

**Unraveling the Culprits of Residential Segregation: Race, Class, and Schooling In
Pretoria, Johannesburg and Vereeniging**

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This paper accesses the mechanisms in which residential segregation impacts the lives of individuals living in the Pretoria, Johannesburg, and Vereeniging (PJV) area of South Africa. Specifically, this paper will focus on the relationship between residential segregation and schooling and income inequality among all racial groups in South Africa.ⁱ Recent analysis on post apartheid South Africa indicates that racial residential segregation at the magisterial district level remains very high among the African and Coloured populations and White and Coloured populations (McClinton and Zuberi, 2006).ⁱⁱ This paper utilizes indirect standardization methodology using several household characteristics to redistribute the population in the Pretoria, Johannesburg, and Vereeniging. Additionally, this paper seeks to examine the distributional regime theory proposed by Seekings and Natrass (2006).

Seekings and Natrass (2006) posit that inequality remained stagnated immediately following apartheid. The authors also describe inequality within racial groups as increasing and inequality between racial groups as decreasing. The distributional regime theory argues that labor market, industrial policies and economics impact the growth pattern of the economy and policies that reallocate agencies within public welfare including such institutions as public education. Furthermore, Seekings and Natrass (2006) argue that class is more salient than race in understanding the persistence of inequality. The purpose of the paper is to address Seekings and Natrass (2006) argument and provide the evidence that racial disparities in income and schooling attainment are prevalent and linked in the post apartheid era.

Previous research which employs the indirect standardization and residential segregation by socioeconomic status methods to describe residential segregation patterns are based on the US context (Kain, 1986; Farley, 1995; Darden and Kamel, 2000; Charles 2001). The use of indirect standardization methodology yields consistent findings that racial factors account for residential segregation patterns in US metropolitan areas. Using four household characteristics, Kain (1986) utilizes indirect standardization to examine the relationship between socioeconomic status and residential segregation patterns in Cleveland and Chicago for 384 and 216 household types, respectively. Kain (1986) concludes that Blacks in Cleveland live in ghettos regardless of their socioeconomic status and the predicted distribution of Chicago's black household differs greatly from the actual distribution. Farley (1995) assesses the 1990 St. Louis census data to examine the relationship between socioeconomic factors and residential segregation patterns between Blacks and Whites. Based on the analysis, Farley (1995) concludes that Blacks and Whites were segregate at all class levels; race remain significant in where people reside, "even more than it did in the past" (1995, 252).

The purpose of this paper is to investigate whether a nexus exist between residential segregation, race, class, and schooling in PJV. By employing indirect standardization and segregation by socioeconomic status methodologies in small geographical areas, this paper goes beyond describing residential segregation to understanding its impact on society.

Apartheid Segregation in South Africa

Segregation began with the Dutch, who reigned from 1652 to 1806 and continued through the nineteenth century with the British colonizers (Beinart and Dubow, 1995). However, modern segregation is a result of industrialization in South Africa, which

resulted from the exploitation of gold and diamonds during the late nineteenth century. During this period, the ideology of segregation was refined and fully extended to everyday life (Beinart and Dubow, 1995). Legislatively, after the Union of 1910, individuals of White descent used their political, economic and social power to impose one of "the most extreme forms of racial segregation in the twentieth century world" (Beinart and Dubow, 1995).

History reveals that legislatively, South Africa sought to sustain residential segregation. From 1910-1948, during the period of segregation in South Africa, several legislative acts were passed to insure the separation of the races, including the Mines and Works Act of 1911, the Native Land Act of 1913, the Urban Area Act of 1923, and the Native Trust and Land Act of 1936. The Native Land Act of 1913 limited land ownership for blacks to designated black areas. The Native Trust and Land Act of 1936 reinforced the Native Land Act of 1913; however it gave Africans exclusive rights to their "homelands" but ownership was unlikely for most blacks as a result of high rents and availability of land.

This legal segregation was transformed into apartheid in 1948. Apartheid was a continuation and extension of the segregationist policies of previous White colonial administrations. After the election of the Nationalist Party in 1948, laws were passed, in which individuals were characterized at birth as White, Indian/Asian, Coloured or African. Apartheid forbade interracial sexual relationships and marriages; social institutions, such as schools, restaurants, and libraries were divided by racial boundaries (Prohibition of Mixed Marriage Act of 1949, Immortality Act of 1950 and Bantu Authorities Act of 1951). Apartheid encompasses four ideas: the classification of four racial groups: Africans, Whites, Coloureds and Indians (defined in the Population Act of 1950). Secondly, Whites maintain control over the state and Whites interests subsisted over Black/ African interests. Lastly, according to apartheid, Whites belong to one single nation and Africans belong to several nations (Thompson 2000). Apartheid impacted every realm of individual's daily lives.

Post Apartheid Segregation in South Africa

Using 1996 census data, Christopher (2001) analyzes whether segregation levels have decreased since the end of "legal" apartheid in 1991. The author concludes the following: 1. Africans have achieved some integration but poverty significantly impacts housing choices. 2. Indians and Asians have achieved the greatest integration levels. This is a result of Indians and Asians returning to the metropolitan areas which they were forced to move in accordance with the 1950 Population Act. 3. Whites remain the most segregated and less receptive to integration than other racial group.

In a subsequent article, Christopher (2005) examines the pace of desegregation in South African between 1996 and 2001. In terms of residential segregation, Christopher (2005) concludes that the post apartheid city resembles the apartheid city. Furthermore, the author concludes that the Coloured population is the only racial group to have encountered substantial desegregation in the post apartheid context. One particular problem arises in the analysis, which is Christopher (2005) fails to discuss what two groups are being compared. For example Coloured - White segregation looks very different from Coloured - African segregation; however, the author labels it Coloured segregation. Additionally, Christopher (2001) and Christopher (2005) rely on residential

segregation measures at the provincial level; however Van Valey and Roof (1976) warns against using large geographical unit of analysis because that type of analysis yields lower residential segregation indices. Noted earlier is the lack of detail associated with the residential segregation indices.

The current literature on residential segregation in South Africa is lacking in several ways. First, the analysis employs large geographical area such as provincial level data to understand the current residential segregation. In this paper, the analysis employs enumeration level data to examine the current residential segregation patterns. Secondly, an analysis which addresses the relationship between the impact of residential segregation and life opportunities in the post apartheid era is nonexistent. The remainder of this paper will proceed as follows. First, I describe the current racial residential patterns for all racial groups in the Gauteng province, with focus on Pretoria, Johannesburg, and Vereeniging and using 1996 census data. Secondly, I determine whether the levels of Africans segregation from Coloureds, Indians/ Asians and Whites in Johannesburg and Vereeniging and Whites' segregation from Africans, Indian/ Asian and Coloureds in Pretoria remain high even when each racial group have comparable levels of household size, income and schooling.

Preliminary Findings

The purpose of this paper was to investigate the relationship between residential segregation and socioeconomic status at several levels in Pretoria, Johannesburg and Vereeniging. An investigation using multivariate analysis to address the nexus between socioeconomic status and residential segregation in South Africa has not been undertaken by scholars until now. To-date, including US based, no study compares the relationship between socioeconomic status and racial residential segregation in three different metropolitan areas. Additionally, this study also compares all four racial groups defined in the 1996 South African census. Therefore this analysis is the most comprehensive analysis in the South African context which addresses the impact of family size, household income, age of the head of household and schooling on racial residential segregation in Pretoria, Vereeniging and Pretoria.

The racial distribution of households in South Africa is unique due to the mandates of the thirty plus years of apartheid regime. In Pretoria, the distribution of households based on household monthly income yield results that are not completely surprising (see table 1). For example, Black households disaggregated by income are distributed evenly throughout Pretoria; with 50 percent obtain low income, compared to 8 percent of their White counterpart. Coloured and Indian/Asians households follow similar patterns of their White counterparts and in some cases are in better economic positions. Therefore in Pretoria, there are more affluent White, Indian/ Asian and Coloured households than African households. Additionally, racial difference in the schooling attainment of the head of the household also provides more details of the racial disparities in Pretoria. Sixty nine percent of Indian/Asian head of households have some secondary schooling compared to 50 percent of their African counterpart.

By controlling for socioeconomic status, the role of residential segregation is examined and presents further invaluable information on the life opportunities of particular individuals in Pretoria (see table 7). The predicted model for Pretoria produces a consistent finding. In order words, Indians/ Asians and Africans/ Black have the largest

income disparities and also the largest ratio of decrease in residential segregation if socioeconomic status was controlled or equal. This is also true for Coloureds in comparison to Blacks. However, this is not case for Whites and Africans in Pretoria. Income disparities are high between Africans and Whites; however the difference between the actual and predicted models is the lowest in comparison to Coloureds and Indians/ Asians.

Similar to Pretoria but with a different racial composition makeup, Johannesburg provides a different outlook on residential segregation with a more even racial distribution of households (see table 2). For example, 54 percent of African household incomes are considered low income compared to 25 percent of their Coloured counterparts. Additionally, 58 percent of Black head of households have some secondary schooling compared to 68 percent of their White counterpart. Based on the distribution of household analysis, households in Johannesburg are more evenly distributed than Pretoria; however; racial disparities do exist but are not exacerbated. Relative to Pretoria, residential segregation in Johannesburg is lower however levels are still high. Once household characteristics are standardized, the residential segregation levels decreases from high to moderate levels (see table 8). These findings are consistent with the literature which describes Johannesburg as an area with similar percentages of Whites and Africans but with varying levels of class statuses (Beavon, 1992). Future analysis on Soweto's residential segregation patterns will provide a more interesting comparison to Johannesburg in the post apartheid context.

Vereeniging provides a scenario to understand the eastern region of South Africa as a whole due to its predominately African population (approximately 73 percent). The racial disparities between Africans and Whites, Coloureds and Indians/ Asians are very prevalent in Vereeniging (see table 3). Approximately 23 percent of African household are considered middle income, in contrast to 66 percent, 56 percent, and 54 percent of their Indian/ Asians, Coloured and White counterparts. Increases in the number of middle class households have not been distributed through all racial groups equally. Similar patterns of disparities are prevalent in schooling attainment. Furthermore, the residential segregation ratio is consistently higher in Vereeniging compared to other areas in PJV (see table 9). By giving all individuals the same life opportunities, residential segregation between Coloureds and Africans would be 1.5 times lower. The difference between the actual and predicted residential segregation between Coloureds and Africans is the second highest in Vereeniging.

Unraveling the culprits of residential segregation in the post apartheid era is necessary and relevant task to undertake. The purpose of this paper is to begin the process of understanding the impact of residential segregation using the 1996 South African census data. There is evidence from the preliminary results that racial disparities in income and schooling attainment remains and are persistence in Pretoria, Johannesburg and Vereeniging. Until these disparities are eliminated, the governmental policies which sought to eliminate racial inequality have failed and are in need of reevaluation. Furthermore, the preliminary findings suggest that race and class are still issues for Pretoria, Johannesburg and Vereeniging and South Africa as a whole. Using three different areas with three different racial compositions are useful tools to understand how inequality unfolds given different social circumstances.

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Table 1

Distribution of Household Characteristics by Race in Pretoria				
Characteristic	African	White	Coloured	Asian
Mean	0.322	0.590	0.040	0.037
Family Size				
1	0.361	0.196	0.103	0.091
2	0.216	0.282	0.139	0.140
3	0.124	0.175	0.191	0.177
4 to 5	0.172	0.284	0.361	0.412
5+	0.128	0.064	0.207	0.181
Mean	2.92	2.94	4.01	3.96
Standard Deviation	2.38	1.61	2.02	1.85
Household Monthly Income				
No Income	0.100	0.019	0.036	0.052
Low Income	0.518	0.087	0.212	0.182
Middle Income	0.329	0.480	0.606	0.555
High Income	0.054	0.414	0.146	0.211
Age of the Household Head				
Less than 25	0.106	0.100	0.088	0.084
25 to 34	0.280	0.215	0.281	0.205
35 to 44	0.282	0.227	0.315	0.259
45 to 54	0.158	0.186	0.155	0.236
55 to 64	0.086	0.124	0.089	0.132
65+	0.088	0.147	0.073	0.084
Schooling attainment of the head of the household				
No schooling	0.160	0.007	0.025	0.051
Some Primary	0.169	0.003	0.047	0.058
Completed Primary	0.090	0.003	0.048	0.031
Some Secondary	0.505	0.616	0.789	0.691
Completed Secondary	0.035	0.113	0.050	0.049
Post Secondary	0.036	0.232	0.034	0.106
Number of Cases	57,125	104,743	7,166	6,626
Source: 1996 South Africa Census Data				

Table 2

<u>Distribution of Household Characteristics by Race in Johannesburg</u>				
Characteristic	African	White	Coloured	Asian
Racial Proportion	0.362	0.335	0.185	0.104
Family Size				
1	0.357	0.217	0.078	0.082
2	0.274	0.286	0.150	0.169
3	0.154	0.173	0.171	0.171
4 to 5	0.153	0.254	0.346	0.386
5+	0.063	0.071	0.255	0.191
Household Monthly Income				
No Income	0.087	0.026	0.104	0.050
Low Income	0.544	0.136	0.256	0.157
Middle Income	0.329	0.458	0.526	0.571
High Income	0.041	0.380	0.115	0.221
Age of the Household Head				
Less than 25	0.141	0.047	0.065	0.071
25 to 34	0.351	0.161	0.248	0.221
35 to 44	0.257	0.200	0.264	0.254
45 to 54	0.139	0.200	0.188	0.220
55 to 64	0.069	0.161	0.124	0.134
65+	0.043	0.230	0.111	0.099
Schooling attainment of the head of the household				
No schooling	0.117	0.019	0.033	0.042
Some Primary	0.157	0.009	0.063	0.060
Completed Primary	0.087	0.009	0.055	0.037
Some Secondary	0.561	0.670	0.785	0.692
Completed Secondary	0.036	0.068	0.033	0.059
Post Secondary	0.028	0.168	0.018	0.083
Number of Cases	67,831	62,812	34,560	19,444

Source: 1996 South Africa Census Data

Table 3

Distribution of Household Characteristics by Race in Vereeniging

Characteristic	African	White	Coloured	Asian
Racial Proportion	0.730	0.201	0.049	0.014
Family Size				
1	0.199	0.139	0.073	0.071
2	0.191	0.282	0.098	0.125
3	0.165	0.197	0.158	0.144
4 to 5	0.265	0.318	0.419	0.452
5+	0.180	0.064	0.252	0.208
Household Monthly Income				
No Income	0.182	0.024	0.066	0.042
Low Income	0.568	0.158	0.254	0.103
Middle Income	0.232	0.549	0.560	0.663
High Income	0.019	0.270	0.120	0.192
Age of the Household Head				
Less than 25	0.097	0.055	0.054	0.067
25 to 34	0.268	0.189	0.294	0.212
35 to 44	0.292	0.239	0.358	0.266
45 to 54	0.166	0.211	0.174	0.231
55 to 64	0.090	0.149	0.073	0.157
65+	0.087	0.158	0.048	0.067
Schooling attainment of the head of the household				
No schooling	0.179	0.012	0.048	0.048
Some Primary	0.197	0.006	0.057	0.061
Completed Primary	0.099	0.003	0.046	0.024
Some Secondary	0.497	0.781	0.773	0.685
Completed Secondary	0.015	0.059	0.030	0.058
Post Secondary	0.007	0.083	0.029	0.071
Number of Cases	65,992	18,189	4,406	1,256

Source: 1996 South Africa Census Data

Table 4ⁱⁱⁱ

**Residential Segregation between Blacks and
White, Coloured and Indians/ Asians with Same
Socioeconomic Status in Pretoria, 1996**

	$I_{d_{bw}}$	$I_{d_{cw}}$	$I_{d_{iw}}$
Family Size			
1	0.660	0.369	0.420
2	0.266	0.575	0.569
3	0.205	0.064	0.007
4 to 5	0.446	0.309	0.516
5+	0.258	0.570	0.466
Household Monthly Income			
No Income	0.323	0.068	0.133
Low Income	0.862	0.502	0.379
Middle Income	0.605	0.504	0.301
High Income	0.721	0.537	0.813
Age of the Household Head			
Less than 25	0.024	0.049	0.065
25 to 34	0.258	0.261	0.042
35 to 44	0.222	0.353	0.131
45 to 54	0.114	0.125	0.199
55 to 64	0.154	0.142	0.030
65+	0.237	0.297	0.253
Schooling attainment of the head of the household			
No schooling	0.612	0.072	0.175
Some Primary	0.663	0.177	0.220
Completed Primary	0.348	0.183	0.113
Some Secondary	0.446	0.692	0.299
Completed Secondary	0.312	0.253	0.255
Post Secondary	0.782	0.790	0.501

Source: 1996 South Africa Census Data

Table 5^{iv}

**Residential Segregation between Blacks and White,
Coloured and Indians/ Asians with Same Socioeconomic
Status in Johannesburg, 1996**

Family Size	ID _{wb}	ID _{cb}	ID _{ib}
1	0.560	0.558	0.550
2	0.048	0.497	0.419
3	0.076	0.070	0.068
4 to 5	0.403	0.771	0.932
5+	0.031	0.770	0.512
Household Monthly Income			
No Income	0.244	0.070	0.144
Low Income	0.817	0.576	0.774
Middle Income	0.519	0.788	0.971
High Income	0.679	0.295	0.721
Age of the Household Head			
Less than 25	0.374	0.303	0.279
25 to 34	0.760	0.414	0.519
35 to 44	0.227	0.028	0.012
45 to 54	0.246	0.196	0.326
55 to 64	0.370	0.222	0.263
65+	0.747	0.272	0.223
Schooling attainment of the head of the household			
No schooling	0.392	0.338	0.300
Some Primary	0.595	0.376	0.390
Completed Primary	0.312	0.128	0.197
Some Secondary	0.440	0.896	0.525
Completed Secondary	0.130	0.010	0.093
Post Secondary	0.557	0.039	0.217

Source: 1996 South Africa Census Data

Table 6^v

**Residential Segregation between Blacks and White,
Coloured and Indians/ Asians with Same Socioeconomic
Status in Vereeniging, 1996**

Socioeconomic Characteristic	ID _{wb}	ID _{cb}	ID _{ib}
Family Size			
1	0.240	0.502	0.513
2	0.364	0.372	0.265
3	0.128	0.028	0.082
4 to 5	0.211	0.613	0.746
5+	0.462	0.288	0.114
Household Monthly Income			
No Income	0.634	0.462	0.560
Low Income	0.821	0.629	0.929
Middle Income	0.634	0.658	0.862
High Income	0.503	0.404	0.692
Age of the Household Head			
Less than 25	0.168	0.172	0.117
25 to 34	0.318	0.102	0.227
35 to 44	0.214	0.264	0.104
45 to 54	0.181	0.032	0.261
55 to 64	0.234	0.068	0.267
65+	0.284	0.159	0.080
Schooling attainment of the head of the household			
No schooling	0.671	0.526	0.527
Some Primary	0.763	0.560	0.544
Completed Primary	0.384	0.212	0.299
Some Secondary	0.567	0.551	0.749
Completed Secondary	0.174	0.060	0.170
Post Secondary	0.305	0.088	0.257

Source: 1996 South Africa Census Data

Table 7

Actual and Predicted Levels of Whites, Coloureds and Indians/ Asians
Residential Segregation from Blacks in Pretoria, 1996

Index of Dissimilarity	ID _{bw}	ID _{cw}	ID _{iw}
Actual	0.686	0.840	0.887
Predicted	0.546	0.571	0.564
Difference	0.141	0.269	0.322
Ratio	1.258	1.472	1.571

Source: 1966 South African Census

Table 8

Actual and Predicted Levels of Whites, Coloureds and Indians/ Asians
Residential Segregation from Blacks in Johannesburg 1996

Index of Dissimilarity	ID _{wb}	ID _{cb}	ID _{ib}
Actual	0.647	0.806	0.778
Predicted	0.542	0.577	0.604
Difference	0.105	0.230	0.174
Ratio	1.194	1.398	1.288

Source: 1966 South African Census

Table 9

Actual and Predicted Levels of Whites, Coloureds and Indians/ Asians
Residential Segregation from Blacks in Vereeniging 1996

Index of Dissimilarity	ID _{wb}	ID _{cb}	ID _{ib}
Actual	0.884	0.907	0.965
Predicted	0.665	0.612	0.682
Difference	0.219	0.295	0.283
Ratio	1.329	1.483	1.415

Source: 1966 South African Census

ⁱ In this paper, I refer to the following racial categories based on 1996 census classification: African White, Indian/Asian and Coloured as described by Khalfani et al (2005). Africans refer to the population that is indigenous African. White category refers to members of the population with Dutch, English, German, French and Afrikaners origins. Coloured category refers to many mixed race persons and all others that were not included in the other three racial groups, including Cape Malays (Republic of South Africa, 1961). The Indian/Asian category refers to the population with origins from Asia and India.

ⁱⁱ A magisterial district is similar to a metropolitan area in the United States. There are approximately 345 magisterial districts in the 1996 South African census.

ⁱⁱⁱ where ID_{bw} is the index of dissimilarity between Africans and Whites, ID_{cw} is the index of dissimilarity between Coloureds and Whites, and ID_{iw} is the index of dissimilarity between Indians/Asian and Whites.

^{iv} where ID_{wb} is the index of dissimilarity between Whites and Africans, ID_{cb} is the index of dissimilarity between Coloureds and Africans, and ID_{ib} is the index of dissimilarity between Indians/Asians and Africans

^v where ID_{wb} is the index of dissimilarity between Whites and Africans, ID_{cb} is the index of dissimilarity between Coloureds and Africans, and ID_{ib} is the index of dissimilarity between Indians/Asians and Africans