Desegregated Fertility: A Spatial Proximity Analysis of black and white biracial fertility in the United States

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Abstract

Since the abolishment of laws regulating interracial sex and marriage (***see*** Loving vs. Loving, 1967), there has been a steady rise in the number of biracial children born in the United States each decade. Race based policies and laws that regulated sex and marriage, once sanctioned and enforced at state government levels, are no longer an impediment to biracial fertility, particularly biracial fertility between black men and white women. And although biracial fertility has been a reality in the United State its entire history, the topic of multi-race fertility is rarely discussed publicly or analyzed scholarly. Using US census data and the national center of health statistic's fertility data, the present study examines the effects of spatial concentration on black-white biracial fertility in the United States for 1990 and 2000. Preliminary findings reveal very strong support for the study's hypotheses that biracial fertility is the outcome of reduced segregation and inflated sex ratios. Seventy percent of variance in county rates of biracial fertility is explained by segregation and sex ratio.

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Despite the steadily rising number of biracial children born in America each year, the subject of biracial fertility continues to be conspicuously absence from both academic literature and public discourse. Even in recent publications, such as Randall Kennedy's *Interracial Intimacies*, *Sex, Marriage, Identity and Adoption* (2003), demographic trends and factors that predict multi-race fertility -current and past – is given no attention. Unlike interracial marriage, dating and adoption of which has become commonplace in social science research, the subject of biracial fertility has not been met with the same enthusiasm.

Theoretically grounded in spatial concentration and race literature, this study analyzes the spatial effects influencing biracial fertility between blacks and whites.

In 1993 Douglas Massy and Nancy Denton wrote a book entitled *America Apartheid*. The book explores racial residential segregation of blacks and whites in 58 metropolitan cities in the United States. The major empirical findings of this research suggests that 1) the residential segregation via white flight increases as the proportion of African Americans increase in a given areal unit, and 2) residential segregation persist for many blacks in America. Furthermore, segregation is the force that creates and maintains black ghettos which restricts blacks' opportunities for education and employment.

In addition to residential segregation (Massy and Denton, 1993; Beggs, Villemez and Arnold, 1997; Farley and Frey, 1994; Massey and Mullan, 1984; Frey, 1985; Farley, 1970), the effects of black spatial concentration, has also been analyzed in relation to pay and occupational opportunity disparities (Kain 1968, Jiobu and Marshall, 1971; Reardon, Yun and Eitle, 2000; Frisbie and Neidrt, 1977; Jencks and Meyers, 1990; Tienda and Lii, 1987; Wilson, 1987; Wilson, 1996; Burr, Galle and Fossett, 1991) and even lynching during the 19th and 20th centuries (Beck and Tolnay, 1990; Corzine, Creech and Corzine, 1983).

Using US census tract data for 1990 and 2000, county composition by race, sex and age was extracted to measure four indices of segregation (index of dissimilarity, Interaction, Isolation and Eta square, *see* Appendix A), the sex ratio of African Americans in reproductive age groups (15-49; 15-44; 18-49; and 18-44), and the percent of African Americans in a county. The National Center of Health

Survey (NCHS) provides biracial fertility data for 1990 and 2000. This variable was constructed based on the self-reported race of the mother and father of a new born.

The following hypotheses were tested. The conditions for black-white fertility are largely plausible when: 1) percent of African Americans in a county is low, 2) segregation is low and 3) African American sex ratio (male to female) is high. These hypotheses are based on the premise that in counties with few blacks, the sex ratio of black men to black women is exaggerated, meaning there are more black men than black women. Furthermore, because such counties are nearly racially homogenous, the opportunities of physical and social segregation (measured by index of dissimilarly, Interaction and Isolation) are significantly reduced. Thus, the combination of few black women and minimal segregation enhance biracial fertility outcomes.

Ordinary least squared regression is used to examine the influence of black concentration on segregation, sex ratio and biracial fertility (**see** appendix B for conceptual model). Preliminary findings based on 1990 data, suggest that segregation[1] and sex ratio have independent effects on biracial fertility. Moreover, these variables fully explain the link between percent black in a country and biracial fertility. Together, these variables explain 70% of the variance in county rates of biracial fertility (**see** table 1.0).

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[1] All segregation indices aforementioned were analyzed and all were equal in significance level, however only interaction is reported in table 1.0 because of its theoretical relevance.

Table 1.0   Ordinary Least Squares Regression of Biracial Fertility, 1990

Independent Variables	Model 1 Coef.		Model 2 Coef.	
Percent Black	-1.192	***	-0.036	
	(-0.065)		(-0.084)	
Interaction (segregation measure)	___		0.663	***
			(-0.046)	
Sex Ratio	___		0.066	***
			(0.007)	
r2	0.451		0.709	
Constant	0.419		-0.314	
	-0.011		-0.043	

Note: Numbers in parentheses are standard errors; N=412
*P.05, **P<. 01, ***P<. 001

Appendix A: Measures of spatial proximity

$$1.\ \textbf{Dissimilarity}\ (D) = \sum_{i=1}^{n} [t_i|Pi\text{-}P|/2TP(1\text{-}P)]$$

A measure of unevenness, the index of dissimilarity essentially evaluates how well integrated an areal units is. This index consists of a range of 0 to 1; one indicating maximum segregation. According to Harrison and Weinberg (2002), conceptually, this measure gauges what proportion of a group is needed to relocate in order to achieve a more even, integrated distribution (Massey and Denton, 1988).

$$2.\ \textbf{Interaction}\ (_xP^*y) = \sum_{i=1}^{n} [x_i/X][Y_i/ti]$$

A measure of exposure – Interaction, Isolation, and Eta Square assess the odds of contact between two groups. Interaction, basically weights the degree to which groups are exposed to each other. Harrison and Weinberg (2002) call it a measure of "minority group members to members of the majority group as the minority weighted average of the majority proportion of the population in each areal unit." This measure according to Massy and Denton (1988) "takes explicit account of the relative size of minority and majority group in determining the degree of residential segregation between them (p.287)". Like the previous measure, this index consists of a range from 0 to 1; the zero indicates minimum exposure (e.g. highly segregated), while the 1 indicates maximum exposure (e.g. least segregated).

$$3.\ \textbf{Isolation}\ (_xP^*x) = \sum_{i=1}^{n}[x_i/X][x_i/ti]$$

Isolation, on the other hand, is interpreted as the extent to which group dominant and minority contact is minimized or "the extent to which minority members are exposed to only one other, rather than majority members" (Massey and Denton, 1988, p. 288). Like the aforementioned, index has a range of 0 to 1; where zero denotes minimum segregation while one implies the highest possible segregation (Harrison and Weinberg, 2002).

$$4.\ \textbf{Eta}^2 = [(_xP^*x\text{-}P)/(1\text{-}p)]$$

The majority exposure to minority and minority exposure to majority are equal only when the two groups consist of the equal proportion (Harrison and Weinberg 2002). To adjust for this unevenness, a correlation ratio or Eta square is introduced as a third index of exposure.

Appendix B: Conceptual Model

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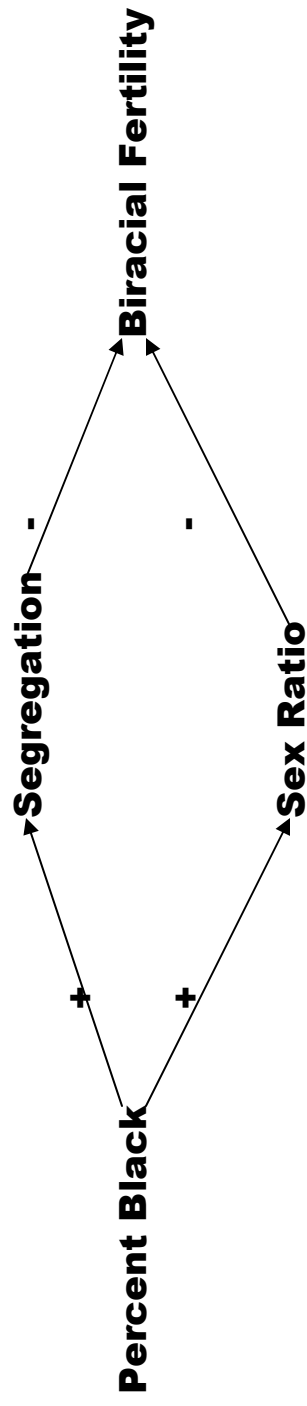
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