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**Academic Marginalization in High School as a Predictor of Depressive  
Symptoms in Midlife**

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**Academic Marginalization in High School as a Predictor of Depressive  
Symptoms in Midlife**

**by**

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## **Abstract**

# **Academic Marginalization in High School as a Predictor of Depressive Symptoms in Midlife**

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Although research has consistently shown that higher levels of educational attainment are associated with better mental health at midlife, we know little about specific aspects of education from adolescence and the transition to adulthood that help to produce educational mental health disparities. This study examines the extent to which academic marginalization in high school, as defined by non-academic math course-taking, lowered educational expectations, and repeated course failures, are related to depressive symptoms in midlife. Using data from the 2014 follow-up survey of the High School and Beyond study, I find that high school students who took a non-academic math curriculum had significantly greater depressive symptoms at midlife, net of selection factors and subsequent degree attainment. Furthermore, failing three or more courses in high school or lowering expectations for high school graduation were also independently associated with depressive symptoms at mid-life, although the models suggest that the effect of course failures work through the subsequent likelihood of completing high school. These results highlight the importance of developing a more nuanced

understanding of the association between education and mental health, and demonstrate that academic outcomes as early as in adolescence have implications for levels of depressive symptoms much later in the life course.

## Table of Contents

List of Tables .....	viii
Introduction.....	1
Literature Review.....	4
Education and Mental Health.....	4
Stratification of Course-Taking in High School .....	6
Course Failures in High School .....	8
“Cooling Out” In High School.....	9
The Present Study .....	10
Data and Methods .....	12
Analytic Strategy .....	18
Results.....	19
Descriptive Statistics.....	19
Multivariate Models.....	21
Discussion.....	25
Implications.....	26
Limitations .....	30
Conclusion .....	31
Tables.....	33
References.....	37

## **List of Tables**

Table 1. Descriptive Statistics.....	33
Table 2. Poisson Models of Depressive Symptoms at Mid-Life for All Respondents .....	34
Table 3. Poisson Models of Depressive Symptoms at Mid-Life for Women.....	35
Table 4. Poisson Models of Depressive Symptoms at Mid-Life for Men .....	36

## **Introduction**

Mental health is an integral part of the overall health and well-being of older adults (CDC 2009). Higher levels of depressive symptoms at midlife are associated with an increased risk physical health problems and cognitive decline as one continues to age (Stansfeld et. al. 2002; Surtees et al. 2008; Skogen et al. 2015; Johannson et al. 2013). Yet not all individuals face the same risk for depressive symptoms; distal factors from earlier in the life course such as educational attainment are associated with better mental health in later life (Lorant 2003; Mirowsky and Ross 2003). In this study, I explore the relationship between education and depressive symptoms at midlife by focusing on academic marginalization that occurs during high school, which I define as academic outcomes indicative of a student not receiving the academic support and educational opportunities needed to attain a high level of education. Specifically, I focus on mathematics course-taking, lowered educational expectations, and repeated course failures during high school. The high school years are a time when opportunities to learn become increasingly unequal through differences in course-taking, and students who do not complete a college preparatory curriculum are effectively marginalized in an economy where success largely depends on obtaining a baccalaureate degree (Rose and Betts 2001; Gamoran 1987). Lowered expectations for educational attainment and repeated course failures during high school represent a failure of schools to meet the needs of students who are struggling academically and foster positive attitudes towards

learning, further contributing to a form of academic marginalization that I argue has important implications for levels of depressive symptoms in midlife.

Using a nationally representative survey that followed respondents from adolescence to midlife, this study examines how academic marginalization is related to depressive symptoms at midlife by focusing on the role of non-academic mathematics course-taking, lowered educational expectations, and repeated course failures in high school. Furthermore, I explore whether obtaining a high school diploma or attending a post-secondary institution mediates this association, or if experiences of marginalization in high school are related to depressive symptoms at midlife independent of these subsequent educational outcomes. I take into consideration the possibility of selection into my academic outcomes of interest by controlling on baseline cognitive/non-cognitive skills, emotional well-being, and aspects of social background from earlier in adolescence.

This study furthers our understanding of the relationship between education and later life mental health by situating the analyses in two models drawn from life course theory: the critical period model and the pathway model (Ben-Shlomo & Kuh 2002). Adolescence can be considered a critical period in which educational experiences have long-lasting and possibly immutable effects on later life mental health because it is a time when individuals develop skills and knowledge necessary to successfully navigate the transition to adulthood. Students who are academically marginalized in high school and do not obtain these skills are not as well equipped to succeed in adulthood and may be placed at a permanent disadvantage in terms of mental health across the life course. A

pathway model would suggest that the effects of academic marginalization in high school on midlife mental health work through subsequent educational outcomes – specifically, the likelihood of graduating high school and attending college. Marginalization in the form of unequal opportunities to learn and unmet academic needs in adolescence starts a “chain of risk” that contribute to inequalities in mental health outcomes at older ages. This study pays special attention to the role of gender, as previous research suggests that such life course models work in different ways for men and women (Umberson et al. 2014).

## **Literature Review**

### **EDUCATION AND MENTAL HEALTH**

Educational inequalities in depressive symptoms are well-documented by research on the epidemiology of mental health (see Lorant et al. 2003 for a review). However, most previous research conceptualizes education in terms of degree attainment, years of schooling, or more recently, the completion of a baccalaureate degree (McFarland and Wagner 2015; Bauldry 2015). Measuring education in this way is problematic in two ways. First, it assumes a causal effect of degrees earned, when factors such as health status in childhood and adolescence may lead to lower levels of degree attainment and also contribute to a greater likelihood of depressive symptoms in later life (Latham 2014; McLeod and Fettes 2007). To address this point, my study includes a robust set of controls for social background and health status in adolescence and directly tests selection factors from high school, such as mathematics course-taking, that are predictive of subsequent degree attainment.

Secondly, a focus solely on degree attainment overlooks academic experiences that precede attainment which can help us to better understand the specific educational opportunities and outcomes associated with depressive symptoms in later life. A life course approach would suggest that academic experiences in adolescence have consequences for later life depressive symptoms because they help to shape trajectories of exposure to stress in adulthood (Ben-Schlomo & Kuh 2002; Elder, Johnson, and Crosnoe 2003). Specifically, the high school years can be considered a critical period for life-course trajectories of mental health because it is a time when individuals develop the

skills and abilities necessary to successfully navigate the transition to adulthood. Poorer academic outcomes in high school may put individuals at a permanent disadvantage in terms of mental health due to insufficient skills development, or act as starting points of pathways to higher levels of depressive symptoms in adulthood that are transmitted through subsequent outcomes such as the likelihood of high school graduation or college attendance.

Previous studies on education and mental health informed by the life course perspective primarily focus on the extent to which socioeconomic status (as defined by degree attainment or years of schooling) can help to explain differentiated trajectories of depressive symptoms from young adulthood to late-life (Miech and Shanahan 2000; Ross and Wu 1996). More recently, pathway models based in life course theory have found that the effect of early-life socioeconomic status on depressive symptoms in adulthood is largely mediated by one's own level of educational attainment (Quesnel-Vallee and Taylor 2012; Harper et al. 2002). These studies, however, largely ignore the role of adolescence – a developmental period in which trajectories of mental health in adulthood begin to emerge (see Walesmann et al. 2009 for an exception). This study adds a significant contribution to the life course literature on education and mental health by focusing specifically on the stratification of learning opportunities in high school and two associated student outcomes – changes in educational expectations and repeated course failures – which I argue are different facets of the same concept, academic marginalization. I employ two models based in life course theory – critical period and

pathway models – to better understand conceptually how academic marginalization impacts depressive symptoms at midlife.

### **STRATIFICATION OF COURSE-TAKING IN HIGH SCHOOL**

The stratification of learning opportunities occurs at all levels of education and intensifies during the high school years, as students are sorted within schools into classes with increasingly differentiated levels of curriculum content (Gamoran 1987). Stratification processes lead some students towards a non-academic curriculum with the goal of only completing a high school degree or obtaining a small amount of vocational training after graduation, while other students are guided towards a more advanced curriculum that prepares them for entry into a baccalaureate program after high school (Alexander et al. 1978). Students who do not take advanced or honors curriculum in high school are less likely to attend college after graduation (Long et al. 2012), and while the curriculum that students are sorted into is somewhat determined by academic ability, other factors such as socioeconomic background and disability status are associated with a greater likelihood of low-level course-taking net of ability (Lucas 2001; Shifrer et al. 2013). As success in the labor market increasingly depends on the completion of a college degree, the sorting of high school students into college preparatory and non-college preparatory curriculums represents a stratification process that contributes to inequalities in later life labor market and health outcomes (Rose and Betts 2001; Fletcher 2012; Carroll et al. N.d.).

High school course taking contributes to the academic marginalization of students who are given a less rigorous curriculum by not only influencing their preparation for college, but also their expectations for degree attainment. Recent research suggests that high school course-taking serves as a signal to students about their academic abilities, and students in turn adapt their expectations for degree attainment based on these signals (Karlson 2015). Students who take a vocational or non-college preparatory curriculum not only have fewer postsecondary opportunities due to insufficient skills development, but also internalize perceptions of their academic abilities that influence the level of education they believe they are capable of achieving. This illustrates that academic marginalization may matter for more than just education and labor market outcomes, as it contributes also to the lowering of students' beliefs in their academic competence that is integral to their sense of personal well-being (Covington 1984).

One of the most stratified curriculums is in the subject area of mathematics. Due to its strict hierarchical structure, sequences of math course taking starting in middle school strongly influence whether students are enrolled in higher level math courses as they continue on through high school, especially in advanced courses such as calculus (Stevenson et al. 1994). Completing a math sequence above the level of algebra 1 significantly increases students' chances of attending college and completing a baccalaureate degree, and is associated with higher levels of income in adulthood (Rose and Betts 2001; Adelman 1999). Students who take a greater number of non-academic math credits (i.e., below pre-algebra) are academically marginalized in that they are given general or vocational math training in lieu of a college preparatory math curriculum. To

this end, the first measure of academic marginalization that I introduce into this study is the intensity (i.e., number of credits) of non-academic math course-taking in high school.

### **COURSE FAILURES IN HIGH SCHOOL**

While a variety of factors contribute to why a student might fail a single course, repeated course failures indicate that a school may not be meeting the needs of a student who is struggling academically. A recent study found that while controlling for incoming students' background characteristics, eighth-grade test scores, and differences in student body composition, rates of course failure differ by approximately 1.4 failures on average across Chicago public high schools (Allensworth and Easton 2007). This suggests that school policies and organization play a large part in the likelihood of students falling "off-track" by repeatedly failing courses during their time in high school. The same study found that students on average had 0.8 fewer course failures in schools with strong teacher-student relationships, compared to similar students in schools with weak teacher-student relationships. Similarly, Needham et al. (2004) found that the relationship between health problems and course failures in adolescence are partially accounted for by levels of teacher-student bonding. Neglecting to address the academic struggles of a student by allowing them to continue failing courses and maintain weak relationships with their teachers can be considered another way in which schools contribute to a form of academic marginalization.

While course failures directly affect students' educational trajectories because they need a certain number of credits to graduate, they also influence students' self-

concept and perception of academic fit within a school. Research suggests that two significant mediating factors between course failures and high school non-completion are a lowering of academic motivation and feelings of rejection by others within the school (Kaplan et al. 1997). Students who repeatedly fail courses in high school become less confident in their academic abilities and may come to be seen as “bad” students by teachers and staff. To the extent that course failures determine whether or not students can enroll in advanced mathematics curriculum, schools further marginalize such students by denying them learning opportunities that can increase their likelihood of attending college. Effectively, these students are pushed aside and often do not receive the special attention they need to improve their grades and perform to the best of their ability.

#### **“COOLING OUT” IN HIGH SCHOOL**

Educational expectations in high school are important not only in how they contribute to students’ subsequent educational trajectories, but also in how they are related to their sense of self during this important developmental period (Jacob and Wilder 2011). Changes in educational expectations during the high school years are largely influenced by grades, track assignment, and teacher-student relationships. Clark (1980) first coined the term “cooling out” to refer to the role of educational institutions in lowering educational expectations for students who are deemed to have “unrealistic” expectations based on their academic performance. While Clark considered this a socially acceptable way of aligning students’ ambitions with their abilities, others argue that

certain students are disproportionately cooled out due to factors unrelated to academic ability. Instead, cooling out has been shown to impede the ambitions of students of lower socioeconomic status or who have health impairments – further contributing to social inequalities in educational attainment (Yuksel and Yuksel 2012; Carroll et al. forthcoming).

A lowering of education expectations can be conceptualized as a reaction to and consequence of academic marginalization in high school. The tracking of students into a non-college preparatory curriculum, which I argue is a form of academic marginalization, contributes to a lowering of expectations for college degree attainment (Karlson 2015). Combined with signals from schools such as poor grades and course failures, students who originally expected to attend college or complete high school may internalize the belief that they are not capable of succeeding academically and consequentially give up these ambitions. To this end, my study seeks to understand the extent to which lowered educational expectations are associated with depressive symptoms at midlife, if such an association is mediated by subsequent high school graduation status or college attendance.

### **THE PRESENT STUDY**

This research study seeks to further our understanding of how education is related to depressive symptoms at midlife by focusing on academic marginalization that occurs in high school. Furthermore, I seek to understand whether such a relationship remains net of degree attainment. I pose two research questions. First, to what extent is academic

marginalization in high school related to depressive symptoms at midlife, after taking into account controls for selection factors? Second, does academic marginalization have an independent effect on depressive symptoms (i.e., critical period model), or does completing high school and/or attending college mediate this relationship (i.e., pathway model)? From these questions and the preceding literature review, I posit five hypotheses:

*H1:* A greater number of non-academic math courses taken in high school is associated with more depressive symptoms at midlife, net of selection factors.

*H2:* Lowered educational expectations from sophomore to senior year is associated with more depressive symptoms at midlife, net of selection factors.

*H3:* A greater number of courses failed in high school is associated with more depressive symptoms at midlife, net of selection factors.

*H4:* Completing high school does not mediate the relationship between these measures of academic marginalization and depressive symptoms at midlife.

*H5:* Attending college does not mediate the relationship between these measures of academic marginalization and depressive symptoms at midlife.

## Data and Methods

This study uses data from the sophomore cohort of the High School and Beyond (HS&B) panel study to estimate the relationship between academic marginalization in high school and depressive symptoms at midlife (High School & Beyond Midlife Follow-up). The HS&B panel study is a nationally representative sample of high school sophomores who were first interviewed in 1980, then followed up again in 1982, 1986, 1992, and 2014. These data are particularly advantageous for the present study because they contain a rich set of indicators about academic experiences and skills in adolescence and young adulthood, in addition to robust measures of behavioral and emotional problems in adolescence and depressive symptoms in midlife.

Of the original 14,825 HS&B sophomore panel respondents, 8,790 were re-surveyed in 2014. In the 2014 survey, 5,090 respondents were given a short-form questionnaire and 3,710 respondents were given a longer, more detailed questionnaire. To test the hypotheses I've put forth, I have restricted the sample to all panel members who completed the long-form questionnaire in 2014 and are not missing responses on the Kessler 6 scale, from which the dependent variable is derived (N=3,660).

*Depressive symptoms at midlife.* Only the 2014 HS&B long form questionnaire included a psychological screening instrument known as the Kessler 6 scale (Kessler 2003). The scale screens for feelings that are symptomatic of an anxiety or depressive disorder. The scale consists of a six questions about the frequency of experiencing negative emotional states in the past 4 weeks (i.e., nervousness, hopelessness, or

worthlessness). Responses are recorded on a Likert scale and summed up to produce a score ranging from 0 to 24.

Validation studies have found that a cut-point of 13 or higher on the Kessler 6 scale is optimal for assessing the prevalence of severe mental illness in a nationally representative sample population (Kessler 2003). For the purposes of this study, the scale score range was top-coded at 13 (the 98th percentile) to reduce a large positive skew that would bias my estimates. A sensitivity analysis conducted by the author found that scale properties are stable for subpopulations defined by gender, race, and socioeconomic status within the 2014 HS&B long-form sample.

*Academic marginalization in high school.* Academic marginalization is operationalized using three measures: number of non-academic and college preparatory math credits taken, lowered educational expectations, and number of course failures. My measure of *non-academic and college preparatory math credits* was developed based on the methodology outlined in Rose and Betts (2001) and uses transcript data from the HS&B High School Transcript Study (HSTS). These measures are defined as the number of full-year math credits a student received non-academic math (general, basic, consumer, technical, vocational, or review math) and college preparatory math (Algebra 1 or above) during their high school career. *Lowered educational expectations* are measured using a categorical indicator of changes in expectations for degree attainment from sophomore to senior year of high school. For both years, I combined responses into categories representing less than high school, high school only, post-secondary education less than a 4-year degree (“some college” hereafter), and a Bachelor’s degree or higher. This was

done to ensure that findings were not being driven by changes among similar levels of education (i.e., between an associate's degree and vocational certification). Categories are defined based on original expectations for degree attainment in sophomore year, with categories for lowered, raised, and same expectations from sophomore to senior year. Lowered expectations are divided into three categories: moving from Bachelor's degree to less than a Bachelor's degree, from some college to only a high school degree, and from only a high school degree to less than high school. Those with the same expectations in sophomore and senior year are divided into those expecting less than a Bachelor's degree and those expecting a Bachelor's degree or higher in order to make the latter a more homogenous reference category in my multivariate models. *Number of course failures* is measured as the number of courses a student failed during their high school career, regardless of whether or not they were trimester, semester, or full-year courses. To account for differences in the length of courses offered in different high schools, I control on the number of course students took throughout their high school career.

*High school degree attainment.* My measure of high school degree attainment was developed based on the methodology outlined in Murnane et al. (2000) and uses both self-reports and transcript data from the HSTS. My measure is defined as receiving a regular high school diploma, obtaining a high school equivalency (GED or certificate), or having not completed high school by 1986.

*Post-secondary attendance.* This indicator is based on my measure of high school degree attainment above, but is augmented using both self-reports of college attendance

and degree attainment in 1986 and 1992, as well as degrees and college attendance reported in the Postsecondary Education Transcript Study (PETS). The measure begins with responses to the 1986 survey, fills in with 1992 self-reports, and then fills in with transcript data for those who had missing data or were found to have attained a higher degree. Categories are defined as attending a 2-year college with no degree, obtaining a 2-year degree or certificate, attending a 4-year college with no degree, and obtaining a Bachelor's degree. Respondents with no post-secondary experience were divided into those with a regular high school diploma and those who did not complete high school or obtained a high school equivalency in order to make the former a more theoretically meaningful reference category as those without a high school diploma do not have the prerequisites needed to attend college.

*Baseline skills controls.* To more accurately estimate the effects of academic marginalization on midlife depressive symptoms, I control on the cognitive and non-cognitive skills students had early in their high school career. Cognitive skills are measured by scores on a math achievement test taken by students in their sophomore year of high school. Math assessment scores are measured on a standardized scale with a mean of 0 and a standard deviation of 1. Non-cognitive skills are measured using a selection of items from Rotter's Locus of Control Scale (Rotter 1966) that students answered in their sophomore year of high school. Locus of control is measured on a standardized scale with a mean of 0 and a standard deviation of 1.

*Adolescent mental health controls.* Internalizing and externalizing problems are a well-known distinction within the field of psychology used to describe adolescent

emotional well-being. Internalizing problems refer to behaviors demonstrative of negative emotions that are focused inward, such as feelings of depression, anxiety, and hopelessness. In contrast, externalizing problems are behavioral responses to negative emotions that are focused outside of the self, such as aggression, rejection of authority, and delinquency. As a way of controlling for selection into my educational outcomes based on adolescent mental health, this study includes uses available measures to best account for both types of problems.

A measure of adolescent negative affectivity is introduced into my models as a measure of adolescent internalizing problems. In their sophomore year of high school, students answered a series of questions about the frequency of experiencing positive and negative emotions, in a screener known as the Affect Balance Scale (Bradburn 1969). Van Schuur and Kruijtbosch (1995) argue that separating positive and negative affect items into separate scales makes the measurement more valid. Based on this recommendation, this analysis includes a scale of negative affectivity derived from a subset of items included in the Affect Balance Scale. Only the negative affect scale is included because negative affectivity has been shown to be associated with the development of anxiety and depressive disorders (Brown, Chorpita, and Barlow 1998).

A measure of disciplinary problems in sophomore year is introduced into the models in this analysis as measures of adolescent externalizing problems. This indicator is measured as a dichotomous variable derived from student self-reports.

*Background controls.* Background characteristics are included in the models to account for possible spurious correlations. Gender is measured by a dichotomous variable

(male or female) included in the HS&B dataset. Race is measured by a categorical variable (white, black, Hispanic, or other) included in the HS&B dataset. Disability status in high school is measured by combining responses to questions asking students to indicate any specific physical disabilities they had (a learning disability, visual handicap, hearing difficulty, deafness, speech disability, orthopedic handicap or other health impairment) and indicate if they had a non-specific condition that limited the amount of work they could do in 1980 and 1982. In 1980, the survey question does not stipulate that the visual handicap is not corrected by glasses and “no impairment” was not an option on the survey. A higher proportion of students than expected selected “visual impairment” or “other health impairment” in the base year survey, thus I do not consider these students as having a disability (Owings and Stocking 1985). Both of these wording issues were fixed in the follow-up survey in 1982. My indicator is a dichotomous variable measuring whether or not a student responded positively to any of these questions in 1980 or 1982. Parents’ education is measured by a categorical variable (less than high school, high school, some college, Bachelor’s or above) as reported by students in 1980. If students did not report their parents’ education in 1980, responses were imputed from the 1982 survey. A measure of high school pregnancy is included for female students to better estimate the effects of academic marginalization net of confounding effects on academic performance and expectations that may occur due to a pregnancy in high school. It is a dichotomous indicator of whether or not female students had a child while still enrolled in high school that follows the methodology outlined in Yakusheva (2011).

## **ANALYTIC STRATEGY**

The results of this study are presented as incident risk ratios (IRRs) calculated from Poisson regression estimates. IRRs are interpreted for dichotomous variables as the percentage change in the expected number of depressive symptoms relative to the expected number for the reference group of a given variable. For continuous variables, it is interpreted as percentage change in the expected number of depressive symptoms due to a one-unit increase in a given variable. Some of the independent variables used in these models do not have complete information for every student, so missing information was imputed using chained equations in Stata's ICE routine. Models were run using Stata's MICOMBINE command with the 2014 long-form sampling weight to account for attrition bias in the follow-up survey. Schools were defined as the primary sampling unit to account for the clustered nature of the HS&B sample.

## Results

### DESCRIPTIVE STATISTICS

Table 1 presents descriptive characteristics of my nationally representative sample of high school sophomores in 1980 overall, as well as separately for men and women. Both men and women exhibit a little more than 3 out of 13 symptoms of depression on average, although approximately one in five exhibit no symptoms of depression (20% and 22% for men and women respectively). The lack of a discernable gender difference in depressive symptoms at mid-life runs counter to previous literature on gender and mental health that suggests women are more likely than men to respond to stressors with affective responses such as depression (Rosenfield and Smith 2010). However, recently this proposition has been challenged and shown not to be supported by empirical research (Hill and Needham 2013), lending support to my finding that men and women are equally likely to experience depressive symptoms. I have chosen to model my analyses separately for men and women because although there is no gender difference in levels of depressive symptoms, there may be important gender differences in the predictors of depressive symptoms from high school and adolescence.

Focusing on my explanatory variables of interest related to academic marginalization, my exploratory analyses (not shown, available by request) revealed that half of 1980 sophomores did not take any non-academic math courses in high school. Approximately 22% of students end up taking more than 1 full-year non-academic math course, with a range of up to 6 full-year courses. Men were more likely to fall into this category than women (27% vs. 18%, respectively). Among those who took more than one

non-academic math course, nearly two-thirds did not take any Algebra 1 or above math courses. This indicates that these students were likely given more non-academic math courses in lieu of higher level math courses that would have better prepared them for college.

While a majority of students raised or did not change their expectations about degree attainment from sophomore to senior year, a little more than one in five students (22%) lowered their expectations for degree attainment. Of these students, most went from believing they could obtain a baccalaureate degree to believing they could not. Bivariate analyses (not shown) revealed that those who took more than one year of non-academic math courses were more likely to lower their expectations than those who did not take any (34% vs. 21%, respectively), indicating that a non-academic math curriculum is associated with lowered educational expectations.

Focusing on course failures, my continuous measure indicates that students fail on average approximately 1.7 courses during their high school careers. However, a majority of students (62%) do not fail any course, indicating that the distribution of course failures is highly skewed and that those who do fail a course are likely to end up failing more than one. To this end, more than half of those who failed at least one course failed three or more courses. Men are more likely than women to fall into this category (25% vs. 17%, respectively). Bivariate analyses (not shown) revealed that those who took more than one year of non-academic math courses were much more likely to fail three or more courses compared to those who did not take any (47% vs. 7%, respectively), indicating that a non-academic math curriculum is also associated with repeated course failures. In sum,

these descriptive statistics suggest that there is a strong relationship between high school math curriculum, educational expectations, and course failures that together take the form of academic marginalization as students proceed through high school. The next set of analyses focus on the relationship between these high school academic outcomes and depressive symptoms at mid-life.

### **MULTIVARIATE MODELS**

Table 2 reports incidence rate ratios from Poisson regression model predicting depressive symptoms at midlife. Model 1 introduces my first explanatory variable of interest, mathematics curriculum, while controlling on aspects of respondents' background, baseline skills, and adolescent emotional well-being. The model estimates that each additional full-year non-academic math course taken in high school is associated with a 9% increase in the number of depressive symptoms at midlife. In more concrete terms, an increase from 0 to 4 full-year non-academic math courses (i.e., the difference between taking a full academic and non-academic math curriculum) is associated with an estimated 41% increase in the number of depressive symptoms at mid-life, all else held constant. This association is largely accounted for by non-academic course-taking among men – no significant effect of non-academic math was found for women (see Tables 3 and 4). Overall, these finding lends support to my first hypothesis that a non-academic math curriculum is associated with more depressive symptoms at midlife.

Model 2 introduces my second explanatory variable of interest, number of course failures in high school. Overall, failing one or two courses marginally increases the number of depressive symptoms at midlife compared to not failing any courses at all. A threshold appears to exist at a point where students fail more than two courses, however. Those who failed three or four courses have 28% more symptoms of depression at midlife, and those who fail five or more courses have an estimated 41% more symptoms of depression compared to those who failed no courses. For men, failing any courses at all has a large impact on the risk of depressive symptoms at midlife, while for women only failing three or more courses is associated with an increase in symptoms. This indicates that course failures in high school, even a small number, have greater implications for men's depressive symptoms in midlife compared to women. This finding lends support to my third hypothesis that course failures are associated with more depressive symptoms at midlife, albeit in different ways for men and women.

Model 3 introduces my third explanatory variable of interest, changes in educational expectations from sophomore to senior year. Students who began with high expectations (i.e., at least some post-secondary education) and lowered them by senior year do not have higher levels of depressive symptoms at midlife. However, an extremely large effect was found for those who originally thought they could complete high school but did not think they could by senior year – such students had more than double the number of depressive symptoms at midlife compared to students who maintained the belief that they could complete a baccalaureate degree throughout their high school career. Gender separate models suggest that this association is largely driven by lowered

educational expectations among women – no significant effect was found for men (see Tables 3 and 4). In sum, these findings lend support to my second hypothesis that a lowering of expectations to complete high school is associated with more depressive symptoms at midlife.

Models 4 and 5 combines all three measures to better understand the relationships between each aspect of academic marginalization and how they relate to depression at midlife. In Model 4, adding both math course-taking and course failures to the model does not significantly attenuate their effects, suggesting that both operate independently on the risk of depression at midlife. The addition of educational expectations in Model 5 does attenuate the effect of course failures and lowered expectations for high school degree attainment, suggesting that the effect of high school course failures on depressive symptoms may work partially through a perceived inability to graduate from high school.

Models 6 and 7 add measures of high school degree attainment and post-secondary attendance to test whether these relationships work through subsequent educational outcomes (i.e., a pathway model) or if they still have an effect net of these outcomes (i.e., a critical period model). Overall, non-academic course-taking and changes in educational expectations continue to have large and significant effects on depressive symptoms at mid-life, net of selection factors, and the magnitude of my estimates are not attenuated. However, the effect of course failures becomes non-significant when high school degree attainment is added to both the pooled models and the gender-separate models. This suggests that the effect of high school course failures on depressive symptoms at midlife partially work through the subsequent likelihood of students with

repeated course failures completing high school on-time. These findings support the conclusion that math course-taking and changes in educational expectations better fit a critical period model, while course failures are associated with chains of risk that ultimately impact levels of depressive symptoms at midlife.

In sum, these models show that the negative association between education and depressive symptoms cannot simply be understood in terms of degree attainment, and that aspects of academic marginalization in high school make a significant contribution to levels of depressive symptoms 35 years later. It should be reasserted that these relationships were found net of strong controls for baseline skills and emotional well-being, two major factors related to the likelihood of academic marginalization in high school. Gender differences in how mathematics curriculum, educational expectations, and course failures are related to depressive symptoms at midlife provide interesting clues as to the mechanisms by which academic marginalization affects later life mental health. The practical implications of these findings will be discussed further in the next section.

## Discussion

Education helps to shape psychological well-being across the life course. This analysis focused specifically on academic marginalization in high school to help inform education policies aimed at improving student achievement with implications for mental health in mind. I sought to better understand the extent to which a non-academic math curriculum, course failures, and changes in educational expectations during high school are associated with levels of depressive symptoms in mid-life. Furthermore, I assessed whether these associations work through subsequent high school degree attainment and college attendance, or if adolescence is a critical period in which such academic outcomes have independent and lasting impacts on mental health in later life. The findings from this study advance our understanding of the link between education and mental health by revealing specific aspects of education that precede degree attainment that are predictive of depressive symptoms in midlife.

My findings indicate that high school students who took a non-academic math curriculum in lieu of a college preparatory curriculum (i.e., Algebra 1 and above) had significantly greater depressive symptoms at midlife, net of baseline skills, adolescent emotional well-being, and aspects of social background. Furthermore, failing three or more courses in high school or lowering expectations for high school graduation were also independently associated with depressive symptoms at mid-life, although my models suggest that the effect of course failures may partially work through perceived inability to complete high school. Finally, I find partial support for both the pathway and critical period hypotheses. The effects of math course-taking and lowered expectations for high

school degree attainment were not mediated by high school degree completion or college attendance, supporting the critical period model. However, the effects of course failures were attenuated by whether or not students graduated high school on time, providing support for a pathway model.

## **IMPLICATIONS**

The major finding of this study is that what happens in high school matters for levels of depressive symptoms much later in the life course, net of baseline skills, adolescent emotional well-being, and subsequent degree attainment. Specifically, a non-academic math curriculum, course failures, and lowered educational expectations are each associated with greater depressive symptoms at midlife. To my knowledge, only one other study to date has specifically focused on how academic outcomes in high school are related to mental health in later life (see Walesmann et al. 2009). My study builds upon these previous findings with direct measures of educational expectations and high-quality measures of grades and course-taking derived from high school transcripts.

The finding that mathematics course-taking in high school is related to depressive symptoms in midlife has implications for our understanding of the long-term mental health consequences of curriculum tracking in high school. Although previous studies have looked at the association between cognitive skills in adolescence and later life mental health outcomes (Zammit et al. 2004, Reichenberg et al. 2002), almost no studies have looked at the process of schooling and how it relates to mental health across the life course.

Although this study does not specifically measure what it is about a non-academic math curriculum that impacts later life depressive symptoms, I argue that students given a non-academic math curriculum in lieu of a more advanced math curriculum are effectively marginalized in that they do not develop the skills and motivation needed to complete a college degree. Students who take higher level math courses are taught to put more effort into their academic responsibilities and exert more control over their academic interests, which contributes to better academic outcomes relative to students who take lower level courses (Carbonaro 2005; Oakes 1985). Cognitive and non-cognitive skills development associated with high school course-taking not only improve students' chances of obtaining a baccalaureate degree (Adelman 1999) but are also the same skills that enable individuals to better identify and solve problems with their health (Pignone and DeWalt 2006; Ross and Wu 1995).

In an economy where success increasingly depends on obtaining a baccalaureate degree, such students are ill-equipped to thrive after leaving high school. Higher rates of unemployment among individuals without a college degree put them at a greater risk for depression (Paul and Moser 2009), as do the financial difficulties that are associated with lower wages (Sweet et al. 2013). Stable, full-time employment provides access to medical insurance and other workplace benefits that better enable individuals to seek treatment for mental health problems. In sum, the resources associated with better labor market outcomes resulting from the completion of a college degree have implications for trajectories of mental health across the life course.

The finding that the relationship between depressive symptoms in midlife and course failures in high school is mediated by high school degree attainment suggests a pathway model in which academic failure leads to a lower likelihood of graduation, which in turn shapes mental health outcomes in later life. This is supported by previous research implying a strong relationship between course failures and high school non-completion (Allensworth and Easton 2005; Kaplan et al. 1997), as well as research linking high school non-completion to a greater likelihood of depressive symptoms in adulthood (Liem et al. 2001). The impact of high school non-completion on health outcomes has garnered enough attention recently for the CDC to suggest framing it as a public health issue (Freudenberg and Ruglis 2007).

Between-school differences in rates of course failures net of student body composition and achievement suggest school policies contribute to a student's likelihood of course failure (Allensworth and Easton 2007). Recent studies show that schools can implement interventions that greatly reduce rates of academic failure (see Lehr et al. 2003 for a review). In essence, repeated course failures represent an inability of schools to provide the special attention that students need to improve their grades and graduate high school. My research shows that this lack of support starts a "chain of risk" that has significant consequences for levels of depressive symptoms at midlife.

Lastly, my finding that a lowering of expectations for high school degree attainment provides new evidence to support a growing body of research on the relationship between agency, expectations and health over the life course. Hitlin and Johnson (2015) argue for a greater emphasis on "perceived capacities and life chances" in

life course theory and empirically show how more optimistic life expectations in adolescence are associated with fewer depressive symptoms in adulthood. A well-established literature has linked a sense of personal agency, based in one's perceived abilities, to trajectories of mental health over the life course (Mirowsky and Ross 2013). Unachieved expectations from adolescence and the transition to adulthood have been shown to be associated with declines in mental health in adulthood (Hitlin et al. 2015). Following this line of research, it has been shown that the development of an optimistic sense of personal agency is one of the primary mechanisms linking education to mental health (Dalgard et al. 2007; Mirowsky and Ross 2003).

A lowering of expectations for high school degree attainment in the senior year of high school symbolizes a drop in one's sense of personal agency throughout the high school years, as signals such as course failures and tracking into lower level course-taking relay to the student that they do not have the ability to realize expectations for degree attainment that they once had. Research suggests that one's sense of personal agency tends to increase during adolescence, but that dropping out of school significantly lowers the extent of these gains (Lewis et al. 1999). To this end, my research shows that a non-academic math curriculum and course failures partially mediate the relationship between lowered academic expectations and depressive symptoms at midlife.

This finding has significant implications in that schools are institutions that can influence the extent to which students maintain or raise expectations for how far they will go in their academic career and develop an optimistic sense of personal agency. Kautz et al. (2014) argue that non-cognitive skills are less stable than cognitive skills in

adolescence, marking a critical period for the development of a sense of personal agency. Their evaluation of school-based interventions aimed at improving non-cognitive skills in adolescence suggests that such programs are successful. Recently, Yeager et al. (2016) conducted randomized experiments using interventions based in the growth mindset literature (Dweck 2006) among students entering high school who were at risk for academic failure, and found that those exposed to the intervention subsequently had better academic performance than similar students who did not receive the intervention. School-based interventions aimed at developing more optimistic sense of personal agency can likely improve their chances for maintaining or raising expectations for their own educational attainment.

#### **LIMITATIONS**

There are two major limitations of the present study. First, my ability to control on selection into my academic outcomes of interest due to behavioral and emotional problems is limited by measures available to us. While my measure of negative affect helps to control on factors underlying the development of anxiety and mood disorders (Brown, Chorpita, and Barlow 1998), I lack strong measures of externalizing behavioral problems in high school. Aggressive and disruptive behavior is a common reaction to psychological distress among adolescents, especially boys (Leadbeater et al. 1999). Furthermore, my measures of emotional well-being only begin in adolescence and are self-reported. Other research has noted that early-onset mental health disorders in childhood are significantly associated with lower academic achievement and the

termination of learning in primary and secondary school (Breslau 2008). Better measures of behavioral problems or mental health diagnoses in childhood and adolescence would help to ensure accurate estimates of the role of academic marginalization in contributing to levels of depressive symptoms in midlife.

Second, my ability to conduct a more nuanced analysis of the effects of high school academic outcomes on levels of depressive symptoms at midlife is limited by the sample used in this study. The fact that only a small subset of my 3,660 respondents in 2014 was characterized as being academically marginalized (for example, only approximately one in five students took a non-academic math curriculum) made it difficult to ascertain whether, for example, there are heterogeneous effects of academic marginalization that have greater consequences for some individuals, such as those with a mental or physical disability in adolescence. With the addition of the HS&B senior follow-up study, other researchers will be able to use the combined sample to explore in greater detail how, and for whom, high school academic experiences matter for midlife mental health.

## **CONCLUSION**

American society is becoming increasingly stratified in work, family, and other spheres of social life by educational attainment (Carnevale and Strohl 2010). This increasing stratification raises questions as to how much other mental health inequalities, such as those by marital status, can be explained by peoples' academic experiences. In this study I showed that math course-taking, course failures, and academic expectations

in high school have implications for levels of depressive symptoms 35 years later, highlighting the importance of educational interventions that can help to disrupt the production of mental health disparities. Encouraging more students to take advanced math courses and get better grades may diminish mental health inequalities, but this remains an open question. Nonetheless, more research on the specific educational processes that improve mental health outcomes will produce findings that can inform policies aimed at addressing the mental health needs of Americans.

## Tables

Table 1. Descriptive Statistics

	All Respondents		Women		Men	
	Mean	s.d.	Mean	s.d.	Mean	s.d.
<b>Depressive Symptoms (Kessler 6 Scale)</b>	3.25	3.26	3.26	3.25	3.24	3.26
<b>Background</b>						
<i>Race</i>						
White	0.73		0.74		0.72	
Black	0.12		0.13		0.11	
Hispanic	0.12		0.11		0.13	
Other	0.03		0.02		0.04	
<i>Parent's Education (Highest)</i>						
Less than High School	0.13		0.16		0.11	
High School Only	0.33		0.32		0.34	
Some College	0.28		0.29		0.26	
Bachelor's or above	0.26		0.24		0.28	
<i>Disability in Adolescence</i>	0.22		0.18		0.27	
<i>High School Pregnancy</i>	-		0.04		-	
<i>Number of HS Courses Taken</i>	28.71	7.76	28.71	8.01	28.71	7.50
<b>Baseline Skills (Sophomore Year)</b>						
<i>Math Test Score</i>	0.07	1.01	0.04	0.96	0.09	1.06
<i>Locus of Control Score</i>	0.07	0.97	0.15	0.93	-0.02	0.99
<b>Adolescent Mental Health (Sophomore Year)</b>						
<i>Disciplinary Problems</i>	0.18		0.14		0.23	
<i>Negative Affect Score</i>	-0.03	0.98	0.09	0.98	-0.15	0.97
<b>Academic Marginalization</b>						
<i>Number of Non-Academic Math Credits</i>	0.74	0.95	0.65	0.91	0.82	0.98
<i>Number of Algebra I or Above Math Credits</i>	1.64	1.45	1.60	1.38	1.69	1.52
<i>Change in Expectations Sophomore to Senior Year</i>						
Bachelors or above -> Less than Bachelors	0.13		0.14		0.12	
Some college -> High school degree or less	0.08		0.07		0.09	
High school degree -> Less than high school	0.01		0.01		0.01	
Same Expectations (Less than Bachelors)	0.17		0.17		0.17	
Same Expectations (Bachelors or above)	0.30		0.29		0.31	
Raised Expectations	0.31		0.31		0.30	
<i>Number of HS Course Failures</i>						
Zero	0.62		0.66		0.57	
One or Two	0.18		0.17		0.18	
Three or Four	0.08		0.06		0.10	
Five or More	0.13		0.11		0.15	
<b>High School Degree Attainment</b>						
HS Non-Completion	0.10		0.09		0.11	
GED or Certificate	0.06		0.05		0.06	
Regular HS Diploma	0.84		0.86		0.83	
<b>Post-Secondary Attendance</b>						
HS Non-Completion/GED	0.11		0.09		0.12	
Regular HS Diploma	0.22		0.19		0.25	
Attended 2-YR College, No Degree	0.10		0.12		0.08	
Attended 2-YR College, Certificate/Associates	0.21		0.24		0.17	
Attended 4-YR College, No Degree	0.08		0.08		0.08	
Attended 4-YR College, Bachelor's	0.29		0.28		0.29	
<b>Observations</b>	3660		1980		1680	

Table 2. Poisson Models of Depressive Symptoms at Mid-Life for All Respondents

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
	IRR	s.e.												
<b>Background</b>														
<i>Race [Omitted = White]</i>														
Black	0.93	0.08	0.91	0.08	0.99	0.08	0.90	0.08	0.91	0.08	0.92	0.08	0.92	0.08
Hispanic	1.05	0.10	1.03	0.09	1.06	0.10	1.04	0.09	1.04	0.09	1.05	0.09	1.04	0.09
Other	0.84	0.08 ~	0.86	0.09	0.90	0.10	0.84	0.08 ~	0.85	0.09	0.85	0.09	0.86	0.09
<i>Gender [Omitted = Male]</i>														
Female (without HS pregnancy)	0.98	0.05	0.99	0.05	0.97	0.05	1.00	0.05	1.00	0.05	1.00	0.05	1.00	0.05
Female (with HS pregnancy)	1.20	0.23	1.19	0.22	1.21	0.24	1.19	0.22	1.21	0.22	1.19	0.21	1.21	0.22
<i>Parent's Education (Highest) [Omitted = Less than HS]</i>														
High School Only	0.91	0.09	0.93	0.08	0.94	0.08	0.93	0.08	0.96	0.08	0.96	0.08	0.96	0.08
Some College	1.00	0.10	1.00	0.09	1.03	0.10	1.00	0.09	1.04	0.10	1.04	0.10	1.04	0.10
Bachelor's or above	0.93	0.10	0.92	0.09	0.98	0.10	0.94	0.09	0.98	0.10	0.98	0.10	0.98	0.10
<i>Disability in Adolescence [Omitted = No Disability]</i>														
	1.11	0.07 ~	1.11	0.07 ~	1.10	0.07 ~	1.11	0.07 ~	1.11	0.06 ~	1.11	0.06 ~	1.11	0.06 ~
<i>Number of HS Courses Taken</i>														
	0.99	0.00	0.99	0.00 ~	1.00	0.00	0.99	0.00 ~	0.99	0.00	1.00	0.00	0.99	0.00
<b>Baseline Skills (Sophomore Year)</b>														
<i>Math Test Score</i>														
	0.97	0.04	0.96	0.04	0.95	0.04	0.99	0.04	1.00	0.04	0.99	0.04	1.00	0.04
<i>Locus of Control Score</i>														
	0.99	0.04	0.99	0.04	0.99	0.04	0.99	0.04	1.00	0.04	1.00	0.04	1.00	0.04
<b>Adolescent Mental Health (Sophomore Year)</b>														
<i>Disciplinary Problems [Omitted = No Disc. Problems]</i>														
	1.14	0.10	1.10	0.09	1.13	0.09	1.10	0.09	1.09	0.09	1.09	0.09	1.09	0.09
<i>Negative Affect Score</i>														
	1.13	0.04 **	1.13	0.04 **	1.13	0.04 **	1.13	0.04 **	1.13	0.04 **	1.13	0.04 **	1.13	0.04 **
<b>Academic Marginalization</b>														
<i>Number of Full-Year High School Math Credits</i>														
Non-academic Math	1.09	0.04 *					1.07	0.04 *	1.07	0.04 *	1.07	0.04 *	1.07	0.04 *
Algebra I or Above	0.97	0.03					0.98	0.03	0.99	0.03	0.99	0.03	0.99	0.03
<i>Number of HS Course Failures [Omitted = No Failures]</i>														
One or Two			1.13	0.08 ~			1.11	0.08	1.09	0.08	1.09	0.08	1.09	0.08
Three or Four			1.28	0.13 *			1.24	0.13 *	1.21	0.13 ~	1.18	0.12	1.19	0.12 ~
Five or More			1.41	0.14 **			1.34	0.14 **	1.28	0.13 *	1.20	0.14	1.22	0.14 ~
<i>Change in Expectations Soph. to Sen. Year [Omitted = Same Expectations (Bachelor's or Above)]</i>														
Bachelor's -> Less than Bachelor's					1.16	0.11			1.10	0.10	1.10	0.10	1.10	0.10
Some College -> High School Only or Less					1.08	0.18			1.00	0.17	0.99	0.17	0.99	0.17
High School Only -> Less than High School					2.13	0.43 **			1.79	0.36 **	1.78	0.38 **	1.73	0.37 **
Raised Expectations					1.08	0.09			1.02	0.09	1.02	0.09	1.03	0.09
Same Expectations (Less than Bachelor's)					1.18	0.10 *			1.11	0.10	1.11	0.10	1.12	0.10
<b>HS Degree Completion [Omitted = Regular HS Grad]</b>														
HS Non-Completion											1.17	0.15		
GED Holder											1.05	0.16		
<b>Post-Secondary Attendance [Omitted = Reg. HS Grad]</b>														
HS Non-Completion/GED													1.11	0.15
Attended 2-YR College, No Degree													0.96	0.09
Attended 2-YR College, Certificate/Associates													1.01	0.08
Attended 4-YR College, No Degree													1.02	0.10
Attended 4-YR College, Bachelor's													1.01	0.08
<b>Constant</b>	3.70	0.51 **	3.49	0.43 **	3.15	0.45 **	3.45	0.46 **	3.05	0.49 **	2.88	0.50 **	2.91	0.50 **
<b>AIC</b>	5484		5468		5464		5453		5421		5417		5417	
<b>Observations</b>	3660		3660		3660		3660		3660		3660		3660	

Note: ~= $p < 0.10$ ; \*= $p < 0.05$ ; \*\*= $p < 0.01$

Table 3. Poisson Models of Depressive Symptoms at Mid-Life for Women

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
	IRR	s.e.												
<b>Background</b>														
<i>Race [Omitted = White]</i>														
Black	0.85	0.10	0.84	0.10	0.90	0.11	0.83	0.10	0.85	0.10	0.85	0.10	0.85	0.10
Hispanic	1.06	0.12	1.04	0.12	1.04	0.12	1.06	0.12	1.05	0.12	1.06	0.12	1.05	0.12
Other	0.67	0.12 *	0.67	0.12 *	0.66	0.12 *	0.68	0.12 *	0.67	0.12 *	0.66	0.12 *	0.67	0.12 *
<i>High School Pregnancy [Omitted = No HS Pregnancy]</i>														
	1.25	0.24	1.23	0.22	1.29	0.25	1.21	0.22	1.24	0.23	1.22	0.21	1.24	0.23
<i>Parent's Education (Highest) [Omitted = Less than HS]</i>														
High School Only	0.92	0.10	0.92	0.10	0.94	0.10	0.93	0.10	0.95	0.10	0.93	0.10	0.94	0.10
Some College	1.07	0.13	1.06	0.12	1.08	0.13	1.08	0.13	1.10	0.13	1.09	0.13	1.09	0.13
Bachelor's or above	0.89	0.11	0.87	0.10	0.93	0.11	0.89	0.11	0.95	0.11	0.94	0.11	0.93	0.11
<i>Disability in Adolescence [Omitted = No Disability]</i>														
	1.11	0.09	1.10	0.09	1.11	0.10	1.11	0.09	1.12	0.10	1.13	0.10	1.12	0.09
<i>Number of HS Courses Taken</i>														
	1.00	0.00	0.94	0.05	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
<b>Baseline Skills (Sophomore Year)</b>														
<i>Math Test Score</i>														
	0.97	0.06	0.94	0.05	0.95	0.05	0.98	0.06	0.99	0.06	0.99	0.06	0.98	0.06
<i>Locus of Control Score</i>														
	0.95	0.04	0.94	0.04	0.95	0.04	0.95	0.04	0.96	0.04	0.96	0.04	0.96	0.04
<b>Adolescent Mental Health (Sophomore Year)</b>														
<i>Disciplinary Problems [Omitted = No Disc. Problems]</i>														
	0.98	0.12	0.94	0.12	0.97	0.12	0.94	0.12	0.94	0.11	0.94	0.11	0.94	0.11
<i>Negative Affect Score</i>														
	1.17	0.05 **	1.17	0.05 **	1.17	0.05 **	1.17	0.05 **	1.17	0.05 **	1.17	0.04 **	1.17	0.05 **
<b>Academic Marginalization</b>														
<i>Number of Full-Year High School Math Credits</i>														
Non-academic Math	1.09	0.05 ~					1.06	0.05	1.06	0.05	1.06	0.05	1.06	0.05
Algebra I or Above	0.96	0.04					0.96	0.04	0.98	0.04	0.99	0.04	0.98	0.04
<i>Number of HS Course Failures [Omitted = No Failures]</i>														
One or Two			1.01	0.10			0.99	0.10	0.97	0.09	0.97	0.09	0.98	0.09
Three or Four			1.25	0.15 ~			1.20	0.14	1.16	0.14	1.16	0.14	1.20	0.15
Five or More			1.35	0.20 *			1.27	0.19	1.18	0.17	1.19	0.19	1.26	0.19
<i>Change in Expectations Soph. to Sen. Year [Omitted = Same Expectations (Bachelor's or Above)]</i>														
Bachelor's -> Less than Bachelor's					1.23	0.16			1.20	0.15	1.20	0.15	1.23	0.16
Some College -> High School Only or Less					1.16	0.28			1.08	0.26	1.09	0.25	1.10	0.27
High School Only -> Less than High School					2.61	0.71 **			2.26	0.61 **	2.34	0.63 **	2.37	0.65 **
Raised Expectations					1.15	0.12			1.12	0.12	1.12	0.11	1.13	0.12
Same Expectations (Less than Bachelor's)					1.29	0.13 *			1.24	0.13 *	1.24	0.13 *	1.25	0.14 *
<b>HS Degree Completion [Omitted = Regular HS Grad]</b>														
<i>HS Non-Completion</i>														
GED Holder											1.19	0.20		
											0.90	0.14		
<b>Post-Secondary Attendance [Omitted = Reg. HS Grad]</b>														
<i>HS Non-Completion/GED</i>														
Attended 2-YR College, No Degree													0.80	0.13
Attended 2-YR College, Certificate/Associates													0.84	0.11
Attended 4-YR College, No Degree													0.95	0.09
Attended 4-YR College, Bachelor's													0.90	0.12
													0.99	0.11
<b>Constant</b>														
	3.20	0.51 **	3.12	0.45 **	2.48	0.40 **	3.15	0.51 **	2.49	0.46	2.47	0.46 **	2.80	0.56 **
<b>AIC</b>														
	5091		5085		5042		5068		5012		5001		4997	
<b>Observations</b>														
	1980		1980		1980		1980		1980		1980		1980	

Note: ~= $p < 0.10$ ; \*= $p < 0.05$ ; \*\*= $p < 0.01$

Table 4. Poisson Models of Depressive Symptoms at Mid-Life for Men

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
	IRR	s.e.												
<b>Background</b>														
<i>Race [Omitted = White]</i>														
Black	1.04	0.13	1.02	0.13	1.09	0.13	0.99	0.13	1.00	0.12	1.01	0.12	1.00	0.12
Hispanic	1.09	0.15	1.06	0.14	1.11	0.15	1.05	0.14	1.06	0.14	1.07	0.14	1.06	0.13
Other	0.96	0.12	0.99	0.13	1.06	0.14	0.94	0.12	0.96	0.13	0.96	0.13	0.96	0.13
<i>Parent's Education (Highest) [Omitted = Less than HS]</i>														
High School Only	0.91	0.14	0.94	0.14	0.95	0.13	0.93	0.14	0.96	0.13	0.97	0.14	0.96	0.13
Some College	0.93	0.14	0.95	0.14	0.97	0.14	0.95	0.14	0.98	0.13	0.99	0.14	0.98	0.13
Bachelor's or above	0.97	0.16	0.98	0.16	1.01	0.17	0.98	0.16	1.01	0.16	1.03	0.17	1.02	0.16
<i>Disability in Adolescence [Omitted = No Disability]</i>														
	1.13	0.10	1.13	0.09	1.12	0.09	1.13	0.09	1.12	0.09	1.12	0.09	1.12	0.09
<i>Number of HS Courses Taken</i>														
	0.99	0.01 *	0.99	0.01 *	0.99	0.01 *	0.99	0.01	0.99	0.01 *	0.99	0.01 ~	0.99	0.01 *
<b>Baseline Skills (Sophomore Year)</b>														
<i>Math Test Score</i>														
	0.98	0.06	0.98	0.05	0.94	0.05	1.00	0.06	1.00	0.06	1.00	0.06	1.00	0.06
<i>Locus of Control Score</i>														
	1.03	0.05	1.02	0.05	1.03	0.05	1.03	0.05	1.03	0.05	1.03	0.05	1.03	0.05
<b>Adolescent Mental Health (Sophomore Year)</b>														
<i>Disciplinary Problems [Omitted = No Disc. Problems]</i>														
	1.29	0.15 *	1.23	0.14 ~	1.28	0.14 *	1.23	0.14 ~	1.23	0.14 ~	1.22	0.14 ~	1.22	0.13 ~
<i>Negative Affect Score</i>														
	1.09	0.05 ~	1.09	0.05 ~	1.09	0.05 ~	1.09	0.05 ~	1.09	0.05 ~	1.08	0.05 ~	1.08	0.05
<b>Academic Marginalization</b>														
<i>Number of Full-Year High School Math Credits</i>														
Non-academic Math	1.10	0.05 *					1.08	0.05 ~	1.08	0.05 ~	1.09	0.05 ~	1.08	0.05 ~
Algebra I or Above	0.98	0.03					1.00	0.03	1.00	0.04	1.00	0.04	1.00	0.04
<i>Number of HS Course Failures [Omitted = No Failures]</i>														
One or Two			1.24	0.12 *			1.22	0.12 *	1.23	0.12 *	1.22	0.12 ~	1.19	0.12 ~
Three or Four			1.31	0.20 ~			1.28	0.20	1.27	0.19	1.21	0.18	1.18	0.17
Five or More			1.46	0.19 **			1.41	0.18 **	1.38	0.18 *	1.27	0.19	1.19	0.17
<i>Change in Expectations Soph. to Sen. Year [Omitted = Same Expectations (Bachelor's or Above)]</i>														
Bachelor's -> Less than Bachelor's					1.05	0.16			0.96	0.15	0.96	0.14	0.94	0.14
Some College -> High School Only or Less					0.97	0.22			0.87	0.20	0.86	0.20	0.83	0.20
High School Only -> Less than High School					1.70	0.56			1.40	0.47	1.31	0.44	1.22	0.39
Raised Expectations					0.98	0.13			0.91	0.13	0.92	0.13	0.93	0.12
Same Expectations (Less than Bachelor's)					1.05	0.14			0.96	0.13	0.97	0.13	0.96	0.13
<b>HS Degree Completion [Omitted = Regular HS Grad]</b>														
<i>HS Non-Completion</i>														
GED Holder											1.12	0.19		
											1.22	0.27		
<b>Post-Secondary Attendance [Omitted = Reg. HS Grad]</b>														
<i>HS Non-Completion/GED</i>														
Attended 2-YR College, No Degree													1.47	0.27 *
Attended 2-YR College, Certificate/Associates													1.13	0.14
Attended 4-YR College, No Degree													1.03	0.13
Attended 4-YR College, Bachelor's													1.13	0.16
													1.00	0.10
<b>Constant</b>														
	4.17	0.81 **	3.81	0.66 **	4.02	0.88 **	3.64	0.67 **	3.69	0.88 **	3.35	0.92 **	3.07	0.80 **
<b>AIC</b>														
	5861		5825		5855		5809		5780		5770		5737	
<b>Observations</b>														
	1680		1680		1680		1680		1680		1680		1680	

Note: ~= $p < 0.10$ ; \*= $p < 0.05$ ; \*\*= $p < 0.01$

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