THE IMPACT OF EARLY PREGNANCY AND UNFULFILLED EDUCATIONAL EXPECTATIONS ON MENTAL HEALTH DURING THE TRANSITION TO ADULTHOOD AMONG AFRICAN AMERICAN AND WHITE FEMALES

A THESIS SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY OF HAWAIʻI AT MĀNOA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

IN

SOCIOLOGY

MAY 2016

By

Noreen M. Kohl

Thesis Committee:

Krysia Mossakowski, Chairperson
Wei Zhang
Katherine Irwin

Keywords: pregnancy, mental health, educational expectations, life course

ACKNOWLEDGEMENTS

I express my deepest gratitude to my mentor and M.A. committee chairperson, Dr. Krysia Mossakowski. The completion of my thesis would not have been possible without the generous contributions of your guidance and expertise. In addition, your professional guidance, encouragement, and faith in my work have been vital to my progress as a graduate student.

Thank you to committee members Dr. Irwin and Dr. Zhang, whose unique insights and supportive input inspire me to expand the current research. I sincerely appreciate your contributions and advice through the pursuit of my M.A. I also acknowledge former committee member Dr. Bill Wood, whose commitment to graduate students and confidence in my own academic endeavors were more helpful and uplifting than he could know.

Thank you to my partner and colleague, Omar Bird. Words cannot capture how much your companionship in life and through graduate school means to me. Thank you to my parents and my granny, Nora Mackle, for your unending support of my educational pursuits and the admirable examples you set for me. My mother, Breege Kohl, inspires a special appreciation for learning and knowledge, which translates to a passion for life. Without the influence of my father, Schyler Kohl, I would not be where I am today. I acknowledge that the support of individuals mentioned here and important others not named led me to write this M.A. thesis.

ABSTRACT

Research has established that parenthood at a young age is associated with higher levels of psychological distress later in life. Less is known about the long-term mental health impact of early *pregnancy* and the potential intervening mechanisms that may help to explain why early pregnancy is distressing. In addition, though rates of early pregnancy remain higher among African Americans compared to Whites, research has yet to explore potential race differences in mental health consequences. Using data from the National Longitudinal Study of Adolescent to Adult Health, this study not only shows that early pregnancy has a long-term negative effect on mental health among Whites but also reveals that unfulfilled educational expectations help explain this negative effect. The study also finds differences in the distressing effect of early pregnancy among African American and White females.

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INTRODUCTION

Using the life course perspective (Elder et al. 1996; Elder, Johnson, and Crosnoe 2004) and social stress process model (Pearlin et al. 1981; Pearlin et al. 2005), this study explores the impact of early pregnancy (defined as pregnancy at or before age 21) on mental health during the transition to adulthood among African American and White females. This study aims to contribute to the sociological research literature by examining whether there are race differences in the long-term effects of early pregnancy on symptoms of depression, also referred to as psychological distress, and by exploring the role of unfulfilled educational expectations. Previous research has focused on the mental health effects of becoming a parent at a young age (Booth, Rustenbach, and McHale 2008; Carlson 2011; Kalil and Kunz 2002; Mirowsky and Ross 2002; Mollborn and Morningstar 2009;) but has yet to examine potential differences in the effects of early pregnancy and unfulfilled educational expectations on symptoms of depression among young adult African Americans and Whites.

African Americans and women with low socioeconomic status (SES) are disproportionately likely to become pregnant early, which can derail opportunities, like education, for SES attainment (Child Trends 2014; Martin et al. 2015). In the current study, at or before age 21 is used to define "early pregnancy" based on previous research establishing "early" ages for first birth (Carlson 2011; Kalil and Kunz 2002; Mirowsky and Ross 2002) and the structure of the survey design of the National Longitudinal Study of Adolescent to Adult Health (Add Health) used for this study.

The current study uses the life course perspective principles of "timing" and "linked lives" as frameworks for understanding the lasting influence of early pregnancy

on mental health. The life course principle of "timing" emphasizes that the age or life stage at which individuals experience events and transitions, such as pregnancy, matters for mental health (Elder et al. 1996; Elder et al. 2004). The timing of early pregnancy may have mental health effects that last beyond the life event of becoming pregnant. Thus, this study accounts for the temporal ordering of pregnancy and depressive symptoms by examining race differences in the effect of becoming pregnant at a young age on subsequent mental health, taking into account prior levels of depressive symptoms.

The life course principle of "linked lives," which asserts that people are inter-dependent and create social networks embedded in socio-historical context, is used to reveal the importance of family background for mental health. Previous research has shown the importance of family socioeconomic background, including parental education, for mental health in adolescence (Wickrama et al. 2008) and young adulthood, regardless of race (Mossakowski 2008). Therefore, the present study accounts for parental education and parental economic hardship in examining race differences in the mental health effects of pregnancy in adolescence, and other dimensions of SES when examining the long-term effects on mental health in young adulthood.

LITERATURE REVIEW

Early Pregnancy and Mental Health

Research has shown that some people do not feel their transition to adulthood is complete even in their early thirties (Arnett 2000). In line with the life course perspective (Elder et al. 2004), the current study views aging as lifelong processes, through which life events and transitions into social roles mark human development. Thus, a person's 20's

and early 30's may be viewed as part of young adulthood (Arnett 2000). Young adulthood represents a vulnerable age for mental health, as the average age of onset for depression is at this time (Kessler et al. 2003). Younger individuals may not be equipped with the emotional and financial resources necessary for coping with the stress of pregnancy, which may lead to symptoms of depression in young adulthood.

Research suggests that, whether the pregnancy was expected or not, parenthood at an early age is associated with increased levels of psychological distress (Kessler et al. 1997; Kalil and Kunz 2002; Mirowsky and Ross 2002; Mossakowski 2011). These studies, however, did not examine race differences in the distressing effect of early parenthood nor the mediating mechanisms that explain why. The life event of becoming pregnant and the role transition into parenthood represent changes in a person's life trajectory and affect mental health over time rather than as isolated events (Mirowsky and Ross 2002). With pregnancy and parenthood come decision-making processes, newfound personal responsibilities, and financial obligations—each of which entail a considerable amount of stress (Mirowsky and Ross 2002). It is plausible that becoming pregnant early in life might damage mental health later in the life course and remain a chronic stressor, especially among those whose educational attainment was disrupted due to pregnancy.

The timing of pregnancy influences depressive symptoms over the life course (Braboy Jackson 2004; Kalil Kunz 2002; Mirowsky and Ross 2002), but research has yet to determine why? Pregnancy at a young age puts individuals at risk for low educational attainment, poor employment outcomes, economic hardship, and marital and family structure instability (Child Trends 2014; Kessler et al. 1997). These factors, which represent status attainment, influence mental health (Williams et al. 1997). Markers of

adulthood like educational attainment and employment are associated with lower levels of depressive symptoms (Mossakowski 2008). However, parenthood, which is also touted as a marker of adulthood, is associated with increased levels of depression (Mirowsky and Ross 2002). It is important to examine the impact of pregnancy at a young age on later depressive symptoms because symptoms of depression during adolescence are associated with increased risk for mental health problems, including major depression and anxiety disorders, later in life (Fergusson and Woodward 2002).

Mirowsky and Ross (2002) found that the impact of parenthood on mental health in adulthood depends on the age at first birth, as U.S. individuals who report becoming a parent before age 23 experience higher levels of symptoms of depression compared to non-parents and compared to those who become first-time parents at later ages. That study, however, is cross-sectional and thus examines the temporal ordering of parenthood and depressive symptoms from a retrospective perspective. An advantage of the current study is it explores the effects of early pregnancy and depressive symptoms on later depressive symptoms, using multiple waves of longitudinal data.

One nationally representative study that used earlier waves of the Add Health data, in conjunction with data from another survey, found that adolescent mothers experience higher levels of psychological distress compared to their childless, teenage peers and adult mothers (Mollborn and Morningstar 2009). In addition, they found that psychological distress does not lead to teenage pregnancy but rather underlying factors, including SES, influence both psychological distress and the likelihood of becoming a parent in adolescence. While this study examined interactions between race and teenage parenthood, finding no significant race differences in the effect of teenage parenthood on

psychological distress, they did not explore race differences in the effects of early *pregnancy* on depressive symptoms, which the current study does.

Other previous research on early parenthood and depressive symptoms has produced contradictory findings. Another nationally representative study that used earlier waves of the Add Health data found no differences in a change in levels of depressive symptoms from an early age to young adulthood between women who transitioned into parenthood before age 20 compared with those who did not (Booth et al. 2008). However, that study did not account for the effect of early *pregnancy* on mental health, nor did it explore race differences. A different study found that unmarried women who experienced their first birth as teenagers report higher levels of symptoms of depression in young adulthood compared to those whose first birth occurred after age 20 and within a marriage (Kalil and Kunz 2002).

The current study uses more recent data and accounts for ever being married and whether unfulfilled educational expectations intervene in the relationship between early pregnancy and depressive symptoms. Mossakowski (2011) found that becoming a parent earlier or later than expected is associated with higher levels of depressive symptoms among young Americans in the baby boomer generation. This study also found that unexpectedly early marriage is associated with lower levels of depressive symptoms, but that this relationship is explained by earlier mental health (Mossakowski 2011). More research should examine other generations, especially now that more young adults are delaying parenthood (Martin et al. 2015).

By delaying parenthood, people generally delay marriage, continue to pursue a higher education, and reduce their likelihood of economic hardship (Mirowsky and Ross

2002). Numerous studies speculate that pregnancy at an early age can negatively impact mental health later in life for reasons such that individuals are forced to enter adulthood earlier than expected and life goals such as education and employment are paused or derailed (Booth et al. 2008; Braboy Jackson 2004; Mirowsky and Ross 2002; Mossakowski 2011). It is plausible that failing to achieve one's desired or expected level of education is part of why early pregnancy harms mental health later in life, but this has yet to be empirically demonstrated. Thus, the current study examines whether unfulfilled educational expectations operate as an intervening mechanism that may explain the effect of early pregnancy on depressive symptoms among young African American and White adults.

The current study also accounts for religious attendance in examining the relationship between early pregnancy and depressive symptoms. Higher levels of religious service attendance have been linked with lower levels of depressive symptoms (Sternthal et al. 2010; Strawbridge et al. 2001). In addition, certain aspects of religious involvement, including the salience of religion in a person's life, are associated with delayed transitions into sexual activity in adolescence (Burdette and Hill 2009), which may affect the mental health consequences of early pregnancy.

Participation in religious activities has been linked with increased depressive symptoms among pregnant adolescents (Sorenson, Grindstaff, and Turner 1995). Sorenson and colleagues (1995) found that young mothers with no religious affiliation experience lower levels of depressive symptoms compared to those who participate in religious activities. Another study found that negative interactions in church harms mental health (Ellison et al. 2009). Perhaps, as Sorenson and colleagues (1995) suggest,

interactions with church members who have conservative religious values contribute to the stress of early pregnancy, especially outside of marriage.

Race, SES, and Depression

Numerous studies consistently demonstrate that higher SES is linked to lower levels of depressive symptoms among young adults and adults (Kessler and Neighbors 1986; Mossakowski 2008; Wickrama et al. 2008). Kessler and Neighbors' (1986) study found that Blacks with lower income levels experience higher levels of psychological distress compared to low income Whites (Kessler and Neighbors 1986). Mossakowski's (2008) study using national longitudinal data shows that race differences in mental health among young adults are partially explained by SES factors including family background and wealth. The effect of past poverty duration also has a strong effect on mental health, regardless of current SES and family background (Mossakowski 2008). Therefore, it is important to control for family background and current SES when evaluating the strength of the effect of early pregnancy on mental health in young adulthood and whether there are race differences.

Race, SES, and Early Pregnancy

Why study race differences in the impact of early pregnancy on depressive symptoms, when the rate of teenage pregnancy in the United States is at an all time low, as is the birth rate for women aged 20-24 years (Child Trends 2014; Martin et al. 2015)? Given that teenage birth rates remain higher among Blacks compared with Whites (Martin et al. 2015) and that individuals from disadvantaged backgrounds are more likely to be teenage mothers compared to more advantaged individuals (Child Trends 2014), it is important to examine race differences while comprehensively measuring SES to better

understand the relationship between early pregnancy and mental health. Therefore, this study focuses on race differences in the mental health effects of early pregnancy, accounting for multiple indicators of SES including family socioeconomic background, respondents' current educational attainment, employment status, household income, and economic hardship.

Previous research on the experiences of life events and transitions associated with entering adulthood early have yet to provide a comprehensive understanding of race differences in the effects of early pregnancy on depressive symptoms. The mental health of structurally disadvantaged groups, like African Americans and individuals of low SES, may be uniquely affected by early pregnancy. Research has shown that SES is a "fundamental cause" of disease because it stratifies access to health resources related to the social factors that it involves, such as education, occupation, income, and wealth (Link and Phelan 1995; Mossakowski 2008). The gradient in SES represents levels of resources that may be used to cope with the stress of pregnancy (McLeod and Kessler 1990; Mossakowski 2008).

Education is a central component of SES and plays an important role in determining differential vulnerability to undesirable life events (McLeod and Kessler 1990). Pregnancy early in life may disrupt the pursuit of education, thus disadvantaging individuals from related achievements. For example, one study found that women who had their first baby after age 21 and who did not further their education after that point experienced later economic disadvantage (Williams et al. 1997). Pregnancy at a young age could operate as a barrier for achieving educational aspirations, which could be one of the main reasons why it leads to symptoms of depression in young adulthood.

Individuals with more privileged family backgrounds are more likely to delay parenthood and pursue expectations associated with status attainment, such as higher levels of education (Booth et al. 2008; Mossakowski 2008). People who transition into parenthood early in life are more likely to come from low-income families (Booth et al. 2008) and teen parenthood is associated with higher dependence on welfare soon after birth (Child Trends 2014). One study found that the odds of Black women receiving public assistance, which are already higher compared to White women, increase among those who have ever been pregnant in adolescence (Casares 2010). In addition, White women who experience a live birth in adolescence are less likely to attain high education levels compared to those who do not (Casares 2010).

African Americans tend to become parents at earlier ages compared to Whites (Carlson and Williams 2011), especially among those who have low SES (Winters and Winters 2012). Black teenagers are twice as likely to report having ever become pregnant compared with White teenagers (Winters and Winters 2012). Demographic trends for timing parenthood among African Americans lead to younger ages at first birth compared to Whites (Braboy Jackson 2004; Carlson and Williams 2011; McCarthy and Menken 1979). Their disadvantaged location in social hierarchies may affect the likelihood of African Americans to become parents at earlier ages, thus affecting educational expectations and attainment. One study found that Black mothers experience more parenting stress due to structural disadvantage compared to White mothers (Nomaguchi and House 2013).

The effect of SES is greater than that of race on teenage pregnancy rates, as low-SES teenagers are almost four times as likely to have ever become pregnant compared

with teenagers who are not of low-SES (Winters and Winters 2012). In addition, the effects of race and SES on rates of teenage pregnancy are greater during time periods of economic decline and high unemployment rates (Winters and Winters 2012). The current study accounts for a young adult's employment status in examining the effect of early pregnancy on mental health in young adulthood.

Research has shown that African Americans first transition into parenthood closer to their expected age compared to Whites (Carlson and Williams 2011). African Americans are also more likely to have and expect premarital first birth compared to Whites (Carlson and Williams 2011). Research suggests that having expected a premarital first birth offsets the damaging mental health effects of it among African Americans. In addition, adolescent Whites tend to have more negative attitudes towards pregnancy in adolescence compared to Blacks and individuals whose parents have lower levels of education tend to have more positive attitudes towards pregnancy compared to those whose parents have higher levels of education (Jaccard et al. 2003). Thus, the mental health effects of having become pregnant early in life may be worse among Whites compared to Blacks, regardless of family socioeconomic background.

Expectations

While we know that levels of educational achievement are important to mental health, less is known about young people's expectations (Mossakowski 2011; Telfair and Shelton 2012). Research has yet to determine race differences in whether unfulfilled expectations for educational attainment explain the effect of early pregnancy on symptoms of depression. Early pregnancy might be particularly distressing among individuals who have yet to achieve their desired or expected level of education. Unmet

expectations manifest as chronic stress for individuals whose structural or social role constraints make certain goals unattainable (Thoits 1999; Mossakowski 2011). The disappointment associated with unmet expectations, such as high school or college graduation, could lead to depressive symptoms especially when exacerbated by the preventative force of an unexpected life event, like pregnancy (Mossakowski 2011). In line with previous research, this study accounts for the effect of unfulfilled educational expectations on mental health among young adults (Mossakowski 2011).

Research has shown that disadvantaged adolescents, including racial minorities with low SES, have lower expectations for educational attainment compared to their more advantaged counterparts (Alexander, Bozick, and Entwisle 2008). Individuals from families of lower SES are likely to have less ambitious educational expectations for reasons such that they have few academic resources and disadvantaged adolescents are most likely to give up the expectation to complete college (Alexander et al. 2008). Teenagers from communities with few resources and limited opportunity who have low educational expectations are more likely to have a teen birth compared with teenagers with high expectations, regardless of family background (Driscoll et al. 2005).

Research has shown that high educational expectations are associated with decreased likelihood of teenage birth among Whites and low-SES teenagers but not among Black teenagers (Driscoll et al. 2005). African Americans' experiences with structural disadvantage negatively impact opportunities associated with social status, including educational achievement (Kao and Thompson 2003). Because African Americans have lower educational achievement relative to Whites in general (Kao and Thompson 2003; NCES 2015) and since education is an essential component of SES, it is

important to examine potential differences in the influence of unfulfilled educational expectations on mental health in early adulthood among Blacks and Whites.

RESEARCH QUESTIONS

1. Is early pregnancy associated with depressive symptoms in adolescence among Black and White females?

Hypothesis 1: Based on previous research, pregnancy in adolescence will be associated with higher levels of depressive symptoms among African American and White females because it is a stressful life event and they may be too young to be socially and psychologically equipped to cope with it, over and above their family socioeconomic background.

2. Does early pregnancy predict subsequent symptoms of depression in young adulthood among Blacks and Whites?

Hypothesis 2: Early pregnancy will have a long-term effect and be associated with higher levels of depressive symptoms later in life.

3. Are the long-term mental health consequences of early pregnancy significant when taking into account earlier depressive symptoms?

Hypothesis 3: The long-term, stressful effect of early pregnancy will be linked with higher depressive symptoms among young adults, net of prior symptoms of depression.

4. Are unfulfilled educational expectations linked with depressive symptoms in young adulthood among Blacks and Whites?

Hypotheses 4: Failing to attain one's expected level of educational attainment will be associated with symptoms of depression among both African American and White females in young adulthood because it is stressful and disappointing.

5. Do unfulfilled educational expectations mediate or explain the long-term effect of early pregnancy on depressive symptoms in young adulthood?

Hypotheses 5: Early pregnancy can disrupt or derail goals and educational attainment in adolescence and early adulthood, and thus unfulfilled educational expectations will help to explain why there is a long-term effect of early pregnancy on depressive symptoms in young adulthood.

DATA AND METHODS

This study uses U.S. data from the National Longitudinal Study of Adolescent to Adult Health (Add Health). The adolescents were in grades 7-12 during the first wave of interviews (at ages 12-21 years) collected in the 1994-1995 academic year. The sample includes 80 high schools and 52 middle schools. The Add Health survey followed this cohort into young adulthood for three in-home interviews. Waves II through IV were collected in 1996 (at ages 11-21 years), 2001-2002 (at ages 18-26 years), and 2008-2009 (at ages 24-33 years), respectively. The Add Health data contain an oversample of Black adolescents, either of whose parent was a college graduate. This is the ideal nationally representative dataset to examine mental health differences among African Americans and Whites regarding early pregnancy and unfullfilled educational expectations in adolesence and young adulthood.

This study uses public Add Health data from Waves I, II and IV. Wave I was chosen because it contains information on early pregnancy and sociodemographic factors including race, gender, and parent-reported socioeconomic information. Wave III was excluded because respondents were not asked about having ever been pregnant in Wave III. Wave IV was chosen to measure the effect of early pregnancy on subsequent depressive symptoms because it contains the most recent data. The effects of unfulfilled educational expectations and having ever become pregnant by young adulthood are also analyzed in Wave IV.

Based on demographic trends showing that African Americans are disproportionately likely to experience early pregnancy (Martin et al. 2015), a focus of this study is race differences, comparing African Americans to Whites. Because this

study focuses on non-Hispanic African Americans and non-Hispanic Whites, individuals who identify with Hispanic ethnicity were dropped from the sample. After restricting the data to non-Hispanic African American and non-Hispanic White females, the total sample size is 2,773. The subsample of African Americans is 781 and the subsample of Whites is 1,992.

Race differences in the effects of early pregnancy on depressive symptoms are examined by separate ordinary least squares (OLS) regression analyses for the African American and White subsamples. The final sample size after list-wise deletion for the OLS regression analysis of the effects of early pregnancy on depressive symptoms in Wave I is 599 for Blacks and 1,688 for Whites. The final sample size after list-wise deletion for the OLS regression analysis of the effects of early pregnancy on depressive symptoms in Wave IV is 639 for Blacks and 1,688 for Whites. The final sample size after list-wise deletion for the OLS regression analysis of the effects of having ever become pregnant at ages 24-33 years on depressive symptoms in Wave IV is 636 for Blacks and 1,664 for Whites. Because the analyses examine two smaller subsamples of the Add Health data, after being restricted to African American and White females only, the data are not weighted.

Measures

Dependent Variables

The dependent variables in the OLS regressions assess levels of *depressive symptoms*, also known as psychological distress, measured by a nine-item version of the Center for Epidemiologic Studies Depression Scale (CES-D) in Waves I and IV (Radloff 1997). The CES-D scale in each of these waves is comprised of nine questions that begin

with “How often was each of the following things true during the past week?” and are as follows: (1) “You were bothered by things that usually don't bother you,” (2) “You felt that you could not shake off the blues, even with help from your family and your friends,” (3) “You felt that you were just as good as other people,” (4) “You had trouble keeping your mind on what you were doing,” (5) “You felt depressed,” (6) “You were happy,” (7) “You enjoyed life,” (8) “You felt sad,” and (9) “You felt that people disliked you, during the past seven days.” The frequency of depressive symptoms ranges from (0) “never/rarely,” (1) “sometimes,” (2) “a lot of the time,” to (3) “most/all of the time.” Questions three, six, and seven are reverse coded so that higher values signify higher levels of depressive symptoms. These nine items are summed to create a scale for levels of depressive symptoms. Sensitivity analyses include factor analysis and reliability analysis for the nine-item CES-D scale. The nine-item CES-D scale has a high internal consistency (Wave I scale Cronbach’s alpha = .825, Wave IV scale Cronbach’s alpha = .848, Range = 0 – 27). Supplementary OLS regression results show consistent results between the logged depressive symptoms scale and non-logged depressive symptoms scale. The depressive symptoms scales presented in the final models are not transformed.

Focal Independent Variables

This study measures *early pregnancy* as pregnancy at or before age 21 because respondents were ages 11-21 years when asked in Wave I about having ever become pregnant. This definition of “early” pregnancy is consistent with previous research establishing “early” ages for first birth and risk for symptoms of depression (Mirowsky and Ross 2002). Because the Add Health data on having ever become pregnant in

adolescence are limited to females my study focuses on females only. Males were not asked about having ever gotten any partner pregnant until later years (Wave IV).

Early pregnancy in Wave I is a focal independent variable (1= ever been pregnant, 0 = never been pregnant). Respondents at ages 11 to 21 years were asked, "Have you ever been pregnant? Be sure to include if you are currently pregnant and any past pregnancy that ended in an abortion, stillbirth, miscarriage, or a live birth after which the baby died," to response categories "yes" or "no." Respondents who answered "no" to having ever had sexual intercourse earlier in the survey were not asked the question on having ever been pregnant and are thus coded as 0, or never been pregnant.

Another focal independent variable measures subsequent *unfulfilled educational expectations* because early pregnancy can derail educational aspirations and a previous study found that unfulfilled educational expectations are linked with depressive symptoms in young adulthood (Mossakowski 2011). In Wave IV, at ages 24-33 years, respondents were asked, "Which of the following best describes your desired level of education?" The response categories, of which the respondent may have chosen one, included, "I have achieved my desired level of education," "I have not achieved my desired level of education but believe that I will," and "I have not achieved my desired level of education and do not believe that I will." A dichotomous variable is created for *unfulfilled educational expectation* from this question (1 = not achieved desired level of education, 0 = achieved desired level of education).

Control Variables

Continuous variables for *age* in Waves I and IV (Range = 11-21 and Range = 24-33, respectively) are constructed by subtracting the respondents' birth date from the interview date.

A question on how many times the respondent has ever been married is used as a proxy measure for marital status in Wave IV because the dataset does not contain a variable for current marital status. Specifically, respondents were asked, "How many persons have you ever married? Be sure to include your current spouse if you are married now." Response categories are continuous ranging from 0 to 4 persons. A dichotomous variable is created from this question to represent having *ever married* (1 = ever married, 0 = never married) for regressions examining depressive symptoms as the dependent variable in Wave IV.

Another control variable measures the *number of children* respondents have in Wave IV. In reference to the live births resulting from all pregnancies that the respondent has had by ages 24 to 33 years, respondents are asked, "How many of these children are still living?" Continuous responses ranging from 0 to 7 from this question measure *number of children*. Respondents who previously reported never having been pregnant were not asked this question and thus are coded as 0, or no children.

A control variable measures frequency of *religious attendance* in Wave I because religious attendance is linked to mental health (Ellison et al. 2009; Strawbridge et al. 2001). At ages 11 to 21 years, respondents were asked, "In the past 12 months, how often did you attend religious services?" The frequency of *religious attendance* ranges from (0) "never," (1) "less than once a month," (2) "once a month or more/less than once a week,"

to (3) “once a week or more.” Respondents who reported having “no religion” earlier in the survey were not asked this question and thus are coded as 0, or “never.”

Dummy variables created to measure respondents’ education level in Wave IV, at ages 24-33 years, are used in regressions examining depressive symptoms in young adulthood. Respondents were asked, “What is the highest level of education that you have achieved to date?” Dummy variables created for respondents’ education level include *less than high school graduate, high school graduate,* attended or completed *vocational/technical school, college dropout*, *college graduate,* and *beyond college* indicating attended or completed graduate or professional school. *Less than high school graduate* is the reference category for respondents’ education level in the OLS regression models.

A variable is constructed to measure *employment status* in Wave IV using multiple indicators throughout the survey (1 = employed, 0 = not employed). Respondents who answered yes to the question, “Are you currently working for pay at least 10 hours a week?” are coded as 1, or employed. Respondents who reported currently serving or active duty status in the military earlier in the survey and those whose interviews were conducted in prison were not asked this question. Respondents who reported currently serving or active duty military are coded as 1, or employed and respondents whose interviews were conducted in prison are coded as 0, or not employed.

In Wave IV when respondents are asked, “Thinking about your income and the income of everyone who lives in your household and contributes to the household budget, what was the total household income before taxes and deductions in {2006/2007/2008}? Include all sources of income, including non-legal sources.” Response categories include

(1) less than $5,000, (2) $5,000 to $9,999, (3) $10,000 to $14,999, (4) $15,000 to $19,999, (5) $20,000 to $24,999, (6) $25,000 to $29,999, (7), $30,000 to $39,999, (8) $40,000 to $49,999, (9) $50,000 to $74,999, (10) $75,000 to $99,999 (11) $100,000 to $149,999, and (12) $150,000 or more. A continuous variable for *household income* was constructed from this question (Range 1-12). To account for missing data (577 respondents), the means of household income for the African American and White subsamples (6.69 and 8.14, respectively) are imputed.

Respondents' *economic hardship*, measured in Wave IV, at ages 24-33 years, is used in regressions examining depressive symptoms in young adulthood. A scale created to measure economic hardship in young adulthood uses questions asked in Wave IV, at ages 24-33 years. The yes/no questions used referred to the past 12 months and are as follows: (1) "Was there a time when you/your household didn't pay the full amount of the rent or mortgage because you didn't have enough money?," (2) "Was there a time when you/your household didn't pay the full amount of a gas, electricity, or oil bill because you didn't have enough money?," and (3) "Was there a time when you/your household worried whether food would run out before you would get money to buy more?" Three dichotomous variables are created from these questions (1 = yes and 0 = no) and are summed to create a scale for *economic hardship* in young adulthood. The scale for economic hardship in young adulthood has good internal consistency for a 3-item scale (Cronbachs alpha = .663, Range = 0 – 3).

Parental economic hardship and parent education level measure family background. Multiple indicators, reported by respondents' parents in Wave I, are used to measure *parental economic hardship*. A scale for *parental economic hardship* is created

using the following yes/no questions asked of respondents' parents in Wave I, (1) "Do you have enough money to pay your bills?," (2) "Are you receiving public assistance, such as welfare?," and (3) "Last month, did you or any member of your household receive: Food stamps?" Three dichotomous variables from these questions (1 = yes, 0 = no) are summed to create a scale for *parental economic hardship*. The parental economic hardship scale has good internal consistency for a 3-item scale (Cronbachs alpha = .619, Range = 0 -3).

The Add Health survey (Wave I) asked respondents' parents, "How far did you go in school?" Dummy variables are created for parental education level including *less than high school graduate, high school graduate, business/trade school, college dropout, college graduate, and* attended or completed *professional school*. *Less than high school graduate* is the reference category in the OLS regression models.

RESULTS

According to the descriptive statistics and t-test results in Table 1, African Americans experience significantly higher levels of depressive symptoms in both Wave I, at ages 11-21 years (Mean = 6.59; Range = 0 - 25) compared to Whites (Mean = 6.06; Range = 0 - 25 t-test; $p < .01$) and in Wave IV, at ages 24-33 years (Mean = 6.0; Range = 0 - 26) compared to Whites (Mean = 5.17; Range = 0 – 27; t-test $p < .001$). In addition, 11 percent of African Americans report experiencing early pregnancy compared to 6 percent of Whites (t-test $p < .001$). African Americans are also significantly more likely to report having ever become pregnant by young adulthood, at ages 24-33 years, (77 percent) compared to Whites (64 percent; t-test $p < .001$). Results show that African

Americans have significantly more children by ages 24-33 years (M = 1.28; Range = 0 - 7) compared to Whites (Mean =1.01; t-test $p < .001$; Range = 0 - 6).

Results reveal that 86 percent of African Americans report having unfulfilled educational expectations, at ages 24-33 years compared to 72 percent of Whites (t-test $p < .001$) who did not achieve their desired level of education. In addition, Whites achieve significantly higher education levels by young adulthood. Compared to 18 percent of Blacks, 24 percent of Whites report graduating college as their highest education level achieved by ages 24-33 years (t-test $p < .01$). However, significantly more Blacks (12 percent) report their highest education level as attending or completing vocational school after high school compared to Whites (8 percent, t-test $p < .01$). There are no significant race differences in likelihood of dropping out of high school or college, graduating high school, or completing an education level beyond college.

Tables 2 and 3 show the unstandardized regression coefficients in three cross-sectional models of the relationship between early pregnancy and symptoms of depression in adolescence (Wave I) among Whites and African Americans, respectively. Model 1 in Tables 2 and 3 answer the first research question and confirm hypotheses, showing that early pregnancy is significantly associated with higher levels of depressive symptoms at ages 11-21 years, at the bivariate level for both Whites (b = 2.50, $p < .001$) (Table 2) and Blacks (b = 2.14, $p < .001$) (Table 3).

Model 2 in Tables 2 and 3 examine the effect of early pregnancy on symptoms of depression controlling for age and religious attendance. The effects of early pregnancy on depressive symptoms remain significant for both Whites (b = 1.83, $p < .001$) (Table 2) and Blacks (b = 2.14, $p < .001$) (Table 3) net of age and religious attendance. For Whites,

older age is significantly associated with higher levels of depressive symptoms (b = 0.18, $p < .001$) and higher frequency of religious attendance is significantly linked with lower levels of depressive symptoms (b = -0.55, $p < .001$) in Model 2 in Table 2. For Blacks, the effect of age is not statistically significant and higher frequency of religious attendance is associated with lower levels of depressive symptoms (b = -0.50 $p < .01$) in Model 2 in Table 3.

Guided by the life course perspective principle of "linked lives," which emphasizes the importance of family socioeconomic background (Elder et al. 2004), Model 3 in Tables 2 and 3 include parental economic hardship and parental education. Results show that the relationship between early pregnancy and symptoms of depression remains statistically significant for both African Americans and Whites at ages 11-21 years, over and above the effects of age, religious attendance, and family background. However, the effect of early pregnancy on depressive symptoms for Whites decreases slightly with the inclusion of family background in Model 3 in Table 2 (b = 1.48, $p < .01$), but maintains statistical significance. The effect of early pregnancy on depressive symptoms for Blacks also decreases after taking family background into account in the final model (b = 1.54, $p < .05$), but remains statistically significant. Model 3 in Tables 2 and 3 reveal that early pregnancy is more significantly related to symptoms of depression for Whites ($p < .01$) compared to Blacks ($p < .05$) after accounting for family background.

Model 3 in Table 2 shows that religious attendance remains significant for Whites (b = -0.52, $p < .001$) net of family background. For Blacks, the effect of religious attendance on depressive symptoms becomes non-significant controlling for family

background as shown in Model 3 in Table 3. Higher levels of parental economic hardship are significantly associated with higher levels of depressive symptoms among Whites (b = 0.53, $p < .01$). For Whites, having at least one parent who graduated college (b = -1.02, $p < .05$) and attended or completed professional school (b = -1.76, $p < .001$) are significantly associated with lower levels of depressive symptoms compared to those whose parent(s) dropped out of high school. Family background does not significantly predict symptoms of depression for Black adolescents.

Tables 4 and 5 show the unstandardized OLS regression coefficients in five longitudinal models of early pregnancy (Wave I), sociodemographics (Wave IV), and SES (Wave IV) predicting depressive symptoms in Wave IV among Whites and Blacks, respectively. Model 1 in Table 4 answers the second research question on whether early pregnancy predicts subsequent depressive symptoms in young adulthood. As hypothesized, early pregnancy significantly predicts higher levels of symptoms of depression at ages 24-33 years (b = 1.69, $p < .001$) among Whites, as shown in Model 1 in Table 4. However, Model 1 in Table 5 indicates that early pregnancy has no significant effect on subsequent symptoms of depression at ages 24-33 years among African Americans. Thus, these results reveal race differences in the effect of early pregnancy on subsequent depressive symptoms in young adulthood.

For Whites, the effect of early pregnancy on subsequent symptoms of depression diminishes somewhat but maintains statistical significance after age, marital status, number of children, and religious attendance from Wave I are included in Model 2 in Table 4 (b = 1.19, $p < .05$). Having more children in young adulthood is significantly associated with higher levels of depressive symptoms (b = 0.26, $p < .05$) in Model 2 in

Table 4. Higher frequency of religious attendance at ages 11-21 years significantly predicts lower levels of subsequent symptoms of depression (b = -0.47, $p < .001$) in Model 2 in Table 4.

The third research question asks whether early pregnancy predicts subsequent depressive symptoms in young adulthood, accounting for prior symptoms of depression. Model 3 in Table 4 confirms hypotheses and indicates that the effect of early pregnancy on subsequent depressive symptoms remains significant (b = 1.00, $p < .05$) for Whites net of prior depressive symptoms. Prior symptoms of depression significantly predict depressive symptoms in young adulthood (b = 0.29, $p < .001$). When controlling for prior depressive symptoms from Wave I, religious attendance from Wave I remains statistically significant for depressive symptoms in young adulthood (b = -0.31, $p < .001$). The effect of number of children becomes non-significant when prior depressive symptoms are included in Model 3. With the inclusion of prior depression, all independent variables in Model 3 in Table 4 explains about 12 percent (r-squared = 0.12) of the variation in depressive symptoms among Whites at ages 24-33 years.

Model 4 in Table 4 answers part of the fourth research question on whether unfulfilled educational expectations predict depressive symptoms among Blacks and Whites. Model 4 in Table 4 reveals the effects of unfulfilled educational expectations and respondents' highest level of education achieved by ages 24-33 years on depressive symptoms among White young adults. Unfulfilled educational expectations are significantly linked with higher levels of depressive symptoms (b = 0.85, $p < .001$). Model 4 in Table 4 also answers the fifth research question regarding whether unfulfilled educational expectations explain the long-term effect of early pregnancy on depressive

symptoms among Whites. When unfulfilled educational expectations and highest education level achieved in young adulthood are included as control variables, the effect of early pregnancy for Whites decreases and is no longer statistically significant (b = 0.54) in Model 4 in Table 4. To test for mediation, supplementary logistic regression analyses (not shown) examine the bivariate relationship of early pregnancy predicting unfulfilled educational expectations in young adulthood. Early pregnancy significantly increases the likelihood of unfulfilled educational expectations (b = 2.67, $p < .01$). In addition, a Sobel Test (Baron and Kenny 1986; Sobel 1982) confirms that unfulfilled educational expectations are a statistically significant mediating mechanism in the relationship between early pregnancy and depressive symptoms in young adulthood (Wave IV) ($p < .01$). In other words, as hypothesized, unfulfilled educational expectations help to explain why early pregnancy has a long-term depressive effect in young adulthood among Whites. In Model 4 in Table 4, higher levels of educational achievement significantly predict lower levels of depressive symptoms. Compared to attaining an education level lower than high school graduate by ages 24-33 years, graduating high school (b = -1.40, $p < .01$), attending or completing vocational or technical school (b = -1.94, $p < .01$), attending but dropping out of college (b = -2.30, $p < .001$), graduating college (-2.84, $p < .001$), and attaining a level of education beyond college (b = -2.94, $p < .001$) are significantly associated with lower levels of depressive symptoms in young adulthood.

When controlling for multiple dimensions of SES in Model 5 in Table 4, the effect of unfulfilled educational expectations remain significant for Whites. However, the level of significance of unfulfilled educational expectations decreases somewhat in the

final model (b = 0.61, $p < .05$), when accounting for all SES measures. Though the significance level decreases, the effect of being a high school graduate, compared to attaining a lower education level, remains significant in predicting depressive symptoms (b = -1.28, $p = .05$) in the final model. The significance levels of the effects of attending or completing vocational or technical school, dropping out of college, graduate college, and achieving a level of education beyond college remain consistent in Models 3 and 4 in Table 5. Prior depressive symptoms remain a strong, significant predictor of symptoms of depression (b = 0.24, $p < .001$), net of all sociodemographics and SES measures.

The final model in Table 4 also shows that being employed is significantly associated with lower levels of depressive symptoms (b = -0.69, $p < .01$) for Whites. Higher levels of household income also significantly predict lower levels of depressive symptoms (b = -0.11, $p < .05$). Higher levels of respondents' economic hardship at ages 24-33 years are a statistically significant predictor of higher levels of depressive symptoms (b = 1.04, $p < .001$). Together, all independent variables in the final Model in Table 4 explain about 19 percent (r-squared = 0.19) of the variation in depressive symptoms at ages 24-33 years for Whites.

In contrast to the findings for Whites, early pregnancy does not predict subsequent depressive symptoms in young adulthood among Blacks. Model 2 in Table 5 shows that having more children is significantly associated with higher levels of depressive symptoms at ages 24-33 years (b = 0.51, $p < .01$) among African Americans. Higher frequency of religious attendance at ages 11-21 years is significantly linked with lower levels of depressive symptoms in young adulthood (b = -0.42, $p < .05$). Model 3 in Table 5 accounts for the effect of prior depressive symptoms from ages 11-21 years,

which significantly predict higher levels of depressive symptoms at ages 24-33 years (b = 0.30, $p < .001$). The effect of number of children decreases (b = 0.35, $p < .05$) when prior symptoms of depression are included in Model 3 in Table 5. Together, all independent variables in Model 3 in Table 5 account for about 11 percent (r-squared = 0.11) of the variation in depressive symptoms in Wave IV among Blacks.

Model 4 in Table 5 examines the effects of unfulfilled educational expectations and highest education level achieved by Wave IV among Blacks. Contrary to hypotheses for the fourth research question, which predict that unfulfilled educational expectations would be damaging for mental health among both Blacks and Whites, unfulfilled educational expectations are not significant in predicting depressive symptoms among Blacks, thus indicating race differences. Compared to achieving a level lower than high school graduate, attending or completing vocational or technical school (b = -1.69, $p < .05$), graduating college (b = -2.04, $p < .05$), and achieving a level of education beyond college (b = -2.33, $p < .01$) are significantly associated with lower levels of depressive symptoms depressive symptoms in Model 4 in Table 5.

In the final model in Table 5, which includes all SES measures, prior symptoms of depression (Wave I) remain a significant predictor of depressive symptoms in Wave IV (b = 0.26, $p < .001$) among Blacks. Respondents' education level loses its effect when controlling for other measures of SES in Model 5 in Table 5. Higher levels of household income are significantly linked with lower levels of depressive symptoms (b = -0.20, $p < .01$). Higher levels of economic hardship in Wave IV also significantly predict depressive symptoms (b = 0.59, $p < .01$) for Blacks. Together, all independent variables in Model 5

in Table 5 explain about 16 percent (r-squared = 0.16) of the variation in depressive symptoms at ages 24-33 years among Blacks.

Supplementary analyses controlled for parental economic hardship and parental education level in the longitudinal models exploring the mental health effects of early pregnancy. Consistent with previous research on SES and mental health (Mossakowsi 2008), parental education level was entirely mediated by respondent education level. In order to prevent more missing data, these measures of family socioeconomic background were excluded from the final analyses.

To compare the long-term effect of early pregnancy with having ever become pregnant, Tables 6 and 7 examine the effect of having ever become pregnant by young adulthood on depressive symptoms. These analyses further understanding of race differences in the long-term impact of early pregnancy. Tables 6 and 7 display the unstandardized regression coefficients in five models that show the effects of having ever become pregnant (Wave IV), sociodemographics (Wave IV), and SES (Wave IV) on depressive symptoms in Wave IV among Whites and African Americans, respectively. Model 1 in Tables 6 and 7 reveal that at the bivariate level, having ever become pregnant is significantly linked with increased levels of depressive symptoms for Whites (b = 0.65, $p < .01$), but not for Blacks. Thus, there are not only race differences in the effect of early pregnancy but also of having ever become pregnant by young adulthood on symptoms of depression by this point in the life course. Model 2 in Table 6 includes age, marital status, number of children, and religious attendance. The effect of ever having become pregnant on depressive symptoms is not net of number of children for Whites, as supplementary analyses (not shown) indicate that having ever become pregnant is no longer statistically

significant controlling for number of children. The association between having ever become pregnant on depressive symptoms in young adulthood is weak compared to the long-term effect of early pregnancy on depressive symptoms for Whites.

DISCUSSION

The theoretical framework of the life course perspective and the social stress process model advance our understanding of the long-term effects of early pregnancy and unfulfilled educational expectations on mental health. The present study extends prior knowledge by discovering race differences in the effect of early pregnancy on mental health among young American adults. One of the key findings is that pregnancy before age 21 significantly predicts subsequent symptoms of depression in young adulthood, net of earlier symptoms, among Whites, but not among Blacks. In addition, this study adds to the sociological research literature by showing that unfulfilled educational expectations not only harm mental health, but also help to explain the harmful mental health consequences of early pregnancy among Whites.

An inspiration for this study, Mossakowski's (2011) study, found that failing to achieve one's expected education level and unexpectedly becoming a parent significantly predict higher levels of depressive symptoms among young adults of the "Baby Boomer" generation. In line with the life course perspective and social stress theory, Mossakowski (2011) theorized that unmet expectations surrounding markers of adulthood, like educational attainment and the timing of parenthood, are chronic stressors. Together Mossakowski's (2011) and this study's findings provide national longitudinal evidence that expectations and timing matter for the mental health impacts of unfulfilled educational expectations. Younger generations, including Generation X, are generally

delaying parenthood until later in life compared to older generations, such as the Baby Boomers, whose averages ages at first birth are earlier in the life course (Taylor et al. 2010). The current research focuses on a cohort born between 1974-1983, known as part of "Generation X."

The current study expands our knowledge on the mental health consequences of early *pregnancy* beyond what has been established about early *parenthood*. Research examining only the mental health effects of early parenthood is limited in its scope of understanding the distressing nature of first time pregnancy and parenthood at a young age. It is important to consider the implications of early pregnancy because the stress of early parenthood is not limited to giving birth and child rearing but also involves the emotional, life-changing experience of pregnancy.

Previous mental health studies (Kalil and Kunz 2002; Mirowsky and Ross 2002; Booth et al. 2008) have examined early transitions into parenthood. These studies did not explore race differences in the long-term mental health effects of early *pregnancy*. The present study demonstrates that the timing of pregnancy, not only parenthood, matters for subsequent mental health and that there are race differences in the lasting influence of early pregnancy on depressive symptoms. Early pregnancy in the present study includes pregnancies that resulted not only in live birth, but also miscarriage, stillbirth, or abortion. Each pregnancy outcome is included in the measure because early pregnancy can be distressing regardless of the outcome. It was not possible to determine the frequency of different pregnancy outcomes due to missing data and structure of the Add Health study design.

With respect to this study's findings, the cross-sectional results are different than the longitudinal findings. The cross-sectional results indicate that early pregnancy is associated with symptoms of depression for both Blacks and Whites, at ages 11-21 years. This suggests that this experience is associated with psychological distress, which could be because individuals may not be emotionally or financially prepared for the stress of pregnancy and parenthood at this young age. In the United States, the majority of pregnancies experienced at ages 19 years and younger are unintended (Finer and Zolna 2011). The experience of early pregnancy might involve initial or lasting feelings of shock, fear, and disappointment, which may be accompanied if not exacerbated by the disruption or derailing of education and career goals, especially among those whose pregnancies were unplanned. However, these cross-sectional findings are limited because the exact age at which the pregnancy occurred is not measured and temporal ordering of pregnancy and depressive symptoms cannot be established. Thus, the cross-sectional findings cannot speak to whether early pregnancy leads to or causes chronic strain on mental health.

An advantage of using the nationally representative, longitudinal data of the Add Health survey is the ability to account for the temporal ordering of early pregnancy and depressive symptoms among young American adults. As hypothesized, the long-term effect of early pregnancy on depressive symptoms in young adulthood, at ages 24-33 years, is not explained by earlier symptoms of depression, at ages 11-21 years. It is important to take earlier symptoms of depression into account because poor mental health could select individuals into early pregnancy. Symptoms of depression, such as feelings of loneliness and sadness, might influence sexual behavior in adolescence, leading to

early pregnancy. However, the longitudinal results suggest that early pregnancy can leave an imprint on mental health and is depressing for young adult Whites who may not have experienced depressive symptoms before. Young adults who report having depressive symptoms in adolescence and through young adulthood could have developed their symptoms after becoming pregnant early in life.

Contrary to the influence of having ever become pregnant by young adulthood on depressive symptoms, which is explained by number of children of the respondent, the long-term effect of early pregnancy on depressive symptoms is not because of the number of children. Rather, results suggest it is the timing of pregnancy early in life that is distressing. At such a young age, pregnancy might by distressing for White females for a myriad of reasons. For example, the pregnancy may be unexpected in adolescence and thus lead to difficult decision-making processes about whether or not to terminate the pregnancy or put the baby up for legal adoption. As well as the social constraints and strains of early pregnancy, young pregnant females face a considerable financial burden of paying for necessary prenatal and childcare expenses. Affording the cost of healthcare during pregnancy and childcare might be particularly stressful for young single mothers without health insurance or financial assistance from family and friends. In addition, a young, pregnant individual might experience shame and fear surrounding the consequences of telling her parents and other loved ones that she has become pregnant. At such a young age, it is not unlikely for pregnancy to occur out of a committed, long-term romantic relationship, in which case young females are forced to face the stress of their pregnancies with less social support, as single parents, and they may feel alone depending on the strength of their social networks.

Qualitative research needs to provide better understanding of which aspects of the experience and under what circumstances early pregnancy is distressing and why. Perhaps early pregnancy is less chronically depressing for individuals with strong social supports and other resources that may be used to offset its long-term mental health consequences. For example, having the financial resources necessary to pay for adequate prenatal and childcare, of which are unlikely for an adolescent to acquire on her own, may lessen the stress of early pregnancy. Thus, the current study accounts for SES, family background, employment status, and respondent's economic hardship in young adulthood. In addition, the experience of early pregnancy may be less stressful if it occurs later in adolescence, possibly after graduating high school, compared with earlier. Though not the focus of this analysis, future research needs to examine the mental health effects of early pregnancy in scenarios such as these, and among different racial/ethnic groups.

Another central finding is that unfulfilled educational expectations are linked with depressive symptoms in young adulthood among Whites, but not among Blacks. As hypothesized, this relationship is over and above the effect of prior symptoms of depression. Having unfulfilled educational expectations in young adulthood is a distressing experience for Whites regardless of preexisting symptoms of depression in adolescence, which could potentially influence motivation for status attainment. Earlier symptoms of depression do not explain why White females who do not fulfill their educational expectations have higher levels of depressive symptoms as young adults. In addition, the current study adds to previous research suggesting that unmet expectations

for educational attainment are chronically distressing (Thoits 1999; Mossakowski's 2011).

Previous research (Mirowsky and Ross 2002; Kalil and Kunz 2002; Booth et al. 2008; Mossakowski 2011) did not explore whether unfulfilled educational expectations are an intervening or mediating mechanism in the relationship between early parenthood and mental health. Results of the present study reveal that the effect of early pregnancy on depressive symptoms is mediated by unfulfilled educational expectations. Thus, unfulfilled educational expectations help to explain why early pregnancy has adverse mental health consequences in young adulthood among Whites in the United States.

The timing of pregnancy may interfere with goals and aspirations that are separate from parenthood. Plans for educational attainment and career pursuits in young adulthood may be interrupted or changed after pregnancy in adolescence. The timing of early pregnancy could derail education because of childcare demands and/or working to financially support the child, potentially leading to unfulfilled educational expectations later in life. In addition, as a barrier to education, early pregnancy likely affects other socioeconomic achievements, such as making employment in the labor force difficult.

Another advantage of this study is the measurement of multiple dimensions of SES. Results show that the effect of unfulfilled educational expectations among Whites decreases but remains statistically significant even after accounting for the respondent's educational level, employment status, household income, and economic hardship in young adulthood, which are each significantly associated with depressive symptoms among Whites. Among Blacks, household income and economic hardship are the indicators of SES that are significantly associated with depressive symptoms. Therefore,

these findings also contribute to research on race differences in the effects of SES on mental health (Kessler and Neighbors 1986; Mossakowski 2008; Wickrama et al. 2008)

With respect to the race differences found in the influence of early pregnancy on subsequent mental health, it important to acknowledge the potential explanations for why early pregnancy may be less distressing among Blacks. Perhaps processes of social comparisons (Pearlin and Rosenberg 1978) contribute to the long-term mental health cost of early pregnancy among Whites but not among Blacks. White individuals who become pregnant at a young age may reflect on prior accomplishments over their life course and experience a distressing sense of inadequacy compared to those who did not become pregnant early. Early pregnancy is not as common among Whites and is even stigmatized in many Whites communities where it is culturally ideal to delay pregnancy (Geronimus 2003). Thus, White females who become pregnant early in life may feel inferior when comparing themselves to others who delay pregnancy until later ages.

Young African Americans are not availed the same access or opportunities for higher education or career building as are Whites (Geronimus 2003). Up against this kind and other structural disadvantages, many African American parents are more focused on strategies for survival and economically providing for their children than they are on preparing their children for entering the competitive labor market or pursuing higher education (Geronimus 2003). With less focus on goal striving for other markers of adulthood and in turn, less emphasis placed on delaying parenthood among young African Americans, early pregnancy may be more common and less stigmatized in some Black communities. Conversely, many Whites maintain delayed parenthood as a goal for their children and view early pregnancy as undesirable (Geronimus 2003). Thus,

processes of social comparisons may not be as distressing for Blacks as they are for Whites.

Alternatively, stigmatizing social assumptions about race and early pregnancy might damage Blacks' mental health in a way that the current analysis is unable to capture. Future research needs to examine the mental health impact of what Geronimus (2003: 889) describes as "the ever-present viewpoint that African American fertility and family behavior contradicts dominant cultural norms for family structure and childbearing," which can damage aspects of Blacks' self-concepts. Public perceptions that portray early childbearing as culturally undesirable lead to stigmatizing assumptions that African Americans may internalize when comparing themselves to Whites or those who are more socioeconomically advantaged and more likely to delay parenthood until later in life.

Another explanation for why early pregnancy is not a significant predictor of subsequent depressive symptoms among Black young adults is that they may cope better with the stress of early pregnancy than Whites. Coping resources like family and other social supports, such as friends or church members, strong self-esteem, and a sense of personal control over life might buffer the stress (Pearlin et al. 2005). Future research needs to examine coping resources such as these, which may intervene in the relationship between early pregnancy and depressive symptoms among Blacks. The present study controlled for religious attendance, which is a coping resource and source of social support, but it is likely that religious attendance alone is not enough to help young females cope with the stress of early pregnancy. Future research should explore the relationships among early pregnancy and aspects of the life course principle of "human

agency," which include self-esteem and sense of personal control over life (Elder et al. 1996; Elder et al. 2004). Perhaps examination of these coping resources and other mental health outcomes, such as substance abuse and dependence, would shed light on the manifestation of early pregnancy as a chronic stressor for Blacks.

Demographic trends that suggest early pregnancy is more socially normative among African Americans compared to Whites may explain in part why early pregnancy is not a significant predictor of subsequent depressive symptoms among Black females in young adulthood. However, future research needs to examine other mental health outcomes of early pregnancy to determine the manifestation of the stress of early pregnancy for Blacks. In addition, qualitative research should explore how Blacks and Whites interpret the subjective meaning of depressive symptoms differently, which may contribute to why the effect of early pregnancy on subsequent depressive symptoms is not significant for Blacks. Qualitative research also needs to uncover what ages are considered "too early" for pregnancy among African American adolescents, which may be different compared with Whites.

Implications

There are a number of implications of this study's findings. Public policies, social welfare programs, healthcare, and educational institutions must be more cognizant of the mental health consequences of coping with the stress of early pregnancy and striving to meet expectations for educational attainment in adolescence and young adulthood. Workplaces across the United States need to provide longer periods of paid maternity leave and childcare for mothers. Policymakers need to develop better social welfare programs, including affordable childcare, that are designed to assist young women who

become mothers early in life with achieving their educational and career goals. Better institutional support for working mothers and more programs supporting the pursuit of higher education among young mothers are imperative.

Policies should guarantee free access to birth control and promote sexual education awareness, especially because the majority of adolescent pregnancies are unintended (Finer and Zolna 2011). In addition, because many adolescents are ill equipped to take on the financial responsibilities of pregnancy, social welfare programs should consider ways to help young mothers access childcare. There is a need for more opportunities within the workplace and educational institutions, such as financial scholarships, mentor programs, and psychological counseling, which help young females to pursue their goals associated with status attainment, including higher education.

Limitations

Despite the advantages of the Add Health data, there are some limitations worth noting. The Add Health data do not include information on the exact age at which the respondent experienced her first pregnancy. Thus, a limitation of this analysis is the inability to determine the effect of the age at which pregnancy first occurs on depressive symptoms. The Add Health survey does not ask respondents how many children they have in Wave I. Therefore, this study only controls for number of children in Wave IV.

This analysis is unable to measure current marital status, as the Add Health survey only asks respondents about having ever been married. More research needs to examine the mental health ramification of the timing of marriage and the sequencing of pregnancy and marriage (Braboy Jackson 2004). Another limitation of the data is the use of self-

reports of depressive symptoms, which limit the findings to more subjective experiences of psychological distress compared to diagnosed depression.

Regarding race, it is important to consider that since the Add Health surveys were conducted face-to-face, the race of the survey interviewer may have impacted Blacks' responses to questions about pregnancy, mental health, and other private information. Previous research shows that the race of the interviewer affects Blacks' and Whites' responses in a national survey and suggests matching interviewer and respondent race, especially for questions on racial matters (Schaeffer 1980). A White interviewer may be less relatable to a Black respondent. For example, Black respondents might be less inclined to share personal information regarding early pregnancy or symptoms of depression with a White interviewer, compared to a Black interviewer, for reasons such that early pregnancy is more socially normative among Blacks compared with Whites (Martin et al. 2015). In addition, because of negative racial stereotypes and social assumptions surrounding early pregnancy, Blacks may feel more at ease sharing personal information about becoming pregnant at a young age or feeling depressed with Black survey interviewers.

CONCLUSION

It is important to consider the mental health implications of demographic trends that show on average, African American women become mothers earlier in life than White women (Martin et al. 2015). It is evident that more women in general are delaying parenthood, as birth rates for teenagers and women in their early twenties are lower than ever before (Child Trends 2014; Martin et al. 2015). Today, there are fewer teenage mothers of newborns than there are mothers of newborns who are ages 35 and older,

whereas in 1990, the opposite was true (Taylor et al. 2010). However, there are still race differences in rates of early pregnancy and parenthood. Women at ages 35 and older who give birth are more likely to be White than Black (Taylor et al. 2010).

In conclusion, this study was informed by the life course perspective and social stress theory, and contributes to the sociological research literature by demonstrating that there are race differences in the long-term effects of early pregnancy on symptoms of depression among young adults in the United States. Results emphasize the importance of the timing of pregnancy for mental health among Whites. Also, unfulfilled educational expectations help to explain the harmful mental health consequences of early pregnancy among White young adults. While the current study contributes knowledge on the long-term psychological impact of early pregnancy for Whites, we need to better understand how the stress of early pregnancy may influence African Americans' mental health in different ways over the life course, and how they may socially and psychologically cope with this life-altering experience.

APPENDIX

Table 1. Descriptive Statistics: Means, Standard Deviations (SD), and Ranges Whites Subsample (*N* = 1,664) and African Americans Subsample (*N* = 636)

	Blacks		Whites		
Variables	**Mean**	**SD**	**Mean**	**SD**	**Range**
WAVE I					
Depressive Symptoms	6.59**	4.70	6.06	4.60	0-27
Early pregnancy	.11***	.41	.06	.23	0-1
Age Wave I	15.48	1.83	15.44	1.77	11-21
Religious attendance	2.14	1.09	1.68	1.21	0-3
Parental economic hardship	1.12	.74	1.01	.52	0-3
Parental education level					
Less than high school graduate	.17	.38	.09	.29	0-1
High school graduate	.29	.45	.35	.48	0-1
Business/trade school	.10	.30	.10	.30	0-1
College dropout	.19	.39	.19	.39	0-1
College graduate	.14	.34	.15	.35	0-1
Professional school	.12	.32	.12	.32	0-1
WAVE IV					
Depressive Symptoms	6.0***	4.71	5.17	4.44	0-27
Ever Pregnant	.77***	.43	.64	.48	0-1
Unfulfilled educational expectation	.86***	.34	.72	.45	0-1
Age Wave IV	28.30	1.84	28.26	1.79	24-33
Ever married	.34	.48	.62	.48	0-1
Number of children	1.28***	1.30	1.01	1.11	0-7
Respondent education level					
Less than high school graduate	.07	.26	.06	.23	0-1
Vocational/technical school	.12**	.33	.08	.27	0-1
College dropout	.35	.48	.34	.47	0-1
College graduate	.18**	.38	.24	.42	0-1
Beyond college	.16	.37	.16	.37	0-1

*$p < .05$ **$p < .01$ ***$p < .001$ (two-tailed t-tests)

Table 2. OLS Regression Models of the Effects of Early Pregnancy and Sociodemographics on Depressive Symptoms (Wave I) Among Whites

Variables	Model 1	Model 2	Model 3
Early pregnancy	2.50***	1.83***	1.48**
	(0.45)	(0.46)	(.52)
Sociodemographics			
Age		0.18**	0.21**
		(.06)	(0.06)
Religious attendance		-0.55***	-0.52***
		(0.08)	(0.09)
Parental economic hardship			0.53*
			(0.21)
Parental Education [a]			
High school graduate			-0.15
			(0.41)
Business/trade school			-0.67
			(0.50)
College dropout			-0.59
			(0.44)
College graduate			-1.02*
			(0.46)
Professional school			-1.76***
			(0.49)
Intercept	5.91***	4.15***	3.55**
R-squared	0.02	0.04	0.06
N	1,987	1,983	1,688

*$p < .05$ **$p < .01$ ***$p < .001$ (two-tailed tests)

[a] Less than high school graduate is the reference category

Table 3. OLS Regression Models of the Effects of Early Pregnancy and Sociodemographics on Depressive Symptoms (Wave I) Among Blacks

Variables	Model 1	Model 2	Model 3
Early pregnancy	2.14***	1.85**	1.54*
	(0.53)	(0.54)	(0.68)
Sociodemographics			
Age		0.15	0.13
		(0.09)	(0.11)
Religious attendance		-0.50**	-0.35
		(0.15)	(0.18)
Parental economic hardship			0.43
			(0.27)
Parental Education [a]			
High school graduate			-0.79
			(0.61)
Business/trade school			-0.48
			(0.78)
College dropout			-1.04
			(0.66)
College graduate			-0.68
			(0.73)
Professional school			-1.36
			(0.77)
Intercept	6.36***	5.17**	5.37**
R-squared	0.02	0.04	0.04
N	778	776	599

*$p < .05$ **$p < .01$ ***$p < .001$ (two-tailed tests)

[a] Less than high school graduate is the reference category

Table 4. OLS Regression Models of the Effects of Early Pregnancy (Wave I), Sociodemographics, and SES (Wave IV) on Depressive Symptoms (Wave IV) Among Whites

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Early Pregnancy	1.69***	1.19*	1.00*	0.54	0.46
	(0.48)	(0.50)	(0.49)	(0.49)	(0.47)
Sociodemographcis					
Age [b]		-0.05	-0.10	-0.04	-0.03
		(0.06)	(0.06)	(0.06)	(0.06)
Ever married [b]		-0.39	-0.26	-0.05	0.13
		(0.24)	(.23)	(0.23)	(0.23)
Number of children [b]		0.26*	0.11	-0.18	-0.38***
		(.11)	(0.10)	(0.11)	(0.11)
Religious attendance		-0.47***	-0.31***	-0.22*	-0.14
		(0.09)	(0.09)	(0.09)	(0.09)
Prior Depressive Symptoms			0.29***	0.26***	0.24***
			(0.02)	(.02)	(0.02)
Unfulfilled Educational Expectation [b]				0.85***	0.61*
				(0.24)	(0.24)
SES					
High school graduate [a]				-1.40**	-1.28*
				(0.53)	(0.52)
Vocational/technical school [a]				-1.94**	-1.63**
				(0.57)	(0.56)
College dropout [a]				-2.30***	-1.88***
				(0.47)	(0.47)

(Continued)

Table 4. (Continued)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
College graduate [a]				-2.84***	-2.11***
				(0.52)	(0.52)
Beyond college [a]				-2.94***	-2.31***
				(0.54)	(0.55)
Employment status [b]					-0.69**
					(0.25)
Household income [b]					-0.11*
					(0.05)
Economic hardship [b]					1.04***
					(0.14)
Intercept	5.07***	7.27***	6.82***	7.03***	7.62***
R-squared	0.01	0.03	0.12	0.15	0.19
N	1,678	1,676	1,672	1,665	1,661

*$p < .05$ **$p < .01$ ***$p < .001$ (two-tailed tests)
[a] Less than high school graduate is the reference category
[b] Wave IV

Table 5. OLS Regression Models of the Effects of Early Pregnancy (Wave I), Sociodemographics, and SES (Wave IV) on Depressive Symptoms (Wave IV) Among Blacks

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Early Pregnancy	0.32	-0.45	-0.96	-1.04	-1.16
	(0.59)	(0.64)	(0.62)	(0.61)	(0.61)
Sociodemographcis					
Age [b]		-0.02	-0.10	-0.10	-0.11
		(0.11)	(0.12)	(0.10)	(0.10)
Ever married [b]		-0.15	0.04	0.37	0.76
		(0.40)	(0.39)	(0.39)	(0.40)
Number of children [b]		0.51**	0.35*	0.17	-0.01
		(0.16)	(.15)	(0.16)	(0.16)
Religious attendance		-0.42*	-0.29	-0.20	-0.14
		(0.18)	(0.17)	(0.17)	(0.17)
Prior Depressive Symptoms			0.30***	0.28***	0.26***
			(0.04)	(0.04)	(.04)
Unfulfilled Educational Expectation [b]				0.19	0.20
				(0.53)	(0.52)
SES					
High school graduate [a]				-0.39	-0.03
				(0.86)	(0.85)
Vocational/technical school [a]				-1.69*	-1.11
				(0.85)	(0.86)
College dropout [a]				-1.38	-0.73
				(0.75)	(0.76)

(Continued)

Table 5. (Continued)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
College graduate [a]				-2.04*	-1.18
				(0.84)	(0.88)
Beyond college [a]				-2.33**	-1.30
				(0.87)	(0.91)
Employment status [b]					-0.51
					(0.44)
Household income [b]					-0.20**
					(0.07)
Economic hardship [b]					0.59**
					(0.22)
Intercept	5.95***	6.97*	7.01*	8.34**	9.52**
R-squared	0.0	0.03	0.11	0.13	0.16
N	651	648	643	641	639

*$p < .05$ **$p < .01$ ***$p < .001$ (two-tailed tests)

[a] Less than high school graduate is the reference category

[b] Wave IV

Table 6. OLS Regression Models of the Effects of Ever Pregnant (Wave IV), Sociodemographics, and SES (Wave IV) on Depressive Symptoms (Wave IV) Among Whites

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Ever pregnant	0.65**	0.44	0.17	-0.00	-0.05
	(0.22)	(0.31)	(0.30)	(0.30)	(0.29)
Sociodemographcis					
Age [b]		-0.03	-0.09	-0.04	-0.03
		(0.06)	(0.06)	(0.06)	(0.06)
Ever married [b]		-0.47	-0.29	-0.03	0.15
		(0.25)	(.24)	(0.24)	(0.23)
Number of children [b]		0.19	0.11	-0.16	-0.35**
		(.13)	(0.13)	(0.13)	(0.13)
Religious attendance		-0.49***	-0.33***	-0.23**	-0.15
		(0.09)	(0.09)	(0.09)	(0.09)
Prior Depressive Symptoms			0.29***	0.26***	0.24***
			(0.02)	(.02)	(0.02)
Unfulfilled Educational Expectation [b]				0.87***	0.63**
				(0.24)	(0.24)
SES					
High school graduate [a]				-1.52**	-1.33*
				(0.52)	(0.52)
Vocational/technical school [a]				-2.07***	-1.69**
				(0.57)	(0.56)
College dropout [a]				-2.44***	-1.94***
				(0.47)	(0.47)

(Continued)

Table 6. (Continued)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
College graduate [a]				-2.99***	-2.18***
				(0.51)	(0.52)
Beyond college [a]				-3.12***	-2.40***
				(0.54)	(0.54)
Employment status [b]					-0.67**
					(0.25)
Household income [b]					-0.11*
					(0.05)
Economic hardship [b]					1.05***
					(0.14)
Intercept	4.75***	6.67***	6.40***	6.99***	7.48***
R-squared	0.03	0.03	0.11	0.15	0.19
N	1,680	1,678	1,674	1,667	1,664

*$p < .05$ **$p < .01$ ***$p < .001$ (two-tailed tests)
[a] Less than high school graduate is the reference category
[b] Wave IV

Table 7. OLS Regression Models of the Effects of Ever Pregnant (Wave IV), Sociodemographics, and SES (Wave IV) on Depressive Symptoms (Wave IV) Among Blacks

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Ever pregnant [b]	0.54	-0.34	-0.42	-0.43	-0.48
	(0.44)	(0.52)	(0.50)	(0.51)	(0.50)
Sociodemographcis					
Age [b]		-0.02	-0.10	-0.11	-0.13
		(0.10)	(0.10)	(0.10)	(0.10)
Ever married [b]		-0.10	0.09	0.40	0.79
		(0.41)	(0.39)	(0.40)	(0.41)
Number of children [b]		0.52**	0.35*	0.17	0.01
		(0.17)	(.17)	(0.18)	(0.18)
Religious attendance		-0.41*	-0.29	-0.20	-0.14
		(0.18)	(0.17)	(0.17)	(0.17)
Prior Depressive Symptoms			0.29***	0.27***	0.26***
			(0.04)	(.04)	(0.04)
Unfulfilled Educational Expectation [b]				0.19	0.20
				(0.53)	(0.52)
SES					
High school graduate [a]				-0.15	0.19
				(0.87)	(0.87)
Vocational/technical school [a]				-1.45	-0.85
				(0.87)	(0.89)
College dropout [a]				-1.20	-0.55
				(0.76)	(0.78)

(Continued)

Table 7. (Continued)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
College graduate [a]				-1.87*	-1.03
				(0.86)	(0.90)
Beyond college [a]				-2.19*	-1.19
				(0.89)	(0.93)
Employment status [b]					-0.49
					(0.44)
Household income [b]					-0.20**
					(0.07)
Economic hardship [b]					0.57**
					(0.22)
Intercept	5.59***	7.03*	7.41*	8.91**	10.23**
R-squared	0.0	0.3	0.11	0.12	0.15
N	646	644	639	638	636

*$p < .05$ **$p < .01$ ***$p < .001$ (two-tailed tests)
[a] Less than high school graduate is the reference category
[b] Wave IV

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