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Ethnic Differences in Trajectories of Depressive Symptoms: Disadvantage in Family Background, High School Experiences, and Adult Characteristics

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Background, High School Experiences, and Adult Characteristics*

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Abstract

Although research investigating ethnic differences in mental health has increased in recent years, we know relatively little about how mental health trajectories vary across ethnic groups. Do these differences occur at certain ages, but not others? We investigate ethnic variations in trajectories of depressive symptoms, and examine the extent to which disadvantage in family background, high school experiences, and adult characteristics explain these differences. Employing random-coefficient modeling using the National Longitudinal Survey of Youth, we find that blacks and Hispanics experience higher symptom levels in early adulthood in comparison to whites, but equivalent levels by middle-age. Ethnic differences remained in early adulthood after including all covariates, but were eliminated by middle-age for Hispanics after controlling for demographics only and for blacks after accounting for the age-varying relationship between income and depressive symptoms. These results highlight the importance of integrating a life-course perspective when investigating ethnic variations in mental health.

Word Count: 148

Ethnic Differences in Trajectories of Depressive Symptoms: Disadvantage in Family

Background, High School Experiences, and Adult Characteristics

National studies find that blacks and Hispanics often exhibit higher levels of depressive symptoms than whites (Luo and Waite 2005; Ostrove, Feldman, and Adler 1999; Wickrama and Bryant 2003). These disparities appear to mirror the social location of minority groups, such that membership in disadvantaged social groups confers higher risk of illness, presumably because these groups experience higher rates of stress and have access to fewer material resources.

Adult socioeconomic position (i.e., income, education, and occupation) is often investigated as the explanation for these ethnic differences in depressive symptoms. Yet, it is likely that childhood and adolescent experiences also play a role in the development of psychological problems. These experiences may structure the types of opportunities individuals have access to and may increase individuals' exposure to various stressors and resource constraints throughout their life course. Given the greater likelihood of exposure to adversity during childhood and adulthood among black and Hispanic populations in the United States (George and Lynch 2003; Taylor and Turner 2002), trajectories of depressive symptoms may vary by ethnicity. Much of the current research, however, utilizes cross-sectional samples that cannot meaningfully measure life course trajectories. Hence, our ability to investigate ethnic disparities in depressive symptoms across the life course has been limited by the shortage of longitudinal studies available to answer such a question.

In general, national studies find higher rates of depressive symptoms among minorities compared to whites (Luo and Waite 2005; Ostrove et al. 1999; Wickrama and Bryant 2003), but regional studies appear more inconsistent, with some studies finding no disparities or even higher

rates for whites (Bromberger et al. 2004; Vega and Rumbaut 1991). This suggests that disparities in depressive symptoms may be influenced by context.

The purpose of this paper is to explore how disadvantage during various developmental periods (e.g., childhood, adolescence, adulthood) and within multiple contexts (e.g., family of origin, school) influence ethnic differences in trajectories of depressive symptoms in early adulthood and middle-age. We employ a life course perspective (Elder, Johnson, and Crosnoe 2003; Pavalko and Smith 1997) with the overarching assumptions that trajectories of depressive symptoms vary by age and these age-related variations are sensitive to the influence of social conditions during critical developmental periods. This suggests that exposure to disadvantage during youth can influence the patterns of depressive symptoms through adulthood. Further, disadvantage is not randomly distributed, but structured by ethnicity. Accordingly, our study investigates whether disadvantage in youth increases the probability of depressive symptoms in early adulthood and whether the greater burden of disadvantage among ethnic minorities contributes to disparities in depressive symptoms across the life course.

Our paper includes several key features. First, we use longitudinal data to assess changes in depressive symptoms during the transition from early to mid-adulthood. Second, we extend our potential explanations beyond traditional measures of adult socio-economic position (SEP) and include measures of family background and high school experiences. Finally, we use data from a large nationally representative sample that includes oversamples of blacks and Hispanics.

THEORETICAL FRAMEWORK

A Life Course Perspective of Depression

Depression appears to follow a U-shaped trajectory across adulthood. Depression is highest in early adulthood, drops during middle age and rises again during late-life (Clarke and

Wheaton 2005; Mirowsky and Ross 1992; Vega and Rumbaut 1991). From a life course perspective, this pattern of depression reflects social conditions and roles: depression is high during early adulthood because of the anxiety and uncertainty inherent in transitions, career entry, and role formations, but declines as roles and relationships stabilize, careers advance, and economic security grows, reaching its lowest level around 44 years of age (Mirowsky and Ross 1992). As individuals enter late-life, depression appears to rise, partly as a result of increasing physical ailments, loss of significant others, and changes in employment (Mirowsky and Ross 1992).

Trajectories of depression appear to be modified by context. For example, historical trends in educational attainment and cumulative exposure to social risk factors appear to alter trajectories of depressive symptoms (Yang 2007). Clarke and Wheaton (2005) also found the decline in depression between early adulthood to mid-life is not a given. According to their results, individuals living in wealthy neighborhoods experienced the anticipated decline in depression as they transitioned from early adulthood to mid-life. This decline, however, did not occur for those living in disadvantaged neighborhoods (Clarke and Wheaton 2003). Human capital can also influence trajectories of depressive symptoms. Indeed, completing at least 16 years of schooling is associated with fewer depressive symptoms throughout the life course than completing less than 12 years of schooling (Miech and Shanahan 2000). Moreover, disparities in depressive symptoms appear to widen with increasing age between those with at least 16 years of schooling and those with less than 12 years of schooling (Miech and Shanahan 2000).

Cumulative disadvantage, defined as the "systematic tendency for inter-individual divergence in a given characteristic (e.g., money, health, or status) with the passage of time" (Dannefer 2003:327), has been used to explain these disparate age-related trajectories of

depressive symptoms. Most studies informed by this perspective have operationalized cumulative disadvantage by examining how the relationship between health and educational attainment varies as individuals age (Lynch 2003; Miech and Shanahan 2000; Ross and Wu 1996). While these studies have been invaluable in advancing our understanding of how trajectories of human capital and health interrelate, they have left childhood and adolescent disadvantage largely unexplored. Yet, it is in childhood and adolescence that disadvantage begins to accrue.

Although human capital acquired *by* adulthood likely influences depression, the acquisition of human capital is itself related to disadvantages experienced *during* childhood and adolescence. For example, social reproduction theory argues that institutionalized inequalities within the education system reinforce existing advantage/disadvantage within the family of origin (Bourdieu 1973; Dannefer 2003; Lewis 2003; Walsemann, Geronimus, and Gee 2008). From this perspective, adult human capital reflects the foreseeable outcomes of an education system that perpetuates inequities of social origin.

Cumulative disadvantage and social reproduction theory can be viewed as existing along the same theoretical continuum. Cumulative disadvantage suggests divergent health trajectories with age that reflect differences in human capital, while social reproduction theory focuses on the social constraints that foster differences in human capital (Dannefer 2003). Thus, differential trajectories of depressive symptoms may reflect both the accumulation of human capital through an individual's own efforts and the reproduction of class privilege within the education system.

Disadvantage during childhood or adolescence may have significant short-term and long-term effects on mental health. For example, losing a parent through death or divorce or living in an economically disadvantaged household is often associated with an earlier onset of

psychological disorders, as well as an increased probability of experiencing psychological problems during adulthood (Gilman et al. 2003; Krause 1998; Luo and Waite 2005). The timing of such adversities may also influence mental health across the life course. For example, if adversities occur during adolescence, a time of great adjustment and change, the negative effects of such adversities may be carried into adulthood and influence formation of intimate relationships, feelings of autonomy, and career choices (Chase-Lansdale, Cherlin, and Kiernan 1995).

Disadvantage within the family can also determine the amount and type of resources one may have available to cope with external adversities. Highly educated parents, for instance, generally have access to greater economic and social resources that can increase the educational opportunities of their children (Lewis 2003). Because black and Hispanic children are more likely than white children to grow up in disadvantaged households, they often have access to fewer educational opportunities - they are more likely to attend racially and economically segregated schools that suffer from overcrowded classrooms, outdated books and supplies, and fewer highly-qualified teachers (Darling-Hammond 2004; Orfield and Lee 2006). Black and Hispanic students are also more likely to be tracked into vocational, remedial, or general education classes (Darling-Hammond 2004), disciplined for subjective offenses (e.g., lack of respect), and punished using harsh methods such as school suspension or expulsion than white students (Skiba et al. 2002). Exposure to such inequality during childhood and adolescence may shape how one views the world, whether one feels as if events and outcomes are within his/her control, and how one responds to events in the future. Indeed, Neighbors and Williams (2001) suggest that the higher rates of psychological problems among black, 18-29 year olds may be a result of the uncertainty of young blacks as to how their lives will turn out in the face of such

adversity.

Inequalities in family resources and educational opportunities may set the stage for later economic, social, and health disadvantage. For example, while exposure to challenging curricula and higher quality education is linked to children learning more and developing greater cognitive skills, lack of exposure increases the odds that one will prematurely drop out of school (Darling-Hammond 2004). Leaving the education system prior to completing high school may arrest cognitive development and limit the knowledge and skills important for preventing and mitigating depression and other health-related conditions (Lewis, Ross, and Mirowsky 1999). Dropping out of school may also increase levels of depression by reducing social and economic resources in adulthood; individuals who do not complete high school are limited in their career options, receive lower earnings (Behrman, Rosenzweig, and Taubman 1996) and experience less stable employment (Thomas 2000).

HYPOTHESES

In our study, we follow one cohort, ages 27-34 years old at baseline, over a 12-year period. Given this age range, we expect to find an overall linear decline in depressive symptoms. Cumulative disadvantage theory, however, posits that trajectories of depressive symptoms will differ by education and income because education and income may result in the accumulation of economic and social resources over the life course that can result in a widening disparity in mental health between those with high education or income and those with low education or income. As such, *we hypothesize that individuals with high education or income will experience lower levels of depressive symptoms at baseline and a faster rate of decline in depressive symptoms over time as compared to those with low education or income.*

Social reproduction theory, however, suggests that disadvantages experienced during

childhood and adolescence may influence depressive symptoms in adulthood, either because of their cumulative accrual over the life course or by manifesting at critical periods in development that set forth other trajectories of inequality. Thus, w*e hypothesize that individuals who experienced disadvantage in family background and high school will report higher levels of depressive symptoms in adulthood compared to individuals who did not experience these types of disadvantages, independent of adult SEP*.

Because blacks and Hispanics share a greater burden of disadvantage across the life course in comparison to whites, *we hypothesize that blacks and Hispanics will experience higher levels of depressive symptoms at baseline and a slower rate of decline than whites*. Once we account for cumulative disadvantage, *we expect that these ethnic differences will attenuate, but not disappear* given blacks and Hispanics potential exposure to racism that is not fully captured in measures of human capital or family background (Van Ausdale and Feagin 2002).

The US Hispanic population is extremely heterogeneous, however, differing in terms of nativity, migration patterns, and ethnic origin (Portes and Rumbaut 2006). In addition to cumulative disadvantage, two other forces may influence trajectories of depression among Hispanics. The first relates to immigration and acculturation. The "healthy migrant" perspective suggests that healthier persons are more likely to immigrate (Lara et al. 2005). Increasing duration in the U.S., however, may erode this immigrant advantage due to encounters with discrimination, financial strain, and loss of protective cultural practices (e.g. familialism) (Lara et al. 2005; Portes and Rumbaut 2006). This line of reasoning would lead to the hypothesis that Hispanics should have lower levels of depression at baseline, but a slower rate of decline compared to whites and blacks.

Our hypotheses about Hispanic trajectories, however, may be refined for two reasons.

First, adolescence and early adulthood is often accompanied by a search for identity and belonging (Schwartz, Montgomery, and Briones 2006). Immigrant and 2nd generation Hispanic adolescents and young adults may experience heightened stress during their search for identity and belonging, particularly if their identity search brings them in conflict with their immigrant parents' expectations and cultural values (Portes and Rumbaut 2006). Second, for immigrant youth the migration experience itself may be stressful, especially if it disrupts normal parent-child relationships (Zhou 1997). As the search for identity and belonging progresses, however, these generational conflicts may subside. Given this, *we expect that Hispanics will experience higher, rather than lower, levels of depressive symptoms than whites during early adulthood, in addition to the slower rate of decline previously discussed*.

SAMPLE AND METHODS

We use the National Longitudinal Survey of Youth (NLSY), a nationally representative survey of persons 14-21 years old in 1979. The NLSY includes an over-sample of blacks and Hispanics, and significant information about respondents' family background and high school experiences (NLSY User's Guide 2003). Our analyses focus on the years when information about depressive symptoms was collected: 1992, 1994, 1998, 2000, 2002, and 2004. We include civilian respondents self-reporting as white, black, or Hispanic (any race). We do not use sampling weights in our analyses, but previous studies demonstrate that unbiased coefficients are produced in unweighted analysis if one includes the variables that were used to sample respondents (Winship and Radbill 1994).

Approximately 1.6% of respondents were lost to mortality prior to the first measure of depressive symptoms (N=153). Approximately 2% of respondents (N=157) had died by 2004. Respondents lost to mortality were more likely to be older, black, male, less educated and report

more depressive symptoms in 1992. We explored the possibility that selective mortality biased our conclusions as follows. First, we ran our models on the subset of respondents who had not died during the survey interval (1992-2004). Second, we ran analyses on the entire sample and included a variable that indicated if the respondent had died during the survey interval. This variable was interacted with age to determine if the slope of respondents' who died during the interval differed from those retained in the sample. Neither analysis revealed any substantive differences from the results we present. After exclusions and attrition, our sample consists of 3,475 non-Hispanic whites, 2,617 non-Hispanic blacks, and 1,634 Hispanics (1,001 Mexicans, 105 Cubans, 280 Puerto Ricans and 248 other Hispanics). We did not disaggregate the Hispanic sample because of small numbers of non-Mexican respondents.

The maximum number of interviews that include information on depressive symptoms varies by cohort, from 2 interviews among the youngest cohort to 3 among the oldest. Approximately 82% of age-eligible respondents completed 3 interviews, while 96.5% of the sample provided at least 2 interviews.

Measures

Depressive Symptoms. We measured *depressive symptoms* using the 7-item Center for Epidemiological Studies Depression Scale (CES-D), a shortened form of the 20-item CES-D. Respondents were asked, "How many days during the past week have you…(1) not felt like eating, (2) had trouble keeping your mind on what you were doing, (3) felt depressed, (4) felt that everything was an effort, (5) experienced restless sleep, (6) felt sad, and (7) felt you could not get going." The standard 20-item CES-D discriminates between clinically depressed individuals and individuals without clinical depression (Radloff 1977). The 7-item CES-D correlates .92 with the full 20-item CES-D (Mirowsky and Ross 1992), and has demonstrated

high reliability in other studies (Miech and Shanahan 2000). The internal consistency (Cronbach's alpha) of the 7-item CES-D in the NLSY ranges from .77 in 1992 to .82 in 2004. Per convention, the 7 items are summed. The distribution was skewed, so a square-root transformation was used to normalize the distribution.

Demographics. We included *nativity* (foreign born vs. U.S. born)*, sex,* and *ethnicity (*non-Hispanic white, non-Hispanic black, and Hispanic).

Family Background. In 1979, all respondents reported information about their household when they were age 14 (reports from respondents older than 14 in 1979 are thus retrospective). Socioeconomic information included *mother's* and *father's* years of education, and the *adult male's* and *adult female's occupational status* (professional/managerial, laborer/blue collar, sales/service/clerical, not working, and no female/male present). Demographic and family characteristics included *father's* and *mother's nativity* (foreign born vs. U.S. born); *family structure* (two married parents resided in the respondent's household vs. otherwise) and *region* (South, non-South, and outside of the U.S.) and the *community* (1 = rural; 0 = city or town) where respondents lived.

High School Experiences. We categorized respondents' self-reported *high school curriculum* as vocational/commercial, general education, and college preparatory. *Educational expectations* were coded 1 if the respondent expected to attend college and 0 otherwise.

Respondents' high school administrators provided additional data on the proportion of poor students and the proportion of black students in their student body. We utilized these two measures as indicators of economic disadvantage and racial segregation, respectively. Both proportions are categorized into quartiles. Administrators also indicated whether NLSY respondents were enrolled in *remedial English* or *remedial math*.

Adult Characteristics. Education was categorized as less than 12 years of schooling versus 12 or more years of schooling as of age 26 (exploratory analysis revealed a threshold effect at 12 years). Unlike the prior variables, *family income* and *marital status* were modeled as time varying. *Family income* was dichotomized at or below $24,000 (constant 2004 dollars) as exploratory analysis revealed a threshold effect at $24,000. *Marital status* was categorized as married versus not married.

Interactions. To examine whether ethnic disparities exist in depressive symptoms, we test the main effects of ethnicity, contrasting blacks and Hispanics with whites. To examine whether these disparities change over time, we test the interaction between *ethnicity* and *age*. Further, we model the interaction between *age* and *education* and between *age* and *income* to test our hypothesis that individuals with high education or income will experience a faster rate of decline in depressive symptoms than those with low education or income. Hence, our models examine whether ethnic disparities exist and change over time after controlling for the possibility of changing economic disparities and other important life and demographic covariates.

Statistical Technique

We employ the following random coefficients model:

(1) $$Y_{it} = \mathbf{X}_i' \beta + \mathbf{Z}_{it}' \lambda + \zeta_{0i} + \zeta_{1i}(age_{it} - 27) + \varepsilon_{it}$$

where Y_{it} is the square-root CES-D score for respondent i at time t and assumes that conditional on ζ_{0i} and ζ_{1i}, Y_{i1} to Y_{in} are independent; $t = 1, \ldots, \mathbf{T}_i$ is the number of occasions on which respondent i was observed and $i = 1, \ldots, n$, $\mathbf{X}_i'$ is a vector of time-invariant covariates (e.g., ethnicity, gender), $\mathbf{Z}_{it}'$ is a vector of time-varying covariates (e.g., age, income), ζ_{0i} and ζ_{1i} are random effects that represent unobserved heterogeneity for respondent i, and are assumed to be

normally distributed with mean 0, and ε_{it} is the random within-person error of prediction for respondent i at time t. We also assume that the random effects ζ_{0i} and ζ_{1i} are independent of ε_{it}, and that all random components are independent of the vector of covariates (Singer and Willet 2003). To facilitate interpretation of the intercept, age is centered at 27, the youngest age of respondents in the sample. Because of concerns about endogeneity, family income and marital status are modeled with a 2-year lag.

Sensitivity Analyses

We tested the sensitivity of the distributional assumption imposed by the random coefficient model (e.g., that ζ_{0i} and ζ_{1i} are independent of ε_{it} and the vector of covariates) by also estimating a fixed effects model, which makes no distributional assumptions (Allison 2005). Analyses found little substantive difference between the two models (results available from authors). Because fixed effects models do not provide estimates for time-invariant measures (e.g., ethnicity), we report estimates from the random coefficient models only.

We also conducted a series of exploratory analyses, stratifying the sample by ethnicity to test whether the estimated coefficients were comparable for whites, blacks, and Hispanics. We found no significant differences in the estimates across ethnicity for family background, high school experiences, and adult characteristics. However, parameter estimates for age differed slightly by ethnicity. Including the interaction terms between age and ethnicity will allow us to model this effect.

RESULTS

Table 1 presents the characteristics of the study sample, stratified by ethnicity. We find higher average levels of depressive symptoms across the survey interval (1992 – 2004) for blacks (2.12) and Hispanics (2.04) in comparison to whites (1.93).

[INSERT TABLE 1 ABOUT HERE]

White respondents reported greater advantage in family background than black and Hispanic respondents. At age 14, white respondents had parents with greater educational attainment, were more likely to live in married households and in households with employed adults. The type of community and place of residence at age 14 also differed by ethnicity. Whites and Hispanics were more likely to reside outside of the South than blacks, while whites were more likely to live in a rural community compared to blacks and Hispanics.

During high school, whites experienced more educational advantages than blacks or Hispanics. Whites were more likely to take college preparatory classes, expect to attend college, and were less likely to take remedial math or English. Black respondents attended schools with greater percentages of economically disadvantaged students; 37% attended schools where approximately 37% of the student population was economically disadvantaged compared to 12% of whites. Comparatively, 39% of blacks attended schools with a predominately white student body, compared to 94% and 95% of whites and Hispanics, respectively.

Adult characteristics also differed by ethnicity. By age 26, 89% of whites, 80% of blacks, and 69% of Hispanics had completed at least 12 years of schooling. Between 1990 and 2002 86% of whites, 62% of blacks, and 73% of Hispanics reported a family income greater than $24,000. Black respondents were less likely to be married than white or Hispanic respondents.

[INSERT TABLE 2 ABOUT HERE]

Table 2 presents the bivariate means of depressive symptoms by ethnicity and age. Depressive symptoms decline between age 27 and 43 for all respondents, although this differs by ethnicity. White respondents report significantly lower levels of depressive symptoms than black or Hispanic respondents across most ages, although the white-Hispanic disparity becomes non-

significant beginning at ages 36-38. The bivariate means also suggest a more rapid decline in depressive symptoms for black and Hispanic respondents than for whites; the difference in depressive symptoms between ages 27-29 and ages 42-43 is -0.18 for whites,

-0.27 for blacks, and -0.36 for Hispanics.

Random Coefficient Models

Although consistent with expectations, these bivariate analyses neither truly model change over time, nor consider the differential experiences of family background, high school experiences, and adult characteristics evident from Table 1. To examine how these factors influence ethnic trajectories in depressive symptoms, random coefficient models are employed (Table 3).

Model 1 presents baseline estimates for depressive symptoms with ethnicity, sex, nativity status, age, and the interaction between age and ethnicity. At age 27, depressive symptoms are higher for blacks (b=0.21) and Hispanics (b=0.18) than whites. Females report higher levels of depressive symptoms in adulthood (b=0.23) than males. Depressive symptoms decline at a statistically equivalent rate for blacks and whites with each additional year respondents' age, but depressive symptoms decline at a faster rate for Hispanics (b=-0.027). We tested for quadratic age patterns, but as hypothesized, we found only a linear pattern.

Model 2 adds information about family background to the baseline model. Although black and Hispanic respondents continue to experience higher levels of depressive symptoms than white respondents, the ethnic gap at age 27 is reduced; family background explains 28.5% of the ethnic gap at age 27 among black respondents (1-[(0.21-0.15)/(0.21)]) and 27.8% of the ethnic gap among Hispanic respondents. Greater maternal education, foreign-born parents', living in a rural community at age 14 and living with two married parents at age 14 are

associated with fewer depressive symptoms in adulthood. The addition of family background covariates does not change the parameter estimates for age or the interaction between age and black ethnicity, although the parameter estimate for the interaction between age and Hispanic ethnicity increases slightly.

[INSERT TABLE 3 ABOUT HERE]

Model 3 adds respondents' high school experiences to Model 1. The ethnic gap continues to be statistically significant at age 27, but again the gap diminishes; school experiences explain 28.5% of the ethnic gap among blacks and 22.2% of the ethnic gap among Hispanics. Respondents who were enrolled in vocational/commercial or general education courses report greater depressive symptoms in adulthood than those enrolled in college preparatory courses. Respondents never enrolled in remedial English or remedial math report fewer depressive symptoms as adults. The parameter estimates for age and the interaction between age and black ethnicity remain unchanged, but the interaction between age and Hispanic ethnicity increases slightly.

Model 4 adds adult characteristics to Model 1. Adult characteristics reduces the ethnic gap at age 27 by 33% for both black and Hispanic respondents. Respondents with less than 12 years of schooling experience greater levels of depressive symptoms (b=0.26) compared to those with at least 12 years of schooling. Respondents earning $24,000/year or less experience higher levels of depressive symptoms (b=.15) than respondents earning more than $24,000/year. Married respondents experience fewer depressive symptoms than non-married respondents (b= -0.06). The addition of adult characteristics increases the estimate for the interaction between age and Hispanic, but does not change the estimates for age or the interaction between age and black ethnicity.

Model 5 includes the combined main effects of family background, high school experiences, and adult characteristics. Although the ethnic gap at age 27 remains statistically significant for blacks and Hispanics, the gap is reduced by 52% among black respondents and 39% among Hispanic respondents from the baseline model (Model 1). Including information on respondents' family background and high school experiences (e.g., comparing Model 4 to Model 5) explains an additional 28.5% of the ethnic gap at age 27 among blacks, and an additional 8% among Hispanics. The parameter estimates of parents' education, family structure, and community however, are reduced in Model 5, suggesting that much of the relationship between family background and depressive symptoms in adulthood operate through adult characteristics. Comparatively, the parameter estimates for curriculum, remedial coursework, and educational expectations, while reduced, remain significant predictors of depressive symptoms in adulthood.

Model 6 includes the interaction terms age x education and age x income. The ethnic gap at age 27 is slightly higher for both blacks and Hispanics compared to Model 5, and remains statistically significant. The age x black interaction is now statistically significant; blacks experience a faster rate of decline in depressive symptoms for each additional year compared to whites. Among Hispanics the rate of change in depressive symptoms increases between Model 5 and Model 6, suggesting that once we account for socioeconomic trajectories, the decline in depressive symptoms among Hispanics occurs more rapidly. Overall, Hispanics experience the fastest rate of decline in depressive symptoms, blacks the next fastest, and whites the slowest, regardless of whether they are socio-economically advantaged or not (see Figures 1 and 2).

To determine the reason for the change in the age x black interaction term, we ran Model 6 including only age x education (e.g., excluding age x income), and then re-ran Model 6 including only age x income (e.g., excluding age x education) (results not shown). In the first

model, black x age remained non-significant, but in the second model, black x age reached statistical significance, suggesting that the cumulative effects of income on depressive symptoms influences rates of decline in depressive symptoms for black respondents, more so than education.

[INSERT FIGURES 1 AND 2 ABOUT HERE]

Because both age x ethnicity interaction terms are statistically significant, ethnic differences vary across the age range. Figures 1 and 2 illustrate these interactions. The average trajectories for advantaged (Figure 1) and disadvantaged (Figure 2) whites, blacks, and Hispanics are depicted, holding all covariates and random effects constant. Disparities are most evident at age 27, when blacks and Hispanics have significantly higher depressive symptoms than whites. However, the disparity between Hispanics and whites is no longer statistically significant by age 35 and the disparity between blacks and whites is no longer significant by age 43.

DISCUSSION

Disadvantages in youth may establish the course of subsequent well-being. These disadvantages are not randomly distributed, but reflect what one inherits from their family and encounters from their local school and communities (Darling-Hammond 2004; Lewis 2003). Further, ethnic minorities may be at higher risk of diminished well-being because of a greater reproduction of class disadvantage and encounters with racial bias (Williams et al. 1997). While these observations may be self-evident, studies often assume that adult SEP is an adequate proxy for earlier life experiences. Yet, disadvantages in family background and schooling may influence one's worldview, the responses one employs to address psychosocial stress, and the social relationships one forms (Bourdieu 1973; Lewis et al. 1999). These outcomes may further interact with one's adult human capital to influence psychological well-being.

Our results indicate that blacks and Hispanics experience higher levels of depressive symptoms compared to whites, but that the size and significance of the disparity varies by age and ethnicity. As hypothesized, trajectories of depressive symptoms followed a linear decline from early adulthood to mid-life across all ethnic groups. Additionally, blacks and Hispanics reported greater disadvantage than whites in their family background, high school experiences, and adult SEP. These disadvantages accounted for about half of the black-white disparity and 40% of the Hispanic-white disparity in depressive symptoms among younger adults.

Black Trajectories

The results generally support our hypothesis that blacks would report higher initial levels of depressive symptoms and a slower rate of decline in depressive symptoms with age. Indeed, even after accounting for disadvantage in family background and high school experiences we found that blacks experienced higher levels of depressive symptoms in early adulthood compared to whites. This finding suggests that other aspects of disadvantage, such as psychosocial stressors, may play a role in black-white disparities in depressive symptoms particularly during the transition to adulthood (Taylor and Turner 2002), and may be a fruitful area for further investigation. However, we did find one notable exception to our hypotheses; once we accounted for the interaction between age and income, blacks experienced a faster rate of decline in depressive symptoms than whites, which resulted in parity in depressive symptoms by age 43. Prior studies have been equivocal in whether black-white disparities in depressive symptoms exist after accounting for social class (Neighbors and Williams 2001). Our results suggest it is not just differences in static dimensions of social class (e.g. income at one point in time), but it is also the cumulative effects of economic disadvantage on depressive symptoms across time. Reliance on cross-sectional studies may have masked these relationships in the past, and could

be one reason why consistent black-white differences in depressive symptoms have not been reported. Additional longitudinal studies are needed, however, to fully understand and explore this potentially dynamic relationship.

Hispanic Trajectories

The cumulative advantage hypothesis was expected to hold for Hispanics, but was further modified to account for this largely immigrant population. As hypothesized, Hispanics experienced higher depressive symptoms in early adulthood, even after accounting for disadvantage in family background, high school experiences and adult characteristics. Contrary to our hypothesis, however, we found that compared to whites, Hispanics experienced a more rapid decline in depressive symptoms during the transition to mid-life with controls for basic demographics only. As a result, levels of depressive symptoms among Hispanics reached parity with whites by the mid-30's.

This unexpected finding suggests several important questions for future research. The sharp decline might reflect key changes in stress and support among Hispanics. A substantial proportion of Hispanics are immigrants, and perhaps acculturative stress contributes to the higher initial levels of depression. The acculturation argument, however, may not be the most plausible, as Vega and Rumbaut (1991) have demonstrated that rates of depression in Mexico are lower than in the U.S. and further, that Mexican immigrants have initially lower levels of depression upon arrival that subsequently rise. A second explanation might lie with conflicts with identity during early adulthood and family support (Landale, Oropesa, and Bradaton 2006; Portes and Rumbaut 2006). The children of immigrants often face challenges related to their identity search during youth, as well as conflicts with their parents. Perhaps these issues begin to dissipate as they age. This may be further hastened as individuals transition into their roles as new parents.

Indeed, a substantial literature suggests that family support may be particularly beneficial for Hispanic families (Landale and Oropesa 2001; Vega, Kolody, and Valle 1986). Although we accounted for marital status, we were unable to explore social relationships and these other explanations in detail.

Social Reproduction

Even though current research often emphasizes the importance of adult SEP, our results suggest that disadvantage in family background and high school also matter. Indeed, as hypothesized, disadvantage in high school experiences directly influenced depressive symptoms in adulthood, above and beyond adult SEP. Perhaps experiencing disadvantages in high school reflects aspects of learning, knowledge, and social position *not* captured by traditional measures of educational attainment (e.g., years of schooling). The rigor of coursework taken throughout schooling, for example, develops key cognitive skills (Darling-Hammond 2004) that may influence one's ability to implement health-enhancing strategies important for preventing or mitigating depression. Lack of access to rigorous coursework may also decrease students' sense of personal control, their educational aspirations and expectations, and their ability to achieve higher education. In such a scenario, the transition to adulthood may be more difficult. Lower levels of personal control and more difficult transitions to adulthood increase depressive symptoms (Lewis et al. 1999), and may be important mechanisms linking high school experiences directly to depressive symptoms. Ignoring high school experiences, therefore, disregards important information about institutional inequalities that may help to explain ethnic differences in depressive symptoms across the life course.

Limitations

In addition to those already noted, several other caveats apply. Considerable

heterogeneity exists within the Hispanic population. Sample limitations prevented formal subgroup analyses, but exploratory analyses suggested that the trajectories previously discussed are most relevant for our large Mexican sub-sample. Cubans showed similar patterns, but the coefficients were not statistically significant. However, these non-significant findings may be due to low statistical power. An important extension to the current study would be to further consider how disadvantage is differentially structured within Hispanic ethnic groups and how these disadvantages contribute to trajectories of depression across the life course.

Although it would have been ideal to model depressive symptoms from age 14, when many of the family and school characteristics were measured, the NLSY did not provide data on depressive symptoms prior to age 27 and thus, we were unable to model the trajectory of symptoms prior to early adulthood. We observed a linear decline in depression between ages 27-43. Had we had prior data, we would have likely observed non-linear trajectories, with a rise from ages 14 and a peak sometime before the decline observed with the present data (Hankin et al. 1998). Further, we might expect a subsequent rise in depressive symptoms if our respondents were followed into late-life (Mirowsky and Ross 1992).

As with all studies, omitted variables may bias our inferences. In the ages considered (27-43), stressors related to one's family and work are generally among the most prominent. Accordingly, we included marital status, education, and income in our analyses. Further, sensitivity analyses using fixed-effects models, which effectively control for all unmeasured time-invariant covariates, produced similar results (Allison 2005). That said, the NLSY did not include information on other important factors relevant to the present study. The CES-D focuses on symptoms within the past week and as a result important contemporaneous stressors may have been omitted. For instance, a respondent might have experienced recent racial

discrimination or other stressors, which could influence his/her current level of depression (Kessler, Mickleson, and Williams 1999). Length of residency and other indicators of acculturation may also be important in determining trajectories of depressive symptoms among Hispanics (Finch, Kolody, and Vega 2000; Vega and Rumbaut 1991). Given that our models explain roughly a quarter to half of the ethnic disparities, more research remains on other important factors, such as discrimination, social support, residential neighborhood and other stressors.

There are several issues related to generalizability. Depressive symptoms constitute only one dimension of well-being. Other outcomes (e.g. externalizing behaviors, stress-related chronic disease) should be explored in future research. The use of only one cohort restricts generalizability to individuals born from 1958-1965. Given findings that certain developmental transitions (e.g. from schooling to full-time employment), are taking longer for cohorts making these transitions in 1980 compared to 1960 (Shanahan 2000), recent cohorts may be experiencing more years in developmental stages associated with heightened psychological problems (e.g., early adulthood). Finally, while a considerable strength of the NLSY is that it is nationally representative, a limitation is that national-level data cannot adequately examine the micro-level social environment (e.g. neighborhood contexts) that may be highly related to depressive symptoms.

CONCLUSION

Our study finds that trajectories of depressive symptoms vary by ethnicity, family background, high school experiences, and adult characteristics. Whether disparities exist depends on the age considered. Moreover, while our study supports existing research on the importance of human capital achieved in adulthood, it also suggests that measures of adult income and

education do not completely capture the accumulation of socioeconomic disadvantages across the life course. Rather, family background and high school experiences may continue to resonate into adulthood. It is by considering these trajectories of disadvantage in multiple developmental periods that we may more comprehensively understand how minority social status contributes to well-being.

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BIOSKETCHES

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TABLE 1: Family Background, High School Experiences and Adult Characteristics of White, Black, and Hispanic Respondents (N=7,726), NLSY, Unweighted Means[a]

	WHITE	BLACK	HISPANIC
DEMOGRAPHICS	Mean	Mean	Mean
Depressive Symptoms in Interval [b,c]	1.93	2.12	2.04
Age (Years) in Interval	34.99	34.97	34.94
Female	0.50	0.51	0.51
Foreign Born [d]	0.02	0.02	0.30
FAMILY BACKGROUND (WHEN R 14)			
Parents' Education (Years of Schooling)			
Father [b]	12.39	10.19	7.95
Mother [b]	12.09	10.77	7.74
Parents' Nativity Status			
Father Foreign Born [d]	0.03	0.02	0.41
Mother Foreign Born [d]	0.04	0.02	0.43
Occupation of Adult Male [d]			
Professional/Managerial	0.29	0.06	0.09
Laborer/Blue Collar	0.42	0.42	0.49
Sales/Service/Clerical	0.15	0.09	0.11
Did not work	0.05	0.08	0.10
No adult male present	0.09	0.35	0.21
Occupation of Adult Female [d]			
Professional/Managerial	0.10	0.07	0.04
Laborer/Blue Collar	0.09	0.15	0.20
Sales/Service/Clerical	0.31	0.36	0.19
Did not work	0.49	0.40	0.56
No adult female present	0.01	0.02	0.01
Family Structure [d]			
Married Household	0.88	0.57	0.75
Place of Residence [d]			
Non-South, United States	0.77	0.40	0.66
South, United States	0.22	0.59	0.25
Outside U.S.	0.01	0.01	0.09
Community [d]			
Rural	0.24	0.18	0.12

(TABLE 1 CONTINUED)	WHITE —	BLACK —	HISPANIC
HIGH SCHOOL EXPERIENCES	Mean	Mean	Mean
High School Curriculum [d]			
Vocational/Commercial	0.16	0.16	0.16
General	0.50	0.57	0.60
College Preparatory	0.34	0.27	0.24
Remedial Coursework in High School [b]			
No Remedial Math or English	0.86	0.74	0.72
High School Characteristics			
Percent of Students Economically Disadvantaged [d]			
0-6.00	0.36	0.14	0.18
6.01 – 15.84	0.30	0.20	0.23
15.85 – 37.00	0.22	0.29	0.27
≥ 37.01	0.12	0.37	0.32
Percent of Black Students [d]			
≤ 1.00	0.41	0.01	0.29
1.01 – 13.00	0.32	0.08	0.40
13.01 – 42.00	0.21	0.30	0.26
≥ 42.01	0.06	0.61	0.05
Educational Expectations [d]			
Attend College	0.40	0.36	0.30
ADULT CHARACTERISTICS			
Educational Attainment by age 26 [d]			
< 12 Years of Schooling	0.11	0.20	0.31
Family Income [d, e]			
≤ 24,000	0.14	0.38	0.27
Marital Status (in Interval) [d]			
Married	0.67	0.35	0.57

NOTES:

[a] All variables are dummy coded and may be interpreted as percents, unless otherwise noted.

[b] Ethnic group differences significant at $p<.05$, two-tailed t-test.

[c] CES-D has been transformed using the square-root. Means are reported in the square-root.

[d] Ethnic group differences significant at $p<.05$, chi-sq test.

[e] Income 1990-2002 in 2004 Dollars.

TABLE 2: Bivariate Means of Depressive Symptoms by Ethnicity and Age [a, b]

	WHITE	BLACK	HISPANIC
Age Range			
27-29	2.00	2.26***	2.21***
	(0.02)	(0.03)	(0.04)
30-32	1.98	2.17***	2.09***
	(0.02)	(0.02)	(0.02)
33-35	1.97	2.16***	2.09***
	(0.02)	(0.02)	(0.03)
36-38	1.94	2.03*	2.09**
	(0.04)	(0.04)	(0.06)
39-41	1.80	2.02***	1.90**
	(0.02)	(0.03)	(0.04)
42-43	1.81	1.98***	1.84
	(0.02)	(0.03)	(0.04)

NOTES:
[a] Mean CES-D scores presented in table using square-root transformation.
[b] *p≤.05, **p≤.01, ***p≤.001, two-tailed test.

TABLE 3: Random Coefficient Models of Depressive Symptoms [a,b] Regressed on Family Background, High School Experiences and Adult Characteristics (N=7,726)

	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5	MODEL 6
INTERCEPT	1.96***	1.99***	1.99***	1.90***	1.93***	1.94***
AGE AND AGE INTERACTIONS						
Age [c]	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***
Age x black	-0.002	-0.002	-0.002	-0.003	-0.003	-0.005*
Age x Hispanic	-0.007*	-0.008**	-0.008**	-0.008**	-0.008***	-0.01***
Age x <12 Years of Schooling						0.007*
Age x ≤ 24,000						0.008*
DEMOGRAPHICS						
Ethnicity						
(Non-Hispanic white reference)						
Non-Hispanic black	0.21***	0.15***	0.15***	0.14***	0.10**	0.12***
Hispanic	0.18***	0.13**	0.14**	0.12*	0.11**	0.13***
Female	0.23***	0.23***	0.23***	0.24***	0.24***	0.24***
Foreign Born	-0.03	0.04	-0.04	-0.06	0.02	0.02
FAMILY BACKGROUND (WHEN R 14)						
Father's Education		-0.003			0.002	0.002
Mother's Education		-0.01***			-0.007†	-0.007†
Father Foreign-Born		-0.08*			-0.07†	-0.07†
Mother Foreign-Born		-0.11**			-0.07†	-0.07†
Family Structure						
Married Household		-0.11**			-0.07†	-0.07†
Occupation of Adult Male						
(Did not work reference)						
Professional/Managerial		-0.07†			-0.01	-0.01
Laborer/Blue Collar		-0.001			0.02	0.02
Sales/Service/Clerical		-0.02			0.02	0.02
No adult male present		-0.04			-0.01	-0.01
Occupation of Adult Female						
(Did not work reference)						
Professional/Managerial		-0.03			0.01	0.01
Laborer/Blue Collar		-0.03			-0.03	-0.03
Sales/Service/Clerical		-0.01			0.01	0.01
No adult female present		0.02			-0.02	-0.02
Place of Residence						
(Non-South, U.S reference)						
South, U.S		-0.02			-0.01	-0.01
Outside U.S.		0.03			-0.01	-0.01
Community						
(City/town reference)						
Rural		-0.04*			-0.03†	-0.04†

(TABLE 3 CONTINUED)	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5	MODEL 6
HIGH SCHOOL EXPERIENCES						
High School Curriculum						
(College Preparatory reference)						
Vocational/Commercial			0.06*		0.05†	0.05*
General			0.13***		0.10***	0.09***
Remedial Courses in High School						
No Remedial Math or English			-0.07**		-0.05*	-0.04*
High School Characteristics						
% Students Disadvantaged						
(0-6.00 reference)						
6.01 – 15.84			0.01		0.01	0.01
15.85 – 37.00			0.01		0.004	0.004
≥ 37.01			0.01		0.004	0.005
% Black Students						
(≤ 1.00 reference)						
1.01 – 13.00			0.04†		0.02	0.02
13.01 – 42.00			0.03		0.01	0.01
≥ 42.01			0.07†		0.03	0.03
Educational Expectations						
Attend College			-0.14***		-0.08***	-0.08***
ADULT CHARACTERISTICS						
Education						
(≥ 12 Yrs of Schooling reference)						
< 12 Yrs of Schooling				0.26***	0.20***	0.14***
Family Income [d]						
(> 24,000 reference)						
≤ 24,000				0.15***	0.13***	0.07***
Marital Status [d]						
Married				-0.06***	-0.06***	-0.06***
Random Effects						
SD (u_{0i})	0.55***	0.55***	0.54***	0.53***	0.53***	0.53***
SD (u_{1i})	0.03***	0.03***	0.03***	0.03***	0.03***	0.03***
Log-Likelihood	-25390	-25332	-25279	-25198	-25134	-25126

NOTES

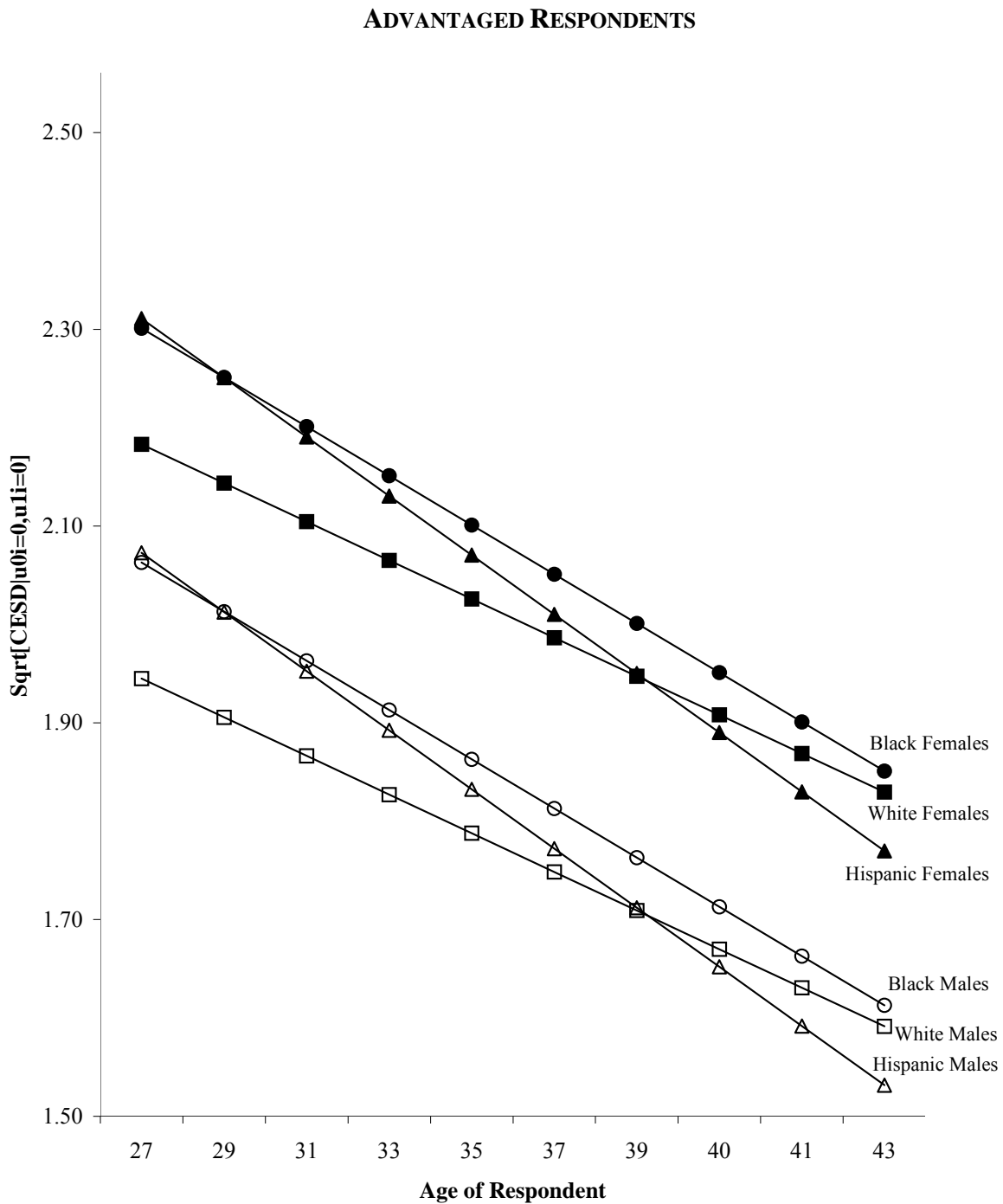[a] CES-D scale uses a square-root transformation.

[b] Nativity status, family background, high school experiences, and marital status are centered at their respective sample means. Education, income, and gender are not centered.

[c] Age is centered at age 27 for main effect and interaction terms.

[d] Time-varying covariates.

† $p<.10$; * $p≤.05$; ** $p≤.01$; *** $p≤.001$, two-tailed test

ADVANTAGED RESPONDENTS

Notes: [a] High socio-economic advantage defined as ≥12 years of schooling and Income >24K. [b] Controlling for family background, high school experiences, and marital status. [c] All remaining covariates held constant at their grand mean and $\zeta_{0i}=0$, $\zeta_{1i}=0$.

FIGURE 2: Trajectories of Depressive Symptoms for White, Black and Hispanic Respondents with Low Socio-economic Disadvantage in Adulthood. [a, b, c]

DISADVANTAGED RESPONDENTS
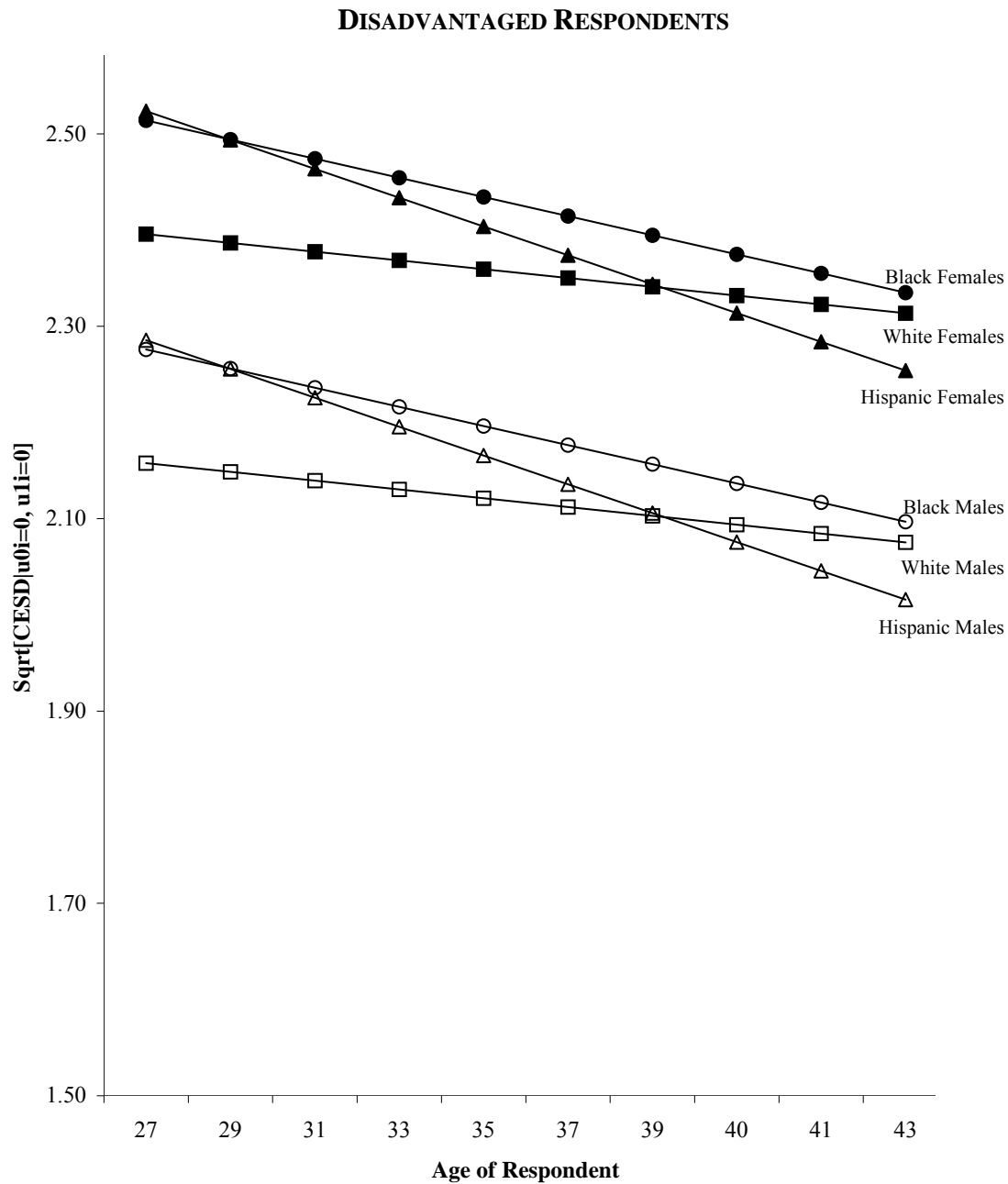
Notes: [a] Low socio-economic advantage defined as < 12 years of schooling and Income ≤ 24K. [b] Controlling for family background, high school experiences, and marital status. [c] All remaining covariates held constant at their grand mean and $\zeta_{0i} = 0$, $\zeta_{1i} = 0$.