850
Distribution of respondents into identified classes		9.4%, 90.6%	8.5%, 8.2%, 83.3%	4.8%, 6.6%, 8.6%, 80.0%	4.3%, 80.2%, 7.9%, 0.0%, 7.5%

Table 2.3: Descriptive Statistics for Full Sample and by Category of Subjective Marginalization Experience

	Full Sample <i>n</i> = 10,869 Mean/ %	Marginalized <i>n</i> = 1,225 Mean/ %	Integrated <i>n</i> = 8,259 Mean/ %	Integrating <i>n</i> = 521 Mean/ %	Marginalizing <i>n</i> = 864 Mean/ %
Depressive trajectory					
Tumultuous	4.76%	6.37%	4.18%	6.53%	6.94%
Worsening	6.62%	10.29%	5.70%	9.02%	8.80%
Improving	8.65%	24.65%	5.35%	16.31%	12.85%
Steady	79.97%	58.69%	84.77%	68.14%	71.41%
Young adult social adjustment (WIII)					
Enrolled/graduated 4-year college	34.11%	28.16%	36.09%	23.10%	35.28%
Relationship status					
Married	20.88%	21.29%	21.37%	17.01%	18.65%
Cohabiting	16.38%	17.81%	15.85%	20.19%	15.06%
Single	62.74%	60.90%	62.77%	62.79%	66.29%
Sociodemographic controls					
Male	47.16%	41.31%	48.29%	41.65%	48.03%
Two-bio parent household (WI)	52.58%	47.76%	53.80%	56.62%	45.37%
Age (WI)	16.38	16.54	16.42	16.02	16.02
Parental income (WI)	47.18	44.70	47.84	46.98	44.51
Parental education					
Less than high school	13.21%	14.90%	12.74%	14.26%	14.76%
High school	28.42%	28.13%	28.44%	28.11%	28.78%

Table 2.3 continued on following page

Table 2.3 continued from previous page

	Full Sample <i>n</i> = 10,869 Mean/ %	Marginalized <i>n</i> = 1,225 Mean/ %	Integrated <i>n</i> = 8,259 Mean/ %	Integrating <i>n</i> = 521 Mean/ %	Marginalizing <i>n</i> = 864 Mean/ %
Some college	22.03%	20.28%	22.12%	21.29%	24.02%
Bachelor's degree	23.09%	24.25%	22.88%	25.50%	21.95%
Post-baccalaureate	13.26%	12.43%	13.82%	10.40%	10.49%
Race/ethnicity					
Non-Hispanic White	51.65%	51.10%	52.33%	47.02%	48.73%
Non-Hispanic Black	19.08%	14.86%	19.65%	17.85%	20.37%
Hispanic	17.64%	19.51%	17.01%	20.15%	19.44%
Non-Hispanic Asian	6.62%	8.41%	6.25%	10.75%	5.09%
Other/multi-racial	5.01%	6.12%	4.76%	4.22%	6.37%
Hs GPA at WI	2.75	2.58	2.80	2.73	2.52
School level controls					
Private school	7.00%	6.12%	7.33%	8.25%	4.40%
School size (hundreds)	14.01	14.57	13.84	14.03	14.77
High school and feeder same	23.96%	22.20%	24.06%	28.60%	22.69%
Urbanicity					
Urban	28.20%	27.10%	28.43%	27.64%	27.89%
Suburban	54.08%	56.41%	53.75%	53.55%	54.28%
Rural	17.72%	16.48%	17.82%	18.81%	17.82%
Region					
West	24.92%	29.47%	23.74%	28.02%	27.89%
Midwest	26.12%	24.90%	26.31%	24.95%	6.74%

Table 2.3 continued on following page

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	Full Sample <i>n</i> = 10,869 Mean/ %	Marginalized <i>n</i> = 1,225 Mean/ %	Integrated <i>n</i> = 8,259 Mean/ %	Integrating <i>n</i> = 521 Mean/ %	Marginalizing <i>n</i> = 864 Mean/ %
South	35.96%	31.76%	37.28%	32.82%	31.25%
Northeast	12.99%	13.88%	12.66%	14.20%	14.12%
Proportion of students under 185% FPL	0.38	0.38	0.38	0.38	0.38
Proportion two bio parent home	0.51	0.51	0.51	0.52	0.50
Academic press	-0.10	-0.11	-0.10	-0.12	-0.11
Proportion of White students	0.51	0.48	0.51	0.90	0.50

Table 2.4: Descriptive Statistics for Full Sample and by Category of Objective Marginalization Experience

	Full Sample	Marginalized	Small Groups	Large to Small Groups	Large Groups
	<i>n</i> = 10,869	<i>n</i> = 3,911	<i>n</i> = 2,186	<i>n</i> = 4,209	<i>n</i> = 563
	Mean/ %	Mean/ %	Mean/ %	Mean/ %	Mean/ %
Depressive trajectory					
Tumultuous	4.76%	5.24%	4.80%	4.21%	5.33%
Worsening	6.62%	7.80%	6.82%	5.68%	4.80%
Improving	8.65%	9.56%	7.46%	8.41%	8.70%
Steady	79.97%	77.40%	80.92%	81.71%	81.17%
Young adult social adjustment (WIII)					
Enrolled/graduated 4-year college	34.11%	25.66%	32.46%	42.41%	34.56%
Relationship status					
Married	20.88%	21.70%	19.69%	20.45%	22.91%
Cohabiting	16.38%	18.38%	15.23%	15.69%	13.01%
Single	62.74%	59.92%	65.09%	63.86%	64.08%
Sociodemographic controls					
Male	47.16%	54.77%	47.67%	40.37%	43.16%
Two-bio parent household (WI)	52.58%	49.55%	53.75%	53.69%	60.75%
Age (WI)	16.38	16.59	16.38	16.25	15.97
Parental income (WI)	47.18	43.61	46.91	50.39	47.29
Parental education					
Less than high school	13.21%	16.96%	13.10%	10.22%	11.15%
High school	28.42%	29.94%	29.11%	26.46%	30.22%

Table 2.4 continued on following page

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	Full Sample	Marginalized	Small Groups	Large to Small Groups	Large Groups
	<i>n</i> = 10,869	<i>n</i> = 3,911	<i>n</i> = 2,186	<i>n</i> = 4,209	<i>n</i> = 563
	Mean/ %	Mean/ %	Mean/ %	Mean/ %	Mean/ %
Some college	22.03%	20.25%	21.65%	23.37%	25.18%
Bachelor's degree	23.09%	21.97%	21.70%	24.75%	23.38%
Post-baccalaureate	13.26%	10.89%	14.44%	15.20%	10.07%
Race/ethnicity					
Non-Hispanic White	51.65%	47.58%	47.94%	55.81%	63.23%
Non-Hispanic Black	19.08%	20.05%	19.85%	19.10%	9.24%
Hispanic	17.64%	20.92%	18.53%	14.61%	14.03%
Non-Hispanic Asian	6.62%	6.37%	8.55%	5.44%	9.59%
Other/multi-racial	5.01%	5.09%	5.12%	5.05%	3.91%
Hs GPA at WI	2.75	2.61	2.77	2.85	2.79
School level controls					
Private school	7.00%	4.47%	7.14%	8.39%	13.68%
School size (hundreds)	14.01	15.38	14.19	12.99	11.36
High school and feeder same	23.96%	16.69%	26.03%	26.68%	25.22%
Urbanicity					
Urban	28.20%	32.37%	28.00%	26.78%	10.66%
Suburban	54.08%	53.80%	57.14%	55.62%	32.68%
Rural	17.72%	13.83%	14.87%	17.61%	56.66%
Region					
West	24.92%	31.45%	24.29%	17.82%	35.17%

Table 2.4 continued on following page

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	Full Sample	Marginalized	Small Groups	Large to Small Groups	Large Groups
	<i>n</i> = 10,869	<i>n</i> = 3,911	<i>n</i> = 2,186	<i>n</i> = 4,209	<i>n</i> = 563
	Mean/ %	Mean/ %	Mean/ %	Mean/ %	Mean/ %
Midwest	26.12%	26.03%	23.01%	24.78%	48.85%
South	35.96%	31.60%	38.11%	42.05%	12.43%
Northeast	12.99%	10.92%	14.90%	15.35%	3.55%
Proportion of students under 185% FPL	0.38	0.40	0.38	0.36	0.34
Proportion two bio parent home	0.51	0.50	0.51	0.51	0.56
Academic press	-0.10	-0.15	-0.10	-0.06	-0.05
Proportion of White students	0.51	0.48	0.49	0.53	0.62

Table 2.5: Multinomial Logistic Regression of Depressive Trajectory on High School Social Marginalization Category

	Tumultuous <i>Coefficient (SE)</i>	Worsening <i>Coefficient (SE)</i>	Improving <i>Coefficient (SE)</i>
<b>FULL SAMPLE</b>			
Marginalized	0.311** (0.095)	0.416*** (0.060)	0.597*** (0.036)
Integrating	0.280** (0.084)	0.227*** (0.063)	0.325*** (0.035)
Marginalizing	0.128 (0.082)	0.225*** (0.062)	0.295*** (0.041)
<b>GIRLS</b>			
Marginalized	0.441*** (0.119)	0.353*** (0.083)	0.599*** (0.047)
Integrating	0.217 (0.122)	0.299*** (0.079)	0.371*** (0.055)
Marginalizing	0.216* (0.089)	0.243** (0.083)	0.254*** (0.058)
<b>BOYS</b>			
Marginalized	0.012 (0.145)	0.478*** (0.087)	0.645*** (0.066)
Integrating	0.314** (0.111)	0.149 (0.097)	0.257*** (0.066)
Marginalizing	-0.023 (0.133)	0.216* (0.089)	0.384*** (0.065)

Note: standardized beta coefficients shown; \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; controlling for full set of individual- and school-level covariates;  $n = 10,869$  for full sample;  $n = 5,743$  for girls;  $n = 5,126$  for boys; reference group for marginalization experiences is Integrated; reference group for depressive trajectories is Steady

Table 2.6: Multinomial Logistic Regression of Depressive Trajectory on High School Social Marginalization Category and Young Adult Educational Attainment

	Tumultuous <i>Coefficient (SE)</i>	Worsening <i>Coefficient (SE)</i>	Improving <i>Coefficient (SE)</i>
<b>FULL SAMPLE</b>			
Marginalized	0.280** (0.089)	0.407*** (0.059)	0.595*** (0.036)
Integrating	0.256** (0.081)	0.224*** (0.062)	0.325*** (0.036)
Marginalizing	0.102 (0.076)	0.213** (0.063)	0.293*** (0.041)
Enrolled/graduated 4-year college	-0.423*** (0.083)	-0.249** (0.092)	-0.064 (0.078)
<b>GIRLS</b>			
Marginalized	0.352** (0.104)	0.341*** (0.081)	0.599*** (0.048)
Integrating	0.170 (0.103)	0.288*** (0.077)	0.372*** (0.056)
Marginalizing	0.153* (0.075)	0.224** (0.082)	0.254*** (0.057)
Enrolled/graduated 4-year college	-0.589*** (0.101)	-0.319** (0.117)	-0.014 (0.108)
<b>BOYS</b>			
Marginalized	0.011 (0.146)	0.475*** (0.087)	0.631*** (0.064)
Integrating	0.318** (0.112)	0.150 (0.096)	0.251*** (0.066)
Marginalizing	-0.024 (0.135)	0.211* (0.092)	0.373*** (0.065)
Enrolled/graduated 4-year college	-0.053 (0.147)	-0.124 (0.157)	-0.195 (0.133)

Note: standardized beta coefficients shown; \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; controlling for full set of individual- and school-level covariates;  $n = 10,869$  for full sample;  $n = 5,743$  for girls;  $n = 5,126$  for boys; reference group for marginalization experiences is Integrated; reference group for depressive trajectories is Steady

Table 2.7: Multinomial Logistic Regression of Depressive Trajectory on High School Social Marginalization Category and Young Adult Relationship Status

	Tumultuous <i>Coefficient (SE)</i>	Worsening <i>Coefficient (SE)</i>	Improving <i>Coefficient (SE)</i>
<b>FULL SAMPLE</b>			
Marginalized	0.306** (0.095)	0.414*** (0.059)	0.595*** (0.036)
Integrating	0.275** (0.081)	0.225*** (0.063)	0.322*** (0.035)
Marginalizing	0.131 (0.080)	0.225*** (0.061)	0.296*** (0.041)
Relationship status (ref: single)			
Married	-0.129 (0.102)	-0.077 (0.094)	0.114* (0.053)
Cohabiting	-0.191 (0.110)	-0.090 (0.087)	0.007 (0.053)
<b>GIRLS</b>			
Marginalized	0.441*** (0.119)	0.353*** (0.081)	0.593*** (0.047)
Integrating	0.219 (0.122)	0.300*** (0.081)	0.367*** (0.056)
Marginalizing	0.218* (0.089)	0.244** (0.082)	0.252*** (0.058)
Relationship status (ref: single)			
Married	-0.121 (0.134)	-0.088 (0.119)	0.103 (0.068)
Cohabiting	-0.076 (0.156)	-0.078 (0.119)	0.075 (0.067)
<b>BOYS</b>			
Marginalized	0.009 (0.142)	0.471*** (0.085)	0.638*** (0.065)
Integrating	0.303** (0.105)	0.145 (0.095)	0.256*** (0.064)
Marginalizing	-0.019 (0.128)	0.216* (0.089)	0.382*** (0.062)

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	Tumultuous <i>Coefficient (SE)</i>	Worsening <i>Coefficient (SE)</i>	Improving <i>Coefficient (SE)</i>
Relationship status (ref: single)			
Married	-0.109 (0.157)	-0.103 (0.143)	0.155 (0.088)
Cohabiting	-0.283 (0.159)	-0.099 (0.127)	-0.117 (0.099)

Note: standardized beta coefficients shown; \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; controlling for full set of individual- and school-level covariates;  $n = 10,869$  for full sample;  $n = 5,743$  for girls;  $n = 5,126$  for boys; reference group for marginalization experiences is Integrated; reference group for depressive trajectories is Steady

Figure 2.1: Not Fitting In Measures by Latent Classes at Waves I and II

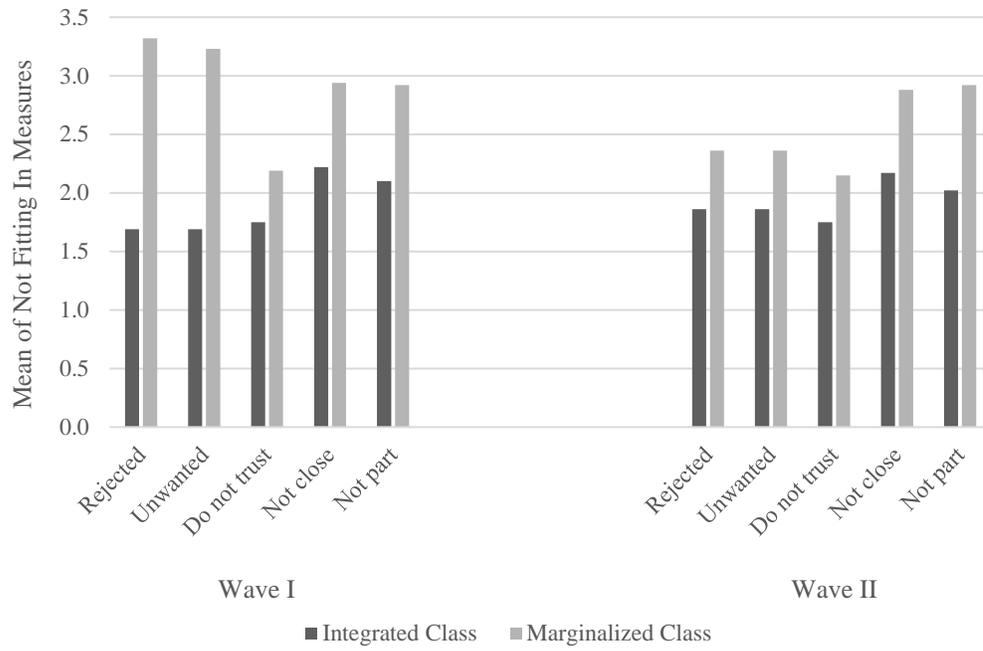


Figure 2.2: Proportion of Adolescents in Socially Marginalized Class at Waves I and II by Latent Transition Group

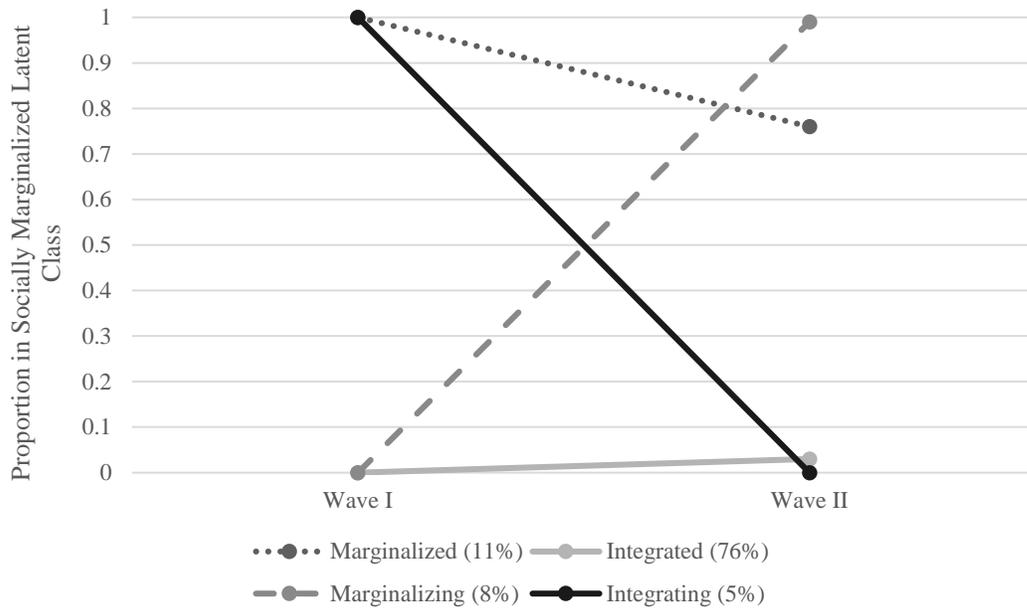
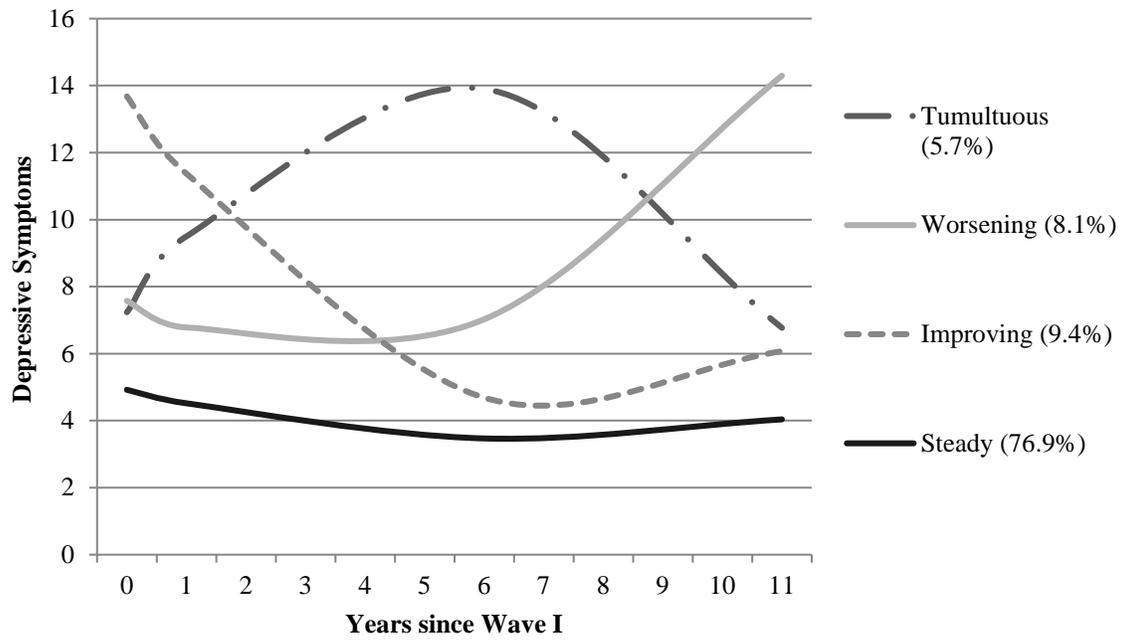


Figure 2.3: Four Classes of Depressive Trajectories from Adolescence to Adulthood



### **Chapter 3: The Interplay of High School Social Risk and Resources on Trajectories of Mental Health into Adulthood**

#### **ABSTRACT**

Adolescents who are socially disconnected from their peers during high school are at risk for psychological distress that extends beyond high school and into adulthood. Yet, not every school offers the same context for social marginalization to have these scarring effects, and even adolescents marginalized in the same school context can have diverging trajectories when they draw on different supports and resources in the school. To explore the interplay between social risk and resources in high schools and their long-term implications, this study examined the degree to which programmatic and relational aspects of high school contexts conditioned links between peer marginalization and longitudinal trajectories of depressive symptomatology using data from the National Longitudinal Study of Adolescent to Adult Health (Add Health;  $n = 10,869$ ). Analyses revealed that such factors as extracurricular involvement, teacher attachment, and non-parental mentors in high school—but not school-based mental health services—were associated with healthier trajectories of mental health into adulthood in general but not for youth who were marginalized by peers. Instead, marginalized youth often fared worse over time when they had such resources. These unexpected findings suggest that the combination of marginalization by peers and reliance on adults and adult-sanctioned activities might identify youth who are at risk for long-term maladjustment rather than a deleterious impact of such resources themselves.

## **INTRODUCTION**

High schools are contexts of social and emotional development, not just academic learning and the acquisition of human capital, and they serve young people who are in critical stages of their development marked by heightened social sensitivity and less differentiation between emotion and cognition (Coleman 1961; Eccles and Roeser 2011). This role of high schools during a sensitive stage of the life course is why social marginalization from high school peers matters for mental health in the moment and also can stay with young people long after high school is over (Hall-Lande et al 2007; Joyce and Early 2014). Yet, schools are diverse and multifaceted institutions. Some schools provide more supportive social climates than others, and some schools offer services to help students in need that others do not. At the same time, even the same school can provide many different avenues for achievement and the development of self-worth beyond maintaining social status with peers (Crosnoe 2011). Consequently, the type of high school that socially marginalized students attend and their particular location within their school matter to whether the experience of marginalization will hurt them now and in the future.

In this spirit, this study works from a developmental life course perspective to evaluate the extent to which trajectories of depressive symptomatology from adolescence to adulthood following experiences of social marginalization vary according to social resources in high school contexts—social resources that differentiate one school from another and that differentiate any two students within the same school. Applying multinomial logistic regression techniques to representative data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), I consider how depressive trajectories are shaped—independently and concurrently—by social marginalization from peers and three types of social resources common in high schools: universal resources such as the availability of school-based mental health services; voluntary resources such as

involvement in extracurricular activities; and, relational resources such as students' connections with teachers and/or mentors. Indeed, mental health services promote treatment and prevention of depressive symptoms (Committee on School Health 2004), extracurricular activities promote social integration (Schaefer et al 2011), and having positive connections with non-parental adults during high school is associated with more positive psychological well-being (DuBois and Silverthorn 2005). The question is whether these resources matter more for youth who have experienced social difficulties in high school and, therefore, help to close mental health disparities between them and their fellow students. Exploring this question requires special attention to gender, given that girls are more likely than boys to draw on social relationships for support, more negatively affected by bad relationships, and more integrated into the conventional structures and order of schools (Rudolph and Conley 2005; Hill and Needham 2013).

Highlighting the interplay of risks and resources in high school contexts illustrates variation in the short- and long-term implications of social marginalization across the life course. By doing so, this study contributes to theoretical understanding of resilience among at-risk youth. Moreover, the fact that the focal high school resources are already linked to extant policies and programs targeting youth in high schools increases the practical value of this research.

## **BACKGROUND**

### **Social Risks and Resources in High School**

Marginalization from peers in high school comes at a critical time of social development. During adolescence, young people place increasing value on their friendships as peers provide a context for adolescents to develop identities independent of their families-of-origin (Larson and Richards 1991; Crosnoe 2000; Giordano 2003). Social

marginalization, furthermore, is detrimental to health and well-being across the life course (House, Landis, and Umberson 1988; Kawachi and Berkman 2001; Cornwell and Waite 2009; Umberson and Montez 2010; Thoits 2011), and it can be especially problematic for young people—with greater potential for lasting scars—because they are in this sensitive developmental period.

Drawing on the life course perspective (Elder 1998), the experience of social marginalization in high school can lead to psychological difficulties that then become self-reinforcing to the point that they endure even after high school is over and even when social marginalization ends. Like all life course processes, however, these trajectories need to be understood within the social and institutional contexts in which they happen; namely, the school (Crosnoe and Johnson 2011). Just because there is a link between social marginalization and psychological trajectories on the population level does not mean that this link generalizes across the many diverse school contexts—and within-school contexts—in this country. Some schools can provide resources that protect youth from the harm of social marginalization, even if they do not protect them from being marginalized. Schools also contain many different micro-contexts, defined by the different relationships, arenas of achievement, and experiences that youth find or that find them (Carbonaro 2005; Mahoney, Harris, and Eccles 2006; Crosnoe 2011)

Thus, understanding whether and how social marginalization during high school continues to shape the psychological well-being of students after high school requires attention to where young people go to school and their niches within school. Are there resources in these contexts that counterbalance what is happening with peers?

## **School Resources to Counteract Social Risk**

High school-level resources can be considered in terms of services provided at some schools but not others (i.e., between-school resources) or services within high schools that adolescents can opt into (i.e., within-school resources). Here, I present three types of resources that have the potential to curb the long-term psychological risks faced by socially marginalized youth in high school. First, I consider how the link between social marginalization and psychological well-being over time varies by between-school resources such as whether or not school-based mental health services are available to students. Next, I turn to variation in this link by two types of resources that students opt into within their schools, including voluntary organizations that students join (i.e., extracurricular activities) and relationships students form during high school, such as those with teachers or mentors.

*Universal resources.* School-based mental health services are increasingly seen as important for treatment and prevention of adolescent mental health problems (Rones and Hoagwood 2000; Committee on School Health 2004). Although the presence and structure of school-based mental health programs vary widely across schools, having mental health services available in high schools consistently reduces barriers to care for at-risk youth and helps adolescents avoid the stigma associated with seeking mental health care in an unfamiliar clinical setting (Stephan et al 2007). A topic of policy discussion in recent decades (Department of Health and Human Services 2003), school-based mental health services have been shown to improve the psychological well-being of young people in ways that may even be comparable to outcomes in clinical mental health settings (Armbruster and Lichtman 1999).

Mental health services at school also foster the development of healthy coping skills and may thereby encourage resilience among marginalized youth. Often, these programs

use strategies to promote emotional understanding, stress management, communication, friendship formation, and self-control (Rones and Hoagwood 2000). Enhanced mental health knowledge through school-based services (Salerno 2016) may also be important for the support and prevention of distress into adulthood (Jorm 2000). Gaining competency in social skills and learning healthy ways to cope may better-equip marginalized adolescents to handle stress and effectively communicate with peers, ultimately helping them to overcome the long-term detriments of social marginalization.

Access to and opinion of mental health services, however, is gendered across the life course. As early as adolescence, girls are more willing to use mental health services than boys, suggesting stigma in accessing care presents long before adulthood (Chandra and Minkovitz 2006). The presence of mental health services in schools, therefore, may mean different things for marginalized girls and boys given that boys be less inclined to value and utilize these services even when they are available.

*Voluntary resources.* Almost every high school in the U.S. provides opportunities for adolescents to join school clubs, teams or organizations, which have been studied extensively in relation to their positive outcomes for adolescent development, academic outcomes, and psychological well-being (e.g., Feldman and Matjasko 2005). Indeed, despite some elevated risk-taking among adolescents who engage in extracurricular activities, these programs tend to be associated with stronger academic orientation, greater likelihood of attending and graduating from college, and, importantly, better socioemotional outcomes.

Extracurricular activities also promote social integration and—despite some variation by the type of extracurricular activity—reduce depressive symptoms even beyond high school (Barber, Eccles, and Stone 2001; Darling 2005; Fauth, Roth, and Brooks-Gunn 2007). In fact, these programs are designed to support the development of social skills and

encourage interaction among students (Dworkin, Larsen, and Hanson 2003; Schaefer et al 2011; Fredricks and Simpkins 2013). Involved adolescents learn team work, foster friendships across diverse groups, and find a safe space to share their true selves with classmates. These experiences may be particularly beneficial for youth who otherwise feel as though they do not fit in with their peers at school. Building friendships, after all, is a primary motivation for becoming involved with extracurricular activities (Dworkin et al 2003). Thus, participating in school clubs, teams, and organizations may provide marginalized youth the social support they lack in friendships, thereby promoting healthier trajectories of psychological health into adulthood.

Extracurricular activities tend to have fairly consistent advantages for girls and boys (Eccles et al. 2003). Among marginalized youth, therefore, extracurricular involvement is likely to boost mental health regardless of gender. Still, given the heightened reactivity of girls' mental health to risky social positions (Mason et al. 2009), marginalized girls likely have more to gain from extracurricular activity participation.

*Relational resources.* A third type of social resource available to high schoolers comes in the form of teacher and mentor relationships. Teacher-student relationships characterized by trust and closeness positively influence cognitive, emotional, and behavioral outcomes of young people (Pianta 1999; Murray, Kosty, and Hauser-McLean 2016). Given their daily interaction with students, teachers occupy unique positions to shape the beliefs and outlook of their students. Adolescents who feel supported by teachers perform stronger academically, are more engaged at school, and report healthier psychological well-being (Crosnoe, Johnson, and Elder 2004; Hallinan 2008; LaRusso, Romer, and Selman 2008; Bergin and Bergin 2009). Similarly, formal and informal mentoring experiences are associated with positive educational, behavioral, and socioemotional outcomes (Jacobi 1991; DuBois and Silverthorn 2005; Erickson,

McDonald, and Elder 2009). Linking youth to non-parental adults and/or older peers who step out of their traditional roles as teachers, counselors, coaches, or relatives, for example, provides adolescents with practical and emotional guidance and social support.

Relationships with teachers and mentors may benefit marginalized adolescents in particular. For one, teachers set the social-emotional climate of the classroom and can promote peer integration (Howes 2000; Langenkamp 2009; Luckner and Pianta 2011; Murray et al. 2016). Interactions between students and teachers, moreover, facilitate academic and emotional development that may encourage growth of social skills among marginalized youth. Furthermore, having a mentor during high school might help adolescents to set their sights on future opportunities. High school mentors influence the educational and occupational trajectories of young people (Erickson et al 2009; McDonald and Lambert 2014). Although marginalized youth are less likely than their integrated peers to attend college (Crosnoe 2011), positive encouragement from a mentor may steer isolated adolescents onto pathways towards college or stable employment. In doing so, the social and economic horizons of young people are expanded, allowing them to leave high school behind and overcome mental health penalties of marginalization.

Again, however, these associations likely vary by gender, particularly as some research suggests that girls, compared to boys, are more prone to view their teachers positively and appreciate the support teachers offer their students (Srivastava, Guglielmo, and Beer 2010; Katz 2017). In this way, psychological responses of marginalized girls may be more receptive to strong attachments with teachers. Similarly, girls form intimate relationship with mentors that are geared towards psychosocial support (Rhodes 2002). Mentors play a different role for boys, as they tend to provide instrumental or practical guidance. This being said, mentors have largely been found to be more effective among boys (Darling et al 2006; McDonald et al 2007). Nonetheless, although boys may benefit

more from the instrumental guidance mentors often offer, the mental health benefits of mentoring may be stronger among girls.

Overall, universal resources that vary from school to school, and voluntary and relational resources that vary across adolescents in the same school promote a spectrum of developmental outcomes in adolescence and encourage positive psychological well-being. These resources may help to buffer the vulnerability of marginalized youth. The advantages of tapping into these resources, however, appear more distinct among girls than boys. As such, marginalized girls who interact with universal, voluntary, and relational resources in high school may be more likely than their male counterparts to recover psychologically from the distress induced by marginalization.

### **Study Aims and Hypotheses**

The goal of this study is to understand how social risks and resources matter for the long-term mental health of girls and boys in high school. To accomplish this goal, I examine the degree to which universal, voluntary, and relational resources in high school predict these trajectories and moderate the links between them and peer marginalization.

The overall hypothesis is that socially marginalized youth will have psychological trajectories more comparable to their non-marginalized peers when they have access to voluntary, universal, and relational resources in high school. Specifically, marginalized youth who are involved in extracurricular activities, have access to school-based mental health services, and/or feel strong attachment to teachers or mentors during high school will experience a reduction in risk for following problematic trajectories of depressive symptoms from adolescence to adulthood. The gender hypothesis is that this protective role of between-school and within-school resources will be stronger for girls than boys.

## **METHOD**

### **Data and Sample**

A school-based study of a nationally representative sample of adolescents in grades 7 through 12, the National Longitudinal Study of Adolescent to Adult Health (Add Health) launched with an in-school data collection in 1994-1995 (Harris et al. 2009). Schools included in Add Health were selected by region, urbanicity, school size, school type, and racial composition based on a stratified sampling design. During the in-school data collection, 90,118 students in 132 middle and high schools across the U.S were surveyed. This survey then created a sampling frame for a nationally representative sample of 20,745 adolescents, who were followed across adolescence into adulthood in a series of four waves. These respondents and their parents participated in an in-home interview in 1995 when respondents were ages 11 to 18. Additional interviews of the respondents were then conducted in 1996 (Wave II;  $n = 14,738$ ), 2001-2002 (Wave III;  $n = 15,197$ ), and 2007-2008 (Wave IV;  $n = 15,701$ ). At each follow-up wave, respondents' ages ranged from 12 to 18 (Wave II), 18 to 26 (Wave III), and 24 to 32 (Wave IV).

The analytical sample for this study was all adolescents who were in high school at Wave I. The sample was further narrowed to respondents with valid longitudinal sampling weights (necessary to adjust for study design effects and correct for differential attrition across waves). Six additional respondents with missing information on all measures of peer marginalization (the dependent variable in analyses) were also excluded. Thus, the final analytical sample for this study included 10,869 adolescents.

### **Measurement**

*Depressive symptomatology.* At each wave, Add Health included a modified Center for Epidemiologic Studies-Depression scale (CES-D) (Perreira et al. 2005). Respondents

reported the frequency of nine feelings in the past week (e.g., “You felt sad,” “You felt that you could not shake off the blues, even with help from your family and your friends”). Responses, ranging from 0 (never or rarely) to 3 (most of the time or all of the time), were summed into a 27-point scale of increasing depressive symptoms. CES-D measures across all four waves were combined through growth mixture modeling (described in the Analytical Plan).

*Social marginalization in high school.* Not fitting in was operationalized using five variables from the Waves I and II in-home interviews. At each wave, adolescents were asked a series of questions including the degree to which they felt socially accepted, felt loved and wanted, got along with other students, felt close to people at their school, and felt like they were part of their school. The adolescents’ responses were measured on a continuous scale from 1 (strongly agree) to 5 (strongly disagree), with higher values coded to indicate greater degrees of not fitting in (Crosnoe 2011). Latent classes of social marginalization experiences at Waves I and II were identified using these five continuous measures and, to take advantage of longitudinal data, the latent classes for Waves I and II were combined using latent transition analysis (described in the Analytical Plan).

Importantly, feelings of not fitting in represent a subjective indicator of peer marginalization. I focus on subjective experiences of marginalization given that adolescents are more likely to act on their feelings rather than their objective positions and because subjective statuses are more strongly linked with health outcomes (Cacioppo and Hawkley 2009). As such, subjective feelings of social marginalization have more lasting implications for mental health (as shown in Chapter 2 of this dissertation).

*Voluntary resources.* Voluntary resources were measured using information on adolescent *extracurricular involvement*. Specifically, during the in-school survey, respondents were asked whether they were participating in or planned to participate in a

list of clubs, organizations, and teams at their school. An indicator of any extracurricular involvement was created by dichotomizing adolescent responses such that 1 = participation in any club, organization, or team at school. Additionally, extracurricular involvement was broken down into activity type, following conventional categorizations (Gibbs et al 2015; Fredricks and Eccles 2006): adolescents received a value of 1 on *athletic activities* if they reported playing baseball/softball, basketball, field hockey, football, ice hockey, soccer, swimming, tennis, track, volleyball, and/or wrestling; *academic activities* included French, German, Latin, and/or Spanish clubs, book club, computer club, debate team, and history, math, and/or science club; respondents were included in the *performance activities* group if they reported being involved with the school's drama team, band, cheerleading/dance, chorus or choir, and/or orchestra; and, *school activities* comprised adolescents who reported being involved with the school newspaper, honors society, student council, and/or the school yearbook.

*Universal resources.* School administrator data allowed the measurement of the availability of universal services in adolescents' high schools. During in-school data collection, school administrators completed a survey to provide contextual information on the schools included in Add Health. Included in the administrator survey was a question on whether or not emotional counseling was provided on school premises. If the administrator responded that there was emotional counseling on school premises, respondents in the school received a value of 1 on *mental health services* being available at their school.

*Relational resources.* Two variables measured relational resources in high school. First, *teacher attachment* was created as a scale based on three items that tapped into adolescent attitudes about their teachers at Wave I (Crosnoe, Johnson, and Elder 2004): the extent to which adolescents had trouble getting along with teachers (reverse-coded),

believed that teachers treated students fairly, and felt that teachers cared about them. Responses ranged from 1 to 5 with higher valued responses indicating increasing feelings of attachment. The teacher attachment scale, then, was calculated as the average of respondent's answers across these items. Second, during the Wave III in-home interview, respondents reflected on the presence of mentors in their lives (i.e., an adult other than your parents or step-parents who has made an important positive difference in your life at any time since you were 14 years old). These mentors shared guidance or advice, provided emotional nurturance, and/or gave instrumental or practical help and were, for example, relatives, teachers or guidance counselors, coaches, or ministers of the adolescent. The Wave III mentor data allowed the measurement of having a *mentor in high school* (Elder et al. 1993). Respondents also reported how old they were when this mentor first became important in their life. The presence of a mentor in high school was coded as 1 only among respondents who reported that this person became important in their lives between the ages of 14 and 18. As such, the mentor was not necessarily associated with the student's high school, but was integral to the respondent's life during high school. Furthermore, young people were asked how this mentor was related to them and the most frequent response (i.e., 30% of the respondents who reported having an adult mentor) was that the mentor was a teacher or guidance counselor. The second most common type of mentor was adult friend (20%), and the third most common was a coach or athletic director (6%).

*Sociodemographic and school-level covariates.* Several controls were measured to account for sociodemographic position and possible spuriousness: gender (1 = female), age, race/ethnicity (non-Hispanic white, non-Hispanic black, non-Hispanic Asian, Hispanic, other/multi-racial), family structure (1 = lived with both biological parents at Wave I, 0 = other family form), student's grade point average on a traditional four-point

scale at Wave I, parent income at Wave I, and parent education (an ordinal variable ranging from 1, less than high school, to 5, post-college degree).

Additional school-level controls were drawn from the school survey or created by aggregating data across all respondents in a school, which was possible given that Add Health applied a census-like structure for each school. School-level controls included: sector (1 = private school), region (South, West, Northeast, Midwest), urbanicity (urban, suburban, rural), proportion of students in the school living below 185% of the Federal Poverty line, proportion of students in the school living with two-biological parents, proportion of white students in the school, school size, high school and feeder same school. A school-level “academic press” variable was also included to account for the emphasis on and pressure for achievement in schools. This measure was based on the school means (aggregated from all individual responses in the school on the in-school survey) of GPA (standard four-point scale), math/science enrollment, and educational expectations (likelihood the student will graduate from college) as well as the administrator report of the percentage of seniors who go to college (Crosnoe, Riegle-Crumb, and Muller 2007). Each item in the composite academic press variable was standardized, and the final scale was the mean of the four z-scores.

### **Analytical Plan**

To proceed with analyses, I first identified social marginalization experiences and trajectories of depressive symptomatology in a structural equation modeling framework.

*Identifying socially marginalized youth.* Latent transition analysis (LTA) is an extension of latent class analysis (LCA), which identifies unobservable (i.e., latent) subgroups within a population. LTA has this same goal, but uses longitudinal data and identifies movement between subgroups over time. For purposes of this study, LTA

allowed me not only to identify groups of youth who felt marginalized in high school, but also allowed me to see movement in and out of social marginalization experiences.

Thus, to identify subgroups at Waves I and II and movement across them, I first determined the appropriate number of latent classes at Wave I and also at Wave II using data on not fitting in at each wave. To do so, I ran LCAs for Wave I and Wave II separately, evaluating several criteria, including a loglikelihood-based test, Bayesian information criterion (BIC), and sample size adjusted BIC (ABIC), to determine the appropriate number of subgroups (or classes) in the study population. For log-likelihood, BIC, and ABIC measures of fit, smaller absolute values indicate better model fit. Thus, the relative change from the  $k$ -class to  $k-1$ -class is important. A Lo-Mendell Rubin (LMR) adjusted likelihood ratio test was also evaluated as a test of model fit. A significant  $p$ -value on the LMR test suggests that the  $k$ -class model is better-fitting than the  $k-1$ -class model. Per the relative changes in log-likelihood, BIC, and ABIC values and the LMR  $p$ -value, a two-class solution was the best fit of the data at Wave I. One class reported agreeing with the 5 measures of not fitting in (marginalized group; 16% of the sample), whereas the second class reported disagreeing with the 5 statements that captured not fitting in (integrated group; 84% of the sample). At Wave II, a two-class solution again fit the data best. The marginalized group comprised 21% of the sample, and the integrated group comprised 79% of the sample. Fit statistics evaluated to make this determination are presented in Table 3.1. Figure 3.1 depicts means of the five measures of not fitting in across the integrated group and marginalized groups resulting from LCA at Waves I and II.

Next, I used LTA to evaluate transition probabilities, or the likelihood of respondents to move from a given class at Wave I to another at Wave II. In doing so, LTA produced a categorical variable of four peer marginalization categories: Integrated adolescents (felt they fit in at both waves; 76% of the sample) Marginalized adolescents

(felt they did not fit in at both waves; 11% of the sample), Marginalizing adolescents (those who felt they fit in at Wave I but not at Wave II; 8% of the sample), and Integrating adolescents (those who felt they did not fit in at Wave I but did at Wave II; 5% of the sample). Figure 2.2 illustrates the proportion of respondents in the marginalized latent class at Waves I and II for each of the four categories of social marginalization identified. Transitions across classes are captured for the Marginalizing and Integrating groups, as shown in the crossover from high-to-low and from low-to-high proportions of marginalized respondents, respectively. These four categories of marginalization experiences were the independent variable in all analyses, and Integrated adolescents were the reference group.

*Estimating trajectories of depressive symptomatology.* I identified different types of depressive trajectories—the most common forms that trajectories took in the population rather than the specific trajectories experienced by each individual person. This approach called for growth mixture modeling (GMM), a technique that reflects the theory that several categories of trajectories may occur within a population. Thus, GMM identifies major heterogeneities in growth curves in a sample. Here, GMM produced a categorical variable of depressive symptomatology trajectories, grouping cases according to the various types of trajectories respondents followed from Waves I to IV. The appropriate number of categories (or classes) was determined through several statistics of model fit (i.e., loglikelihood, BIC, ABIC, and LMR  $p$ -value), which, moreover, were evaluated in conjunction with the usefulness of the model classes.

Table 3.2 provides the criteria used to determine how many types of trajectories of depressive symptomatology existed in the sample. In this case, the four-class model was the best fit of the data according to the LMR  $p$ -value and the relative changes in loglikelihood, BIC, and ABIC values. In addition to model fit, the four identified trajectories presented substantively meaningful classes (see Figure 3.1). The four classes included: 1)

adolescents with moderate levels of depressive symptoms that increased slightly and then improved during the transition to young adulthood (Tumultuous; 5% of the sample), 2) adolescents with moderate levels of depressive symptoms that increased more sharply during the transition to young adulthood (Worsening; 7% of the sample), 3) adolescents with high levels of depressive symptoms that decreased sharply during the transition to young adulthood (Improving; 9% of the sample), 4) and adolescents with low levels of depressive symptoms that decreased during the transition to young adulthood (Steady). Steady was the majority group, accounting for nearly 80% of the sample. The dependent variable in all analyses was the class of depressive trajectory, with the Steady trajectory as the reference group.

*Linking marginalization and school factors to psychological trajectories.* Once peer marginalization experiences and trajectories of depressive symptomatology were identified, analyses to explore the main effects and interaction effects of risk and resources in the high school environment proceeded in two steps. First, to document the associations between social marginalization, high school resources, and long-term trajectories of depressive symptoms, a series of multinomial logistic regression models predicted depressive trajectory membership by social marginalization experience and voluntary, universal, and relational resources in the school. A second series of models, then, built on the first by including an interaction term between risk (i.e., category of social marginalization experience) and resource (i.e., voluntary, universal, and relational).

Importantly, to evaluate gender differences in these pathways, multinomial logistic regression models were estimated for the full analytical sample and then separately by gender (results presented). I also attempted to formally test gender differences by estimating interaction effects in a three-way interaction (i.e., gender x social marginalization experience x high school resource; results not shown). Importantly,

however, cell coverage was too low to converge some of these three-way interaction models. As a result, only gender-stratified models are presented.

All analyses were conducted in Mplus statistical software (Muthén and Muthén 2008). Full information maximum likelihood estimation (FIML) accounted for missingness, so that all cases in the analytical sample were retained even if they had missing data on individual variables. FIML fits the covariance structure model directly to the observed and available raw data, thereby specifying the variances of exogenous variables to avoid listwise deletion. The cluster function in Mplus adjusted standard errors to account for students being nested within schools per the Add Health sampling design. Longitudinal sampling weights were applied in all analyses to address differential probability of being sampled and differential attrition across waves. Traditional levels of statistical significance ( $p < .05$  or greater) were used as the benchmark for identifying significant trends. Standardized beta coefficients are shown.

## **RESULTS**

Table 3.3 presents descriptive statistics for school resources and depressive symptoms by social marginalization in high school. Integrated youth had the highest frequency of extracurricular involvement (57%), reported the strongest attachment to their teachers ( $M = 3.8$ ), and had the highest frequency of the Steady trajectory (85%), characterized by consistently low depressive symptoms across adolescence to adulthood. This group also reported the most frequent participation in athletic (40%) and school (18%) clubs at school.

Integrating youth, those who reported not fitting in at Wave I but stronger feelings of fitting in at Wave II, had the highest frequency of mentors in high school (38%) and the most frequent participation in academic (19%) and performance (27%) clubs at school.

Less than 30% of Integrating youth, moreover, had problematic trajectories of depressive symptomatology.

Marginalized and Marginalizing youth, on the other hand, reported similarly low frequencies of extracurricular participation (45%) and the lowest teacher attachment ( $M = 3.4$ ). The proportion of youth who reported having a mentor in high school was similar across Marginalized, Integrated, and Marginalizing groups. Additionally, close to 40% of Marginalized youth and more than 30% of Marginalizing youth displayed problematic trajectories of mental health across the transition to adulthood.

### **Social Marginalization, High School Resources, and Mental Health Trajectories**

Documenting the baseline association between social marginalization in high school, resources, and depressive trajectories revealed that main effects for social marginalization and high school resources were largely independent. Specifically, social marginalization experiences in high school, compared to consistent feelings of integration in high school, were associated with greater risk for membership in Tumultuous, Worsening, and Improving trajectories of depressive symptoms as compared to Steady trajectories. Some modest gender differences were found. For example, relative to Integrated youth, Marginalized girls but not boys and Integrating boys but not girls had significantly greater risk of Tumultuous trajectories compared to Steady trajectories. Additionally, extracurricular involvement was associated with lower risk of Worsening trajectories ( $\beta = -0.358, p < .01$  for the full sample;  $\beta = -0.302, p < .01$  for girls;  $\beta = -0.442, p < .001$  for boys) and Improving trajectories ( $\beta = -0.150, p < .01$  for full sample;  $\beta = -0.176, p < .05$  for girls) compared to Steady trajectories (Table 3.4). When broken down by activity type, school clubs were associated with lower risk of Worsening and Improving trajectories for the full sample ( $\beta = -0.235, p < .01$  and  $\beta = -0.119, p < .05$ , respectively)

and for girls ( $\beta = -0.314, p < .01$  and  $\beta = -0.231, p < .001$ , respectively) relative to Steady trajectories. Sports teams were associated with reduced risk of Worsening trajectories for all adolescents ( $\beta = -0.262, p < .01$  for the full sample;  $\beta = -0.328, p < .001$  for boys;  $\beta = -0.189, p < .05$  girls) and lower likelihood of Improving trajectories for boys ( $\beta = -0.228, p < .05$ ). Academic and performance extracurricular activities, however, were not associated with depressive trajectories. For relational resources, as compared to Steady trajectory membership, stronger teacher attachment was associated with lower risk of Tumultuous trajectories for the full sample ( $\beta = -0.263, p < .05$ ) and for girls ( $\beta = -0.373, p < .001$ ), reduced likelihood of Worsening trajectories for boys ( $p < .05$ ), and lower risk of Improving trajectories for all adolescents ( $\beta = -0.258, p < .001$ ) (Table 3.5). Conversely, having a mentor in high school was associated with significantly greater risk of Improving trajectories among boys ( $\beta = .234, p < .05$ ) (results not tabled given no significant associations for the full sample). Mental health services in high schools (not shown) were not associated with long-term trajectories of depressive symptoms when controlling for social marginalization.

In sum, social marginalization and high school resources were each associated with depressive trajectories across adolescence into adulthood. For resources, however, only within-school resources—voluntary (i.e., extracurricular involvement) and relational (i.e., teacher attachment)—were associated with more positive socioemotional functioning. Between-school resources such as mental health services were not associated with depressive trajectories. Having a mentor in high school (i.e., a within-school relational resource) was linked to greater risk for trajectories of depressive symptoms characterized by high distress in adolescence followed by recovery.

## **The Interplay between Social Marginalization and School Resources**

With this background information, the main goal was to investigate whether voluntary, universal, and/or relational resources in high schools moderated links between social marginalization and long-term trajectories of depressive symptoms. I focus on each between-school or within-school resource iteratively.

*Universal services.* To begin, I tested whether universal services such as availability of mental health counseling on school premises conditioned the link between social marginalization and long-term depressive trajectories. No significant interaction effects emerged for the full sample or by gender.

*Voluntary resources.* As shown in Table 3.6, the interaction between social marginalization and extracurricular involvement was not significantly associated with risk for membership in trajectories of depressive symptoms, suggesting that the mental health benefit of being involved in school clubs, organizations, and teams was consistent for all youth, regardless of their experience with social marginalization. Stratifying models were gender, however, revealed significant moderation. For girls with Integrating marginalization experiences relative to Integrated experiences, participating in extracurricular activities was associated with a sharp decline in the likelihood of Improving trajectory membership ( $\beta = -0.196, p < .01$ ) compared with Steady trajectory membership. On the other hand, for Marginalized boys, extracurricular involvement significantly increased risk of Tumultuous trajectory membership ( $\beta = .307, p < .05$ ) compared with Steady trajectory membership. To further probe the non-significant moderation for the full sample and the gender differences in moderation by extracurricular involvement, supplemental analyses tested the interaction between social marginalization experience and specific types of extracurricular activities.

When considering academic activities—such as foreign language clubs, debate team, or math teams—multinomial logistic regression results for the full sample suggested that involvement in academic clubs and organizations did not significantly moderate the association between social marginalization and trajectory membership. Still, gender differences emerged. For Integrating girls relative to Integrated girls, participating in academic extracurricular activities was associated with reduced likelihood of Improving and Worsening trajectories compared to Steady trajectories. For Marginalized boys relative to Integrated boys, participating in academic extracurricular activities was associated with increased likelihood of Tumultuous trajectories compared with Steady trajectories.

Performance activities also did not condition the links between social marginalization and depressive trajectories for the full sample or for boys. For Integrating girls, however, being involved in performance-related extracurricular activities reduced likelihood of Improving trajectory membership. Similarly, school activities (i.e., newspaper or honor society) reduced Integrating girls' likelihood of Improving trajectories compared with Steady trajectories. Though school organizations also conditioned the association between Integrating marginalization experiences and Improving trajectories of depressive symptoms, nearly 85% of the boys who reported participating in school activities also fell into the Integrated social marginalization category. As such, the cell coverage was too low to estimate interaction effects between social marginalization and school activities on depressive trajectories among boys. In fact, of the 19 Integrating boys who participated in school activities, only one boy followed a Tumultuous trajectory, none followed Worsening trajectories, and two boys followed Improving trajectories.

Although athletic activities were not a moderator for the link between social marginalization and depressive trajectories for the full sample, important distinctions were found in gender-specific moderation models. For Marginalizing girls and Marginalized

boys, being a member of a sports team was associated with increased likelihood of Tumultuous trajectories. Marginalized boys who were members of sports teams, moreover, had greater risk for Worsening trajectories.

Taken together, academic and school activities were associated with a lower likelihood of problematic trajectories of depressive symptoms, but mostly among girls who were socially marginalized. In fact, among socially marginalized boys, extracurricular involvement generally (and academic activities specifically) were associated with increased risk of Tumultuous trajectories compared with Steady trajectories. Additionally, for both girls and boys with marginalization experiences, being involved with school athletics was associated with increased risk for problematic trajectories of depressive symptoms from adolescence across the transition to adulthood.

*Relational resources.* Interactions between teacher attachment and social marginalization (Table 3.7) and between having a mentor in high school and social marginalization (Table 3.8) were estimated to evaluate the moderating role of high school relational resources. For Marginalized youth in the full sample, stronger teacher attachment was associated with increased likelihood of Improving trajectories ( $\beta = .309, p < .05$ ). Furthermore, gender-specific models suggested that, for Marginalized girls, stronger teacher attachment was associated with increased likelihood of Worsening trajectories ( $\beta = 1.206, p < .01$ ) than Steady trajectories. Similarly, having a mentor in high school did not significantly interact with social marginalization to condition risk for long-term depressive trajectory membership among the full sample; but, gender-specific models suggested that Integrating boys who have a mentor in high school were at significantly greater risk for Tumultuous trajectories ( $\beta = .253, p < .05$ ) than Steady trajectories.

Overall, moderation models point to significant conditioning of the associations between social marginalization and depressive trajectories from adolescence to adulthood

by voluntary and relational resources. This moderation, however, was not consistently in the expected direction. Instead, for some marginalized girls and boys, engaging with school resources predicted heightened risk for problematic depressive trajectories. For example, although extracurricular involvement was associated with reduced risk of Improving trajectories for Integrating girls, it was also associated with greater risk for Tumultuous trajectories among Marginalizing girls and Marginalized boys. When considering relational resources, moreover, greater teacher attachment was associated with greater risk of Improving trajectories among the full sample and for Worsening trajectories among Marginalized and Integrating girls. Having a mentor in high school was associated with significantly higher risk of Tumultuous trajectories for Integrating boys. Between-school universal resources (i.e., school-based mental health services) did not condition the association between high school social marginalization and depressive trajectories.

## **DISCUSSION**

The social resources that high schools provide students matter for the development and well-being of adolescents (Coleman 1961; Eccles and Roeser 2011). High schools, however, are highly diverse social and institutional contexts. The long-term mental health consequences of not fitting in with peers during high school may, therefore, vary substantially by where they go to school, and also by the relationships and supports that they opt into at their school. The goal of this research, therefore, was to evaluate the linkages between high school social marginalization, various between-school and within-school social resources, and depressive trajectories from adolescence to adulthood.

In general, school-based mental health services (i.e., universal resources that vary from one school to the next) were not associated with trajectories of depressive symptoms into adulthood. On the other hand, extracurricular involvement and teacher attachment (i.e.,

voluntary and relational resources in high schools that varied within schools) were associated with more positive socioemotional functioning for girls and boys well into adulthood. Having a non-parental mentor in high school (a second example of a relational resource), however, was linked to greater risk for trajectories of depressive symptoms.

The main hypothesis of this study focused on the interplay between risks and resources and posited that socially disconnected youth would benefit more from accessing the support and social skills provided by resources in high school. I found limited support for this hypothesis. In fact, although extracurricular involvement was associated with reduced risk of problematic trajectories for girls who became more integrated in high school, it was also associated with greater risk for problematic trajectories among girls and boys who experienced consistent or increasing marginalization. Furthermore, strong teacher attachment for some marginalized youth (and for marginalized girls more specifically) and having a non-parental mentor for some marginalized boys was associated with increased risk for problematic trajectories. On the other hand, the link between social marginalization and depressive trajectories did not vary by presence of school-based mental health services in the school.

Together, these findings point to the potential for school resources to facilitate psychological adjustment, but less consistently for socially marginalized youth. Instead, the heightened likelihood of problematic depressive trajectory membership among marginalized youth who interacted with school resources may be identifying the most at-risk youth. Perhaps marginalized adolescents who belong to clubs or teams are reminded in those settings of their inability to connect with peers. In fact, extracurricular activities reinforce youth's identity and peer group membership (Eckert 1989; Eccles et al. 2003). Given the amount of structured time spent with co-participants and the shared interests among members of the organization, teammates and classmates who are involved in the

same extracurricular activities in high school frequently form peer groups. As a result, when youth who are involved in activities report not fitting in, they are likely on the periphery of these groups. In other words, the participation of marginalized adolescents in extracurricular organizations—alongside peers with whom they do not connect—reminds them of their problems fitting in, potentially exacerbating the mental health risks of social marginalization.

In contrast to this pattern of exaggerated penalties for involved but marginalized adolescents, general extracurricular involvement, academic activities, performance clubs, and school organizations were associated with reduced risk of problematic depressive trajectories only for Integrating girls, whose marginalization experiences were characterized by increasing feelings of fitting in with peers across Waves I and II. Perhaps for this subset of students, extracurricular activities generated peer connections and aided gradual social integration during high school. This finding supports research highlighting extracurricular activities as places to form friendships (Dworkin et al 2003). As such, only when a shift towards fitting in occurred did extracurricular involvement improve likelihood of healthy psychological trajectories. At the same time, the potentially protective role of extracurricular involvement for Integrating youth held for girls but not for boys. Boys prioritize shared activities in their friendships (Clark and Ayers 1993; Vigil 2007), making this gender complexity somewhat surprising. Compared to boys, however, girls invest more in their relationships (Cross and Madson 1997) and, consequently, may be more willing to put themselves out there by joining a school team or club. Thus, future research should tease out gender differences in the ability of extracurricular involvement to promote friendship formation, paying close attention to variation in adolescents' psychological responses to the influence of involvement on peer relationships.

Relational resources interacted with marginalization experiences to exacerbate long-term psychological disadvantage, again highlighting the vulnerability of marginalized youth who form attachments with teachers and mentors. This finding stands in contrast to previous research on the importance of non-parental relationships for resilience (Werner and Smith 1982). Perhaps, in the case of marginalization from peers, however, the combination of non-parental relationships and marginalization points to the most vulnerable youth. In that case, the advantages of teacher attachment and non-parental mentors may extend only so far as a young person's environment remains constant and relationships endure (e.g., Rhodes and DuBois 2006). As this vulnerable group of young people leave high school behind and lose touch with the social support of teachers and mentors, the benefit of these resources may be less likely to stick in the long term, even if they do support youth's development and well-being in the short term.

Benefits of school-level resources may also be contingent on the support marginalized youth receive from adults at home. In other words, involvement in extracurricular activities and non-parental relationships may have bearing on long-term mental health trajectories for marginalized youth only if resources at home can step in when these resources dissipate after high school. Although this study was focused explicitly on school-level resources, adolescent-parent relationships may also mitigate or intensify risk for problematic trajectories of depressive symptoms among adolescents who struggle to fit in with peers. Moreover, resources at home play a role in connecting young people to extracurricular participation and/or non-parental influences. For example, adolescents with more parental resources are more likely to report having a mentor in their lives, despite the somewhat contradictory fact that these relationships matter more for young people with fewer resources at home (Erickson et al 2009). Future research, therefore, should evaluate

how parental relationships interact with school resources to support the psychological adjustment of marginalized youth across the transition to adulthood.

One exception to the value of social resources for long-term depressive trajectories—generally and as a moderator for marginalized adolescents—was the presence of school-based mental health services, which were not significantly associated with trajectories of psychological well-being. Despite the persistence of mental health issues across adolescence to adulthood, access to mental health services is often fragmented (Kim-Cohen et al 2003). For vulnerable adolescents, therefore, exiting high schools where mental health services are accessible may discontinue treatment thereby reviving depressive symptoms and spiraling into troubling trajectories. This may be particularly true when adolescents move into adult environments without easily accessible public mental health services (Munson et al 2012). Additionally, a limitation of the current analyses was that, although I measured the presence of these programs in school, I consider them only as a resource that varied across schools and do not account for whether or not the adolescent engaged with the services offered. In other words, the marginalized youth in my sample may not be buffered by the presence of these services because they are not utilizing these programs. Future research should therefore consider the consistency of access to mental health care as a moderator between high school social marginalization and long-term depressive trajectories.

High schools are dynamic institutions that link adolescents with peers, teachers, counselors, coaches, and a wide network of school members. The resources high schools provide vary across schools and across individuals within schools. For marginalized youth, accessing these resources may exacerbate risk for long-term depressive symptoms, suggesting that the amalgamation of marginalization and reliance on adults and adult-sanctioned activities might identify youth who are at risk for long-term maladjustment.

Extracurricular activities likely reinforce feelings of not fitting in with peers, and leaving relational resources behind after high school re-introduces risk. In conclusion, the practical value of high school resources may be enhanced by developing ways to provide more targeted support to students on the margins of high school peer groups.

Table 3.1: LCA Criteria for Class Determination

	1 Class	2 Classes	3 Classes	4 Classes
<b>WAVE I</b>				
Loglikelihood	-70266	-63773	-53823	-36100
# parameters	10	16	22	28
BIC	140626	127695	107849	72460
ABIC	140594	127644	107780	72371
LMR <i>p</i> -value		0.000	0.204	1.000
Entropy		0.988	0.999	0.999
Distribution of respondents into identified classes		84.3%, 15.7%	59.3%, 15.7%	25.0%, 25.0%, 4.7%, 11.0%, 59.3%
<b>WAVE II</b>				
Loglikelihood	-44292	-41738	-37190	-36544
# parameters	10	16	22	28
BIC	88673	83619	74577	73338
ABIC	88641	83568	74508	73249
LMR <i>p</i> -value		0.000	0.157	0.124
Entropy		0.793	1.000	0.947
Distribution of respondents into identified classes		79.3%, 20.7%	50.3%, 40.2%, 44.8%, 40.2%, 9.5%	5.6%, 9.5%

Table 3.2: GMM Criteria for Class Determination

	1 Class	2 Classes	3 Classes	4 Classes	5 Classes
Loglikelihood	-105389	-104331	-103779	-103189	-103189
# parameters	10	14	18	22	26
BIC	210872	208792	207724	206583	206620
ABIC	210840	208748	207667	206543	206538
LMR $p$ -value		0.000	0.000	0.001	0.500
Entropy		0.877	0.828	0.826	0.850
Distribution of respondents into identified classes		9.4%, 90.6%	8.5%, 8.2%, 83.3%	4.8%, 6.6%, 8.6%, 80.0%	4.3%, 80.2%, 7.9%, 0.0%, 7.5%

Table 3.3: Descriptive Statistics for Full Sample and by Category of Marginalization Experience

	Full Sample <i>n</i> = 10,869 Mean/ %	Marginalized <i>n</i> = 1,225 Mean/ %	Integrated <i>n</i> = 8,259 Mean/ %	Integrating <i>n</i> = 521 Mean/ %	Marginalizing <i>n</i> = 864 Mean/ %
Depressive trajectory					
Tumultuous	4.76%	6.37%	4.18%	6.53%	6.94%
Worsening	6.62%	10.29%	5.70%	9.02%	8.80%
Improving	8.65%	24.65%	5.35%	16.31%	12.85%
Steady	79.97%	58.69%	84.77%	68.14%	71.41%
Extracurricular activities	54.68%	44.73%	57.03%	56.81%	45.02%
Academic	15.84%	13.80%	16.41%	19.19%	11.34%
Performance	22.80%	20.49%	23.13%	27.26%	20.25%
Sports/athletic	37.37%	25.88%	39.71%	35.51%	32.41%
School organizations	17.15%	13.88%	18.34%	16.70%	10.65%
Mental health services in school	59.30%	61.35%	59.15%	58.48%	58.37%
Teacher attachment	3.70	3.36	3.80	3.54	3.35
Mentor in HS	34.19%	33.20%	34.11%	37.84%	34.02%
Sociodemographic controls					
Male	47.16%	41.31%	48.29%	41.65%	48.03%
Two-bio parent household (WI)	52.58%	47.76%	53.80%	56.62%	45.37%
Age (WI)	16.38	16.54	16.42	16.02	16.02
Parental income (WI)	47.18	44.70	47.84	46.98	44.51

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	Full Sample <i>n</i> = 10,869 Mean/ %	Marginalized <i>n</i> = 1,225 Mean/ %	Integrated <i>n</i> = 8,259 Mean/ %	Integrating <i>n</i> = 521 Mean/ %	Marginalizing <i>n</i> = 864 Mean/ %
Parental education					
Less than high school	13.21%	14.90%	12.74%	14.26%	14.76%
High school	28.42%	28.13%	28.44%	28.11%	28.78%
Some college	22.03%	20.28%	22.12%	21.29%	24.02%
Bachelor's degree	23.09%	24.25%	22.88%	25.50%	21.95%
Post-baccalaureate	13.26%	12.43%	13.82%	10.40%	10.49%
Race/ethnicity					
Non-Hispanic White	51.65%	51.10%	52.33%	47.02%	48.73%
Non-Hispanic Black	19.08%	14.86%	19.65%	17.85%	20.37%
Hispanic	17.64%	19.51%	17.01%	20.15%	19.44%
Non-Hispanic Asian	6.62%	8.41%	6.25%	10.75%	5.09%
Other/multi-racial	5.01%	6.12%	4.76%	4.22%	6.37%
Hs GPA at WI	2.75	2.58	2.80	2.73	2.52
School level controls					
Private school	7.00%	6.12%	7.33%	8.25%	4.40%
School size (hundreds)	14.01	14.57	13.84	14.03	14.77
High school and feeder same	23.96%	22.20%	24.06%	28.60%	22.69%
Urbanicity					
Urban	28.20%	27.10%	28.43%	27.64%	27.89%
Suburban	54.08%	56.41%	53.75%	53.55%	54.28%
Rural	17.72%	16.48%	17.82%	18.81%	17.82%

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	Full Sample <i>n</i> = 10,869 Mean/ %	Marginalized <i>n</i> = 1,225 Mean/ %	Integrated <i>n</i> = 8,259 Mean/ %	Integrating <i>n</i> = 521 Mean/ %	Marginalizing <i>n</i> = 864 Mean/ %
Region					
West	24.92%	29.47%	23.74%	28.02%	27.89%
Midwest	26.12%	24.90%	26.31%	24.95%	6.74%
South	35.96%	31.76%	37.28%	32.82%	31.25%
Northeast	12.99%	13.88%	12.66%	14.20%	14.12%
Proportion of students under 185% FPL	0.38	0.38	0.38	0.38	0.38
Proportion two bio parent home	0.51	0.51	0.51	0.52	0.50
Academic press	-0.10	-0.11	-0.10	-0.12	-0.11
Proportion of White students	0.51	0.48	0.51	0.90	0.50

Table 3.4: Multinomial Logistic Regression of Depressive Trajectory on High School Peer Marginalization and Extracurricular Involvement

	Tumultuous <i>Coefficient (SE)</i>	Worsening <i>Coefficient (SE)</i>	Improving <i>Coefficient (SE)</i>
<b>FULL SAMPLE</b>			
Marginalized	0.311** (0.095)	0.383*** (0.057)	0.586*** (0.035)
Integrating	0.280** (0.084)	0.220*** (0.057)	0.324*** (0.035)
Marginalizing	0.128 (0.082)	0.201*** (0.058)	0.287*** (0.040)
Extracurricular involvement	0.003 (0.085)	-0.358*** (0.068)	-0.150** (0.054)
<b>GIRLS</b>			
Marginalized	0.441*** (0.119)	0.339*** (0.078)	0.589*** (0.045)
Integrating	0.217 (0.122)	0.291*** (0.074)	0.369*** (0.053)
Marginalizing	0.215* (0.090)	0.225** (0.077)	0.245*** (0.056)
Extracurricular involvement	0.002 (0.110)	-0.302*** (0.077)	-0.176** (0.068)
<b>BOYS</b>			
Marginalized	0.012 (0.144)	0.415*** (0.082)	0.635*** (0.067)
Integrating	0.315** (0.111)	0.149 (0.085)	0.258*** (0.066)
Marginalizing	-0.024 (0.133)	0.183* (0.085)	0.378*** (0.065)
Extracurricular involvement	-0.025 (0.158)	-0.442*** (0.112)	-0.107 (0.107)

Note: standardized beta coefficients shown; \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; controlling for full set of individual- and school-level covariates;  $n = 10,869$  for full sample;  $n = 5,743$  for girls;  $n = 5,126$  for boys; reference group for marginalization experiences is Integrated; reference group for depressive trajectories is Steady

Table 3.5: Multinomial Logistic Regression of Depressive Trajectory on High School Peer Marginalization and Teacher Attachment

	Tumultuous <i>Coefficient (SE)</i>	Worsening <i>Coefficient (SE)</i>	Improving <i>Coefficient (SE)</i>
<b>FULL SAMPLE</b>			
Marginalized	0.262** (0.092)	0.401*** (0.059)	0.490*** (0.034)
Integrating	0.254** (0.080)	0.220*** (0.063)	0.275*** (0.033)
Marginalizing	0.093 (0.082)	0.215** (0.063)	0.227*** (0.037)
Teacher attachment	-0.263* (0.104)	-0.077 (0.082)	-0.388*** (0.051)
<b>GIRLS</b>			
Marginalized	0.363** (0.114)	0.365*** (0.084)	0.511*** (0.044)
Integrating	0.185 (0.114)	0.303*** (0.081)	0.328*** (0.054)
Marginalizing	0.153 (0.088)	0.252** (0.084)	0.195*** (0.055)
Teacher attachment	-0.373*** (0.104)	0.090 (0.116)	-0.352*** (0.065)
<b>BOYS</b>			
Marginalized	0.007 (0.145)	0.418*** (0.088)	0.499*** (0.070)
Integrating	0.311** (0.109)	0.125 (0.093)	0.193** (0.064)
Marginalizing	-0.031 (0.135)	0.179* (0.090)	0.294*** (0.059)
Teacher attachment	-0.035 (0.161)	-0.258* (0.123)	-0.462*** (0.069)

Note: standardized beta coefficients shown; \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; controlling for full set of individual- and school-level covariates;  $n = 10,869$  for full sample;  $n = 5,743$  for girls;  $n = 5,126$  for boys; reference group for marginalization experiences is Integrated; reference group for depressive trajectories is Steady

Table 3.6: Multinomial Logistic Regression of Depressive Trajectory on the Interplay between High School Peer Marginalization and Extracurricular Involvement

	Tumultuous <i>Coefficient (SE)</i>	Worsening <i>Coefficient (SE)</i>	Improving <i>Coefficient (SE)</i>
<b>FULL SAMPLE</b>			
Marginalized	0.209 (0.132)	0.305*** (0.081)	0.575*** (0.051)
Integrating	0.230* (0.092)	0.253*** (0.070)	0.377*** (0.047)
Marginalizing	0.014 (0.117)	0.185* (0.075)	0.293*** (0.052)
Extracurricular involvement	-0.106 (0.098)	-0.400*** (0.076)	-0.127 (0.078)
Marginalized x extracurricular	0.145 (0.105)	0.133 (0.090)	0.021 (0.046)
Integrating x extracurricular	0.067 (0.103)	-0.055 (0.075)	-0.079 (0.054)
Marginalizing x extracurricular	0.156 (0.097)	0.024 (0.077)	-0.009 (0.053)
<b>GIRLS</b>			
Marginalized	0.397* (0.173)	0.289** (0.108)	0.570*** (0.070)
Integrating	0.242 (0.143)	0.358*** (0.091)	0.497*** (0.071)
Marginalizing	-0.001 (0.146)	0.259** (0.096)	0.235** (0.069)
Extracurricular involvement	-0.088 (0.143)	-0.293** (0.087)	-0.138 (0.108)
Marginalized x extracurricular	0.049 (0.137)	0.082 (0.115)	0.029 (0.074)
Integrating x extracurricular	-0.027 (0.149)	-0.086 (0.099)	-0.196** (0.073)
Marginalizing x extracurricular	0.268* (0.113)	-0.080 (0.108)	0.018 (0.073)

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	Tumultuous <i>Coefficient (SE)</i>	Worsening <i>Coefficient (SE)</i>	Improving <i>Coefficient (SE)</i>
<b>BOYS</b>			
Marginalized	-0.206 (0.190)	0.295** (0.102)	0.599*** (0.095)
Integrating	0.196 (0.100)	0.169 (0.100)	0.165 (0.090)
Marginalizing	0.002 (0.141)	0.110 (0.101)	0.383*** (0.087)
Extracurricular involvement	-0.126 (0.170)	-0.535*** (0.112)	-0.152 (0.124)
Marginalized x extracurricular	0.307* (0.134)	0.195 (0.107)	0.054 (0.078)
Integrating x extracurricular	0.139 (0.128)	-0.081 (0.106)	0.124 (0.092)
Marginalizing x extracurricular	-0.069 (0.185)	0.132 (0.104)	-0.020 (0.089)

Note: standardized beta coefficients shown; \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; controlling for full set of individual- and school-level covariates;  $n = 10,869$  for full sample;  $n = 5,743$  for girls;  $n = 5,126$  for boys; reference group for marginalization experiences is Integrated; reference group for depressive trajectories is Steady

Table 3.7: Multinomial Logistic Regression of Depressive Trajectory on the Interplay between High School Peer Marginalization and Teacher Attachment

	Tumultuous <i>Coefficient (SE)</i>	Worsening <i>Coefficient (SE)</i>	Improving <i>Coefficient (SE)</i>
<b>FULL SAMPLE</b>			
Marginalized	-0.064 (0.338)	-0.049 (0.346)	0.179 (0.160)
Integrating	0.409 (0.383)	-0.188 (0.300)	0.106 (0.140)
Marginalizing	-0.197 (0.327)	-0.063 (0.368)	0.096 (0.186)
Teacher attachment	-0.296* (0.119)	-0.177 (0.106)	-0.449*** (0.069)
Marginalized x teacher attachment	0.328 (0.351)	0.441 (0.330)	0.309* (0.154)
Integrating x teacher attachment	-0.173 (0.394)	0.406 (0.308)	0.172 (0.135)
Marginalizing x teacher attachment	0.298 (0.321)	0.272 (0.378)	0.127 (0.188)
<b>GIRLS</b>			
Marginalized	0.053 (0.433)	-0.891* (0.397)	0.081 (0.233)
Integrating	0.377 (0.547)	-0.645 (0.488)	0.076 (0.233)
Marginalizing	-0.065 (0.319)	-0.249 (0.477)	-0.193 (0.233)
Teacher attachment	-0.410*** (0.114)	-0.119 (0.118)	-0.442*** (0.092)
Marginalized x teacher attachment	0.311 (0.478)	1.206** (0.386)	0.424 (0.227)
Integrating x teacher attachment	-0.226 (0.618)	0.916 (0.495)	0.251 (0.229)
Marginalizing x teacher attachment	0.222 (0.311)	0.471 (0.466)	0.393 (0.224)

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	Tumultuous <i>Coefficient (SE)</i>	Worsening <i>Coefficient (SE)</i>	Improving <i>Coefficient (SE)</i>
<b>BOYS</b>			
Marginalized	-0.546 (0.421)	0.597 (0.411)	0.234 (0.224)
Integrating	0.433 (0.480)	0.329 (0.279)	0.161 (0.210)
Marginalizing	-0.568 (0.810)	-0.048 (0.438)	0.283 (0.255)
Teacher attachment	-0.078 (0.171)	-0.246 (0.160)	-0.510*** (0.084)
Marginalized x teacher attachment	0.542 (0.394)	-0.190 (0.429)	0.264 (0.207)
Integrating x teacher attachment	-0.135 (0.475)	-0.213 (0.308)	0.029 (0.215)
Marginalizing x teacher attachment	0.526 (0.772)	0.250 (0.449)	-0.009 (0.261)

Note: standardized beta coefficients shown; \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; controlling for full set of individual- and school-level covariates;  $n = 10,869$  for full sample;  $n = 5,743$  for girls;  $n = 5,126$  for boys; reference group for marginalization experiences is Integrated; reference group for depressive trajectories is Steady

Table 3.8: Multinomial Logistic Regression of Depressive Trajectory on the Interplay between High School Peer Marginalization and Having a Mentor

	Tumultuous <i>Coefficient (SE)</i>	Worsening <i>Coefficient (SE)</i>	Improving <i>Coefficient (SE)</i>
<b>FULL SAMPLE</b>			
Marginalized	0.323* (0.127)	0.362*** (0.086)	0.590*** (0.043)
Integrating	0.179 (0.096)	0.205** (0.073)	0.304*** (0.048)
Marginalizing	0.175 (0.093)	0.248** (0.080)	0.251*** (0.047)
Mentor in high school	-0.019 (0.129)	0.002 (0.112)	0.031 (0.080)
Marginalized x HS mentor	-0.027 (0.126)	0.089 (0.085)	0.011 (0.053)
Integrating x HS mentor	0.155 (0.109)	0.040 (0.072)	0.038 (0.052)
Marginalizing x HS mentor	-0.100 (0.092)	-0.047 (0.094)	0.069 (0.052)
<b>GIRLS</b>			
Marginalized	0.418** (0.151)	0.295** (0.107)	0.577*** (0.064)
Integrating	0.218 (0.147)	0.279** (0.102)	0.343*** (0.074)
Marginalizing	0.302** (0.100)	0.270* (0.111)	0.206** (0.066)
Mentor in high school	-0.063 (0.172)	0.096 (0.147)	-0.089 (0.091)
Marginalized x HS mentor	0.033 (0.154)	0.090 (0.111)	0.035 (0.066)
Integrating x HS mentor	-0.008 (0.125)	0.032 (0.083)	0.049 (0.071)
Marginalizing x HS mentor	-0.191 (0.122)	-0.049 (0.138)	0.079 (0.073)

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	Tumultuous <i>Coefficient (SE)</i>	Worsening <i>Coefficient (SE)</i>	Improving <i>Coefficient (SE)</i>
<b>BOYS</b>			
Marginalized	0.069 (0.194)	0.425*** (0.116)	0.628*** (0.082)
Integrating	0.116 (0.119)	0.143 (0.119)	0.239** (0.078)
Marginalizing	-0.050 (0.150)	0.232* (0.117)	0.331*** (0.075)
Mentor in high school	0.039 (0.144)	-0.117 (0.165)	0.205 (0.133)
Marginalized x HS mentor	-0.120 (0.171)	0.092 (0.133)	-0.008 (0.103)
Integrating x HS mentor	0.253* (0.117)	0.007 (0.161)	0.017 (0.078)
Marginalizing x HS mentor	0.047 (0.161)	-0.050 (0.138)	0.073 (0.074)

Note: standardized beta coefficients shown; \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; controlling for full set of individual- and school-level covariates;  $n = 10,869$  for full sample;  $n = 5,743$  for girls;  $n = 5,126$  for boys; reference group for marginalization experiences is Integrated; reference group for depressive trajectories is Steady

Figure 3.1: Not Fitting In Measures by Latent Classes at Waves I and II

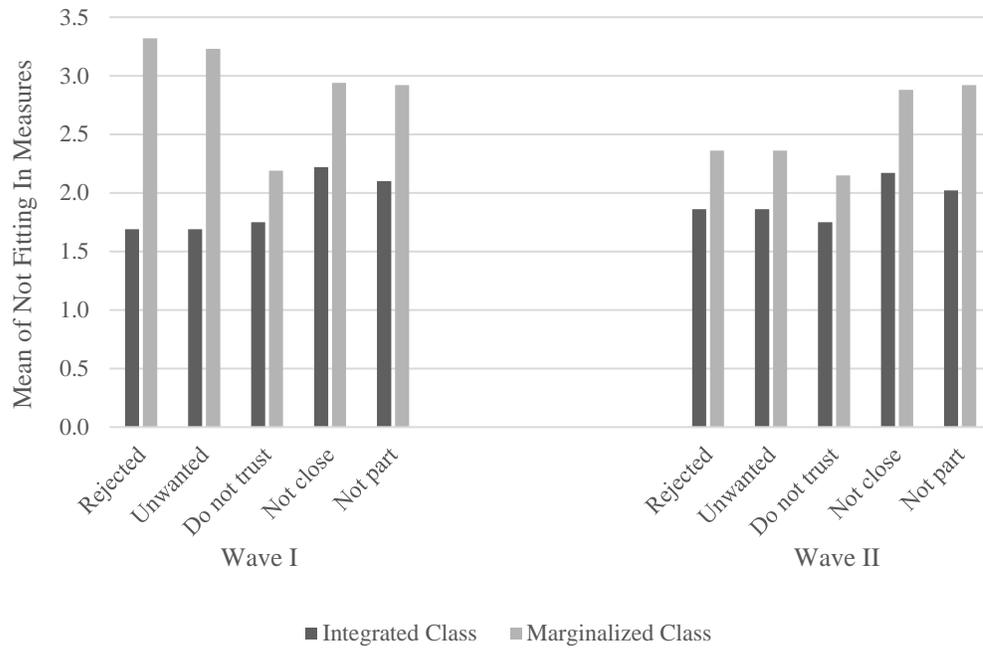


Figure 3.2: Social Marginalization Experiences across Waves I and II of Four Latent Classes Identified with Latent Transition Analysis

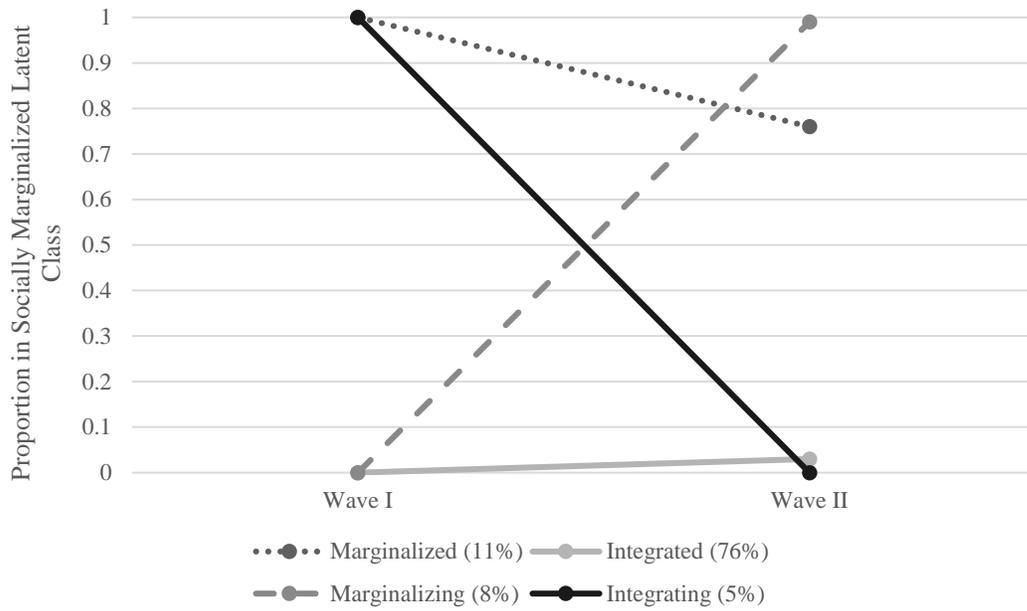
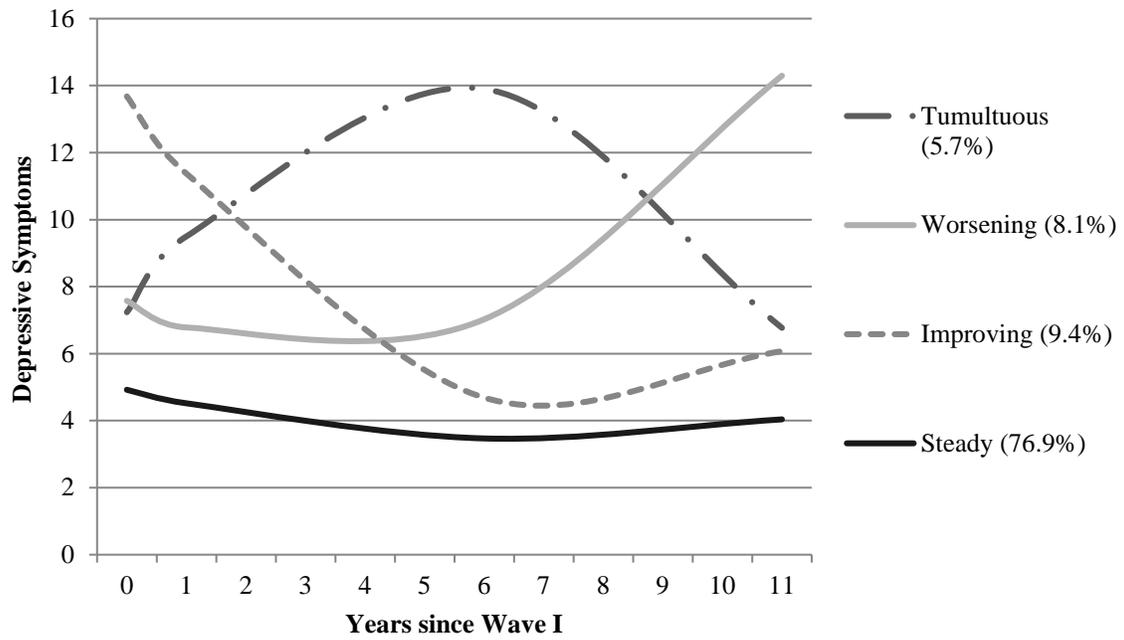


Figure 3.3: Four Classes of Depressive Trajectories from Adolescence to Adulthood



## **Chapter 4: Social Marginalization in High School and Trajectories of Psychological Distress and Binge Drinking into Adulthood**

### **ABSTRACT**

High schools are complex social systems that adolescents navigate during a critical developmental period. Feeling disconnected from peers in these settings could lead to both higher levels of psychological distress and greater engagement in binge drinking. These internalizing and externalizing responses to stress complement each other, and therefore deserve to be studied as bi-directional, mutually influential pathways of adjustment. Applying parallel process modeling to longitudinal data on depressive symptoms and binge drinking frequency from the National Longitudinal Study of Adolescent to Adult Health ( $n = 10,869$ ), this study documents the complex connections between trajectories of distress and trajectories of drinking behavior. Findings suggest that heavy drinking among socially marginalized adolescent girls jeopardized their mental health across the transition to adulthood. For marginalized boys, on the other hand, the linkages mattered more long term. Heavy drinking across the transition to adulthood was associated with more problematic trajectories of depressive symptoms, while improvements in psychological well-being were associated with a higher frequency of binge drinking among marginalized boys. The social ups and downs of high school, therefore, affect adjustment and functioning in ways that threaten health and well-being long past high school.

## **INTRODUCTION**

Psychological distress and alcohol use in adolescence can be complementary and mutually influential symptoms of maladjustment. The internalization of stress undermines mental health and may provoke drinking, while externalization through alcohol use is risky, but rewarding, and has complex implications for psychological well-being. Although drinking is linked to a host of emotional and physical problems (Hawkins, Catalano, and Miller 1992; Schulenberg and Maggs 2002; Crosnoe, Frank, and Muller 2004), adolescent alcohol use also confers social advantages, providing youth with opportunities to expand their peer networks (Cheadle, Stevens, and Williams 2013). In the short term, the social rewards of adolescent drinking may outshine the risks (Crosnoe 2011), particularly given the increasing significance ascribed to peer relationships in high school (Larson and Richards 1991; Crosnoe 2000; Giordano 2003). Over the long term, however, sustained drinking leads to unhealthier trajectories and diminishes well-being. These enduring risks may be especially pronounced among youth already vulnerable in some way, such as those who are marginalized within the complex social systems of their high schools. Marginalized youth are prone to heightened psychological distress in adolescence (Hall-Lande et al. 2007) with mental health problems lasting well into adulthood. Thus, in addition to social motivations for drinking, marginalized adolescents may drink to cope (Kuntsche et al. 2005). Over time, however, the immediate gratification of alcohol use may wane such that drinking instead contributes to the persistence of psychological distress.

In this spirit, this study uses a developmental life course framework to explore the interconnectedness of psychological distress and alcohol use across the transition to adulthood for youth who are marginalized in high school and youth who are not. Applying parallel process modeling techniques to longitudinal data on psychological distress and alcohol use from the National Longitudinal Study of Adolescent to Adult Health, I

document the degree to which trajectories of depressive symptoms and problematic alcohol use across adolescence into adulthood are mutually reinforcing and consider variation in these linkages by social experiences in high school. The hypothesis is that socially disconnected youth will turn to binge drinking both as a coping mechanism and as a social activity. In doing so, however, their increasingly problematic alcohol use will reinforce poor mental health trajectories in ways that jeopardize psychological well-being into adulthood. The added complexity to unpacking these parallel processes is that their mutual influence may also be conditioned by gender. Girls are more emotionally sensitive to the social dynamics of adolescence (Schulenberg, Sameroff, and Cicchetti 2004; Rudolph and Conley 2005), whereas boys are more likely to report problematic and frequent drinking (CDC 2011). Indeed, boys are more likely to externalize their stress responses, whereas girls are more likely to internalize (Hill and Needham 2013). As such, I pay attention to gender differences in the ways that trajectories of psychological distress and binge drinking develop simultaneously and by high school marginalization experiences.

Building on theoretical knowledge of life course processes, this study sheds light on the long reach of high school. Are the social ups and downs of high school something that youth get over as they move into adulthood, or do these experiences affect their adjustment and functioning in the moment in ways that leave a residue on their healthy functioning long past high school? Disentangling the connections between depressive symptoms and drinking across the transition to adulthood and understanding variation in these connections according to high school experiences prior to this transition can shed light on the cumulative nature of the life course and inform policies aiming to improve the social climate and safety of high schools.

## **BACKGROUND**

### **The Interconnectedness of Psychological Well-Being and Alcohol Use**

During adolescence, young people establish who they are and where they fit in the social world as they experience dramatic changes to their bodies and brains (Steinberg 2005; Steinberg 2014; Schulenberg, Sameroff, & Cicchetti 2004). The confluence of the physical and social changes of adolescence results in elevated emotional volatility, an exaggerated desire for peer approval, and heightened drive to do things just to feel good, regardless of the consequences. As a result, adolescents engage in behaviors that pose significant health risks (e.g., binge drinking) and experience mental health problems, leading to accidents, suicides, and injuries in the short term and, if not corrected, enduring psychological distress that persists throughout adulthood (Harris 2010; Bauldry et al. 2012). As such, adolescence is a critical stage for psychological and behavioral development, serving as a foundation for life course trajectories.

In some ways, psychological distress and problematic behaviors can be viewed as two sides of the same coin. Patterns of poor mental health and binge drinking have been considered, respectively, as internalizing and externalizing stress responses (Hill and Needham 2013) that can be disruptive to the transition to adulthood (Schulenberg et al 1996; Hoyt et al. 2012). That is, while some adolescents respond to environmental or social stressors by feeling down, others act out and engage in risky behaviors. In the short term, participating in risky behaviors such as binge drinking provide release—a chance for young people to let loose and forget the problems and stressors plaguing them. Over time, however, the rewards of drinking behaviors dwindle and the risks intensify. As such, frequent drinking over the long term can increase psychological distress. To be sure, mental health and unhealthy behaviors have been examined as risk factors for the other, resulting in a broader debate on temporal ordering. Does diminished well-being lead to drinking, or

does drinking lead to diminished well-being? Although some evidence suggests that risky behaviors predict depression (Hallfors et al. 2005; Boden and Fergusson 2011), a broader literature points instead to a link from depression to substance use (e.g., Diego, Field and Sanders, 2003; Poulin et al. 2005; Measelle, Stice, and Hogansen 2006). In other words, youth with heightened levels of distress are more likely to also externalize their symptoms and seek relief. They start drinking and, furthermore, drink with greater frequency.

Perhaps the most compelling evidence linking mental health and risk behaviors, however, confirms the bi-directionality of trajectories of psychological distress and binge drinking using parallel process modeling (Needham 2007). Indeed, the most likely association between depressive symptoms and binge drinking is that they co-develop across the transition to adulthood. This model of mutually reinforcing trajectories is consistent with a life course approach to developmental processes, which maintains that the direction and level of trajectories can be altered and deflected by changes in other settings, opportunities, or behaviors. Thus, trajectories of depressive symptoms and binge drinking can be thought of as taking shape and intensifying—or subsiding—alongside one another. In this spirit, this study expands Needham's (2007) parallel process models, which were estimated with three waves of Add Health data, to include information on distress and binge drinking at Wave IV. Doing so allows me to consider curvilinear growth in psychological and behavioral trajectories thereby extending the understanding of how these processes continue their mutual influence in adulthood.

At the same time, psychological and behavioral trajectories—and their interplay—are highly gendered. In fact, well-established gender differences in mental health document higher levels of psychological distress among girls than boys. These disparities emerge in adolescence and persist throughout adulthood (Nolen-Hoeksema 1990; Cyranowski et al. 2000). Across the same developmental timeframe, however, boys are more likely to engage

in risky behaviors, including binge drinking (Courtenay 2000). Independently, therefore, girls appear more likely to internalize, whereas boys appear more likely to externalize. Still, these patterns of mental health and risky behaviors complement each other in nuanced ways when considered separately for girls and boys. Specifically, when considering—by gender—how these processes are intertwined across the transition to adulthood, Needham (2007) found that higher adolescent depressive symptoms were linked to less frequent binge drinking in young adulthood for both girls and boys, whereas higher frequency of binge drinking in adolescence was associated with sharper declines in depressive symptoms across the transition to adulthood only for girls. As a result, neither girls nor boys appear to have a double disadvantage whereby problematic trajectories in one domain predict problematic trajectories in the other. Perhaps, however, the risks of drinking for psychological well-being are still accumulating across the transition to adulthood such that they do not fully take shape until early adulthood. Gender differences nonetheless point to potential variation in the reciprocity of psychological and behavioral trajectories. Girls, in particular, appear to have stronger bi-directional connections between their mental health and binge drinking behaviors from adolescence to adulthood. Extending these analyses to include early adulthood, therefore, requires a similar eye towards gender variation.

### **Distress, Drinking, and Social Marginalization**

The main contribution of this study is tying this parallel process phenomenon back to a key issue of great public interest: how adolescents get lost in the social worlds of their high schools and whether they ever get over it (Senior 2013). I make this connection through a five-part argument.

First, high school contexts organize complex social hierarchies. Across time and location, cliques have dominated high school culture (Coleman 1961; Eckert 1989; Barker,

Eccles, and Stone 2001). Adolescents' membership in a clique often defines who their friends are and how they spend their time. Navigating high school social contexts can be challenging to some youth, but figuring out where one fits into their high school's social hierarchy contributes to the broader development of self-identities happening during adolescence (Crosnoe 2011).

Second, this immersion in a complex and turbulent social system comes at a developmental moment of heightened salience of peers. During high school, peer networks expand and social evaluation becomes prominent (Larson and Richards 1991; Crosnoe 2000; Giordano 2003). The heightened sensitivity to social influence that is characteristic of adolescence, in turn, increases the degree to which young people are attuned to and shaped by what their peers are doing (Steinberg 2008). Social experiences and the extent to which young people feel connected to their peers, therefore, have longstanding implications for psychological processes and health behaviors.

Third, being marginalized within such a complex social system during a critical developmental period could lead to both higher levels of depressive symptoms and greater engagement in binge drinking. When adolescents feel isolated from peer networks in high school, they are more vulnerable to psychological distress (Hall-Lande et al. 2007; Joyce and Early 2014). These early mental health penalties, moreover, reverberate beyond high school such that, compared to their integrated counterparts, socially marginalized adolescents follow unhealthier psychological trajectories well into adulthood. Social pressures in high school are also central to adolescent alcohol use (Johnston et al. 2011). Adolescent drinking is a highly social activity. Drinking occurs in settings where young people mingle with friends and have fun (Kahler et al. 2003; Leigh and Stacy 2004). The party environments where adolescent drinking occurs provide opportunities to socialize with existing friends and also to form new friendships (Cheadle et al 2013). The social

nature of drinking and the opportunities it presents to connect with peers may be particularly attractive to marginalized youth, who see parties as opportunities to incorporate themselves into the social scenes of their high school.

Fourth, not only will this experience lead to more depressive symptoms and drinking during high school, it will encourage a stronger feedback loop between the two across the transition into adulthood. For socially disconnected youth, the psychological distress that accompanies social isolation triggers risky behaviors (Shankar et al. 2011). The draw to binge drinking is twofold. Parties allow marginalized youth to connect with peers, and alcohol provides means for self-medicating (Wills 1986; Bradizza, Reifman, and Barnes 1999; Hussong et al. 2011). Enticed by these short term rewards of alcohol use, isolated youth may drink to fit in and to feel better. Uptake of problematic drinking, however, can perpetuate feelings of despair and hopelessness, manifesting in enduring symptoms of distress that persist beyond adolescence. In this way, the long-lasting coupling of depressive and drinking trajectories may be more damaging among socially marginalized youth than integrated youth, and thus, may promote the psychological scarring of adolescent social marginalization.

Fifth, this role of social marginalization in high school in the unhealthy intertwining of depressive symptoms and alcohol use into adulthood will be more pronounced for girls than boys. Peer relationships among girls are characterized by small, close-knit friend groups. In these tight circles, girls are not only more sensitive to the ups and downs of their relationships with friends, but they are also more vulnerable to peer norms and influences (Gaughan 2006; Dick et al 2007). Peer relationships among boys are more status-oriented and focused on shared activities (Benenson 1990; Benenson et al. 2011; Hall 2011), and, boys report stronger social motives for drinking in adolescence (Kuntsche et al. 2006). Girls who feel as though they do not fit in and occupy the periphery of peer circles may

seek deeper connections through drinking, whereas boys in similar positions may drink to gain status and social approval. Still, the heightened sensitivity of girls to social marginalization (Rudolph and Conley 2005) may strengthen their link between depressive and drinking trajectories. Distress induced by feelings of isolation may lead to partying, which may further damage marginalized girls' psychological well-being, particularly when social disconnect persists.

### **Study Aims and Hypotheses**

Applying a life course perspective and building on theoretical and empirical evidence for the bi-directionality of psychological and behavioral trajectories across adolescence to adulthood, this study has three specific aims.

The first aim is to extend previous research and document—for the full sample and by gender—parallel processes of depressive symptoms and binge drinking across adolescence into adulthood using four waves of data from Add Health. The hypothesis is that these trajectories will be mutually reinforcing for all youth, but particularly for girls.

The second—and more important—aim will then be to document variation in these intertwining trajectories according to adolescents' experiences of social marginalization experiences in high school. The hypothesis is that these processes will come together in more perilous ways for marginalized youth than for integrated youth, particularly when heightened depressive symptoms of socially marginalized adolescents encourages the uptake of problematic drinking behaviors over time that then reinforce unhealthy psychological pathways.

The third aim is to evaluate gender differences in how high school social marginalization conditions parallel processes of depressive symptoms and binge drinking.

The hypothesis is that the link between trajectories of depressive symptoms and trajectories of binge drinking will be stronger among girls than boys.

## **METHOD**

### **Data and Sample**

The National Longitudinal Study of Adolescent to Adult Health (Add Health) has followed adolescents into young adulthood over four waves (Harris et al. 2009). It launched in 1994 with an in-school survey of 90,118 students in 132 middle and high schools across the U.S. Schools included in Add Health were selected by region, urbanicity, school size, school type, and racial composition based on a stratified sampling design. This survey created a sampling frame for the nationally representative sample of 20,745 students in the Wave I in-home interviews in 1995, who were followed across into adulthood. These respondents and their parents participated in an in-home interview in 1995 when respondents were ages 11 to 18. Additional interviews of the respondents were then conducted in 1996 (Wave II;  $n = 14,738$ ), 2001-2002 (Wave III;  $n = 15,197$ ), and 2007-2008 (Wave IV;  $n = 15,701$ ). At each follow-up wave, respondents' ages ranged from 12 to 18 (Wave II), 18 to 26 (Wave III), and 24 to 32 (Wave IV).

The analytical sample for this study was all adolescents who were in high school at Wave I and had valid longitudinal sampling weights (necessary to adjust for study design effects and correct for differential attrition across waves). Six additional respondents with missing information on all measures of peer marginalization (the dependent variable in analyses) were also excluded from the sample. Thus, the final analytical sample for this study included 10,869 adolescents.

## Measurement

*Depressive symptomatology.* At each wave, Add Health included a modified Center for Epidemiologic Studies-Depression scale (CES-D) (Perreira et al. 2005). Respondents reported the frequency of nine feelings in the past week (e.g., “You felt sad,” “You felt that you could not shake off the blues, even with help from your family and your friends”). Responses, ranging from 0 (never or rarely) to 3 (most of the time or all of the time), were summed into a 27-point scale of increasing depressive symptoms. CES-D measures across all four waves were combined through latent growth curve modeling (described in the Analytical Plan).

*Binge drinking.* Also at each wave, Add Health respondents reported on their drinking behaviors. First, respondents were asked a filter question of whether or not they had a drink of beer, wine, or liquor more than two times. If respondents answered yes, they were then asked several additional questions including, “during the past 12 months, on how many days did you drink five or more drinks in a row?” Responses to this question measured the frequency of binge drinking in the past year (Resnick et al. 1997) and included: none (0), one or two days (1), once a month (2), two or three days a month (3), one or two days a week (4), three to five times a week (5), and every day or almost every day (6). If respondents answered no to the filter question of ever drinking, they were included in the 0 category. Binge drinking measures across all four waves were combined through latent growth curve modeling (described in the Analytical Plan).

*Social marginalization in high school.* Not fitting in was operationalized using five variables from the Waves I and II in-home interviews. At each wave, adolescents were asked a series of questions including the degree to which they felt socially accepted, felt loved and wanted, got along with other students, felt close to people at their school, and felt like they were part of their school. The adolescents’ responses were measured on a

continuous scale from 1 (strongly agree) to 5 (strongly disagree), with higher values coded to indicate greater degrees of not fitting in (Crosnoe 2011). Latent classes of social marginalization experiences at Waves I and II were identified using these five continuous measures (described in the Analytical Plan) and class membership was then used to create a binary measure of marginalization (1 = marginalized at Wave I and/or Wave II).

Importantly, feelings of not fitting in represent a subjective indicator of peer marginalization. I focus on subjective experiences of marginalization given that adolescents are more likely to act on their feelings rather than their objective positions and because subjective statuses are more strongly linked with health outcomes (Cacioppo and Hawkey 2009).

*Sociodemographic and school-level covariates.* Several controls were measured to account for sociodemographic position and possible spuriousness: gender (1 = female), age, race/ethnicity (non-Hispanic white, non-Hispanic black, non-Hispanic Asian, Hispanic, other/multi-racial), family structure (1 = lived with both biological parents at Wave I, 0 = other family form), student's grade point average on a traditional four-point scale at Wave I, parent income at Wave I, and parent education (an ordinal variable ranging from 1, less than high school, to 5, post-college degree).

Additional school-level controls were drawn from the school survey or created by aggregating data across all respondents in a school, which was possible given that Add Health applied a census-like structure for each school. School-level controls included: school sector (1 = private school), region of school (South, West, Northeast, Midwest), school urbanicity (urban, suburban, rural), proportion of students in the school living below 185% of the Federal Poverty line, proportion of students in the school living with two-biological parents, proportion of white students in the school, school size, high school and feeder same school. A school-level "academic press" variable was also included to account

for the emphasis on and pressure for achievement in schools. This measure was based on the school means (aggregated from all individual responses in the school on the in-school survey) of GPA (standard four-point scale), math/science enrollment, and educational expectations (likelihood the student will graduate from college) as well as the administrator report of the percentage of seniors who go to college (Crosnoe, Riegle-Crumb, and Muller 2007). Each item in the composite academic press variable was standardized, and the final scale was the mean of the four z-scores.

### **Analytical Plan**

The analyses for the various aims of this project follow three steps: 1) identifying socially marginalized youth, 2) estimating trajectories of depressive symptomatology and binge drinking, and 3) examining the associations between social marginalization and unhealthy trajectories of depressive symptoms and binge drinking in general and by gender.

*Identifying socially marginalized youth.* Latent class analysis (LCA) identifies unobservable (i.e., latent) subgroups within a population. For purposes of this study, LCA allowed me to identify youth who felt marginalized in high school based on their reported feelings of not fitting in (i.e., at Wave I and/or Wave II).

To do so, I determined the appropriate number of latent classes at each wave by running LCAs for the five measures of not fitting in at Wave I and Wave II separately. I evaluated several criteria, including a loglikelihood-based test, Bayesian information criterion (BIC), and sample size adjusted BIC (ABIC), to determine the appropriate number of subgroups (or classes) in the study population. For log-likelihood, BIC, and ABIC measures of fit, smaller absolute values indicate better model fit. Thus, the relative change from the  $k$ -class to  $k-1$ -class is important. A Lo-Mendell Rubin (LMR) adjusted likelihood ratio test was also evaluated as a test of model fit. A significant  $p$ -value on the LMR test

suggests that the  $k$ -class model is better-fitting than the  $k-1$ -class model. Per the relative changes in log-likelihood, BIC, and ABIC values and the LMR  $p$ -value, a two-class solution was the best fit of the data at Wave I. One class reported agreeing with the 5 measures of not fitting in (marginalized group; 16% of the sample), whereas the second class reported disagreeing with the 5 statements that captured not fitting in (integrated group; 84% of the sample). At Wave II, a two-class solution again fit the data best. The marginalized group comprised 21% of the sample, and the integrated group comprised 79% of the sample. Fit statistics evaluated to make this determination are presented in Table 4.1. Figure 4.1 depicts means of the five measures of not fitting in across the integrated group and marginalized groups resulting from LCA at Waves I and II.

Next, I used LCA class membership to create a binary indicator of marginalization experience in high school. Specifically, if a respondent grouped into the marginalized class at either Wave I or Wave II (or both), they were assigned a value of 1 on the marginalization measure. If the respondent grouped into the integrated group at both Wave I and Wave II, they were assigned a value of 0. Approximately 26% of the analytical sample were classified as marginalized.

*Estimating trajectories of depressive symptomatology and binge drinking.* To evaluate trajectories of depressive symptoms and binge drinking across the transition to adulthood, I estimated separate unconditional latent growth curve models (LGCs) of each outcome across four waves of data. I determined the shape of the curve for the full sample of adolescents and separately by marginalization experiences by comparing fit statistics—including, for example, RMSEA and CFI values—for linear versus curvilinear growth. For depressive symptoms and for binge drinking, curvilinear growth was the better fit of the data. For depressive symptoms, the RMSEA value of the quadratic model was 0.053 and the CFI was 0.947. For binge drinking, the RMSEA value of the quadratic model

was 0.040 and the CFI was 0.989. These RMSEA and CFI values are consistent with a good model fit. Additionally, to test whether the differences between the linear and quadratic models were statistically significant, I performed a Chi-square difference test. The difference between the quadratic and linear models for both depressive symptoms and binge drinking was highly significant, indicating that the quadratic model was a better fit of the data than the linear model for both processes. These unconditional growth models show the basic developmental trajectories of depressive symptoms (Figure 4.2) and binge drinking (Figure 4.3) during the transition to adulthood. For depressive symptoms, youth tended to see mental health recovery during the transition to adulthood that was followed by gradual upticks in depressive symptoms during adulthood. For binge drinking, youth increased their binge drinking frequency gradually across the transition to adulthood, but this gradual increase was followed by sharper upticks in binge drinking in adulthood.

To determine if the shape of these trajectories differed significantly by whether or not adolescents experienced marginalization in high school, supplemental analyses incorporated marginalization and all sociodemographic covariates in multivariate conditional models that predicted changes in trajectories of depressive symptoms and trajectories of binge drinking. Results for trajectories of depressive symptoms confirmed that, compared to youth with no marginalization experiences in high school, marginalized youth report significantly higher levels of depressive symptoms in adolescence, as evidenced by positive association between marginalization and trajectory intercept ( $p < .001$ ). Furthermore, a significant negative association between marginalization and the slope function of trajectories of depressive symptoms ( $p < .001$ ) and a significant positive association between marginalization and the quadratic function of trajectories of depressive symptoms ( $p < .001$ ) point to more shallow recovery of mental health across the transition to recovery and sharper uptick in depressive symptoms in adulthood. Overall, therefore,

the patterns of psychological distress followed by marginalized youth were characterized by disadvantaged mental health in adolescence that follows more problematic trajectories into adulthood.

The intercept, slope, and quadratic function of binge drinking trajectories, on the other hand, did not differ significantly by whether or not the respondent experienced social marginalization in high school.

*Linking social marginalization to unhealthy trajectories.* Once marginalization experience was classified using LCA and trajectories of depressive symptomatology and binge drinking were identified with LGCM, analyses proceed in three steps to understand how depressive symptoms and binge drinking unfold as parallel processes.

First, to explore the co-dependent ways mental health and health behaviors unfold from adolescence to adulthood, parallel processes models were estimated to jointly analyze trajectories of depressive symptoms and binge drinking. This modeling strategy allowed me to evaluate trajectories of depressive symptoms and binge drinking as pathways that unfold simultaneously. Specifically, I tested how the starting point and change rate of one trajectory (i.e., intercept, slope, and quadratic) influenced change in the other trajectory (i.e., slope and quadratic). Parallel process models were estimated for the full sample and by gender. In all models, the intercept, slope, and quadratic function of trajectories of depressive symptoms and drinking were regressed on the full set of sociodemographic covariates such that I controlled not only for how individual- and school-level characteristics influence where adolescents start, but also how they change over time.

Second, multiple group analyses determined whether these parallel processes varied by high school marginalization experiences. After running an unconstrained model in which all paths were free to vary, I constrained the pathways between trajectories of depressive symptoms and trajectories of binge drinking to be equal across respondents who

felt marginalized in high school and respondents who did not. A  $\chi^2$  difference test compared changes in  $\chi^2$  value and degrees of freedom between the unconstrained model and the constrained models. A significant  $\chi^2$  difference test indicated poorer fit for the constrained model, thus implying significant group differences. Given that I applied a maximum likelihood estimator with robust standard errors (MLR), I calculated  $\chi^2$  difference tests using the Satorra-Bentler scaling correction factor, computing difference test scaling correction and scaled  $\chi^2$  statistics (Satorra and Bentler 2010).

Importantly, to evaluate gender differences in how marginalization experiences condition parallel processes of depressive symptoms and binge drinking, the third analytical step was to estimate gender-stratified multiple group models. Again, I tested for significant group differences in parallel processes of depressive symptoms and binge drinking using the Satorra-Bentler method, this time limiting analyses first to compare girls who felt marginalized in high school and girls who did not and second to compare boys who felt marginalized in high school and boys who did not.

All analyses were conducted in Mplus statistical software (Muthén and Muthén 2008). Full information maximum likelihood estimation (FIML) accounted for missingness, so that all cases in the analytical sample were retained even if they had missing data on individual variables. FIML fits the covariance structure model directly to the observed and available raw data, thereby specifying the variances of exogenous variables to avoid listwise deletion. The cluster function in Mplus adjusted standard errors to account for students being nested within schools per the Add Health sampling design. Longitudinal sampling weights were applied in all analyses to address differential probability of being sampled and differential attrition across waves. Accounting for the complex survey design required that an MLR estimator be used (as previously mentioned). Traditional levels of statistical significance ( $p < .05$  or greater) were used as

the benchmark for identifying significant associations. Unstandardized beta coefficients are shown.

## **RESULTS**

Table 4.2 presents descriptive statistics for depressive symptoms, binge drinking, and all sociodemographic covariates for the full sample and by social marginalization in high school.

Adolescents who were marginalized in high school reported higher levels of depressive symptoms at each wave compared to adolescents who were not marginalized in high school. For example, at Wave I, marginalized youth reported greater than 8 symptoms of depression, compared to approximately 5 symptoms reported by integrated youth. This disadvantage carried into adulthood, with the marginalized group reporting more than 6 symptoms of depression at Wave IV compared to less than 5 reported by the integrated group. These descriptive results complemented the conditional LGCM results that showed socially marginalized youth to have significantly different levels of depressive symptoms in adolescence that changed at more troubling rates over time.

Patterns of binge drinking across adolescence to adulthood, on the other hand, were similar for socially marginalized and integrated youth. At Wave I, mean binge drinking frequency for both groups suggested that, on average, marginalized and integrated youth consumed five or more drinks in a sitting only once or twice in the 12 months prior to interview. At Wave IV, the average frequency of binge drinking was around 3, suggesting that in adulthood, marginalized and integrated respondents binge drank two or three times a month. Again, descriptive patterns are consistent with the conditional LGCM results that showed no significant differences in the intercept, slope, and quadratic functions of binge drinking trajectories between socially marginalized and integrated respondents.

## **Parallel Processes of Depressive Symptoms and Binge Drinking**

To document associations between trajectories of depressive symptoms and binge drinking, Table 4.3 presents results of parallel process models for the full analytical sample and separately by gender.

For the full sample, higher frequency of binge drinking in adolescence was associated with shallower recovery of depressive symptoms following adolescence and sharper upticks of depressive symptoms in adulthood. This pattern was evidenced by the significant, negative association between binge drinking intercept and the slope function of trajectories of depressive symptoms ( $B = -1.820; p < .001$ ) and the significant, positive association between the intercept of binge drinking trajectories and the quadratic function of trajectories of depressive symptoms ( $B = 1.586; p < .001$ ). A significant, positive association between the slope function of binge drinking trajectories and the quadratic function of trajectories of depressive symptoms ( $B = 2.712; p < .001$ ), moreover, suggests that sharper increases in binge drinking across the transition to adulthood were associated with sharper upticks of depressive symptoms in adulthood. Together, unhealthy binge drinking trajectories were associated with more problematic trajectories of psychological distress into adulthood.

Levels of and changes in depressive symptoms also mattered for trajectories of binge drinking. A negative association between intercept of trajectories of depressive symptoms and the slope function of binge drinking trajectories ( $B = -0.105; p < .001$ ) indicates that higher depressive symptoms in adolescence were associated with shallower increases in binge drinking across the transition to adulthood. At the same time, however, higher initial depressive symptoms were also positively associated with the quadratic function of binge drinking trajectories ( $B = 0.057; p < .01$ ), indicating that more depressed youth experienced sharper increases in binge drinking frequency across the transition to

adulthood. Sharper recoveries in depressive symptoms from adolescence to adulthood were also associated with quicker increases in binge drinking, per the positive association between the slope function of trajectories of depressive symptoms and the quadratic function of binge drinking trajectories ( $B = 0.262$ ;  $p < .001$ ). Generally, therefore, although poor adolescent mental health was associated with less frequent binge drinking across the transition to adulthood, healthier psychological trajectories from adolescence to adulthood were associated with more frequent binge drinking.

Notable gender differences were observed in stratified parallel process models. Among girls, adolescent binge drinking frequency (i.e., the intercept of these trajectories) was associated with the slope and quadratic functions of trajectories of depressive symptoms ( $p < .05$ ) in ways that mirrored the full sample results. Changes in binge drinking across the transition to adulthood for girls (i.e., the slope function of binge drinking trajectories), however, were not significantly associated with changes in trajectories of psychological distress. Conversely, levels of adolescent depressive symptoms (i.e., the intercept) were not associated with changes in binge drinking trajectories for girls; but, similar to the full sample results, a positive association between the slope function of trajectories of depressive symptoms and the quadratic function of binge drinking trajectories indicates that sharper recoveries in depressive symptoms from adolescence to adulthood among girls were associated with quicker increases in binge drinking in adulthood ( $p < .05$ ). Overall, however, the linkages between trajectories of depressive symptoms and trajectories of binge drinking among girls were observed to a lesser extent than when the full sample was considered.

Boys, on the other hand, displayed similar patterns as the full sample model. One exception was that the intercept of trajectories of depressive symptoms did not significantly predict the quadratic function of binge drinking trajectories.

Consistent with my the hypothesis, therefore, modeling trajectories of depressive symptoms and binge drinking simultaneously revealed that they are mutually reinforcing processes, whereby the starting point and change rate of each trajectory were associated with change in the other trajectory. Problematic binge drinking trajectories were associated with problematic trajectories of psychological distress. Generally, however, unhealthy psychological profiles in adolescence predicted less frequent binge drinking across the transition to adulthood. Youth with trajectories of depressive symptoms characterized by recovery were expected to see sharper increases in binge drinking into adulthood. The association of patterns of depressive symptoms (or drinking behaviors) and upticks in binge drinking (or rebound of depressive symptoms) in adulthood were more distinct among boys than girls, a finding counter to my gender hypothesis.

### **Variation by Experiences of Social Marginalization**

With the interrelatedness of psychological and behavioral trajectories as background, the focal analytical step was to determine whether marginalization experience conditioned the association between these trajectories. Results from Satorra-Bentler  $\chi^2$  difference tests are presented in Table 4.4 for the full sample and by gender.

For the full sample model, significant  $\chi^2$  difference tests confirmed that the associations between trajectories of depressive symptoms and binge drinking varied by whether respondents felt marginalized or integrated in high school. In fact, all six constraints tested revealed statistically significant differences, suggesting that the associations between trajectories of depressive symptoms and trajectories of binge drinking depended on social marginalization experiences. To understand these group differences, I referred to unconstrained model results for integrated and marginalized adolescents, shown in Table 4.5.

Patterns linking trajectories of depressive symptoms and binge drinking among integrated youth mirrored the full sample results presented in Table 4.3. To recap, unhealthy binge drinking trajectories were associated with more problematic trajectories of depressive symptoms into adulthood. Moreover, although poor mental health in adolescence was associated with less frequent binge drinking trajectories, healthier trajectories of depressive symptoms from adolescence to adulthood were associated with more problematic binge drinking in adulthood.

Despite the persistence of strong connections between trajectories of depressive symptoms and binge drinking among marginalized youth, the nuances of these associations were quite different than those documented among integrated youth. Specifically, more frequent binge drinking among marginalized youth in adolescence was associated with quicker recovery of depressive symptoms across the transition to adulthood and less pronounced upticks in poor mental health, as evidenced by the associations between the intercept of binge drinking trajectories and the slope ( $B = 2.257; p < .001$ ) and quadratic ( $B = -2.402; p < .001$ ) functions of trajectories of depressive symptoms. Furthermore, a negative association between the slope function of binge drinking trajectories and the quadratic function of trajectories of depressive symptoms ( $B = -1.941; p < .01$ ) indicated that marginalized adolescents with more striking increases in binge drinking experienced shallower rebounds in depressive symptoms in adulthood. Unhealthy binge drinking trajectories among marginalized youth, therefore, were associated with healthier mental health trajectories.

Additionally, heightened depressive symptoms in adolescence (i.e., higher intercepts) were associated with sharper increases in binge drinking for marginalized youth (per a positive association with slope function of binge drinking;  $B = 0.166; p < .001$ ) followed by milder increases in drinking across the transition to adulthood (per a negative

association with quadratic function of binge drinking;  $B = -0.205$ ;  $p < .001$ ). Said otherwise, marginalized youth with higher levels of depressive symptoms in adolescence were expected to binge drink more frequently across the transition from adolescence to adulthood, but were not expected to follow the same sharp uptick in binge drinking in adulthood as observed by the quadratic function of binge drinking trajectories. Additionally, when improvements in depressive symptoms occurred more quickly from adolescence to adulthood, increases in young adult binge drinking among marginalized youth were less pronounced, as evidenced by the negative association between the slope function of trajectories of depressive symptoms and the quadratic function of binge drinking trajectories ( $B = -0.194$ ;  $p < .01$ ). Among marginalized youth, therefore, poor adolescent mental health was associated with more problematic binge drinking across the transition from adolescence to adulthood, but healthier trajectories of psychological distress were associated with less frequent binge drinking in adulthood.

To summarize, trajectories of depressive symptoms and binge drinking were mutually reinforcing processes regardless of social experiences in high school, but the nature and direction of the interplay between these trajectories varied greatly by whether or not an adolescent experienced social marginalization in high school. For integrated youth, unhealthy trajectories of depressive symptoms were associated with problematic binge drinking trajectories, but, generally, healthier trajectories of depressive symptoms were associated with more frequent binge drinking in adulthood. For marginalized youth, on the other hand, problematic binge drinking trajectories were associated with healthier trajectories of depressive symptoms and, on the whole, healthier trajectories of depressive symptoms were associated with less frequent binge drinking in adulthood. Thus, I found support for my second hypothesis that trajectories of depressive symptoms and binge drinking would combine in more troubling ways for marginalized youth, but only for the

links between trajectories of psychological distress with binge drinking and not for the links between binge drinking trajectories with psychological well-being.

### **Parallel Processes, Marginalization Experience, and Gender**

Table 4.4 also shows results of Satorra-Bentler  $\chi^2$  difference tests for gender-stratified multiple group models.

Among girls, multiple group models suggested that the intercept of binge drinking trajectories was associated with the slope and quadratic function of trajectories of depressive symptoms in significantly different ways for integrated and marginalized youth. Referring to the unconstrained model (not shown), integrated girls with higher starting values on binge drinking were expected to see sharper improvements in depressive symptoms across the transition to adulthood (regression of slope function of depressive trajectory on intercept of binge drinking;  $B = 1.474$ ;  $p < .001$ ) and less pronounced increases in depressive symptoms in adulthood (regression of quadratic function of depressive trajectory on intercept of binge drinking;  $B = -1.438$ ;  $p < .001$ ). For marginalized girls, on the other hand, higher starting values on binge drinking were associated with less improvement in depressive symptoms across the transition to adulthood (regression of slope function of depressive trajectory on intercept of binge drinking;  $\beta = -1.440$ ;  $p < .05$ ). The intercept of binge drinking trajectories and the quadratic function of trajectories of depressive symptoms, however, were not significantly linked for marginalized girls. In sum, therefore, integrated girls who binge drank frequently in adolescence were expected to follow healthier trajectories of depressive symptoms, whereas marginalized girls who were frequent binge drinkers in adolescence were expected to follow more troubling patterns of depressive symptoms.

The association between rate of change in trajectories of depressive symptoms (i.e., slope) and the quadratic function of binge drinking trajectories was also significantly different for integrated and marginalized girls. Whereas sharper recoveries in depressive symptoms from adolescence to adulthood were associated with more moderate increases in binge drinking in adulthood for integrated girls (regression of quadratic function of binge drinking trajectory on slope of depressive drinking;  $B = -0.339$   $p < .001$ ), the slope function of trajectories of depressive symptoms among marginalized girls was not significantly associated with the quadratic function of binge drinking trajectories. Indeed, the linkages between trajectories of psychological distress and binge drinking were more distinct among integrated girls than marginalized girls.

Multiple group models for boys also revealed significant differences in the ways trajectories of depressive symptoms and binge drinking intertwined for integrated and marginalized youth. For integrated boys, the association between the slope function of binge drinking trajectories and the quadratic function of trajectories of depressive symptoms was negative ( $B = -1.061$ ;  $p < .01$ ), indicating that sharper increases in binge drinking across the transition to adulthood were associated with less pronounced upticks in adult depressive symptoms. For marginalized boys, the reverse was true. Sharper increases in binge drinking across the transition to adulthood for marginalized boys were associated with more pronounced upticks in adult depressive symptoms ( $B = 1.709$ ;  $p < .01$ ). Problematic drinking trajectories, therefore, were associated with healthy psychological profiles for integrated boys and unhealthy profiles for marginalized boys.

In terms of group differences in how trajectories of depressive symptoms shaped binge drinking trajectories, integrated boys with higher depressive symptoms in adolescence ( $B = -0.235$ ;  $p < .001$ ) and those with more improvement in depressive symptoms across the transition to adulthood ( $B = -0.372$ ;  $p < .001$ ) saw less pronounced

increases in binge drinking in adulthood (i.e., the quadratic function of drinking trajectories). For marginalized boys, on the other hand, the intercept of trajectories of depressive symptoms was not associated with the quadratic function of binge drinking trajectories, but marginalized boys with greater improvement in depressive symptoms across the transition to adulthood experienced sharper increases in binge drinking in adulthood (i.e., the quadratic function of drinking trajectories;  $B = -0.350$   $p < .01$ ). Sharper improvements in psychological trajectories across adolescence to adulthood, therefore, were associated with less binge drinking among integrated boys, but more binge drinking among marginalized boys.

By and large, gender-stratified multiple group models revealed important similarities and differences in the ways that social marginalization differentiated the trajectories of psychological distress and binge drinking of girls and boys. For integrated youth, regardless of gender, more problematic drinking trajectories tended to be linked to healthier psychological trajectories, whereas, for marginalized girls and boys, frequent binge drinking was associated with unhealthy depressive trajectories. Gender differences emerged, however, in the ways in which trajectories of depressive symptoms predicted binge drinking trajectories. For integrated youth, those with healthier trajectories of depressive symptoms followed healthier patterns of binge drinking. For marginalized youth, trajectories of depressive symptoms did not predict binge drinking trajectories among girls, and healthy psychological trajectories were associated with more problematic drinking trajectories among boys.

## **DISCUSSION**

Trajectories of depressive symptoms and binge drinking across adolescence to adulthood are connected and mutually reinforcing (Needham 2007). Although adolescent

drinking is both a highly social activity and an avenue for coping with stress, drinking leads to long-term maladjustment and undermines well-being (Hawkins, Catalano, and Miller 1992; Schulenberg and Maggs 2002; Crosnoe, Frank, and Muller 2004). The goal of this study was to evaluate the bi-directionality of trajectories of depressive symptoms and binge drinking over developmental time, and to determine how the linkage of these trajectories can be shaped by social marginalization experiences in high school and by gender. The hypothesis was that the mutual reinforcement of depressive symptoms and binge drinking would be especially salient for socially marginalized youth in general—and marginalized girls more specifically—since these vulnerable adolescents would be attracted to the social aspect of adolescent drinking in addition to the self-medication it provides. In turn, however, the uptake of binge drinking would reinforce psychological distress of marginalized youth over time.

Overall, problematic binge drinking trajectories among marginalized youth were associated with healthier trajectories of depressive symptoms and healthier trajectories of depressive symptoms were associated with less frequent binge drinking in adulthood. This general pattern, however, varied by gender. For marginalized girls, trajectories of depressive symptoms and binge drinking were connected in the short term. More frequent binge drinking in adolescence hindered the improvement of depressive symptoms across the transition to adulthood for marginalized girls. I found no evidence of bi-directionality of depressive symptoms and binged drinking for marginalized girls, however, into adulthood. On the other hand, for marginalized boys, the connections between trajectories of depressive symptoms and binge drinking were more pronounced over the long term. Specifically, sharper increases in binge drinking frequency across the transition to adulthood was associated with sharper upticks in adult depressive symptoms, whereas

more marked improvement in depressive symptoms across the transition were associated with sharper increases in binge drinking. These results raise two important questions.

First, why might healthier trajectories of depressive symptoms be associated with more frequent binge drinking? Indeed, increases in binge drinking among marginalized youth predicted healthier trajectories of depressive symptoms, and declines in depressive symptoms among marginalized boys predicted more frequent binge drinking. These results likely point to social norms surrounding binge drinking across the transition to adulthood and suggest that social drinking may be a sign that marginalized youth are able to recover. Marked increases in heavy drinking among young people have generated widespread public health concern. Alcohol use peaks across the transition to adulthood (Schulenberg and Maggs 2002; Jager et al. 2013). Importantly, however, these trends are driven in large part by the high rates of binge drinking among college students in general and college-going male students in particular (O'Malley and Johnston 2002; Turrisi et al. 2006). Although college climates encourage binge drinking (Seo and Li 2009), however, college-going provides a host of long-term economic, social, and health benefits (Mirowsky and Ross 2003; Goldin and Katz 2008). Cashing in on these benefits may be especially fruitful for marginalized young people, who are less likely than their integrated counterparts to attend college in the first place (Crosnoe 2011).

Since binge drinking is a highly social activity embedded in the institutional culture of higher education, the association between improved psychological well-being and increased problematic drinking among marginalized youth may signal positive adjustment after high school. When the psychological well-being of marginalized boys improves, they may be better-positioned to incorporate themselves into scenes of social drinking after high school. Besides, as young people settle into their adult roles after college, forming romantic unions and transitioning to parenthood, binge drinking subsides (Schulenberg and Maggs

2002). To account for the potential that improvements in depressive symptoms predicted increased binge drinking among marginalized youth when these young people were better-suited to go to college and successfully transition into adult roles, sensitivity analyses extended the models presented by controlling for the effect of college-going and union formation in young adulthood on the slope and quadratic functions of trajectories of depressive symptoms and binge drinking. The results were consistent—for the full sample and for girls—with those presented. For marginalized boys, however, declines in depressive symptoms no longer predicted more frequent binge drinking, suggesting that college-going and union formation may help to explain why healthier psychological trajectories were associated with more frequent binge drinking among marginalized boys. Moreover, sharper increases in binge drinking across the transition to adulthood were no longer significantly associated with upticks in adult depressive symptoms, indicating that college-going and romantic relationships may also attenuate the mental health risks of heavy drinking for marginalized boys. Together, these preliminary results suggest dynamic links between psychological well-being, health behaviors, and transitions through young adult social roles, which should be more extensively considered in future research.

The second question raised by this study is: why might trajectories of depressive symptoms and trajectories of binge drinking be linked over the long term for marginalized boys but not marginalized girls? My hypothesis was that the co-occurrence of these trajectories would be more pronounced among girls given the heightened sensitivity of girls to social evaluation (Rudolph and Conley 2005). Instead, I documented that linkages in these trajectories over time were stronger for marginalized boys. These patterns may speak to gendered norms in stress responses. In general, from adolescence through adulthood, men are more likely to binge drink than women (Naimi et al. 2003), whereas women are more likely to report higher levels of psychological distress than men (Cyranowski et al.

2000). Not only do boys drink more across developmental time, moreover, but they also report stronger increases in social motives for drinking than girls in adolescence (Kuntsche et al. 2006). The gendered social norms and pressures to drink may, therefore, trigger the unraveling and coupling of trajectories of depressive symptoms and binge drinking in a way that is stronger among boys. This male disadvantage over the long term is also consistent with the fact that girls may be more likely than boys to age out of unhealthy behavior patterns across the transition to adulthood (Olson, Hummer, and Harris 2017).

At the same time, health behaviors do not develop in isolation, but rather as a constellation of activities in which young people engage. Although this study advanced our understanding of linkages between depressive symptoms and binge drinking among marginalized youth, a notable limitation was that I focused on trajectories of binge drinking without considering other health behaviors. Undoubtedly, several types of coping behaviors of marginalized youth—in addition to and in conjunction with drinking—can perpetuate problematic trajectories of health and well-being and may also be gendered. For example, girls are more likely than boys to deal with stressful environmental or social situations by deliberate self-harm or disordered eating (Croll et al. 2002; Ross and Heath 2002). Similar to drinking, these behaviors may feel good in the short term, but can carry implications for poor psychological health over time. To best capture how gender conditions the coupling of trajectories of depressive symptoms and trajectories of health behaviors, future research should consider patterns of behaviors that unfold across the transition to adulthood and their association with trajectories of psychological well-being.

During adolescence, young people establish foundations for their health and well-being across the life course while navigating the complex social hierarchies of high school. For adolescents who felt disconnected from peers during high school, this study documents bi-directionality between patterns of depressive symptoms and patterns of binge drinking

well into adulthood. These connections mattered more for girls in the short term, but more for boys in the long term, for whom mental health improvements actually increased the frequency with which they binge drank. These conclusions suggest that increased drinking across the transition to adulthood may signal positive adjustment, particularly among marginalized boys, as the social nature of drinking embeds young people in settings that may encourage integration and, thereby, improve psychological well-being. Still, the simultaneous unraveling of psychological health and heavy drinking behavior—for better or worse—among marginalized youth supports the necessity of positioning adolescent social risks as integral to the development of healthy adults.

Table 4.1: LCA Criteria for Class Determination

	1 Class	2 Classes	3 Classes	4 Classes
<b>WAVE I</b>				
Loglikelihood	-70266	-63773	-53823	-36100
# parameters	10	16	22	28
BIC	140626	127695	107849	72460
ABIC	140594	127644	107780	72371
LMR <i>p</i> -value		0.000	0.204	1.000
Entropy		0.988	0.999	0.999
Distribution of respondents into identified classes		84.3%, 15.7%	59.3%, 15.7%	25.0%, 25.0%, 4.7%, 11.0%, 59.3%
<b>WAVE II</b>				
Loglikelihood	-44292	-41738	-37190	-36544
# parameters	10	16	22	28
BIC	88673	83619	74577	73338
ABIC	88641	83568	74508	73249
LMR <i>p</i> -value		0.000	0.157	0.124
Entropy		0.793	1.000	0.947
Distribution of respondents into identified classes		79.3%, 20.7%	50.3%, 40.2%, 44.8%, 40.2%, 9.5%	5.6%, 9.5%

Table 4.2: Descriptive Statistics for the Full Sample and by Marginalization Experience

	<i>Mean/ %</i>		
	Full Sample <i>n</i> = 10,869	Marginalized in High School <i>n</i> = 2,785	Integrated in High School <i>n</i> = 8,084
Depressive symptoms			
Wave I	6.16	8.47	5.36
Wave II	6.09	8.50	5.24
Wave III	4.55	5.64	4.17
Wave IV	5.21	6.37	4.81
Binge drinking			
Wave I	0.85	0.87	0.84
Wave II	0.86	0.92	0.84
Wave III	1.25	1.22	1.26
Wave IV	3.19	3.06	3.23
Sociodemographic controls			
Male	47.16%	44.17%	48.19%
Two-bio parent household (WI)	52.58%	49.23%	53.74%
Age (WI)	16.38	16.25	16.43
Parental income (WI)	47.18	45.22	47.86
Parental education			
Less than high school	13.21%	15.09%	12.57%
High school	28.42%	28.35%	28.44%
Some college	22.03%	21.40%	22.24%
Bachelor's degree	23.09%	23.46%	22.96%
Post-baccalaureate	13.26%	11.69%	13.80%
Race/ethnicity			
Non-Hispanic White	51.65%	49.16%	52.51%
Non-Hispanic Black	19.08%	17.41%	19.66%
Hispanic	17.64%	19.75%	16.91%
Non-Hispanic Asian	6.62%	7.79%	6.21%
Other/multi-racial	5.01%	5.89%	4.71%
Hs GPA at WI	2.75	2.59	2.80
School level controls			
Private school	7.00%	5.96%	7.36%

Table 4.2 continued on following page

Table 4.2 continued from previous page

	<i>Mean/ %</i>		
	Full Sample <i>n</i> = 10,869	Marginalized in High School <i>n</i> = 2,785	Integrated in High School <i>n</i> = 8,084
School size (hundreds)	14.01	14.55	13.82
High school and feeder same	23.96%	23.27%	24.20%
Urbanicity			
Urban	28.20%	27.83%	28.33%
Suburban	54.08%	54.94%	53.79%
Rural	17.72%	17.24%	17.89%
Region			
West	24.92%	28.65%	23.64%
Midwest	26.12%	25.31%	26.40%
South	35.96%	32.35%	37.21%
Northeast	12.99%	13.68%	12.75%
Proportion of students under 185% FPL	0.38	0.38	0.37
Proportion two bio parent home	0.51	0.51	0.51
Academic press	-0.10	-0.11	-0.10
Proportion of White students	0.51	0.49	0.51

Table 4.3 Parallel Process Models of Depressive Symptoms and Binge Drinking

	<i>Coefficient (SE)</i>			
	Depressive Symptoms		Binge Drinking	
	Slope	Quadratic	Slope	Quadratic
<b>FULL SAMPLE</b>				
Intercept binge drinking	-1.820*** (0.133)	1.586*** (0.148)		
Slope binge drinking		2.712*** (0.354)		
Intercept depressive symptoms			-0.105*** (0.011)	0.057** (0.020)
Slope depressive symptoms				0.262*** (0.033)
<b>GIRLS</b>				
Intercept binge drinking	-1.108* (0.503)	0.903* (0.439)		
Slope binge drinking		-2.697 (1.890)		
Intercept depressive symptoms			0.135 (0.094)	-0.159 (0.104)
Slope depressive symptoms				0.531* (0.253)
<b>BOYS</b>				
Intercept binge drinking	-1.619*** (0.175)	1.462*** (0.173)		
Slope binge drinking		1.542*** (0.273)		
Intercept depressive symptoms			-0.140*** (0.022)	0.058 (0.036)
Slope depressive symptoms				0.354*** (0.060)

Note: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ;  $n = 10,869$  for full sample,  $n = 10,869$ ,  $n = 5,743$  for girls,  $n = 5,126$  for boys; controlling for full set of sociodemographic covariates

Table 4.4: Multiple Group Models by Marginalization Experience

Path	$\chi^2$	df	Scaling Correction	$\chi^2$ Difference	<i>p</i> -value
<b>FULL SAMPLE</b>					
Form (no constraints)	697.49	126			
All pathways constrained	653.69	132	2.77	14.61	0.024
Constrain intercept binge --> slope depress	660.36	127	4.21	11.59	0.001
Constrain intercept binge --> quadratic depress	662.55	127	4.21	10.71	0.001
Constrain slope binge --> quadratic depress	627.88	127	6.75	13.50	0.000
Constrain intercept depress --> slope binge	627.66	127	6.75	13.56	0.000
Constrain intercept depress --> quadratic binge	653.20	127	5.48	9.92	0.002
Constrain slope depress --> quadratic binge	654.31	127	6.75	6.81	0.009
<b>GIRLS</b>					
Form (no constraints)	425.51	122			
All pathways constrained	448.77	128	1.85	23.00	0.001
Constrain intercept binge --> slope depress	438.93	123	1.64	13.42	0.000
Constrain intercept binge --> quadratic depress	441.89	123	0.41	54.74	0.000
Constrain slope binge --> quadratic depress	424.32	123	2.87	0.80	0.372
Constrain intercept depress --> slope binge	424.64	123	2.87	0.98	0.322
Constrain intercept depress --> quadratic binge	423.90	123	2.87	0.56	0.455
Constrain slope depress --> quadratic binge	440.51	123	2.87	10.11	0.001
<b>BOYS</b>					
Form (no constraints)	392.90	122			
All pathways constrained	404.45	128	1.06	7.08	0.314
Constrain intercept binge --> slope depress	413.61	123	6.91	0.91	0.341
Constrain intercept binge --> quadratic depress	395.30	123	4.45	3.52	0.060
Constrain slope binge --> quadratic depress	393.32	123	6.91	3.88	0.049
Constrain intercept depress --> slope binge	393.69	123	6.91	3.79	0.051
Constrain intercept depress --> quadratic binge	393.49	123	3.22	4.58	0.032
Constrain slope depress --> quadratic binge	392.28	123	3.22	5.20	0.023

Note: Satorra-Bentler difference test scaling correction and scaled  $\chi^2$  difference shown

Table 4.5: Unconstrained Multiple Group Model for the Full Sample

	<i>Coefficient (SE)</i>			
	Depressive Symptoms		Binge Drinking	
	Slope	Quadratic	Slope	Quadratic
<b>INTEGRATED</b>				
Intercept binge drinking	-1.671*** (0.149)	1.502*** (0.161)		
Slope binge drinking		2.145*** (0.356)		
Intercept depressive symptoms			-0.122*** (0.014)	0.068* (0.029)
Slope depressive symptoms				0.296*** (0.045)
<b>MARGINALIZED</b>				
Intercept binge drinking	2.257*** (0.356)	-2.402*** (0.396)		
Slope binge drinking		-1.941** (0.701)		
Intercept depressive symptoms			0.166*** (0.050)	-0.205*** (0.056)
Slope depressive symptoms				-0.194** (0.059)

Note: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ;  $n = 10,869$ ; controlling for full set of sociodemographic covariates

Figure 4.1: Not Fitting In Measures by Latent Classes at Waves I and II

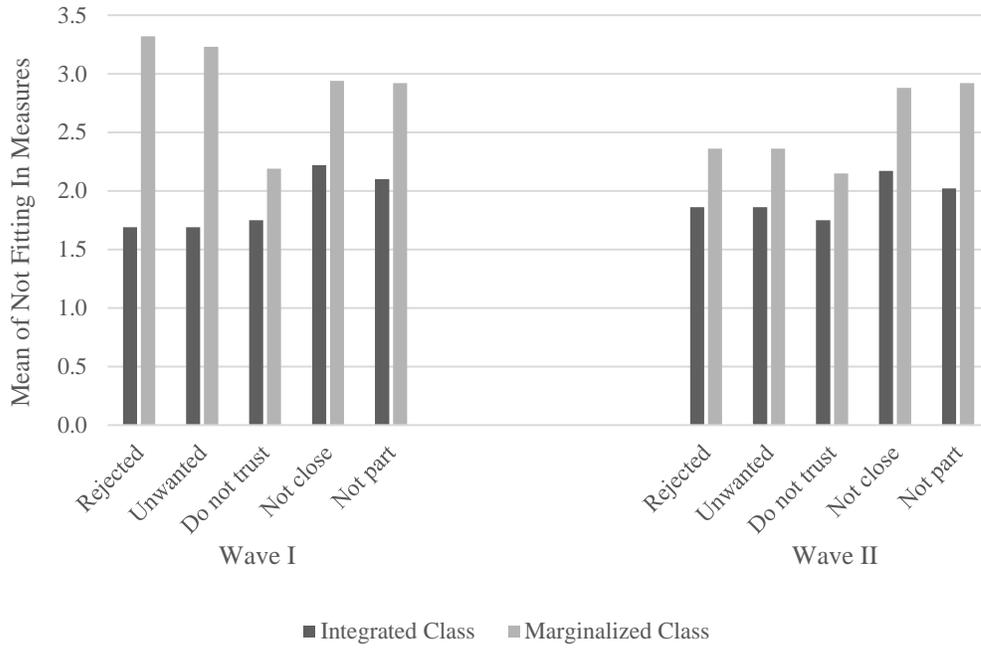


Figure 4.2: Trajectories of Depressive Symptoms from Adolescence to Adulthood for Full Sample and by Marginalization Experience

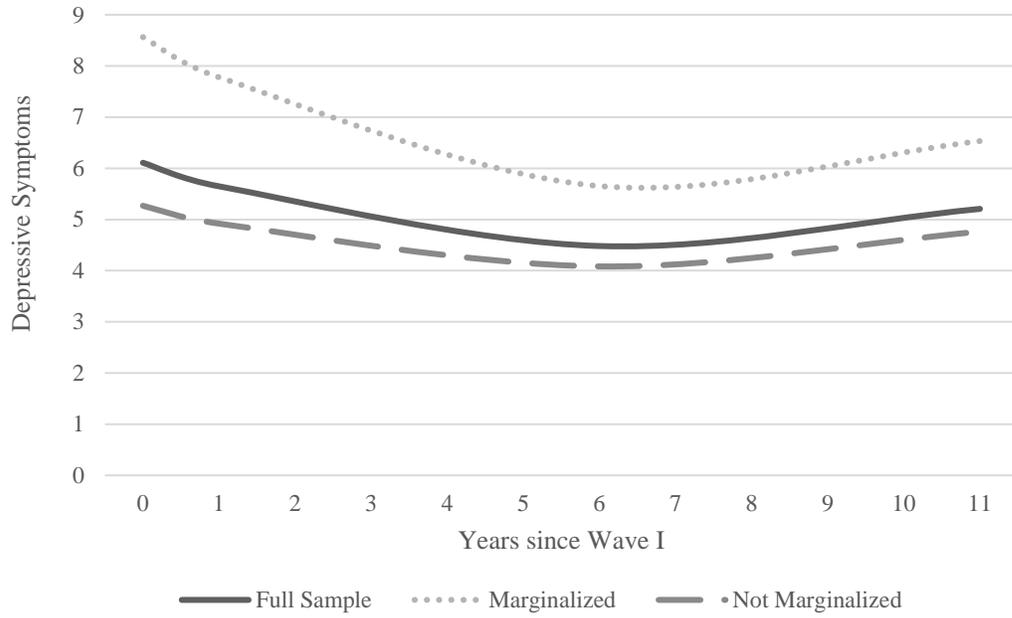
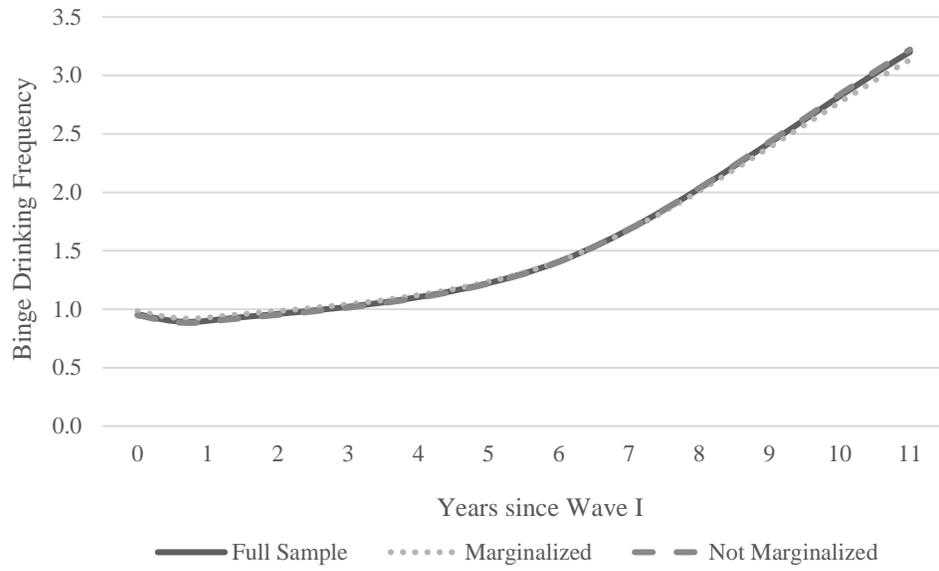


Figure 4.3: Binge Drinking Trajectories from Adolescence to Adulthood for Full Sample and by Marginalization Experience



## Chapter 5: Conclusion

### OVERVIEW

A period of rapid development and growth, adolescence sets the stage for future life course processes. The confluence of physical, social, and neurological changes during adolescence, however, results in elevated emotional volatility, an exaggerated desire for peer approval, and heightened drive to do things just to feel good, regardless of the consequences. As a result, adolescents experience mental health problems and engage in behaviors that pose significant health risks (e.g., substance use, overeating, recklessness), leading to accidents, suicides, and injuries in the short term and, if not corrected, problematic health trajectories into adulthood (Harris 2010; Bauldry et al. 2012).

At the same time, the substantial social and developmental changes of adolescence make it a particularly stressful period. In light of the increasing importance ascribed to peer networks during adolescence, poor integration into the vibrant social scene of high school is not only detrimental to the mental health of young people in the short-term (Hall-Lande et al. 2007; Joyce and Early 2014), but may also reverberate across the transition to adulthood. To be sure, the ways adolescents respond to risky social experiences have the potential to undermine health and well-being and disrupt adjustment and functioning long after those risks have faded.

This project wove together these two critical issues of public health concern—adolescent health and stress response—that have generated substantial academic inquiry and public discussion on their own. By positioning adolescent social experiences as foundational to life course trajectories of adjustment, functioning, health, and well-being, I ask: are adolescent social risks something that girls and boys can “get over” after they leave high school, or is the legacy of these risks evident in enduring trajectories of

psychological distress? To address this overarching question and focusing explicitly on the risk of adolescent social marginalization, the aims of this dissertation were to: 1) understand how and why socially marginalized adolescents accumulate risk over the long term or recover from risk in the short term; 2) explore the interplay between social marginalization and resources in high schools and whether resources buffer the long-term implications for unhealthy trajectories of psychological distress following marginalization; and, 3) document the complex, mutually influential connections between trajectories of distress and trajectories of drinking behavior among socially marginalized youth. The findings of investigating each of these aims have been discussed within the chapters of this dissertation along with their theoretical and practical implications. Still, I highlight two overall themes.

First, this dissertation highlighted adolescence as a sensitive period. Across the three studies of this dissertation, not fitting in with peers deterred the long-term mental health of young people. Indeed, marginalized youth followed problematic trajectories of mental health characterized by psychological distress. Life course researchers understand sensitive periods to represent developmental moments during which exposure to risk introduces permanent, irreversible damage (Ben-Shlomo and Kuh 2002). In this case, by disrupting short- and long-term psychological health, the risk of social marginalization was not something that young people could reverse. Importantly, this pattern held true regardless of how young people transitioned into adulthood—their educational pathways, relationship formation, reliance on school-level resources, and drinking behaviors. The findings of this dissertation, therefore, corroborate the idea that adolescence is a sensitive period, thereby encouraging researchers to position adolescent social risks as essential to developmental and disease processes.

Second, this dissertation stressed the importance of high school social contexts. Public perceptions that, “you never truly leave high school” (Senior 2013) are not overstated. Neuroscientists and psychologists often point to brain plasticity of adolescence as contributing to the stickiness of this life course stage (e.g., Steinberg 2014). Taking a sociological approach, however, helps us to understand social pressures to fit in, hierarchies of high school, variation in school-level social resources across and within schools, and norms around binge drinking and other coping mechanisms. Importantly, navigating the complex and turbulent social system of high school comes at a developmental moment of heightened salience of peers. As such, not fitting in with peers in high school may derail young people’s health and well-being. Indeed, focusing on the social contexts of high schools, this dissertation led to two notable findings. One finding is that socially marginalized youth who rely on school-based activities and non-parental relationships may have been the most vulnerable. The second is that trajectories of individual psychological health developed in the context of social norms that encourage unhealthy behaviors, meaning that psychological and behavioral trajectories of marginalized young people are closely intertwined. The findings of this dissertation, therefore, spoke to the vulnerability of marginalized high school students by probing into the broader social landscape where marginalization occurred.

Together, these cross-study themes speak to the broader theoretical and practical contributions of this dissertation. Theoretically, although life course theory guides our understanding of how social conditions and risk in early life can have consequences that trickle across time and place (Hayward and Gorman 2004), this research encourages life course scholars to think more carefully about the scarring of adolescence. Practically, this research can be leveraged to support policy on high school-level resources. Specifically,

school-based resources would be enhanced by developing ways to provide more targeted support to students on the margins of high school peer groups.

#### **LIMITATIONS AND FUTURE DIRECTIONS**

These contributions, however, should be considered in light of several notable limitations to this research that may inform future research.

First, the transition to adulthood is multi-faceted. As young people complete high school, they enter college or join the labor force, form unions or stay single, engage in unhealthy behaviors or abstain from smoking, drinking, and drug use, become parents or remain childless. Each of these status transitions, then, coalesce to speak to the adjustment and functioning of young people in adulthood. Importantly, successful transitions into the roles and statuses associated with adulthood promote recovery, whereas poor transitions into these roles and statuses facilitate the accumulation of risk (Hogan and Astone 1986). In this dissertation, I consider markers of young adult social adjustment and functioning as point-in-time measures of attending college and forming a co-residential union (Chapters 2 and 4). These point-in-time measurements obscure the more dynamic life course processes that young people navigate to establish these roles. As such, a limitation of this work is that the establishment of young adult roles—and how they buffer against long-term mental health penalties of adolescent social marginalization—would be better conceptualized as life course processes. Future research, therefore, should consider how the transition to adulthood unfolds for marginalized youth.

Second, social support and coping mechanisms are also multi-dimensional. Although school-based resources did not buffer marginalized adolescents from long-term psychological penalties (Chapter 3), the resources examined provided mere glimpses into the array of potential buffers from which marginalized youth may benefit. Buffering

resources considered need to be better contextualized as a compilation of the people and places at school and home that young people can turn to in times of distress. Similarly, despite the links between trajectories of depressive symptoms and trajectories of binge drinking among marginalized youth (Chapter 4), coping behaviors can take many forms. Trajectories of depressive symptoms, thus, likely unfold in tandem with other behavioral trajectories (i.e., drug use, self-harm, eating behaviors) that also matter for long-term health and well-being. This limitation, therefore, suggests that much work is still needed to unpack the processes by which adolescent social marginalization jeopardizes psychological well-being beyond adolescence into adulthood.

Third, social marginalization is also likely to co-occur with other adolescent challenges (e.g., school failure, problems at home, appearance), which also matter for the health and well-being of young people. The ways in which these negative experiences are patterned deserve to be examined, given that marginalized youth with multiple layers of disadvantage are likely to struggle more beyond adolescence. Overall, with these limitations in mind, future research should point to mechanisms through which adolescent social marginalization sticks with young people.

Other data and methodological limitations of this dissertation also warrant mentioning. Although I document associations between social marginalization and trajectories of psychological distress, I am unable to make causal claims about these linkages based on the methodologies presented. To enhance knowledge of causal pathways, future research should leverage fixed effects and/or instrumental variable designs. In terms of psychological trajectories, moreover, I do not account for the non-equivalence of CES-D scores across racial and ethnic groups (Perreira et al. 2005). As a result, the patterns documented in this dissertation may vary in important ways by race/ethnicity. A next step, therefore, would be to investigate heterogeneity in the linkages between social

marginalization in high school and long-term mental health by race/ethnicity. Finally, Add Health data on peers and fitting in at school is limited to the respondent's high school. In other words, if members of an adolescent's peer group attend different schools, they would not be counted as peers. The conclusions of this dissertation, therefore, are only generalizable to feelings of social marginalization within one's high school and do not speak to the broader social networks that young people may form within their communities.

## **CONCLUSIONS**

In conclusion, the need for research and policy to more fully understand the long-term implications of adolescent social experiences is especially strong right now given the poor health of young people and the rising midlife mortality in the U.S. relative to other high-income countries (Case and Deaton 2015; National Research Council and Institute of Medicine 2013). Together, the findings and implications of this dissertation advance our understanding of high school social life and the developmental significance of adolescence and point to the long-term vulnerability of socially disconnected youth.

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