

MITCHELL, IMANI N. M.S. Examining the association of maternal depressive symptoms in early and middle childhood and academic outcomes in adolescence: Does timing of exposure matter? (2022)

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Major depression is the most common mental health disorder in the United States. Research has begun to investigate the association between maternal depressive symptoms and academic outcomes among children. However, the educational impact of exposure to maternal depressive symptoms in minority youth is often understudied. Further, the effects of the timing of experiencing maternal depressive symptoms on youth educational outcomes has also been less examined. The current study is a secondary data analysis that examined the association between experiencing maternal depressive symptoms in early and middle childhood and academic outcomes in adolescence among African American and Hispanic youth. The final sample included 2,568 African American and Hispanic mothers from the Fragile Families and Child Wellbeing Study.

This study was framed in the life course theory. The study used multivariate linear regressions to estimate how maternal depressive symptoms at year 3 and year 9 were related to academic outcomes at year 15 among African American and Hispanic youth in two separate analyses, as well as the interaction of race and depressive symptoms on academic outcomes in the combined sample in a third analysis. Maternal depressive symptoms at year 3 were significantly related to lower academic performance (behavior difficulties) for African American ( $\beta = 0.06, p < 0.04$ ), and Hispanic youth ( $\beta = 0.08, p < 0.03$ ). No significant relationships were found for the impact of maternal depressive symptoms at year 3 ( $\beta = 0.00, p < 0.93$ ) ( $\beta = 0.05, p < 0.22$ ) and academic achievement (grade difficulties). Maternal depressive symptoms at year 9 were not significantly associated with academic achievement (grade difficulties) for African American youth ( $\beta = 0.03, p < 0.25$ ) or Hispanic youth ( $\beta = 0.00, p < 0.92$ ). Maternal depressive symptoms at year 9 were not associated with academic performance (behavior difficulties) in African American youth ( $\beta = 0.04, p < 0.16$ ) or Hispanic youth ( $\beta = 0.06, p < 0.11$ ). The

interaction between race and maternal depressive symptoms at year 3 was not significantly associated with academic achievement (grade difficulties) ( $\beta = -0.04, p < 0.34$ ) or academic performance (behavior difficulties) ( $\beta = -0.02, p < 0.57$ ) for African American and Hispanic youth. The interaction between race and maternal depressive symptoms at year 9 was not significantly associated with academic achievement (grade difficulties) ( $\beta = 0.03, p < 0.46$ ) or academic performance (behavior difficulties) ( $\beta = -0.03, p < 0.54$ ). These findings indicate that the impact of maternal depressive symptoms experienced earlier in childhood were more educationally impactful in adolescence, in both race groups . They provide important information to practitioners and policymakers on potential mechanisms to reduce the education gap among minority students, as well as ways to center minority experiences in research.

EXAMINING THE ASSOCIATION OF MATERNAL DEPRESSIVE SYMPTOMS IN EARLY AND  
MIDDLE CHILDHOOD AND ACADEMIC OUTCOMES IN ADOLESCENCE: DOES TIMING OF  
EXPOSURE MATTER

by

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## CHAPTER I: INTRODUCTION

This study examined the impact of maternal depressive symptoms experienced by children at ages 3 and 9 years, on their academic outcomes in adolescence at 15 years old. Major depressive disorder is one of the most common chronic mental health disorders (NIMH, 2021). According to the National Institute of Mental Health (2021), an estimated 19.4 million adults in the U.S. had at least one major depressive episode in 2019. Among adults living with depression, the prevalence of major depressive disorder is the highest in women (NIMH, 2021). Research shows that depression among mothers may be of particular concern due to a spillover effect on children (Turney, 2012). Depression of parents is also one of the Adverse Childhood Experiences (ACEs) that have been shown to have a significant long-ranging impact on those who experience them (Goodman et al., 2011).

Adverse Childhood Experiences (ACEs) are remarkably common with more than 50% of adults experiencing at least one ACE in their lifetime (Felitti et al., 1998; Merrick et al., 2018). ACEs refer to any potentially traumatic event that happens to a person before the age of eighteen years old (Doi et al., 2020; Sacks & Murphy, 2018; Slack et al., 2017). ACE exposure has been associated with a range of subsequent negative outcomes at different ages, such as chronic absenteeism in school-age youth (Stempel et al., 2017) and internalizing and externalizing behavior problems in adolescence (Appleyard et al., 2005). ACEs not only encompass traumatic events such as physical, sexual, and emotional abuse, but also familial and socio-emotional influences such as witnessing violence, living with someone with a mental illness, and household dysfunction (Felitti et al., 1998). ACEs provide a useful framework for understanding how the mental health of a parent impacts their child over the longer term. Therefore, the present study examines the effect of one specific adverse factor- maternal mental health.

Several key findings have emerged from the literature on maternal depressive symptoms and their impact on children. Specifically, children of depressed mothers often have impaired cognitive, behavioral, and health outcomes from infancy through adulthood (Brennan et al., 2000; Civic & Holt, 2000; Kiernan & Huerta, 2008). Further, depressed mothers often exhibit maladaptive parenting behaviors (Lovejoy et al., 2000). Mothers who experience depressive symptoms often display parenting behaviors that are hostile and are less engaged with their child (Turney, 2011). Thus, the mental health of a parent is a very important ACE as it affects children's developmental and educational outcomes (Claessens et al., 2015; Elgar et al., 2004; Smith, 2004).

Major depression is highly prevalent among ethnic minority women. Additionally, individuals with lower educational attainment and racial/ethnic minorities are less likely to receive treatment for depression (Bromberger et al., 2004; Plant & Sachs-Ericsson, 2004). In a longitudinal sample of nearly 5,000 parent-child dyads, 48% of non-Hispanic African American and 26.4% of Hispanic mothers exhibited symptoms of depression (Turney, 2012). The findings illustrate the substantial proportions of racial minorities who experience depressive symptoms.

Moreover, minority children's academic outcomes in adolescence are negatively affected due to several reasons such as school composition (NAEP, 2015) and social conditions such as racism and poverty (Adair, 2015; Bowman, 2018). However, the role of maternal depressive symptoms experienced in childhood as influencing academic outcomes has been much less examined. The impact of ACEs experienced earlier in childhood might have a more negative impact on educational outcomes in adolescence due to exposure during critical developmental years (Evans et al., 2020; Nelson & Gabard-Durnam, 2020; Schroeder et al., 2020), though little research examines the impact of timing.

Thus, the aim of the present study is to examine the impact of maternal depressive symptoms during different ages in childhood on the academic achievement of racial minority adolescents. The present study is guided by the following research questions:

1. Does exposure to maternal depressive symptoms earlier in childhood (Year 3 versus Year 9) result in worse academic outcomes at Year 15 among African American youth?
2. Does exposure to maternal depressive symptoms earlier in childhood (Year 3 versus Year 9) result in worse academic outcomes at Year 15 among Hispanic youth?
3. Does the strength of the association between the timing of maternal depressive symptoms and Year 15 academic outcomes differ between African American and Hispanic youth?

## CHAPTER II: THEORETICAL FRAMEWORK

This study is framed in the life course perspective, which enables examination of how experiences earlier in life shape subsequent outcomes, within the social context. As defined by the World Health Organization, “health” is a state of complete physical, mental, and social well-being and not simply the absence of disease (Burton-Jeangros et al. 2015). The term health further denotes the ability to adapt and to self-manage (Burton-Jeangros et al., 2015). Exposure to ACEs directly infringes on an individual's health and well-being by compromising their physical, mental, and social well-being, and by affecting their ability to adapt over time. Additionally, exposure to maternal depressive symptoms, a notable ACE, impacts a child's cognitive (Kiernan & Mensah, 2009; Lui et al., 2017; Pettersen & Alber, 2001) and behavioral functioning (Civic & Holt, 2000) at the time of exposure and subsequently.

Life course theory, also known as the life course perspective, is a paradigm for the study of people's lives, structural contexts, and social change over time. A life course refers to a series of socially defined events and roles that an individual enacts over time (Elder et al., 2015; Hutchinson, 2015). A defining factor of the life course perspective is its emphasis on context. Elder et al. (2015) defines context as the social embedding of individuals in the various environments they inhabit. In addition to this social embeddedness, individuals occupy various ecological systems and different dynamics in the form of cumulative processes which may result in advantages and disadvantages through the life course (Bronfenbrenner, 1979; Elder et al., 2015).

The social life of individuals is embedded within their specific birth cohorts and ecological dynamics (Elder et al., 2015). The sample of African American and Hispanic youth in the current study are all within the same birth cohort and were raised in large U.S. cities. Elder et al. (2015) argues that these ecological dynamics such as interactions within the micro-, meso-, and macrosystem, may result in amassed inequality or disadvantage for some

individuals that accumulate over the life course. Some of the contributors to cumulative disadvantages noted by Elder et al. (2015) are what Felitti et al. (1998) considers adverse childhood experiences. Maternal depressive symptoms can be considered as a contributor to cumulative disadvantage as research has shown that earlier exposure results in subsequent poorer behavioral functioning, cognitive functioning, and school outcomes (Civic & Holt, 2000; Claessens et al., 2015; Kiernan & Mensah, 2009; Lui et al., 2017; Pettersen & Alber, 2001).

Life transitions and trajectories are integral parts of the age and temporality concept of the life course perspective. Transitions refer to a change in roles, and a trajectory refers to one's behavioral pattern over time (Elder et al., 2015). Developmental trajectories and transitions coincide and affect one another. Specifically, an early life transition can have developmental consequences that persist over the life course. Turning points in the life course, defined as a change in social circumstances that alter the life course, have the potential to steer individuals away from a cycle of cumulative disadvantages (Elder et al., 2015). Although often discussed as a positive change, turning points can also be negative and alter a trajectory. Negative turning points such as ACE exposure can alter child outcomes from an adaptive to maladaptive trajectory. In this same vein, exposure to maternal depressive symptoms earlier in life can have lasting negative outcomes into adolescence and young adulthood. The presence of maternal depressive symptoms and the resulting poor maternal parenting behaviors, early in a child's life, directly impacts the child during crucial developmental years (Turney, 2011).

Guided by the life course perspective, the research questions addressed in this proposal are: (1) Does exposure to maternal depressive symptoms earlier in childhood (Year 3 versus Year 9) result in worse academic outcomes at Year 15 among African American youth? (2) Does exposure to maternal depressive symptoms earlier in childhood (Year 3 versus Year 9) result in worse academic outcomes at Year 15 among Hispanic youth? (3) Does the strength of the association between the timing of maternal depressive symptoms and Year 15 academic outcomes differ between African American and Hispanic youth?

## CHAPTER III: LITERATURE REVIEW

### **Maternal Depressive Symptoms and Child Outcomes**

The association between maternal depressive symptoms and adverse child outcomes is well documented in the literature (Beck, 1999; Goodman et al., 2011; Lui et al., 2017).

Depressive symptoms make it difficult for mothers to meet the demands of parenting and they are often less responsive to their children (Albright & Tamis-LeMonda, 2002). Numerous studies suggest an association between maternal depressive symptoms and child behavioral outcomes (Ahun et al., 2018; Kouros & Garber, 2010; McCarthy & McMahon, 2003). Specifically, exposure to maternal depressive symptoms is associated with internalizing and externalizing problem behaviors during childhood (Ahun et al., 2018; Allen et al., 2010). Further, Gueron-Sela et al. (2018) found a longitudinal association between maternal depressive symptoms during toddlerhood and lower executive functioning in preschool. Additionally, maternal depressive symptoms appear related to poorer cognitive development in early childhood (Lui et al., 2017).

Academic performance during adolescence is crucial for positive adjustment as it captures both cognitive and personality traits that are relevant for success later in life (Bechtiger 2021), and positive and supportive parenting are needed to ensure the positive adjustment of youth. Exposure to maternal depressive symptoms in childhood may have long lasting negative associations with adolescent academic performance (Bechtiger et al., 2021). Maternal depressive symptoms are related to lower scores in math and reading for kindergarten and third grade youth (Dahlen, 2016). Further, persistent maternal depression is associated with more negative school related outcomes such as lower academic achievement and school attendance (Claessens et al., 2015). However, a gap in the literature exists regarding the impact of maternal depressive symptoms experienced in childhood on the educational performance of racial/ethnic minority adolescents. The current study aims to address this gap.

## **The Timing of Maternal Depressive Symptoms and Child / Youth Outcomes**

Existing literature on the developmental impact of the timing of adverse events shows that higher frequency of adversity in early childhood has been associated with an increased likelihood of behavior problems in middle school (Schroeder et al., 2020). Additionally, exposure to maternal depressive symptoms have been correlated with language and cognitive deficits during infancy and early childhood (Kiernan & Mensah, 2009; Pettersen & Alber, 2001). Children exposed to maternal depression in early childhood are also at greater risk for experiencing developmental vulnerabilities related to social competence and emotional maturity at school entry compared to their non-exposed peers (Wall-Wieler et al., 2020). This may in turn affect academic performance over the course of their schooling. Few studies have addressed exposure to depressive symptoms during early life and academic achievement during adolescence.

A portion of the maternal depressive symptom literature has examined exposure during middle childhood. While this literature base is not as vast as the literature on exposure during early childhood, it does suggest adverse outcomes in response to exposure. As prior literature suggests, maternal depressive symptoms are associated with internalizing behaviors in youth during middle childhood (Ahun et al., 2018). Internalizing behaviors (depression and anxiety) are highly prevalent and have a tendency to increase with age (CDC, 2021). Given this, these symptoms often arise during middle childhood years. While few studies such as Brennen et al. (2000) have explicitly examined the impact of earlier versus later timing of maternal depressive symptoms exposure on child outcomes, the literature points to earlier exposure being more impactful (Kiernan & Mensah, 2009; Schroeder et al., 2020; Wall-Wieler et al., 2020). The present study aims to add to the evidence that exposure to maternal depressive symptoms earlier in life (Year 3) are more impactful on academic outcomes in adolescence compared to exposure during middle childhood (Year 9).

## **Academic Outcomes among African American and Hispanic Youth**

Both African American and Hispanic youth face cultural and structural issues that affect their developmental and academic outcomes. Scholars have highlighted academic difficulties among African American youth such as low rates of high school completion, more disciplinary actions, and poor academic performance (Davis, 2003; Howard, 2013). Additionally, in 2019 the dropout rate for Hispanic students was 7.7% (NCES, 2021). Further, parenting styles and parental involvement significantly predict academic outcomes among African American and Hispanic students (Altschul, 2011; Taylor et al., 1995).

A large base of literature on African American students and academic outcomes suggests an academic opportunity and achievement gap between African American students and their peers (Bowman et al., 2018). In a 2019 report by the National Center for Education Statistics, African American students had the lowest total SAT score (NCES, 2021). Further, in 2019 the National Assessment of Educational Progress (NAEP) issued a report showing reading and math scores in grades 4, 8, and 12. In all three grades, African American students had the lowest scores in both reading and math (NCES, 2019). These NCES (2019) statistics further emphasize an achievement gap between Hispanic and African American students.

Prior literature suggests that African American families are embedded in sociocultural contexts marked by racism and discrimination (Holloway & Varner, 2021). These discriminatory experiences can affect a parent's psychological and emotional functioning, as well as influence child outcomes. African American mothers who experience or perceive racial discrimination endorse maternal depressive symptomology (Banerjee et al., 2016; Holloway & Varner, 2021). Additionally, depressive symptoms are associated with parental efficacy which can impact child academic outcomes. Among a sample of African American mothers and their children, perceptions of racial discrimination negatively impacted academic efficacy (Banerjee et al., 2016). Feelings of depression can inhibit a parent's sense of their abilities about themselves as

well as their child. These feelings may shift onto their child and affect the child's perception of their ability to succeed academically (Banerjee et al., 2016).

Warm and cognitively engaging homes are optimal for the academic achievement of youth according to ecological theory (Bronfenbrenner, 1986). Experiencing ACEs can be a potential negative turning point, leading to a negative academic trajectory. In a national sample of African American mothers and their children, maternal depressive symptoms were negatively related to maternal warmth (Baker & Iruka, 2013). Specifically, the presence of maternal depressive symptoms impacted African American mother's ability to engage in warm parenting behaviors such as hugging and kissing their child. Additionally, maternal depressive symptoms were correlated with parenting stress which negatively affected maternal warmth and cultural socialization (Baker & Iruka, 2013). Racial/cultural socialization is a defining feature of parenting among African American families (Coard & Sellers, 2005). African American youth whose mothers conveyed racial socialization messages to them have better academic skills than youth whose mothers who do not (Coard et al., 2007; O'Brien et al., 2002). Further, among African American mothers, maternal depressive symptoms were negatively associated with children's reading and math achievement in kindergarten (Baker & Iruka, 2013).

There are fewer studies that specifically examine the academic outcomes of Hispanic youth compared to studies on African American youth. However, reports from the National Center of Education Statistics, suggest that Hispanic students do receive lower achievement scores in reading and math compared to their White peers (NCES, 2019). Further, although in the fall of 2015, 60 percent of students enrolled in public schools were Hispanic, in 2016 Hispanic adults had the highest rate of high school non-completion at 33 percent compared to 8 percent for White adults and 17 percent for American Indian/Alaska Native adults (de Brey et al., 2019).

Like the research on African American families, the literature on Hispanic families suggests that parental involvement is associated with educational outcomes for youth. In a

national sample of Mexican American students, parenting factors such as educational resources in the home, parents and children engaging in enriching activities together, and parents discussing school matters were all positively related to academic outcomes in grade 10 (Altschul, 2011). Students who had parents with higher levels of academic involvement and engagement received higher test scores compared to students with lower levels of parental involvement. These findings are consistent with findings from the literature on African American families. While prior studies on African American families and school outcomes highlight warm and positive home environments as a predictor of academic achievement, findings from Altschul (2011) also emphasize the importance of the home environment for Hispanic youth.

Less research has examined between-group variations among minority youth regarding the impact of maternal depressive symptoms experienced in childhood on adolescent educational outcomes. The current study aims to address this gap. Given the reports by the National Center for Educational Statistics, it is apparent that there is an achievement gap between African American and Hispanic students. While both racial minority students face barriers that result in lower academic achievement, African American students have consistently scored the lowest in reading and math for a number of years. Moreover, there appear to be differences in family context, maternal depressive symptoms, and ethnic socialization between these two communities (Brown et al., 2003; Gorman-Smith et al., 2000; Hughes, 2003). Hence, the current study aims to investigate the association of maternal depressive symptom exposure in early and middle childhood, and academic outcomes in adolescence for both African American and Hispanic youth. In light of the trend of lower test scores for African American youth, I examine whether African American youth have a stronger negative association between maternal depressive symptom exposure and academic outcomes in adolescence, as compared to Hispanic youth.

## Current Study

The goal of the current study is to examine the relationship between the timing of adverse childhood experiences and academic outcomes for African American and Hispanic youth. Specifically, the current study seeks to examine one measure of household dysfunction experienced in childhood: maternal depressive symptoms, and its impact on academic outcomes for African American and Hispanic adolescents, to highlight within group differences. I've chosen this single measure of household dysfunction because (1) it is one of the four ACEs originally measured in the pioneering study by Felitti et al. (1998) (2) this association is less examined in the literature, and (3) the analysis will highlight the impact of one single factor. Further, I've chosen to only examine African American youth and Hispanic youth in response to the disproportionate rates racial/ethnic minorities experience ACEs, to explore within-group differences and variation, and to fill a gap in the maternal depressive symptoms literature. The current study aims to explore the following research questions:

1. Does exposure to maternal depressive symptoms earlier in childhood (Year 3 versus Year 9) result in worse academic outcomes at Year 15 among African American youth?
2. Does exposure to maternal depressive symptoms earlier in childhood (Year 3 versus Year 9) result in worse academic outcomes at Year 15 among Hispanic youth?
3. Does the strength of the association between the timing of maternal depressive symptoms and Year 15 academic outcomes differ between African American and Hispanic youth?

Based on the above literature review, I hypothesize the following:

H1: Exposure to maternal depressive symptoms earlier in life (Year 3) will result in worse academic outcomes at Year 15 for African American youth.

H2: Exposure to maternal depressive symptoms earlier in life (Year 3) will result in worse academic outcomes at Year 15 for Hispanic youth.

H3: African American students will show a stronger negative association between maternal depressive symptom exposure at Year 3 and academic outcomes at Year 15 compared to Hispanic youth.

## CHAPTER IV: METHODS

### **Data**

The study utilizes data from The Fragile Families and Child Wellbeing Study (FFCWS). This national study has a longitudinal sample of nearly 5,000 children born between 1998 and 2000 across 20 large U.S. cities. Children in the study were identified via stratified random sampling with purposeful oversampling of nonmarital births. Data were collected from parents and/or primary caregivers and focal children at birth, ages 3, 5, 9, and 15. The 'focal child' is the child born during baseline data collection from 1998-2000. During each wave a phone interview was conducted, and additional in-home interviews were given to mothers and their children.

Data from the current study came from interviews at birth, year 3, 9, and 15. The subsample for this study was limited to only non-Hispanic African American and Hispanic families (N=3,662), where race was measured by the mother's self-report at baseline. The subsample was further limited to African American and Hispanic families who participated in year 15 interviews. The resulting sample (N=2,568) consists of 1,722 African American families and 846 Hispanic families. 76.3% of the mothers in the subsample were not married to their child's biological father at the time of the year 3 interview. Additionally, 85.7% of the mothers in the sample were born in the United States and 70.1% had more than a high school education.

### **Academic Outcomes**

The dependent variables capture overall academic performance and use data from the Year 15 adolescent survey wave. Academic outcomes are indicated by two measures: (1) academic achievement (grade difficulties) and (2) academic performance (behavior difficulties). The first measure captures grade difficulties in each of the four core subjects, English, Math, Science, and Social Studies. Grades are calculated on a 4 point scale: A = 1, B = 2, C = 3, D or lower = 4. The grades were averaged together and higher scores on this item indicate greater grade difficulties or poorer academic achievement. This is a continuous variable.

The second outcome measure is also continuous and assesses trouble at school using four statements: “trouble paying attention in school”, “trouble getting along with teachers” and “trouble getting homework done” and “trouble getting along with other students. Response categories for each range from 1=Never to 3=Often. These four items were averaged together to assess overall academic performance. Higher scores indicate greater trouble of behavior difficulties. Cronbach’s alpha for this measure is  $\alpha = 0.65$ .

### **Maternal Depressive Symptoms**

Maternal depressive symptoms consist of a series of questions from the Composite International Diagnostic Interview- Short Form (CIDI-SF) (Kessler et al., 1998). The CIDI-SF consists of thirty-three questions, however in the Fragile Families and Child Wellbeing Study only fifteen questions were used. The CIDI-SF provides the probability of a respondent being a “case” (i.e., having major depression) if the full CIDI were administered.

Screening questions were used to assess if the mother experienced feelings of sadness (dysphoria) or no longer enjoyed things that were normally pleasurable (anhedonia) for 2 weeks or more during the past 12 months. Using the scoring procedures outlined by Kessler et al. (1998), each screening question requires the respondent to report two weeks of symptoms lasting at least half of the day and almost every day.

If the respondent answered yes to either of two screening questions, they were asked seven follow-up questions about their depressive symptoms. These seven items included: trouble concentrating, losing interest, feeling tired, change in weight, trouble sleeping, feeling worthless, and thinking about death. Using Kessler et al. (1998) criteria, scores on the CIDI-SF range from 0-8, and respondents who score 3 or higher are coded as 1 = probable depression. Those who score lower than 3 are coded as 0 = no probable major depression. Those who answered ‘no’ to both the screening questions were included in the ‘0’ group. Thus, this is a dichotomous variable to represent the ‘caseness’ or likelihood of probable major depression.

## **Controls**

Control variables include child sex at baseline, maternal poverty status at year 3, maternal education level at year 3, mother's country of origin, and mother's marital status at year 3.

Child sex at baseline is coded as 0=male and 1=female. . Maternal poverty status at year 3 was dichotomized as 0 = < 100% and 1 = ≥100% of the poverty threshold. FFCWS calculated the year 3 poverty threshold based on mother and father reports of household size and composition in that wave.

Maternal education level is divided into the following categories: less than high school, high school or equivalent, some college or technical school, college or graduate school. Each category is coded as a separate variable and dichotomized. For example, less than high school is coded as 0 = no and 1 = yes.

Maternal marital status is dichotomized as 0 = married to the biological father and 1 = not married to the biological father.

Lastly, mother's country of origin was dichotomized as 0 = born in the U.S. and 1 = born outside of the U.S.

## **Analysis**

All analyses were conducted using Mplus version 8.6 (Muthén & Muthén, 2015) and missing data were addressed using full information maximum likelihood (FIML). FIML is one of the most appropriate missing data estimation techniques as it has been shown to produce unbiased parameter estimates and standard errors (Enders & Bandalos, 2001). The relationships between maternal depressive symptoms earlier in childhood and academic outcomes in adolescence were assessed through multivariate regression techniques.

First, descriptive statistics and bivariate correlations were computed for all variables used in the analysis: academic performance, academic achievement, maternal depressive

symptoms, and control variables. Second, using multivariate linear regression, academic achievement (grade difficulties) and academic performance (behavior difficulties) were regressed on maternal depressive symptoms at year 3 and year 9, along with the control variables, to analyze research question 1 and 2. Academic achievement and academic performance were each regressed in separate models while controlling for covariates among both the African American and Hispanic sample.

Next, using the combined subsample of African American and Hispanic families, an interaction term was added to the aforementioned models to analyze research question 3. Academic achievement (grade difficulties) was regressed on maternal depressive symptoms at year 3 and year 9, along with the interaction of race and depressive symptoms at each time point, main effects, and control variables. The same model was run with academic performance (behavior difficulties). All models included in the analyses were standardized in Mplus.

## CHAPTER V: RESULTS

### Preliminary Analyses

#### Descriptive Statistics and Correlations

The final analytic sample consisted of 2,568 African American and Hispanic families. Table 1 presents the descriptive statistics for adolescent outcomes, childhood hardships, and covariates among the full subsample and separately for African American and Hispanic families. Panel A describes adolescent educational outcomes at age fifteen, specifically academic achievement and performance. Bivariate associations were conducted using Pearson correlations and ANOVAs. Bivariate associations revealed that the means for achievement (grade difficulties) and performance (behavior difficulties) were significantly different across racial groups. Specifically, African American students had higher averages in both achievement and performance at year 15 compared to their Hispanic peers. Higher averages on both academic measures indicate greater difficulties.

Panel B describes maternal depressive symptoms at ages 3 and 9. For maternal depressive symptoms at year 3, the means significantly differed by race. Notably, African American mothers reported significantly higher rates of depressive symptoms compared to Hispanic mothers. At year 9, rates of maternal depressive symptoms decreased for both African American and Hispanic mothers, and the racial differences are no longer statistically significant.

Panel C details all childhood covariates including child sex, maternal poverty status, maternal education level, maternal marital status, and mother's country of origin. African American and Hispanic mothers did not vary greatly in terms of poverty status. There were no significant differences in the means of maternal poverty status by race among the sample. The averages for maternal education were significantly higher for African American mothers compared to Hispanic Mothers, specifically for the following education levels: less than high school, high school or equivalent, and some college or technical school. Additionally, the

means of maternal marital status and mother's country of origin were significantly different by race. African American mothers were less likely to be married to their child's biological father at year 3 and to be born outside of the United States, compared to Hispanic mothers.

## **Primary Analyses**

### **Hypothesis Testing**

#### ***Research Question 1***

Table 2 presents multivariate linear regression results among the subsample of African American families. At year 3, maternal depressive symptoms were significantly related to lower academic performance (behavior difficulties) for African American youth ( $\beta = 0.06, p < 0.04$ ), partially supporting hypothesis 1. No significant relationships were found between maternal depressive symptoms at year 3 and academic achievement (grade difficulties), or between maternal depressive symptoms at year 9 and either academic outcome for African American youth. Additionally, a significant negative relationship was found for mother's country of origin and both academic achievement (grade difficulties) ( $\beta = -0.06, p < 0.02$ ) and academic performance (behavior difficulties) ( $\beta = -0.08, p < 0.00$ ) for African American youth. Being born outside the U.S. was coded as 1, suggesting that children of foreign-born African American mothers could have fewer academic difficulties. A significant positive association of mother's marital status was found for both academic achievement (grade difficulties) ( $\beta = 0.05, p < 0.04$ ) and academic performance (behavior difficulties) ( $\beta = 0.06, p < 0.02$ ). Non married mothers were coded as 1, suggesting that their children had more academic difficulties.

#### ***Research Question 2***

Table 3 presents multivariate linear regression results among the subsample of Hispanic families. A significant negative relationship was found between maternal depressive symptoms at year 3 and academic performance (behavior difficulties) for Hispanic youth ( $\beta = 0.08, p <$

0.03), partially supporting hypothesis 2. No significant relationships were found between maternal depressive symptoms at year 3 and academic achievement (grade difficulties) ( $\beta = 0.05, p < 0.22$ ), or between maternal depressive symptoms at year 9 and either academic outcome for Hispanic youth ( $\beta = 0.00, p < 0.92$ ) ( $\beta = 0.06, p < 0.11$ ). In these analyses, the coefficient for mother's country of origin was not significant for either grade difficulties ( $\beta = -0.02, p < 0.69$ ) or behavior difficulties ( $\beta = 0.02, p < 0.62$ ). Mother's marital status was significantly and positively associated with academic achievement (grade difficulties) ( $\beta = 0.05, p < 0.04$ ) and not for academic performance (behavior difficulties) ( $\beta = 0.02, p < 0.56$ ), indicating that children of non-married Hispanic mothers had more grade difficulties.

### **Research Question 3**

In the next set of analyses, a multivariate linear regression model estimated academic achievement and performance at year 15 based on maternal depressive symptoms at year 3 and 9 among the combined sample (Table 4). The model included interaction terms between race and maternal depressive symptoms at both time points. Hypothesis 3 was not supported. The interaction between race and maternal depressive symptoms at year 3 was not significantly associated with either academic achievement (grade difficulties) ( $\beta = -0.04, p < 0.34$ ) or performance (behavior difficulties) ( $\beta = -0.02, p < 0.57$ ). Similarly, the interaction of race and maternal depressive symptoms at year 9 was not significantly associated with achievement (grade difficulties) ( $\beta = 0.03, p < 0.46$ ) or performance (behavior difficulties) ( $\beta = -0.03, p < 0.54$ ). In these analyses, the coefficients for the mother being foreign-born were not significant ( $\beta = -0.04, p < 0.09$ ) ( $\beta = -0.03, p < 0.21$ ). The coefficient for mother's marital status was significant and positive for academic achievement (grade difficulties) ( $\beta = 0.06, p < 0.00$ ) and academic performance (behavior difficulties) ( $\beta = 0.05, p < 0.02$ ) suggesting that in the combined sample, children of non-married mothers had more academic difficulties.

## CHAPTER VI: DISCUSSION

The current study aimed to better understand how the timing of experiencing maternal depressive symptoms during early and middle childhood relate to academic outcomes in adolescence, specifically among minority youth. Prior research has provided some evidence for how maternal depressive symptoms impact child outcomes, but outcomes among minority youth are understudied. Much of the literature on maternal depressive symptoms has focused on its impact on behavioral outcomes for youth (Ahun et al., 2018; Kouros & Garber, 2010; McCarthy & McMahon, 2003), whereas academic outcomes have been studied less frequently. As a result, we lack understanding of the ways in which maternal depressive symptoms uniquely affect racial and ethnic minority youth and their education. This study addressed gaps in the literature by examining academic outcomes in only African American and Hispanic youth, by incorporating a longitudinal perspective, and investigating two childhood age points of experiencing maternal depressive symptoms, as well as whether the timing of depression impacted outcomes differently for African American and Hispanic youth

Bivariate associations revealed significant differences in academic outcomes among African American and Hispanic students at age 15. Compared to Hispanic students, African American students had lower averages in both academic achievement (grade difficulties) and academic performance (behavior difficulties). This finding is consistent with reports from the National Center for Education Statistics (NCES). NCES reports show that African American students receive the lowest overall SAT, reading, and math scores (NCES, 2019; 2021). Many scholars have investigated factors unique to African American students that contribute to lower academic achievement and performance such as the intersection of racism and classism, stereotypes of African American youth, and poverty (Bowman et al., 2018; Davis, 2003; Douglas et al., 2008; Rowley et al., 2014). For Hispanic youth, prior literature has examined factors such

as stereotype threat and self-fulfilling prophecies (Guyll et al., 2010) that contribute to lower academic achievement and performance.

Further, bivariate associations revealed significant differences in maternal depressive symptoms between African American and Hispanic mothers at year 3. In the current study, African American mothers reported significantly higher rates of depressive symptoms at year 3 compared to Hispanic mothers. Few studies have specifically compared African American and Hispanic women on maternal depressive symptoms. However, research has shown that while Hispanic mothers have a higher prevalence of depressive symptoms compared to the general population (Harris & Santos, 2020), African American mothers may be hampered by depressive symptoms as they often lack resources to cope with these experiences (Banerjee et al., 2016). The current findings were found among a sample of low-income African American and Hispanic Mothers. Future research should examine specific processes, structural, and cultural differences between African American and Hispanic mothers that could explain these differences. Future research should also investigate if similar outcomes are present for mothers across different socioeconomic statuses. Additionally, the current study noted differences in sample size and rates of maternal depressive symptoms between year 3 and year 9. Both African American and Hispanic mothers reported lower depressive symptoms at year 9 compared to year 3 and the significant difference between the two groups vanished. Future research should examine these trends in more detail.

Research Questions 1 and 2 examined the association between maternal depressive symptoms at two childhood age points and academic outcomes for African American and Hispanic youth respectively. Findings were consistent with prior literature. Maternal depressive symptoms at year 3 were associated with poorer academic outcomes at year 15 for African American youth and Hispanic youth, while maternal depressive symptoms at year 9 had no impact above and beyond symptoms at year 3. Thus, it seems that maternal depressive symptoms are more impactful on child outcomes when experienced earlier in childhood. In

terms of child development, adversity earlier in life (year 3) appears to be more impactful on later outcomes compared to adversity later in life (year 9) (Duncan et al., 2012; Dunn et al., 2019; Nelson & Gabard-Durnam, 2020; Schroeder et al., 2020).

Specifically, these results are consistent with previous findings that maternal depressive symptoms earlier in childhood are associated with adverse outcomes later in life (Ahun et al., 2018; Bechtiger et al., 2021; Dahlen, 2016). This is consistent with prior literature that suggests adverse behavioral outcomes and an increase in externalizing behavior among youth, in response to maternal depressive symptoms (Ahun et al., 2018; Kouros & Garber, 2010; McCarthy & McMahon, 2003). Notably, for both African American and Hispanic youth, only academic performance (behavior difficulties) was negatively associated with maternal depressive symptoms at year 3. Thus, it appears that for minority youth, while experiencing maternal depressive symptoms at age 3 may not impact actual grades, it nonetheless affects behaviors at age 15 that contribute to the existing education gap (Gregory et al., 2010; Skiba et al., 2011). Maternal depressive symptoms experienced earlier in the child's life may affect parenting behaviors during critical developmental years (Turney, 2011). A lack of warm and responsive parenting behaviors (resulting from maternal depression) could lead to increases in externalizing and problem behaviors among children, thus affecting how youth behave in school.

Notably, mothers' country of origin significantly predicted both academic outcomes for African American youth. This association was not present for Hispanic youth. Prior literature has noted an immigrant paradox wherein U.S. born youth have less optimal developmental outcomes compared to immigrant youth (Marks et al., 2014). African American youth whose mothers were born outside of the U.S. had fewer grade and behavior difficulties. Although a higher percentage of Hispanic mothers were born outside the U.S., this same association was not found for Hispanic students. This may be due to other factors such as acculturative stress

and school belonging that affect academic outcomes among Hispanic youth (Roche & Kuperminc, 2012).

Research Question 3 examined whether the strength of the association between the timing of maternal depressive symptoms and year 15 academic outcomes differed significantly by race, and no significant associations were found. Maternal depressive symptoms at year 3 and year 9 did not significantly differ in impact on educational achievement in adolescence in African American vs Hispanic youth. This suggests that exposure to maternal depressive symptoms exerts similar influence on the academic outcomes of both African American and Hispanic youth. Specifically, when minority youth are raised in the United States they are subjected to forms of public education where teachers often are not equipped to support students from diverse backgrounds and societal inequality shapes educational attainment, thereby furthering the existing opportunity and education gap (Douglas et al., 2008). In accordance with the life course theory, adverse experiences at age 3 as opposed to age 9 may have acted as a turning point and influenced the academic trajectory of African American and Hispanic youth in the sample (Elder et al., 2015).

In the two separate race group analyses and the combined sample analyses, children of non-married mothers experienced worse academic outcomes at age 15 for most indicators. This finding is in line with other research showing that children of single mother's experience poorer academic outcomes (Pong et al., 2003), it also suggests that single mother families need additional economic and family resources to support their children to succeed (Nieuwenhuis & Maldonado, 2018).

The findings of the current study also have implications for future research. Prior research has largely compared African American and Hispanic students to their White peers. The current study advances the field by only examining African American and Hispanic students, thus highlighting commonalities and differences between the two minority racial/ethnic groups. Future research should focus on centering the voices of African American and Hispanic

students, rather than comparing them to their White peers. By moving away from a deficit model and decentering White samples, researchers can begin to identify factors that have stymied educational progress among minority students. There is a need for a strengths-based perspective when investigating academic performance among African American and Hispanic students. Research should investigate individual differences and resilience processes among minority. Additionally, future work should aim to conduct needs assessments to identify the type of school supports that minority students need to close existing achievement gaps.

### **Policy and Practice Implications**

The findings of the current study indicate that maternal depressive symptoms at year 3 are more influential on year 15 academic outcomes than depressive symptoms at year 9. These findings have important implications for maternal health policies. There is evidence that maternal depressive symptoms can make it hard to meet the demands of parenting and can result in maladaptive parenting behaviors (Lovejoy et al., 2000; Turney, 2011). As many of the mothers in the current study are unmarried, the responsibilities associated with parenting fall solely on them. Additionally, the sample contained low-income mothers who may have had limited access to childcare and other forms of instrumental support. Access to formal childcare and early childhood education can alleviate some of the stress associated with parenting, and potentially buffer the negative effects of maternal depressive symptoms (Herba et al., 2013; Lee et al., 2006). Future policies should support the implementation of universal childcare and early childhood education programs to provide additional support to mothers.

These findings also have implications regarding the quality of childcare programs. The findings of the current study note an association between maternal depressive symptoms at year 3 and behavior difficulties. Childcare programs should not only include developmentally appropriate practices and policies, but also be cognizant of culture and socialization practices. Research has noted how cultural models of childrearing may contrast with the practices of

childcare providers (Holloway et al., 1995). Future interventions and policies should adopt a culturally sensitive lens to identify how best to support the socialization of minority youth.

Further, racial minority women experience high rates of depressive symptoms, yet are the least likely to receive treatment and mental health services (Bromberger et al., 2004; Plant & Sachs-Ericsson, 2004). Future policies should focus on making mental health services and supports more accessible for diverse communities. Additionally, many racial minority individuals face barriers such as stigma, prejudice, and discrimination that bar them from seeking out mental health services (Gary, 2005). Future policies and policymakers should work to disentangle the complexities related to health disparities to combat the stigma that exists in diverse communities.

### **Limitations**

Several limitations should be considered when interpreting the findings from this study. First, this study utilized a dichotomous measure of maternal depressive symptoms which highlights 'caseness' of maternal depressive symptoms. As a result, differences based on the number of depressive symptoms the mother experienced were not captured. Second, this study could not examine protective factors among African American or Hispanic youth. By not incorporating a strength-based approach, these findings may not accurately represent the lived experiences of minority youth. Third, this study cannot establish causality between maternal depressive symptoms and academic outcomes because the analyses are correlational. Randomized control trials of maternal depressive symptoms would be unethical to establish causality, therefore future research could incorporate different causal methods. Lastly, this study did not control for contextual factors such as region as it was not the focus of the study. As individuals are socially embedded in their environments, extraneous contextual factors could have influenced the current findings.

## **Conclusion**

The current study provides further information about the role of maternal depressive symptoms experienced at different childhood time points on academic outcomes for African American and Hispanic youth. The current study also extends previous findings by only examining African American and Hispanic youth. Consistent with previous research, the findings support the notion that maternal depressive symptoms earlier in childhood are more impactful on later outcomes (Ahun et al., 2018; Bechtiger et al., 2021; Gueron-Sela et al., 2018). Additionally, findings suggesting poorer academic outcomes for African American youth are consistent with prior research (NCES, 2019; 2021). These findings provide valuable insight but also raise important questions regarding research on African American and Hispanic youth, educational policies, and maternal health and social safety net policies and programs. Focusing solely on minority youth and their academic outcomes has the potential to inform educators, policymakers, and researchers about the factors and processes specific to the learning and opportunities of minority youth.

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APPENDIX A: TABLES

**Table 1. Descriptive Statistics for Child and Mother Characteristics**

	<b>Full Sample at Year 15 (N = 2568)</b>				<b>African American at Year 15 (N = 1722)</b>				<b>Hispanic at Year 15 (N = 846)</b>				<b>Difference</b>
	N	Range	Mean or %	(SD)	N	Range	Mean or %	(SD)	N	Range	Mean or %	(SD)	
<b><u>Panel A. Adolescent Outcome at Age 15</u></b>													
<b>Academic Outcomes</b>													
Achievement	2,511	1-4	2.21	(0.65)	1,680	1-4	2.25	(0.63)	831	1-4	2.13	(0.67)	**
Performance	2,532	1-3	1.83	(0.48)	1,700	1-3	1.84	(0.48)	832	1-3	1.79	(0.49)	*
<b><u>Panel B. Adverse Childhood Experiences at Age 3 and 9</u></b>													
<b>Maternal Depressive Symptoms</b>													
Year 3	2,363	0-1	21%		1,599	0-1	23%		764	0-1	18%		**
Year 9	2,397	0-1	17%		1,626	0-1	17%		771	0-1	15%		
<b><u>Panel C. Childhood Controls at Birth and Age 3</u></b>													
<b>Controls</b>													
<i>Child Sex at Baseline</i>	2,568				1,722				846				
Male			50.8%				50.8%				50.8%		
Female			49.2%				49.2%				49.2%		
<i>Mother's Poverty Status</i>	2,367	0-1	-		1,602	0-1	-		765	0-1	-		
Below 100%			48.3%				49.2%				46.4%		
At or Above 100%			51.7%				50.8%				53.6%		
<i>Mother's Education</i>	2,365		-		1,600		-		765		-		
Less than HS			29.8%				24.5%				40.9%		**

Highschool or Equivalent			31.2%			33.3%			26.9%	**
Some College or Technical School			32.6%			35.7%			26.3%	**
College or Graduate School			6.3%			6.6%			5.9%	
<i>Mother's Marital Status</i>	2,365	0-1		1,600	0-1		765	0-1		**
Married			23.6%			17.3%			36.9%	
Not Married			76.3%			82.7%			63.1%	
<i>Mother's Country of Origin</i>	2,561	0-1		1,715	0-1		846	0-1		**
Born in US			85.7%			96.5%			63.7%	
Born outside US			14.3%			3.5%			36.3%	

**Note: Differences by Race are significant at \* p < 0.05, \*\* p < 0.01**

**Table 2. Multivariate Regression Analysis for African American Youth**

<i>Multivariate Regression Results for the Association of Maternal Depressive Symptoms and Academic Outcomes for African American Youth</i>						
	Achievement (Grade Difficulties)			Performance (Behavior Difficulties)		
	$\beta$ (Estimate)	Standard Error	p Value	$\beta$ (Estimate)	Standard Error	p Value
<b>Maternal Depressive Symptoms</b>						
Year 3	0.00	0.03	0.93	0.06	0.03	0.04
Year 9	0.03	0.04	0.25	0.04	0.03	0.16
<b>Controls</b>						
Maternal Poverty Status	-0.04	0.03	0.17	-0.03	0.03	0.36
Maternal Marital Status (Married reference category)	0.05	0.03	0.04	0.06	0.03	0.02
Mother's Country of Origin (Born in US reference category)	-0.06	0.02	0.02	-0.08	0.02	0.00
<b>Child Sex (Male reference category)</b>						
Female	-0.14	0.02	0.00	-0.01	0.02	0.72
<b>Maternal Education (Less than HS reference category)</b>						
High School or Tech School	-0.13	0.03	0.00	-0.06	0.03	0.08
Some College	-0.13	0.03	0.00	-0.02	0.03	0.59
College or Graduate School	-0.11	0.03	0.00	-0.03	0.03	0.28
R-Square	(0.05)	-	0.00	(0.03)	-	0.00

**Table 3. Multivariate Regression Analysis for Hispanic Youth**

<i>Multivariate Regression Results for the Association of Maternal Depressive Symptoms and Academic Outcomes for Hispanic Youth</i>						
	Achievement (Grade Difficulties)			Performance (Behavior Difficulties)		
	$\beta$ (Estimate)	Standard Error	p Value	$\beta$ (Estimate)	Standard Error	p Value
<b>Maternal Depressive Symptoms</b>						
Year 3	0.05	0.04	0.22	0.08	0.04	0.03
Year 9	0.00	0.04	0.92	0.06	0.04	0.11
<b>Controls</b>						
Maternal Poverty Status	-0.06	0.04	0.11	-0.07	0.04	0.06
Maternal Marital Status ( <i>Married reference category</i> )	0.05	0.03	0.04	0.02	0.04	0.56
Mother's Country of Origin ( <i>Born in US reference category</i> )	-0.02	0.04	0.69	0.02	0.04	0.62
<b>Child Sex (Male reference category)</b>						
Female	-0.08	0.03	0.02	-0.07	0.03	0.05
<b>Maternal Education (Less than HS reference category)</b>						
HS or Tech School	-0.02	0.04	0.55	0.02	0.04	0.71
Some College	-0.02	0.04	0.70	0.03	0.04	0.52
College or Graduate School	-0.12	0.04	0.00	-0.02	0.04	0.55
R-Square	(0.04)	-	0.00	(0.03)	-	0.02

**Table 4. Multivariate Regression Analysis for Interaction**

<i>Multivariate Regression Results for the Interaction of Maternal Depressive Symptoms and Race on Academic Outcomes for African American and Hispanic Youth</i>						
	Achievement (Grade Difficulties)			Performance (Behavior Difficulties)		
	$\beta$ (Estimate)	Standard Error	p Value	$\beta$ (Estimate)	Standard Error	p Value
<b>Maternal Depressive Symptoms</b>						
Year 3	0.05	0.04	0.22	0.08	0.04	0.04
Year 9	-0.01	0.04	0.83	0.06	0.04	0.12
Race*MDSYear 3	-0.04	0.04	0.34	-0.02	0.04	0.57
Race*MDSYear 9	0.03	0.04	0.46	-0.03	0.04	0.54
<b>Controls</b>						
Maternal Poverty Status	-0.05	0.02	0.04	-0.04	0.02	0.05
Maternal Marital Status (Married reference category)	0.06	0.02	0.00	0.05	0.02	0.02
Mother's Country of Origin (Born in US reference category)	-0.04	0.02	0.09	-0.03	0.02	0.21
<b>Mother's Race (Hispanic reference category)</b>						
African American	0.07	0.03	0.01	0.03	0.03	0.22
<b>Child Sex (Male reference category)</b>						
Female	-0.12	0.02	0.00	-0.03	0.02	0.17
<b>Maternal Education (Less than HS reference category)</b>						
HS or Tech School	-0.09	0.03	0.00	-0.04	0.03	0.14
Some College	-0.09	0.03	0.00	-0.01	0.03	0.80
College or Graduate School	-0.11	0.02	0.00	-0.03	0.02	0.18
R-Square	(0.05)	-	0.00	(0.02)	-	0.00

**Note:** "Race\*MDSYear 3" and "Race\*MDSYear 9" represent the interaction of maternal depressive symptoms and race at both year 3 and year 9