

Gender and Socio-economic Residential Segregation in Mexico City

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2007 PAA Meeting

Draft

Although the American literature has extensively addressed the consequences of residential segregation on individuals' life chances, evidence from developing countries is sparse. Moreover, little attention has been paid to gender differences in this respect. This paper looks to contribute to understand the role that space plays in manufacturing and reproducing social inequalities in third-world cities. It examines the effects of socio-economic residential segregation on precarious employment outcomes, particularly whether it has a gendered effect. Using data from the 2000 Mexican Population and Dwelling Census, I implement a hierarchical linear model where individuals' employment is a function of individual and neighborhood characteristics in Mexico City.

Background

In contrast to American cities' persistent segregation, Mexican metropolises were historically characterized by more fluid residential geographies of race and class. Color lines were less imprinted on Mexico's residential geographies as a result of its social construction of race. In addition, urban spaces were far more socio-economically heterogeneous (across city areas and within neighborhoods) than theories would predict given Mexico's highly unequal income distribution and occupational structures. Today, however, that contrast is diminishing as a consequence of increasing inequality in urban Mexico. Research suggests that socio-economic residential segregation is on the rise in the largest metropolitan areas; in particular a recent paper shows that the Dissimilarity Index by household income grew in Mexico City from 0.33 in 1990 to 0.45 in 2000 (Ariza and Solis 2005).

Yet it remains unclear whether higher levels of residential segregation have consequences for the urban poor. This paper focuses on the consequences that residential

segregation could have on people's employment. Based on three sets of literature – studies of residential segregation; analyses of employment networks; and theories of labor market segmentation– I examine whether residential segregation could matter for urban residents' employment opportunities and why we could expect a gendered effect.

Studies of American cities point out that high unemployment disrupts job networks in poor minority segregated communities, since few neighbors can pass on information about jobs or act as referrals (Wilson 1987, Wacquant 1989). Most of these analyses, however, focus exclusively on joblessness. I propose to expand on these studies by examining if neighborhood composition matters for the quality of employment people have. This analysis is particularly necessary for the studies of Mexican metropolises, where informality and underemployment are widespread and constitute main determinants of low earnings and unstable labor trajectories, particularly for women.

Broadly speaking, residential segregation could have a detrimental effect on employment opportunities due to a process of social stratification that translates geographic isolation into social disadvantages such as access to public services, education and employment sources. In addition, social dynamics within segregated neighborhoods could deteriorate even further the employment opportunities of their residents. In particular, several studies point to the role of neighborhood-based networks and cultural capital in channeling individuals into particular segments of the labor markets (Granovetter 1995, Lin 1999, Elliott 2001, Lommtz 1979, Hanson and Pratt 1995, McPherson et al 2001, Green, Tigges and Browne 1995, Fernandez-Kelly 1995). Since multiple studies suggested that the poor, minorities and women tend to rely more heavily on neighborhood-based networks, it is expected that residents of segregated areas would

have access to limited employment opportunities due to the composition of their networks (Green, Tigges and Browne 1995, Elliott 2000, Lomnitz 1979). Thus, for residents of poor segregated communities, neighborhood contacts would likely lead to low-wage occupations and racial and gender segregated jobs.

In segregated neighborhoods, women are likely to experience double jeopardy, because of their greater reliance on neighborhood-based networks and the gendered dynamics of social networks themselves. Gender homophily in social networks accentuates gender roles. For women it tends to increase their involvement in childrearing activities, which in turn push women to rely more on kin-related or other types of childrearing-oriented flows of information, instead of occupation-oriented as in the case of men (Smith-Lovin and McPherson 1993). Such activities quite often occur within the neighborhood's boundaries. It is not just that women spend more time at home, but the types of activities they take part in reinforce their reliance on neighbors. Moreover, studies conducted in Mexico show that women living in poor areas are often in charge of pursuing access to regular and quality public services for their neighborhoods, in addition to their family duties, which limits the type of jobs they could take (Roberts 1995, Ramírez 2003, Salazar 1999).

Data, Methods and Research questions

Data come from the 2000 Mexican Population and Dwelling Census. I draw on the census expanded questionnaire, which covers 10 percent of the population and contains detailed information about individuals' demographic characteristics, income, employment, living arrangements and dwelling, among others. It is the only source that

allows estimating residential segregation levels at a small scale, called Agebs¹ which are similar to census tracts. Although population density varies importantly across Agebs, these units represent a relatively small physical area that households inhabit and, as such, it is possible to use these divisions as a proxy for neighborhoods. Clearly, this is only a rough approximation to “neighborhoods” as sites of social interactions among their inhabitants, but it is still a somewhat reasonable one because multiple studies documented that physical proximity furthers interactions across residents and that neighbors still constitute a good proportion of people’s acquaintances, even in large metropolises (Fernandez and Su 2004, McPherson, Smith-Lovin, and Cook 2001

I implement a two-level hierarchical lineal model, where individuals’ employment is a function of individual and neighborhood characteristics. I present the results for 3 different dependent variables: a) informal employment, b) critical labor conditions, and c) hourly wages. These three variables look to capture the idea of precarious employment²:

Informal employment (dichotomous) is defined as those working without health insurance or social security –full-time workers are entitled to both benefits under the Mexican labor law. **Critical conditions employment** (dichotomous): it is defined as those working between 35 and 40 hours but earning less than one daily minimum wage or those earning more than 2 daily minimum wages but working more than 48 hours.

¹ In the Mexican census data this unit is called Basic Geo-statistic Area (AGEB). In highly urbanized areas, like Mexico City, Agebs include 20 to 50 blocks and their limits are clearly marked by physical characteristics such as streets, highways or rivers. The latter means that no Ageb would be crossed-over by large physical obstacles. The 10 % sample was drawn by taken a random sample of two or more blocks (depending on their population density) in each Ageb of the city.

² A composite measure of job formality, earnings, and weekly work hours was also examined, but the results are not presented in this paper.

Clearly, this is an indicator of overwork, underpaid work.³ **Hourly wage** (continuous): earnings per hour, regardless of working hours per week⁴.

To model all dependent variables, I include at the first level individual characteristics that previous studies suggest are associated with employment quality, specifically human capital variables (education); demographics (gender, age); family-related variables (marital status, family structure, and presence of children in the family); and occupation [see appendix A for definitions] . At the second level, as characteristics of the neighborhoods, I include poverty location quotient to measure residential segregation. It calculates whether the proportion of poor households in the census tract is closer or further away from the proportion of poor households in the whole city (see Appendix A). If we look exclusively at poor households, then larger LQ numbers imply higher proportion of poor in the neighborhood, and when LQ is greater than 1 it means that the neighborhood concentrates more poor households than we will expect if they were evenly distributed across the city. Poverty status were determined using the Mexican government poverty line for households per capita income, the threshold used correspond to the minimum amount of money needed to pay for food, education and health (CONAPO 2000).

For each dependent variable I consider:

- (1) Whether there is a significant difference on labor precariousness across

³ A monthly salary equivalent to one minimum wage was 1,137 pesos in 2000, approximately 110 dollars.

⁴ I top-coded this variable at 5000 pesos (approximately 480 dollars) per hour, this in order to reduce the skewness of its distribution and as way to deal with extreme outliers. In this way all these cases were transformed into 5000 values and remain in the sample. Because the variable was still skewed, I use its logarithm to achieve normality in the dependent variable. I limited my analysis to individuals in the labor force between 18 and 64 years old and that reported income (> zero).The final number of individual cases to 197,513, nested within 783 neighborhoods.

neighborhoods,

(2) the magnitude of the residential segregation effect on individuals' precarious employment, above and beyond individual determinants,

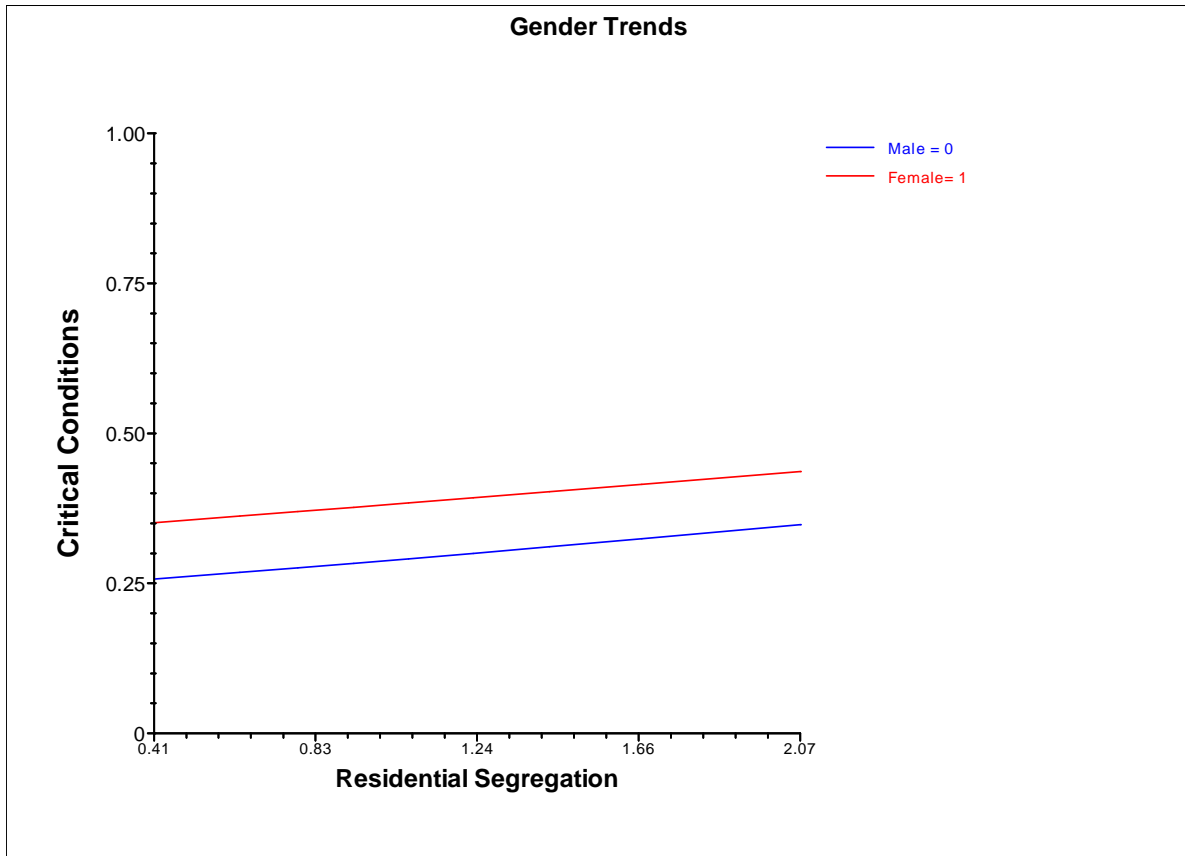
(3) the interaction between neighborhood composition and gender in determining residents' labor market outcomes, that is, to estimate if women's precariousness is more affected by residence than men's one is.

Results

Although unemployment was low (2.1%) precariousness is a pervasive characteristic of Mexico City's labor market: in 2000, about 46 % of the workers were informally employed, while almost 33.4 % were employed in critical conditions. Similarly, hourly wages mean was 28.74 pesos. Differences between men and women are noticeable: a higher percentage of women are employed in critical conditions (39.5% vs. 30 % for men), but their percentage is lower in the informal sector: while 47.8 % of the men lack social security or health insurance, 45.2 % of the women do. Joblessness is also more common among men (2.22 % vs. 1.60 % for women). In addition, women's mean hourly wages are 0.55 cents lower than men's one and show less dispersion (see table 2).

Preliminary results suggest that residential segregation is positively associated with precariousness, above and beyond other significant individual variables –age, education, gender, family structure, and occupation. However, its effect varies across the dependent variables analyzed. Although the probability of being **informally employed** does vary significantly across neighborhoods, the levels of residential segregation do not significantly increase it, once that individuals' characteristic are taken into account. Women have slightly lower chances of being informally employed after controlling for

age, education, marital status, family variables and occupation. Even though the effect of sex on informal employment probabilities differs across neighborhoods, residential segregation does not significantly predict such variation (see table 2). On the other hand, socio-economic residential segregation significantly increases the chances of being employed under critical conditions, even after considering relevant individual attributes - including informal employment. Thus, as residential segregation augments the average odds of critical-conditions employment increase by 30% across neighborhoods. In this model, the odds of a woman being underpaid are 1.5 times higher than those of a man, and such odds vary significantly across place of residence. However, as in the previous variable, segregation does not significantly predict women's dissimilar probabilities across neighborhoods. The following graph illustrates the relationship between segregation, gender and critical employment.

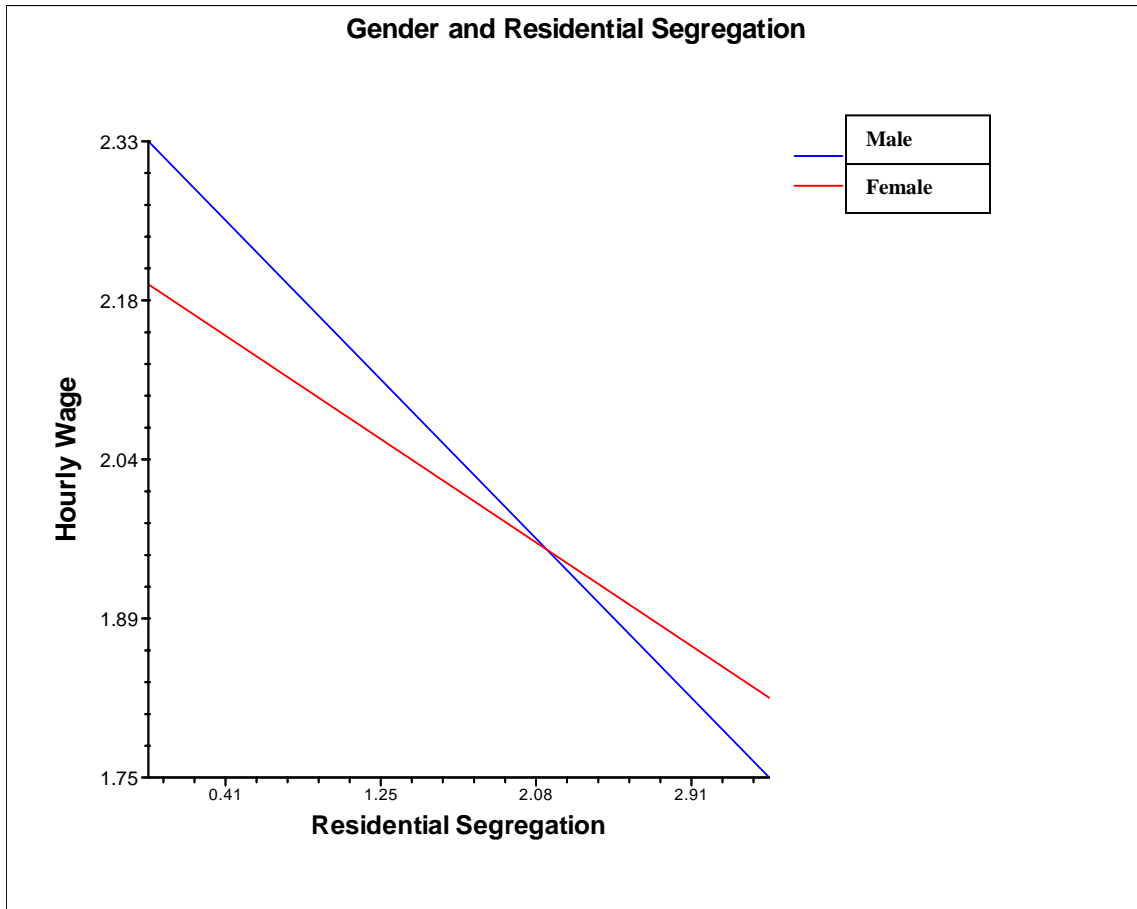


The average ln hourly wage across all neighborhoods and individuals is 2.29 or back into the non-logarithmic scale 10 pesos per hour (approximately 1 dollar)⁵. Similarly, socio-economic residential segregation reduces average hourly wages across neighborhoods: for each unit increment of segregation the mean hourly wages decreases by 20.8 % after controlling by all individual variables. As expected, female reduces hourly wages by 8.8 % on average⁶. However, such effect varies significantly across areas of residence, 95 % of the plausible values of this effect fall between (-0.204 and 0.018). Interestingly, the cross-level interaction between segregation and sex is positive and significant. Thus, as segregation increases the gender gap reduces in such a way that in highly segregated

⁵ The intraclass correlation in the empty model shows that almost 13 % of the variance in hourly wage (ln) occurs between neighborhoods.

⁶ Since the dependent variable was transformed to the logarithmic scale the coefficients are evaluate as: $100(\exp B - 1)$

neighborhoods women's hourly wages will tend to be above men's ones. This association is clearly shown in the following model graph.



Discussion: limitations and future directions

In order to fully examine the effects of residential segregation on labor incomes better data is needed. A longitudinal survey that follows people in their labor and residential trajectories would be ideal, but such type of data is not available. In fact, Census data is currently the only source that allows computing residential segregation measures at a small scale. The restricted variables included in the census and the cross-sectional nature

of it limits the analysis. Particularly, one should be aware of a possible selectivity problem: unmeasured variables directly connected to people's employment could lead them to live in particular neighborhoods. However, the gender difference is less likely to run into this trouble: men and women do not live segregated one from another, and other variables that could influence women's residency are also accounted for (e.g. female headed household), as well as attributes related to their employment. Therefore, this analysis could contribute to understand another source of gender inequalities, such as spatial socio-economic disparities. Still, strategies to deal with sample-selection problems need to be used in order to improve the analysis and face the constraints imposed by the limited data available.

Table 1. Descriptives

DESCRIPTIVES					
Individual Level	N	MEAN	SD	MINIMUM	MAXIMUM
Age	202256	34.22	11.15	15.00	65.00
Schooling	202256	10.63	4.25	0.00	22.00
Marital Status	202256	0.55	0.50	0.00	1.00
Female	202256	0.41	0.49	0.00	1.00
Presence of Children < 14	202256	0.60	0.49	0.00	1.00
Female-headed households	202256	0.24	0.43	0.00	1.00
Trade	202256	0.10	0.30	0.00	1.00
Agriculture	202256	0.00	0.07	0.00	1.00
Personal Services	202256	0.23	0.42	0.00	1.00
Industrial	202256	0.18	0.38	0.00	1.00
Informal Job	202256	0.47	0.50	0.00	1.00
Critical Conditions	202256	0.30	0.46	0.00	1.00
Hourly Wage (ln)	202256	2.85	0.99	-3.00	9.21
Unemployed	202256	0.00	0.03	0.00	1.00
Ageb Level					
Segregation	781	1.16	0.64	0.00	3.33
Informal Prop.	781	0.36	0.14	0.00	1.00
Inequality	781	0.30	0.18	-0.35	1.48

Table 2. Selected indicators by sex		
	Male	Female
Hourly Wage		
Mean	19.45	18.87
Std. Deviation	5.25	3.33
Median		
	Percentage	Percentage
Critical Conditions	30.00	39.46
Informal Employment	47.76	45.16
Unemployment	2.22	1.60
	Male	Female
Mean		
Age	35.87	34.79
Schooling	10.41	10.56
Percentage		
Coupled	67.80	49.02
Presence of Children	61.19	49.63
Female Households	14.06	48.00

Table 3. Informal Employment

Informal job	Model	Odds Ratio	Significance
Fixed Part			
<i>Intercept</i>	0.566	1.761	*
Individual level variables			
Age (grand centered)	-0.031	0.970	*
Schooling	-0.112	0.894	*
Female	-0.001	0.999	*
Marital status	-0.422	0.656	*
Presence of Children	-0.039	0.961	*
Female-headed Household	-0.059	0.943	*
Job and Occupation			
Professional, medium-high management			
Agriculture et al	2.161	8.677	*
Trade	0.882	2.415	*
Personal Services	1.026	2.790	*
Industrial	0.721	2.056	*
Neighborhood level variables			
Segregation	0.273	1.314	+
Cross-level Gender*Segregation	-0.039	0.962	+
Random Part			
Uo Ageb level	0.25931	0.06724	*
Ue Individual level			
U gender	0.16017	0.02565	*
* p value < .001			

Table 4. Critical-conditions Employment

Critical Conditions	Coefficient	Odds Ratio	Significance
Fixed Part			
<i>Intercept</i>	-1.169038	0.310666	*
Individual level variables			
Age (grand centered)	-0.009206	0.990837	*
Schooling	-0.071235	0.931243	*
Female	0.465036	1.592072	*
Marital status	0.153583	0.85763	*
Presence of Children	0.080944	1.08431	*
Female-headed Household	-0.016745	0.983394	+
Job and Occupation			
Informal job G50	0.877762	2.40551	*
Professional, medium-high management			
Agriculture et al	0.924009	2.519369	*
Trade	0.410535	1.507624	*
Personal Services	0.335363	1.398447	*
Industrial	0.203792	1.226043	*
Neighborhood level variables			
Segregation	0.260706	1.297846	*
Cross-level Gender*Segregation	-0.044326	0.956642	+
Random Part			
Uo Ageb level	0.12722	0.016	*
Ue Individual level			
U gender	0.07819	0.006	*
* p value < .001			

Table 5. Hourly Wage (ln)

	Model 3 Segregation and Gender	Standard Error	Significance
Fixed Part			
<i>Intercept</i>	2.2967	0.0115	*
Individual level variables			
Age (grand centered)	0.0132	0.0002	*
Schooling	0.0909	0.0006	*
Female	-0.0932	0.0103	*
Marital status	0.1007	0.0045	*
Presence of Children	-0.0609	0.0039	*
Female-headed Household	-0.0235	0.0046	*
Job and Occupation			
Informal job	-0.1005	0.0040	*
Professional, medium-high management	-	-	
Agriculture et al	-0.2946	0.0272	*
Trade	-0.3052	0.0065	*
Personal Services	-0.3191	0.0056	*
Industrial	-0.3204	0.0061	*
Neighborhood level variables			
Segregation	-0.1891	0.0064	*
Cross-level Gender*Segregation	0.0342	0.0098	*
Random Part			
	Variance	Significance	
Uo Ageb level	0.03542	*	
Ue Individual level	0.62847	-	
U gender	0.0033	*	
* p value < .001			

Appendix A. Independent Variables

	Individual variables
Age	Years. Variable was always grand centered.
Schooling	Accumulative years of schooling
Female	0 Male, 1 female
Married Status	0= single, separated or widow; 1= married or civil union
Presence of Children	Whether there were children 14 years old and younger in the household
Female-headed Households	Whether the head of the household was female
Occupation	Large occupational groups
Informal Job	0= formal job, works in a job with health insurance and/or contributes to social security pension, 1= informal job, neither health insurance nor pensions
	Neighborhood variables
Poverty Location Quotient	LQ=proportion of poor at each neighborhood/proportion of poor in the whole city

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