Maternal Health Status and Early Childbearing:

A Test of the Weathering Hypothesis

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Abstract

The weathering hypothesis states that teen childbearing among African American women is rationalized given greater early exposure to poor physical health and shortened life spans that result from the physical consequences of social inequality in African American communities (i.e., "weathering"). This paper tests a simple yet unexplored test of the basic assumption of the weathering hypothesis: do adolescents use their mother's health status when making fertility decisions? If the weathering hypothesis is correct, poor maternal health and early births should be positively correlated among African Americans but not whites or Hispanics. Using the Panel Survey of Income Dynamics (PSID) we find that daughters whose mothers who have worse self-rated health are more likely to have early non-marital births. Moreover, this effect holds across race and ethnic groups and in fact, maternal self-rated health has the strongest effects among non-Hispanic white and adolescents of "other" race.

INTRODUCTION

Early childbearing, especially as an adolescent, has been labeled by one former President as the country's "most important social problem" (Clinton 1995). Conventional wisdom suggests that having a child as a teenager is detrimental for maternal well-being, especially educational attainment and labor market outcomes, but also for interpersonal outcomes, such as relationship quality with partners and exposure to intimate violence. Many studies confirm such expectations (see Hayes 1987). Empirically, teenage childbearing has been linked to lower levels of completed education (Hotz, Mullin, & Sanders 1997; Fletcher & Wolfe 2009), lower wages and earnings and generally worse labor market outcomes (Chevalier & Viitanen 2003; Klepinger, Lundberg, & Plotnik 1999), and lower rates of marriage and higher overall fertility (Bennet, Bloom, & Miller 1995; Hoffman, Foster, & Furstenberg 1993), although some studies have suggested the negative economic and social consequences of teen pregnancy and childbearing are not as large as once thought (Furstenberg 1991; Lawlor & Shaw 2002; Scally 2002; Rich-Edwards 2002). Even more noteworthy than these negative consequences, however, are the race/ethnic disparities that surround teenage births. In 2007, the live birth rate per 1,000 teens aged 15 to 19 was 27.2 among white youths but 64.2 among African American youths and 81.7 among Hispanic youths (Hamilton, Martin, & Ventura 2009). These race/ethnic differences are also apparent among even younger teens between the ages of 10 and 14. Thus, while it is important to study early childbearing because of its potential life long negative consequences for women, it is also important to study because of its implications for the intergenerational reproduction of race/ethnic inequality and disparities in health and well-being.

Much of the research seeking to account for race/ethnic differences in teenage childbearing focuses on family related factors, such as socioeconomic status. One of the most

popular explanations is the weathering hypothesis (Geronimus 1991). Weathering refers to the physical consequences of social inequality. Specifically, it states that minority women (as well as men) who live in poverty may physically deteriorate more quickly, relative to more advantaged women, as a result of the biological and social processes associated with poverty and racism. The weathering hypothesis, as it pertains to teenage childbearing (Burton 1990; Geronimus 1991, 1992b, 1996, 2001), suggests that teen pregnancy and childbearing among African American women is rationalized given greater early exposure to poor physical health and shortened life spans. Thus early childbearing may represent a more normative act among certain segments of the population based on the poor health status of surrounding adults. The young women in these communities may believe that peak reproductive years should shift to earlier stages in the life course given the rapid aging they perceive.

We propose a simple yet, to date, unexplored test of the basic assumption of the weathering hypothesis at a basic ecological level: does an adolescent's parents' health status predict her odds of experiencing pregnancy and childbirth at a young age? If the weathering hypothesis is correct, we would expect that poor parental health and teen pregnancy are positively correlated among African American youths but that this association will not exist among white teens. Using a subsample of young women from the Panel Survey of Income Dynamics (PSID) we explore how parental self-rated health when a young woman is age 14 is associated with her odds of experiencing a pregnancy before age 20, controlling for other individual, parental, and family level characteristics.

BACKGROUND

Race/Ethnic Differences in Health

Race/ethnic differences in health have been well-documented (Dressler, Osths, & Gravlee 2005; Geronimus et al. 2001; Wong, Shapiro, Boscardin, and Ettner 2002). For example, Geronimus and Thompson (2004) have estimated that in central Harlem and the south side of Chicago black adults were as or more likely to suffer health-induced functional limitations at age 34 as were 55 year-old whites nationwide. Disability rates among 55 year-old blacks approximated those of 75 year-old whites. They also estimate that 30 percent of teenage African American girls and 20 percent of African American boys could expect to be alive and able-bodied at age 65. The corresponding figures for whites nationwide were 70 and 60 percent, respectively. The weathering hypothesis has been used to explain these race/ethnic differences in health status.

According to the weathering hypothesis, African Americans have higher allostatic load, or the physiological response to chronic stress (McEwen 2000), given the hardships they face with respect to poverty and economic hardship as well as racism (Geronimus, Hicken, Keene, & Bound 2006; Geronimus, Keene, Hicken, & Bound 2007; Williams 1999). Allostatic load is linked to a "wearing down" (or weathering) of the body's cardiovascular system and ability to fight off disease and illness (McEwen 1998). Evidence also suggests that increased stress is associated with chronic diseases, such as hypertension, which is one of the primary reasons for excess mortality among urban blacks (Geronimus et al.1996; Geronimus and Thompson 2004; Williams 1999; Williams & Jackson 2005).

As individuals age, the minority gap in health widens, as the deleterious effect of cumulative stress exposure takes it toll (Clark & Maddox 1992; Shuey & Willson 2008). Among many minorities, disease, illness, functional limitations, and disabilities are already present in the mid 20s and early 30s and rates rise through the 40s and 50s (Geronimus et al. 2006). The

weathering hypothesis suggests that it is this pervasive health uncertainty that women of childbearing and working age face that is responsible for higher birth rates at younger ages among African Americans. Or as Lancaster, Geronimus, Hamburg, and Kramer (2008) suggest, "weathering is a formidable threat to family economies and caretaking systems" (p. xx). Chronic diseases also complicate pregnancy (e.g., hypertension and diabetes) resulting in an increased number of babies born prematurely, with low birth weight, or who will die before they reach the first year of life (Gilbert, Young, & Danielsen 2007; Rosenberg, Garbers, Lipkind, & Chiasson 2005). Thus, having a child early, while still healthy and physically robust, is seen as a positive life event. In the same Harlem sample mentioned above, infant mortality rates among teen mothers were roughly half of what they were for older mothers, who were still in their 20s (Geronimus 2003).

Weathering and Early Childbearing

Geronimus (1992b, 1996) first reported the paradoxical finding that birth outcomes, such as birth weight, among teen black mothers were better than among older black mothers. For white women, the reverse was true: white women in their 20s always had better infant health outcomes than white women in their teens. She went on to argue that health deterioration among race/ethnic minorities occurred more rapidly than among whites given greater cumulative exposure to socioeconomic disadvantage, discrimination, and other structural constraints that result in harsh environments. Her weathering hypothesis postulates that age patterns at birth are an adaptive response to the life conditions that each group experiences and represent women's efforts to take advantage of an optimal age at birth, with black births occurring, on average, earlier than white births.

Wildsmith (2002) suggests that there are two ways to test the weathering hypothesis: 1) by comparing age-specific patterns of health outcomes between socioeconomically advantaged and disadvantaged groups and 2) by examining within-group variations of these outcomes across age. Using the first strategy, Geronimus (1992b) examined black-white differences in infant survival and found that black infants had the greatest survival advantage at younger maternal ages whereas white infants have the greatest survival advantage at older ages (see also Ananth et al. 2001; Rich-Edwards et al. 2003). More generally, Geronimus' work has sought to test the weathering hypothesis by seeing whether black women, relative to white women, have worse health during the child bearing years (see Geronimus & Bound 1990; Geronimus, Neidert, & Bound 1991; Geronimus, Andersen, & Bound 1991; Geronimus & Hillemeier 1992; Geronimus et al. 2007). Using the second strategy, Wildsmith (2002) examined Mexican-origin women, both native and U.S. born, and found some support for the weathering hypothesis. Among U.S. born women, rates of neonatal mortality and hypertension showed a curvilinear relationship with age, reaching the lowest levels between 17 and 18.

As noted above, existing empirical tests of the weathering hypothesis have focused on race/ethnic differences in maternal and infant health outcomes. When more positive health outcomes (e.g., neonatal mortality, birth weight, etc.) are observed among younger disadvantaged sample members authors typically conclude that they have found support for the weathering hypothesis. We argue, however, that this is not a complete test of the weathering hypothesis. With respect to teenage childbearing, the weathering hypothesis has two components, one explicit and one more implicit. First, the theory explicitly states that blacks and other race/ethnic minorities have worse and more rapidly deteriorating health status compared to whites given differential cumulative exposure to all sorts of structural factors (e.g., poverty,

discrimination, violence). Second, and more implicit in the theory, minority teens use the world around them to make assessments about own future health and mortality (see Geronimus 1992a; Geronimus, Bound, & Waidmann 1999). Such social construction is likely to be based on the physical health of the adults closest to them (i.e., family and community members). In a qualitative study of a black community in the northeast, Burton (1990) finds evidence of what she calls an accelerated family time table. She notes that, "…the community is so homogenous and close-knit that individuals often interpreted their life-course possibilities in light of what happened to individuals around them" (132). She goes on to report that many women, including teenagers, were extremely cognizant of community mortality patterns suggesting the very real possibility of an early death. Many of these women aspired to have children early not only to maximize their own reproductive success but also to allow their own mother, or even grandmother, to take part in the child's life.

Despite the implied importance of intergenerational health for the weathering hypothesis this piece of the theory has never been empirically tested. Geronimus and colleagues (1999) examined the probability that a child's parents or grandparents would live to see the child's 20th birthday across a number of urban U.S. areas and found that blacks were less likely than whites to have family members who survived to the end of the interval and the discrepancy grew as age at birth increased. Although the findings support the first component of the theory, the analysis falls short of explicitly testing whether adult health has a direct impact on teen childbearing decisions and thus does not test the second component of the theory outlined above. We argue that the most theoretically grounded test of the weathering hypothesis with respect to teenage childbearing should focus on the association between adult health and teen pregnancy/childbirth, specifically focusing on the lineage of maternal health status. According to the theory, teens

with parents, especially mothers, who are in poor health should have higher odds of teen pregnancy and childbirth. Because health status is likely to vary by race/ethnicity and class, it will be important to test the association between maternal health and teenage childbearing across these dimensions.

Learning Theories and Early Childbearing

Two social psychological theories, derived from learning theory, further suggest that minority adolescents and young adults may use parental health status as a basis for their own fertility intentions: social cognitive theory and the theory of planned action. Both posit that individuals construct new knowledge from their experiences in the social world (Bandura 1977). Social cognitive theory (SCT) explains how people acquire and maintain certain behaviors, while also providing a rationale for intervention strategies (Bandura 1989, 1997). It describes learning in terms of the relationships between behavior, environmental factors, and personal factors (e.g., cognitions, affect, or biological events). Knowledge is gained through experiencing the interplay of these elements of life and new experiences are evaluated with respect to past experiences such that they help an individual to determine what their own individual actions will be across a range of situations. In other words, SCT is a learning theory based on the idea that people base their own behavior on the behavior and experiences of others around them (Miller & Dollard 1941). Ultimately the individual comes to believe that certain things will happen because he or she observes them happening to others around her and this element of the theory relies heavily on outcome expectancies. These expectancies are greatly influenced by the individual's environment and for teenagers the family serves as one of the primary environments from which these expectancies are formed.

As previously mentioned, there are large health discrepancies among African American and white adults and these differences are not restricted to objective measures of health status like chronic disease (National Center for Health Statistics 2009), disability (Kelley-Moore & Ferraro 2004), life expectancy (Harper et al. 2007), and mortality (Satcher et al. 2005). Age- and sex-adjusted estimates from the 2008 National Health Interview Survey show that 69.7% of white adults reported very good or excellent health compared to 58.1% of African American adults (Heyman, Barnes, & Schiller 2009). The percentage for Latino adults is very good or excellent health is even lower at 56.8%. Adjusted regression models suggest that African American adults are roughly twice as likely as whites to report fair or poor SRH (Boardman 2004; Borrell & Crawford 2006; Ferraro 1993). Spencer and colleagues find that, controlling for physical functioning, older white adults were almost four times as likely as older African American adults to report favorable self-rated health. The authors suggest that health pessimism is stronger among the African American elderly population than whites. These studies suggest that African American youths have a higher rate of exposure to adults in poor physical health. Thus, based on social learning theory one could argue that this difference in the prevalence of morbidity, mortality, and poor subjective health ratings among adult minorities might also lead to lower expectations about future health status among African American youths compared to white youths.

Building on the concept of expectancies, the theory of planned behavior predicts that beliefs and attitudes (i.e., expectations), shared norms, and perceived behavior control indirectly determine actual behavior via behavioral intention (Azjen 1991). Beliefs and values about a certain behavior, and more importantly, its consequences, are evaluated with respect to norms surrounding both behavior and outcome. Individuals also assess how much self-efficacy they

have with respect to the behavior. That is, for a behavior to occur individuals must believe they are capable of successfully executing that behavior in order to produce the desired result (Bandura 1977). When self-efficacy is high, the behavior is thought to be normative, and both the behavior and especially the outcome are positively valued the odds of that behavior actually occurring are increased via heightened behavioral intention (Azjen & Fishbein 1980).

Many of the elements of the theory of planned behavior have been applied to early childbearing, including beliefs about age at first pregnancy, norms about early childbearing, and contraceptive use (see Buhi & Goodson 2007; Myklestad & Rise 2007). For some young women, early age at first pregnancy is not viewed in a negative light, but rather is seen as a way to connect with the child's father or grow closer to her family, to force adulthood at a time when most teens struggle with forming an identity, or as motivation to work harder in order to support the child (Rosengard et al.2006). Some scholars, like Geronimus (1991, 2003) and Burton (1990) have argued that early childbearing can be a normative life course event among certain race/ethnic cultures, especially African Americans. A lack of stigma surrounding teenage childbearing (Mollborn 2009; Olson 1980), and the view that having a child early in life offers more benefits than negative consequences, may lead some adolescents and young adults to view childbearing as a positive event. When these conditions co-exist, some teens and young women may participate in behaviors that facilitate their desired outcome. And indeed, some research on early childbearing suggests that inconsistent and infrequent use of contraception is a planned behavior (Brückner, Martin, & Bearman 2004; Davies et al. 2006; Jaccard, Dodge, & Dittus 2003; Rosengard, Phipps, Adler, & Ellen 2004).

Hypotheses

Lancaster and colleagues (2008) note that how ecologies come to influence fertility timing is an understudied question. They suggest that teens and their elders may make conscious fertility decisions without having explicit knowledge of the statistical odds of death, disability, and disease among the African American community. Instead, because these events are pervasive in the culture, poor physical health is assumed to be a biological imperative. Qualitative studies of African Americans suggest that fertility-timing decisions in specific high poverty areas do involve socially derived knowledge of the benefits of early childbearing and multi-generational childrearing (Stack and Burton 1993; Geronimus 1996), but similar empirical evidence is lacking.

Based on social cognitive theory, as well as the theory of planned behavior, we expect that teens and young adults will use the health status of their parents as guides for their own fertility behavior. These theories lead us to hypothesize that young women will use environmental cues, like mother's self-rated health, to inform pregnancy decisions at early ages. Along with Geronimus' weathering hypothesis, these theories also make powerful predictions about how race and ethnicity interact with environmental cues. In particular, African American teens may be more likely to witness adults with low levels of physical health, given the combined deleterious effects of socioeconomic disadvantage and racism. If, as suggested by social cognitive theory, these young women derive expectations about their own future health status from the observed health of those around them, especially their mothers, they may come to believe that good health occurs only during a brief period, early in the life course. If they then use those beliefs to make decisions about the sexual behavior and timing of pregnancies, as suggested by the theory of planned behavior, we might expect African American teens to enter into motherhood at an earlier age than teens of other race/ethnic groups. Thus, we propose a

direct test of the weathering hypothesis that examines whether or not a teen's parents' self-rated health status is associated with increased odds of having a child before the age of 20.

We also extend our test of the weathering hypothesis to see whether the association between maternal self-rated health and the odds of early childbearing vary across race/ethnic status. That is, is this association stronger among African American versus Hispanic or white young women? Until now the existing literature has used the fact that rates of teenage births are higher among African Americans as evidence of the weathering hypothesis at work—institutionalized racism and prevalent poor adult physical health in African American communities leads African American teens to have early births. However, a stronger test of the hypothesis would assess whether there are differences in how such environmental factors may influence young women of all race and ethnic groups. If in fact poor maternal self-rated health is also associated with early childbearing among Hispanic and white youths, and there are no differences in the magnitude of this association, then the weathering hypothesis may not be a sufficient explanation of race/ethnic differences in teen birth rates.

METHOD

The dataset used to perform the analyses comes from the Panel Study of Income Dynamics (PSID), a national survey of 5,000 American families first interviewed in 1968. The PSID sample was interviewed every year for the first 20 years of data collection and every other year thereafter. The PSID is an excellent data source for examining the effects of parents' health status on adolescent children's fertility because it follows children from the original sample as they have grown into adulthood and formed their own households. Our primary parent health measure will be self-rated health (asked each year since 1984). Although the PSID has contained other health items in each wave, health content was not expanded and consistent until the 1990s.

We restrict our analysis to daughters born between 1970 and 1991 who were still in the file at age 14 and who had not had a birth by age 14. Consequently, the first year in which we observe a daughters pregnancy or birth outcome is 1984 for daughters 14 and the last year we observe a daughter's outcome is for cohorts of daughters aged 14 in 2005 (the most recent year for which public use data are currently available).[1]

Measures

The complete sample consists of 3,359 teenagers, of whom 11.2 percent had a non-marital birth before age 19. Compared to previous studies using the PSID, this sample includes teens from cohorts in the 1990s, when birth rates were falling. This birth rate is consistent with what others have found using the PSID sample that includes most recent cohorts. Lopoo (2005) found 9.3 percent of the PSID sample had a birth at age 17 or 18. The dependent variable in this study is time to an event; in this case, the event is age at first non-marital birth through age 19. For those who had not had a birth by age 19, or were married before their first pre-19 birth, their age at the time that they were right censored was considered.

The covariates include daughter's race/ethnicity (black, white, Latino, other), maternal characteristics when daughter was 14 years, including self-rated health (ranging from 1=excellent to 5=poor), marital status (divorced/separated, widowed, never married), education (in single years), employment status (employed or not), and logged family income. We also include (but do not show in the results) a measure for missing family income. To assess whether the effect of maternal health status when daughter is aged 14 on age at first birth varies by race or ethnicity, we include interactions between race/ethnicity and maternal self-reported health.

Analysis

[1] In future analyses we plan to explore different censoring points, with respect to age, in order to check the robustness of our findings.

Data were analyzed using survival time analysis for adolescents of all race and ethnic group combined. Observations for daughters within the same family are not independent; therefore we correct all standard errors and p-values for the complex (clustered) data structure that would be miscalculated in a standard survival time analysis.

We use multiple imputation to replace missing values in five simulated versions (Royston 2007; Rubin 1987). The simulated complete dataset is analyzed by standard methods, and the results are combined. All analyses are conducted in STATA 10 SE.

RESULTS

The analytic sample is 38 percent black, 47 percent white, 13 percent Latino, and two percent other (see Table 1). One-third of mothers themselves had an early first birth. Sixty-six percent of mothers were married when the index daughter was 14. Sixteen percent of mothers reported their health status as being fair or poor when daughter was 14 (ranging from 8 percent of white mothers to 29 percent of Latino mothers). White mothers are least likely to report fair or poor health (8 percent) and Latino mothers the most likely to do so (29 percent).

[Insert Table 1 about here.]

We estimate the association between the characteristics of daughters and mothers when daughters are age 14 and time until first teen non-marital birth (Table 2). An odds ratio greater than one indicates a greater likelihood of experiencing a first non-marital teen birth before age 19. Model 1 shows that each unit decrease in mother's self-rated health is associated with younger age at first birth for daughters in the sample overall. As seen in Model 2, black adolescents have highest risk of early first non-marital birth. The coefficient associated with mother's self-rated health is unchanged when adjusting for race/ethnicity (Model 2) or other maternal characteristics (Model 3). Most notably, as seen in Model 4, even adjusting for the

mother having had a teen birth herself (Model 4), mother's self-rated health status when the daughter was 14 remains highly predictive of age at first non-marital birth.

[Insert Table 2 about here.]

To test whether maternal self-rated health status matters similarly for the timing of first non-marital births across race and ethnic groups, we must consider not only the mother's self-rated health-race/ethnicity interactions term (e.g., SRH*Black) alone but rather the sum of each interaction term and the corresponding race/ethnicity term (e.g., "Black"). The sum of those terms estimates the absolute difference in maternal self-rated health for non-white and white daughters, or what is sometimes called the "simple main effect" of mother's self-rated within race/ethnicity. Here these summed terms are significant for black and Hispanic mothers (results not shown) indicating that maternal self-rated health has less of an influence on age at first birth of black daughters and Latino daughters, compared with white daughters. There are no differences between daughters of other race/ethnicity and white daughters.

Discussion

Our results present the first direct test of the weathering hypothesis that daughters' fertility decisions incorporate information on the health status of individuals around them. In particular, we find evidence to suggest that adolescent girls with mothers who have worse self-rated health are more likely to have an early non-marital birth. Moreover, we find that this effect holds across race and ethnic groups and in fact, maternal self-rated health has the strongest effects among non-Hispanic white and adolescents of other race/ethnic status. The results have implications for the usefulness of the weathering hypothesis as an explanation for race/ethnic differences in teenage birth rates and suggest that more nuanced hypotheses derived from it should be tested before its validity is determined.

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Table 1. Descriptive Statistics.

	Total Sample	Black	White	Hispanic
Individual Characteristics				
Percent Experiencing Nonmarital Birth Before Age 19	10.1	18.6	6.1	5.9
Race/Ethnicity				
Black	37.9	-	-	-
White	46.5	-	-	-
Hispanic	13.4	-	-	-
Other	2.2	-	-	-
Parent Characteristics				
Mother				
Percent Experiencing Birth Before Age 19	32.3	47.7	18.7	32.3
Marital Status[b]				
Married	66.3	45.2	82.4	70.7
Divorced/Separated	20.2	27.5	15.5	14.8
Widowed	2.1	3.1	1.1	3.1
Single	11.5	24.3	1.1	11.5
Education in Years (1 – 17)	12.2 (2.7)	12.1 (1.9)	13.1 (2.1)	9.1 (4.0)
Currently Employed[b]	90.4	82.9	94.5	91.3
Health Status[b]				
Self-Rated Health (1 - 5)	3.5 (1.0)	3.3 (1.0)	3.8 (.9)	3.1 (1.1)
Percent in Fair/Poor Health	16.0	20.8	7.8	29.3
Household Characteristics[b]				
Family Income[c]	33.6 (38.0)	21.7 (20.9)	44.6 (47.2)	29.4 (23.6)
Percent Missing Family Income	28.0	27.6	26.1	34.6
N	3,359	1,272	1,561	451

Notes: Unweighted means or percentages are presented in the table, with ranges and standard deviations in parentheses if applicable. Total Sample N refers to number of teens with some data from mothers—2.1 percent of cases dropped because there was no information from mothers.
[a]When teen is age 16. [b]When teen is age 14. [c]In $1,000s.

Table 2. Logistic Regression of Non-Marital Childbearing Under Age 19 and Mother's Self-Rated Health (Odds Ratios Presented).

	Model 1	Model 2	Model 3	Model 4
Mother's Self-Rated Health (1=Excellent, 5=Poor)	1.29***	1.20**	1.33**	1.33**
Individual Characteristics				
Race/Ethnicity[a]				
Black		2.90**	3.82***	3.45***
Hispanic		0.85	2.22	2.28
Other		0.83	0.54	0.55
Other Maternal Characteristics[b]				
Race/Ethnic Interactions				
F/P Health*Black			0.81*	0.81*
F/P Health*Hispanic			0.56**	0.58**
F/P Health*Other			1.08	1.07
Marital Status[c]				
Divorced/Separated			1.87***	1.80***
Widowed			1.26	1.28
Single			1.41*	1.31
Education in Years (1 – 17)			0.87***	0.89***
Employed			1.13	1.16
Mother Birth Before Age 19				1.59***
Household Characteristics[b]				
Family Income[c]			1.00	1.00
N	3,359	3,359	3,359	3,359

Notes: Unweighted results presented in the table. Total Sample N refers to number of teens with some data from mothers—2.1 percent of cases dropped because there was no information from mothers.
[a]White is the reference category. [b]When teen is age 14. [c]In $1,000s
†p < .10 *p < .05 **p < .01 ***p < .001