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Assessment of the Neighborhood Environment and its Association with Gestational Age at Birth

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Précis: Both genetic and environmental factors contribute to gestational age at birth. Yet, the increased environmental heterogeneity estimated in African American populations is thought to explain the marked disparity in race-specific mean gestational age at birth. The aim of this study is to assess objective and subjective measures of the neighborhood environment and their association with gestational age at birth.

Introduction

Preterm birth (< 37 completed weeks of gestation) is one of the most persistent of health disparities and accounts for five times more African American versus European American infant death. The preterm birth rate in African American (18.1%) is nearly twice as high compared to European Americans (11.2%). Recent studies have shown that a major contributor to this disparity is the **greater environmental heterogeneity seen in African American populations** (York et. al. 2010).

The goal of this study is to examine how the measured neighborhood environment influences race-specific **gestational age at birth (GA)** by:

1. Assessing the degree of neighborhood heterogeneity that exists between self-identified race
2. Estimating the extent these sources are associated with GA
3. Comparing both a subjective and objective measurement of the neighborhood environment
 1. **Objective Measure: Neighborhood Inventory for Environmental Typology (NifETy)**
 2. **Subjective Measure: Neighborhood Environmental Survey (NES)**

Primary Hypothesis: Women who score higher in perceiving their neighborhood environment as safe/positive will have on average a higher gestational age at birth.

Methods

- **Research Subjects**
 - N = 30 (50% African American, 50% European American)
 - Informed consent was obtained through their participation in the Pregnancy, Race, Environment and Genes (PREG) study
 - PREG is part of a NIMHD funded P60 center grant www.healthdisparities.vcu.edu
- **Subjective scales** (Crum et al., 1996; Lambert et al., 2004):
 - **Neighborhood Drug Involvement:** 1) I have seen people using or selling drugs in my neighborhood; 2) in the morning or later in the day, I often see drunk people on the street; 3) in my neighborhood, the people with the most money are the drug dealers and; 4) there are people in my neighborhood who have offered me drugs.
 - **Neighborhood Cohesion:** 1) I like living in my neighborhood; 2) my neighborhood would help me in an emergency; 3) my neighbors can tell if someone is a stranger and; 4) the people who live in my neighborhood always take care of each other and protect each other from crime.
- **Objective scale** (Furr-Holden et al., 2010):
 - **Neighborhood Disorder:** 1) total broken windows; 2) unboarded abandoned buildings; 3) unmaintained property; 4) trash in open spaces; 5) broken bottles; 6) graffiti; 7) noisy; 8) people yelling; 9) public intoxication; 10) drug paraphernalia and; 11) discarded alcohol bottles.
 - Two research assistants (one male, one female) assessed each neighborhood block. The general procedure is to walk up one side of the block and then walk back down on the other side. Research assistants should walk the block roughly four times in order to capture all items on the NifETy rating sheet.

Results

1. This data supports that there is no statistically significant differences in neighborhood measures between races (Table 1).
 2. Neighborhood measurement of **drug involvement** and **disorder** were negatively correlated with **gestational age**, while the neighborhood measurement of **cohesion** was positively correlated with **gestational age** (Table 2).
1. A significant negative correlation was estimated between **Drug involvement** and **Cohesion**. **Drug involvement** and **disorder** was statistically significant and positively correlated. Finally, **cohesion** and **disorder** were negatively correlated, however, not statistically significant (Table 2).
 2. These results support the primary hypothesis that women who score higher in perceiving their neighborhood environment as safe/positive have on average a higher gestational age at birth.

Table 1. Sample characteristics by self-reported race

	AA	EA	p-Value
GA	M=274.2 SD=11.5	M=275.3 SD=7.5	0.715
Mom's Age	M=27.3 SD=4.9	M=31.1 SD=5.5	< 0.001
Disorder	M=4.9 SD=4.0	M=4.5 SD=7.5	0.287
Drug Involvement	M=2.2 SD=2.4	M=0.933 SD=1.9	0.065
Cohesion	M=1.4 SD=1.1	M=1.3 SD=0.8	0.965

GA: Gestational Age AA: African American EA: European American

Table 2. Pairwise Spearman correlation coefficients

	DI	COHESION	DISORDER	GA
DI	1	-0.457 *	0.411 *	-0.305 *
Cohesion		1	-0.214	0.407 *
Disorder			1	-0.402 *
GA				1

DI: Drug Involvement GA: Gestational Age *p < 0.05

Discussion

1. Although it is generally accepted that there exists mean differences in gestational age between racial categories, this pilot data reported no differences likely due to the small sample size.
2. These results show that experiences that are positive correlate with longer gestational ages, while negative experiences that are negative correlate with shorter gestational ages.

1. There was statistically significant agreement between the subjective NES ratings and the objective NifETy ratings.

This preliminary data shows that both subjective and objective measures of the neighborhood environment were more correlated with gestational age than self-reported race.

• A limitation of this pilot study is the small sample size available for data analysis. Although interesting correlations were obtained, further analyses were not attempted that could clarify the nature of these relationships by, for instance, adjusting for covariate measures.

Works Cited

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