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# USING CENSUS DATA TO CLASSIFY COMMUNITY COLLEGE STUDENTS BY SOCIOECONOMIC STATUS AND COMMUNITY CHARACTERISTICS

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Colleges and state higher education agencies too often lack accurate information about the socioeconomic status (SES) of their students. Information on family income, education levels, and other demographics is available for students who fill out a Free Application for Federal Financial Aid (FAFSA), but at most colleges only a portion of students do so. This presents a problem for efforts to better understand patterns and determinants of student success, since research shows that SES is a key factor in college access and attainment (Adelman, 1999; Cabrera, Burkum, & La Nasa, 2005; Long, 2004; Pascarella & Terenzini, 2005; Rouse, 1995).

The Washington State Board for Community and Technical Colleges (WSBCTC) is in need of acquiring accurate information on its students' SES so it can make informed policy decisions and provide well-grounded guidance to its member colleges on ways to improve service to the residents of the state. Recently, for example, the WSBCTC and other policy makers in the state have become interested in the questions of whether the students served by community and technical colleges reflect the changing population of the state and whether there are particular groups of residents that are not being adequately served. Some hypothesize that increases in tuition that the colleges have had to impose over the past decade have prevented some low-income students from attending college. The WSBCTC has explored various methods for measuring student income, including information from the FAFSA combined with data from Unemployment Insurance wage records, state welfare rolls, and other administrative datasets. The results of these previous efforts were unsatisfactory, however, due to the inconsistency of data from the different sources.

This paper describes the methodology that Community College Research Center (CCRC) researchers used to estimate the SES of individual students in the Washington State community and technical college system using SES descriptors from the Census information on their geographic area of residence.[1] Data collected by the federal government for the decennial Census provide indicators of SES for relatively small, homogenous geographic areas known as "block groups." We matched students' addresses with Census block groups and then classified them according to the average SES characteristics of their block group.

The paper is organized as follows: Following this introduction, the second section describes how we linked students with block groups to estimate their SES, defined in terms of household income, education, and occupation. We did this analysis using data from both the 1990 and 2000 Censuses. In the third section, we used cluster analysis to combine Census block groups into 15 demographically distinctive "community clusters," and then matched each student with a cluster. Doing this enabled us to classify students according to a richer set of information than just income, education, and occupation. These community clusters will be useful to the WSBCTC and its member colleges in gauging their "market penetration" in various demographic sectors of the state, and in identifying particular communities where students may face barriers to college access. Given the interest of the state in ensuring access to college by students from low-income families, the fourth section shows how the community clusters break out by SES. We conclude with some suggestions for ways that state agencies and colleges in other states can use this methodology.

## EXTRACTING SOCIOECONOMIC STATUS FROM CENSUS BLOCK GROUPS

### Step 1

The first step in this process is acquiring a dataset with a unique identifier and home address for each student. An identifier is necessary in order to merge the Census information with other student datasets. Student addresses should be the ones that most accurately reflect their family's socioeconomic status. For example, for students who recently moved to a college town, using the address of an emergency contact, such as a parent, may produce a more accurate measure of SES than the address of their college. Although, it is difficult to make these types of decisions without longitudinal address information, it is important to use the address that most accurately reflects the student's true SES.

### Step 2

In a process called geocoding, student address data from

college enrollment records are matched with a larger database that provides the precise latitude and longitude of the student's address. Geographic Information System (GIS) software, such as ArcGIS, have tools to do this, and several other utilities exist as freeware that can be downloaded from the Internet. Difficulties arise in situations where, for example, students give a post office box rather than a residential address, since they might then be matched to a geographic location that is not their place of residence. Also, researchers may find that the geocoding database contains no matching latitude and longitude; thus, to acquire locations for these students, it may be necessary to abandon computer automation and locate coordinates using alternative methods.

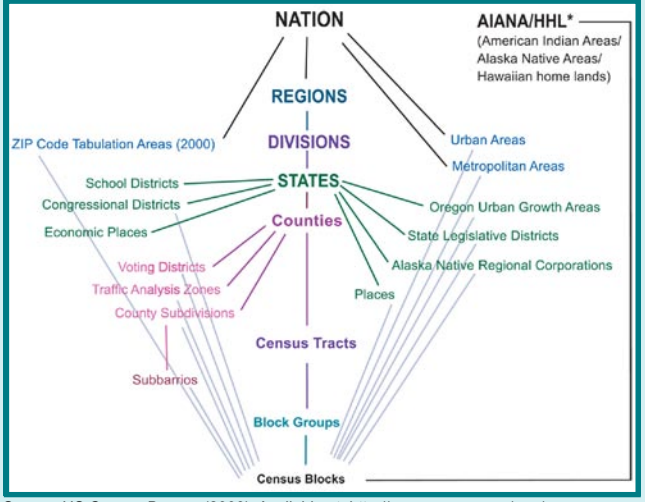
### Step 3

With student latitude and longitude information in hand, a GIS user then creates a geographic dataset (geodata) that will be used to match student locations to block groups.

### Step 4

Next, the proper geographic unit to use must be determined. The U.S. Census Bureau uses a hierarchy of geographic analysis units. The smallest unit is the block, which may consist of individual city blocks in an urban area or up to several square miles in rural areas. Block groups are agglomerations of one or more blocks. They are the smallest geographic unit for which the Census Bureau provides many of the economic and demographic variables we used in this analysis. Figure 1 depicts the geographical hierarchy of the Census.

**Figure 1: Census Hierarchy of Geographic Units**




Source: US Census Bureau (2006). Available at: http://www.census.gov/geo/www

Since block groups are the most specific geographic area for our purposes, we used block group geodata for Washington State that came packaged with ArcGIS. Washington State had 4,620 block groups in the 1990 Census and 4,825 in the 2000 Census, each containing, on average, a little more than 1,200 persons and about 470 households.

### Step 5

Since we had geographic data indicating both student addresses and Washington State block groups, we could overlay the addresses (points) on the block groups (polygons) to determine which address points were located in which block groups. By using the GIS software to geographically intersect student coordinates with the area in the state covered by individual block groups, we appended the address geodata so that each student now had additional fields that referenced his or her block group and variables specific to that block group.

### Step 6

Now that Census data are directly linked with student addresses, they could also be merged back to the main student file using the student identifier mentioned in Step 1. This provided a direct link between the students and the demographic and economic information for individuals and households in the block group to which each had been assigned. Several variables in the Census can be construed as SES indicators for block group residents, including household income, education, and occupation category. They can be combined in various ways to create anything from a SES index to a series of SES indicator variables for discrete SES levels.

### Summary of Steps to Find Socioeconomic Status from Block Groups:

1. Acquire student addresses.
2. "Geocode" student addresses by converting them into latitude and longitude points.
3. Create GIS data containing student latitude and longitude points.
4. Acquire Census geodata at block group level.
5. Match, or geographically intersect, student data points to block groups.
6. Assign SES variables from Census data at the block group level to each student.

## USING CENSUS DATA TO CLASSIFY GEOGRAPHIC COMMUNITIES BY DEMOGRAPHIC CHARACTERISTICS

A second part of our exploration of Washington Census data was an analysis of the relationship between population characteristics of different regions or communities in the state and characteristics of students in its community and technical colleges. As mentioned, the WSBCTC is interested in learning how well its colleges' students represent the state's population and whether there are particular demographic groups who are not well served. To answer questions such as these, we needed to define a set of demographically distinct communities throughout the state. For these community definitions to be useful for analysis and discussion, the communities must not be too numerous and must have quantitative and qualitative descriptions that accurately define and distinguish each area.

To identify these sets of communities, we used a method called cluster analysis, which is a set of algorithms for grouping

objects with similar characteristics into categories. In this case, we clustered Washington Census block groups together based on similarities in their demographic, economic, and geographic characteristics. Creating a relatively limited set of demographically similar communities in this way enabled us to avoid having to separately describe the characteristics of several thousand different block groups.

Cluster analysis is not a statistical technique in the sense that it proves at some level of significance any similarity among a cluster of block groups or can be used to test hypotheses or make inferences. Yet, cluster analysis is a valid mathematical tool for mining data to produce groups of similar objects. The results depend on the distance and linkage methods as well as the variables one chooses to use in defining the clusters. The following steps outline the cluster analysis process we used to define community clusters in Washington State.

**Step 1**
The first step in the cluster analysis process is deciding which geographic level to cluster. We chose the block group because, again, it was the smallest geographic level for which we had a substantial array of demographic data elements.

**Step 2**
After acquiring the data so that each observation is a block group, a set of variables was chosen based on characteristics that will be useful in identifying similarities among block groups. It is important to note that different sets of variables will yield different clusters, and researchers will often revisit this step several times in the process. We chose variables that are relevant to community college educators in thinking about the types of populations from which they want to draw students. The variables used in this analysis are presented below:

- Percent Hispanic
- Percent White
- Percent Black
- Percent Asian or Pacific Islander
- Percent Native American

- Percent under 5 years of age
- Percent age 5 to 17
- Percent age 18 to 21
- Percent age 22 to 29
- Percent age 30 to 39
- Percent age 40 to 49
- Percent age 50 to 64
- Percent age 65 or older

- Median HH (household) income
- Unemployment rate
- Urbanicity (measured by rural-urban commuting area)

- Percent in professional or managerial occupations
- Percent in service sector occupations
- Percent in farming, fishing, or forestry occupations
- Percent in production, construction, maintenance, or transportation occupations
- Percent of persons 25 or older with a bachelor's degree
- Percent of persons 25 or older with some postsecondary education
- Percent of persons 25 or older with a high school diploma/ GED only
- Percent of persons 25 or older without a high school diploma

- Percent of households in poverty
- Percent of households headed by a single parent
- Percent of households with children under age 18

- Percent of households in which the primary language spoken is not English
- Percent of persons who speak English less than "very well"

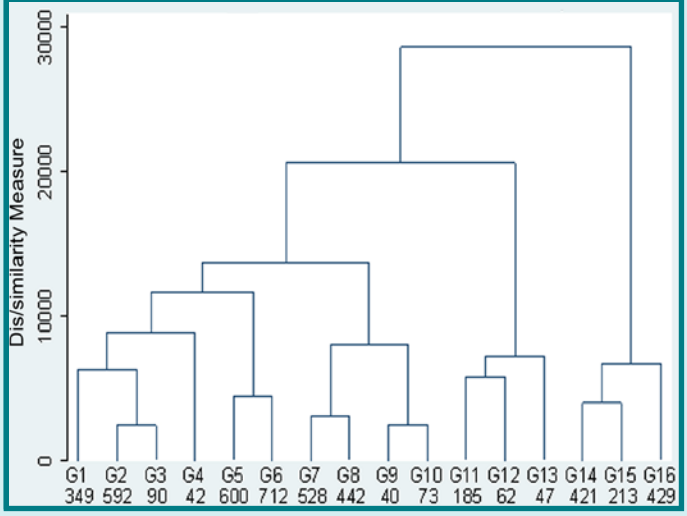
**Step 3**
Once the variables are selected, they need to be standardized in order to prevent any one variable from having a disproportionate impact in the clustering algorithm. With this in mind, we standardized the values so that all variables have equal weight in the cluster algorithm. However, variables such as median income and race/ethnicity, which may exhibit greater variation among block groups (due to economic and racial segregation), may take on a greater role in producing distinctions between block groups. In this sense, they may have greater influence or "weight" in creating the clusters.

**Step 4**
The next step is deciding which cluster methodology to use. A detailed description of different cluster methodologies is outside the scope of this paper (see Anderberg, 1973; Everitt, 1993). We selected an agglomerative hierarchical clustering technique. Researchers need to define two factors with this method: a distance metric and a linkage method. The distance metric tells the algorithm how to compare the values of the characteristic variables of individual block groups to those of other individual block groups. The linkage method specifies a way to make these comparisons when clusters of block groups are involved. After a series of trials, we determined that the most accurate clusters from the perspective of those familiar with WA demography and geography resulted from a Euclidean squared distance metric and Ward's linkage method.

**Step 5**
After the variables and an algorithm are chosen, the cluster routine is ready to build clusters. The cluster analysis assigns block groups to clusters in a multi-step process which, due to its agglomerative and hierarchical nature, starts with each block group in its own cluster. The number of clusters in the first iteration was 4,825 for Washington 2000 data. This first step identified the two block groups that are the most similar (or least dissimilar) based on all their values of all the variables and then placed them together into a cluster. This led to a set of 4,824 clusters (one fewer than before). The process continues by merging the next two most similar block groups (or clusters of block groups) until the desired number of clusters is reached.

The following tree diagram (Figure 2), or dendrogram, illustrates the combining of block groups and clusters. In this illustration, we have chopped the dendrogram at 16 clusters and depicted the final stages of the cluster algorithm up to one cluster. The numbers prefixed with G (e.g., G1 to G16) are the cluster numbers. The numbers below the cluster numbers indicate the number of block groups in each cluster. Reading up from the bottom, the diagram shows which next set of clusters are most similar and will be merged to form a new cluster at the next level. In this example, clusters G2 and G3 are the most similar, and if we were interested in a set of 15 clusters, G2 and G3 would be merged and the other 14 clusters would remain untouched.

**Figure 2: Dendrogram for 2000 WA Block Group**




**Step 6**

The cluster algorithm by default creates a complete set of clusters, and the researcher must select how many distinct clusters should be further analyzed. For this study, we used the 1990 and 2000 Census block group data from Washington to create 15 community clusters for each Census year and named them based on a careful analysis of the summary demographic, economic, and geographic characteristics of each. Fifteen clusters were chosen because this was a manageable number that divided the state into logical subdivisions. At this stage, any number of clusters can be defined depending on the researcher's purposes. Names and detailed characteristics and descriptions of each cluster are presented in the appendix. These cluster descriptions were derived from the descriptive statistics presented in the table spread at the end of the Appendix.

### Summary of Steps Involved in the Cluster Analysis:

1. Decide geographic level.
2. Select variables.
3. Standardize variables.
4. Choose cluster methodology, and if necessary, distance metric and linkage method.
5. Run cluster algorithm.
6. Identify the number of clusters to be defined.

Often, steps two through six will be repeated numerous times until a satisfactory cluster grouping is found. This is to be expected since there is no "right" way to perform a cluster analysis, and the process is often considered more of an art than a science. It is important to choose variables and algorithms so that the resulting clusters are useful from the researcher's perspective. Considerable experimentation may be required.

## USING COMMUNITY CLUSTERS TO THINK ABOUT SES

We next examined the SES of the 15 community clusters in 1990 and 2000. The following tables (Tables 1 and 2) show the block group clusters and how the clusters rank according to SES in each time period. To compare cluster SES, we used three variables: income, occupation, and education. Specifically, we looked at median household income, percentage of people in professional or managerial occupations, and percentage of persons 25 or older with a bachelor's degree. To compute an SES index, we used the standardized values, or z-scores, of our three SES measures and found the average z-score for each SES variable in the cluster. We then summed these three z-score averages for each cluster and ranked the clusters on this sum. The z-score sum indicates where the cluster group lies in the distribution of our three SES measures. Higher z-scores suggest higher SES since those at the upper end of the distribution will have higher incomes, education, and propensity to be a professional.

The tables are organized such that the highest SES cluster group is first.[2,3] At the request of the WSBCTC, we also divided the clusters into three and five SES groups. We did this by selecting natural breaks in the z-score sums. This then provided another way to look at the distribution of SES in each Census year. We linked individual student data to particular clusters or any of the SES categorizations for these cluster groups simply by merging the student data with the cluster data by block group.

## USING CLUSTER AND SES METHODOLOGIES

### Recommendations and Examples

The methodology presented here is potentially valuable to a variety of different users and audiences. Here we suggest some ways that states and individual institutions can use it.

- Geographic Information Systems (GIS) can be used to generate maps that show the distribution of student SES across the state or an individual college's service region. These SES maps can be superimposed over any number of layers with various elements (such as demographic characteristics, forest lands, dominant types

**Table 1: Year 1990 - 15 Clusters Ranked on SES**

| Name | Block Groups | % of HH | z-score Sum | SES Rank | 5 SES Groups | % of HH | 3 SES Groups | % of HH |
|---|---|---|---|---|---|---|---|---|
| Family Dream | 337 | 7.8 | 5.200508 | 1 | 1 | 7.8 | 1 | 35.1 |
| Young Professionals | 453 | 11.8 | 2.254682 | 2 | 2 | 27.3 | | |
| Suburban Contentment | 651 | 15.5 | 1.741609 | 3 | | | | |
| Campus Communities | 25 | 0.4 | 0.292222 | 4 | 3 | 51.1 | 2 | 51.1 |
| Mixed Suburban Success | 695 | 18.4 | -0.366412 | 5 | | | | |
| Blue Collar Whites | 551 | 10.9 | -0.66862 | 6 | | | | |
| Early Gentrification | 118 | 2 | -0.984917 | 7 | | | | |
| Older Middle-Class Empty Nesters | 474 | 9.6 | -1.274645 | 8 | | | | |
| Asian Newcomers | 73 | 1.3 | -1.319842 | 9 | | | | |
| Forests, Mountains, and Plains | 502 | 8.5 | -1.556149 | 10 | | | | |
| African American Urban Core | 66 | 1 | -1.981626 | 11 | 4 | 12.7 | 3 | 13.8 |
| The Working Fringe | 391 | 8.5 | -2.200243 | 12 | | | | |
| Native American Communities | 26 | 0.3 | -2.250031 | 13 | | | | |
| Rural Core | 189 | 2.9 | -2.273884 | 14 | | | | |
| Farmworker Communities | 69 | 1.2 | -3.11137 | 15 | 5 | 1.2 | | |

**Table 2: Year 2000 - 15 Clusters Ranked on SES**

| Name | Block Groups | % of HH | z-score Sum | SES Rank | 5 SES Groups | % of HH | 3 SES Groups | % of HH |
|---|---|---|---|---|---|---|---|---|
| Family Dream | 213 | 3.6 | 6.289018 | 1 | 1 | 3.6 | 1 | 36.7 |
| Young Professionals | 429 | 9.8 | 2.846448 | 2 | 2 | 33.1 | | |
| Well-Stocked Empty Nest | 421 | 8.5 | 2.714559 | 3 | | | | |
| Climbing the Ladder | 712 | 14.8 | 1.394414 | 4 | 3 | 45.5 | 2 | 45.5 |
| Campus Communities | 42 | 0.8 | -0.239341 | 5 | | | | |
| African American Urban Core | 40 | 0.6 | -0.589765 | 6 | | | | |
| Exurban Expansion | 600 | 11.9 | -1.0884 | 7 | | | | |
| Mixed Success | 442 | 10.8 | -1.264565 | 8 | | | | |
| Older Middle-Class Empty Nesters | 682 | 15.1 | -1.322138 | 9 | | | | |
| Forests, Mountains, and Plains | 349 | 6.3 | -1.497568 | 10 | | | | |
| Native American Communities | 47 | 0.7 | -1.834456 | 11 | 4 | 16.7 | 3 | 18 |
| Asian Newcomers | 73 | 1.2 | -2.033913 | 12 | | | | |
| Blue Collar Bedrock | 528 | 11.3 | -2.147674 | 13 | | | | |
| Rural Core | 185 | 3.5 | -2.294076 | 14 | | | | |
| Farmworker Communities | 62 | 1.3 | -3.762875 | 15 | 5 | 1.3 | | |

of industry, crime statistics, etc.) to see how student SES is geographically related to these elements.

- SES of students can be compared with SES of the state or region to see if a state system or individual college is serving a population that mirrors the SES of the state or service area.
- States and colleges can use SES information to inform tuition and financial aid policy.
- Information on changes from 1990 to 2000 in the composition of communities that surround institutions can help states and institutions make better informed forecasts and planning decisions.
- States can use cluster results when evaluating construction and expansion plans to identify particular neighborhoods that can potentially benefit from new or extension campuses.
- Colleges can use the neighborhood information to better understand their service areas. For example, if a college is in an area surrounded by households that are largely non-English speaking, it can devote more resources to ESL programs.
- The cluster framework can be used to place students in a particular community in order to assess market penetration and analyze from which community areas community and technical colleges are likely to draw or not draw their students. This information can help colleges target their marketing efforts.
- SES information can be used to help institutions analyze the impact of various costs, such as tuition, student fees, and parking, on student behaviors and to determine if such costs affect students differentially.
- Attaching an SES indicator to student records will allow researchers to add this proxy into statistical models to control for student SES or examine the impact of SES on access and attainment.

In the initial stage of work with these data, the WSBCTC did some analyses that we summarize here. One analysis described the SES level of students attending each of the community and technical colleges in Washington State. Figure 3 shows the distribution of students at each two-year college in WA by SES level. Observe the great variation among colleges in the

proportion of their students from each level.

A second analysis, shown in Figure 4, highlights the similarities and differences between the proportion of the state population from each SES level and the proportion of the student population in community and technical colleges by SES.

A final example, shown in Figure 5, utilizes Google™ Earth (http://earth.google.com) mapping software to display the concentration of block groups that are part of the "Rural Core" cluster and within 30 miles of a community college in Washington State.

## APPENDIX: 1990 AND 2000 WASHINGTON STATE CLUSTERS

### 1990 WA Clusters

1. **Forests, Mountains, and Plains** (502 block groups; 8.5% of all households)
Overwhelmingly White and rural communities across the state. Fairly high rates of older and retired populations and low rates of persons age 18 to 39. Dependence on forestry, farming, and fishing, as well as blue collar occupations. Average rates of income and unemployment, though lower than average rates of poverty. Most persons have a high school diploma or less.

**Figure 3: Two-Year Colleges by SES Levels of Students Served, 2000**

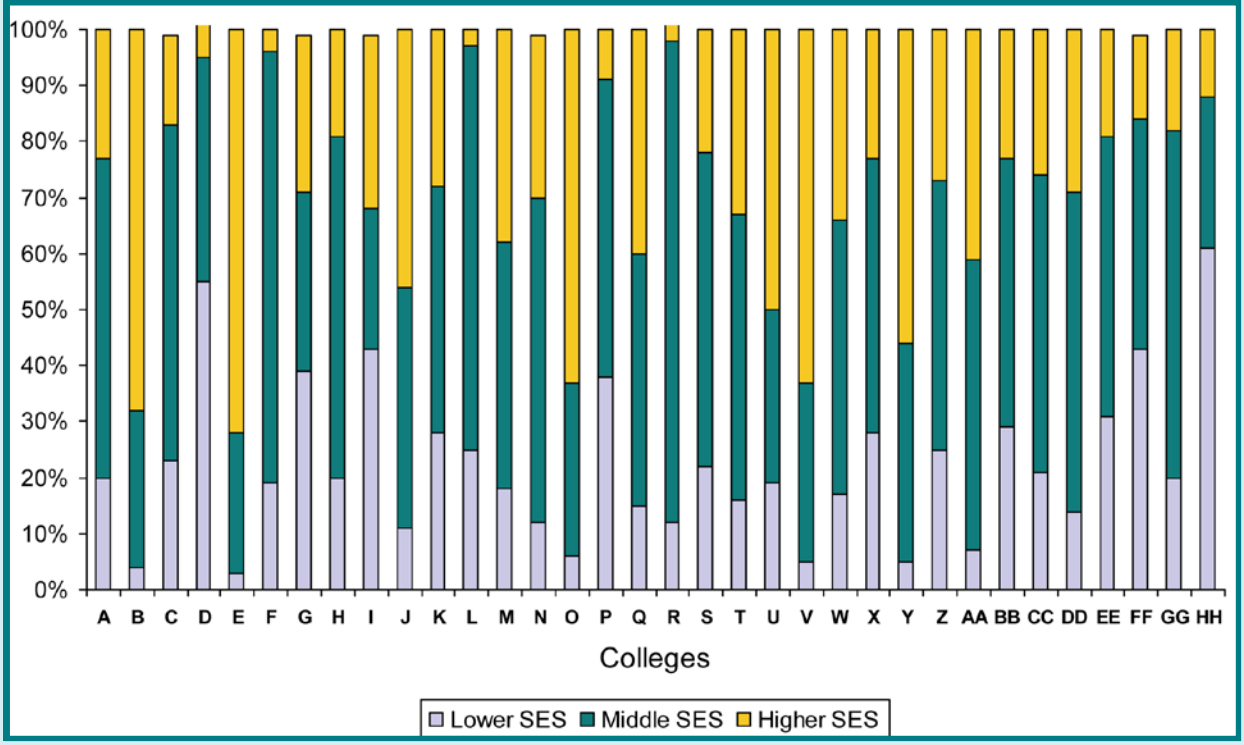
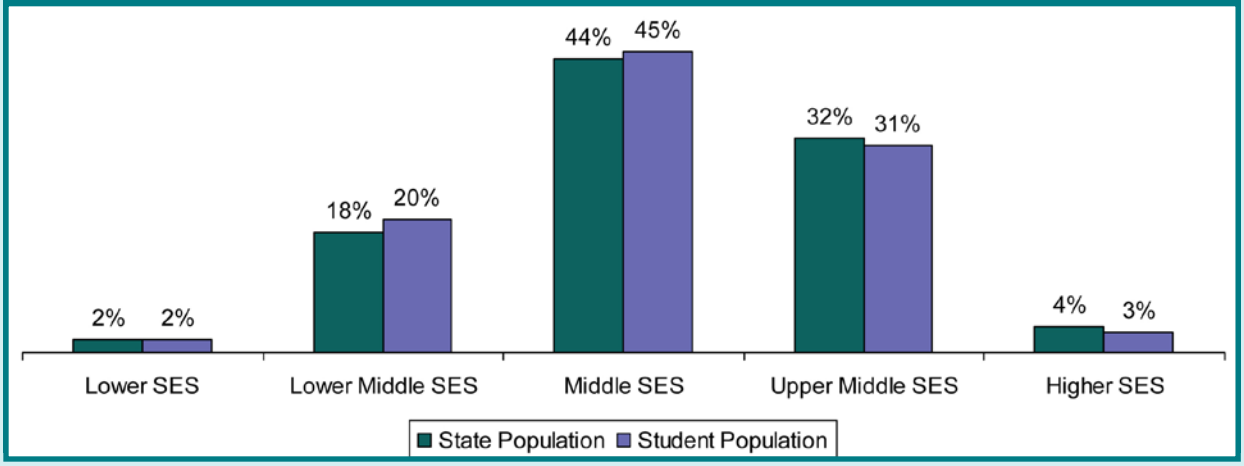



**Figure 4: State Population and Students by Five SES Levels, 2000**



2. **Rural Core** (189; 2.9%)
Rural communities and a few suburbs that are nearly three-fourths White, but include high percentages of Hispanic and Native American populations. High concentrations of forestry, farming, and fishing employment, as well as blue collar work. Mostly poor and older communities with many persons age 50 and over. Over one-third of adults do not have a high school diploma and another 28 percent are without any college education. This cluster can be seen as a middle ground among Clusters 1 (Forest, Mountains, and Plains), 3 (Older Middle-Class Empty Nesters), and 7 (Farmworker Communities).

3. **Older Middle-Class Empty Nesters** (474; 9.6%)
Mostly suburban and rural communities with over 40 percent of the population over age 50 and few children. Education and income levels are low to moderate. High rates of service sector employment. Income levels are below average, but so are poverty and unemployment rates.

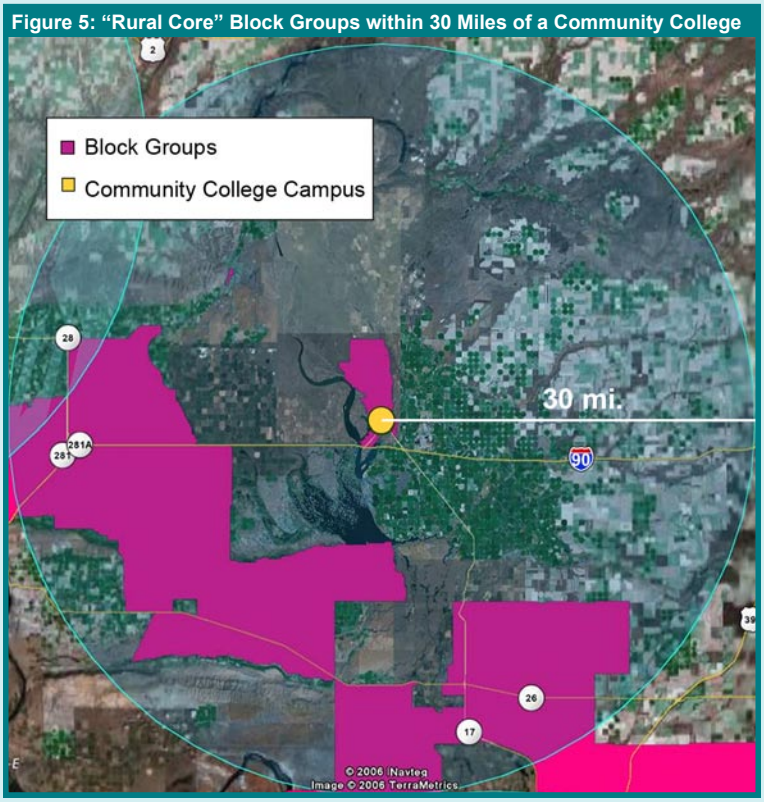
4. **Blue Collar Whites** (551; 10.9%)
Suburban and exurban communities, with particularly high concentrations around Spokane, Vancouver, and other smaller cities in the state. Highest concentration of non-Hispanic Whites with only 5 percent minority population. Primarily blue collar and service sector employment with most adults having a moderate (non-bachelor's) level of education. Pre-retirement empty-nesters by many families with teenagers. High median income and low rates of poverty and unemployment.

5. **Mixed Suburban Success** (695; 18.4%)
This cluster with the largest number of block groups is comprised of mixed family communities throughout the inner and outer ring suburbs around all major cities. It has the third highest median income of any cluster and although it has moderate rates of bachelor's degree attainment, nearly two in five have some college without a bachelor's degree, and there are low rates of persons without high school diplomas. This cluster has a relatively even distribution across occupation categories and high rates of persons in their 30s and their 5- to 17 year-old children.

6. **The Working Fringe** (391; 8.5%)
Fairly poor suburban, exurban, and some rural, mostly White, working-class communities of young families with high rates of single parents. Fewer than one in ten adults has a bachelor's degree, though one-third have some college and 36 percent have a high school diploma only.

7. **Farmworker Communities** (69; 1.2%)
Columbia basin farming communities with more than half the population Hispanic. Lowest levels of education, as over 50 percent are without a high school diploma and less than one-fourth have any college at all. Employment is overwhelmingly in blue collar and forestry, farming, and fishing. Very young population with many children, high rates of poverty and unemployment, and nearly half the households using a language other than English.

Figure 5: "Rural Core" Block Groups within 30 Miles of a Community College




Source: Google™ Earth (2006)

8. **Native American Communities** (26; 0.3%)
Three-quarters of the population in this cluster of mostly rural block groups are Native American. Generally low incomes with one-sixth of the population in poverty and the highest unemployment rate (19 percent) of any cluster. Although service sector employment is most common this cluster has high relative employment in the farming, forestry, and fishing sector. Very low levels of education – over half the population have at most a high school diploma. Many children (38 percent of the population is under 18) and relatively few persons over 50, while one-fifth of the households are single parent. The farthest average distance to a community college of any cluster.

9. **Asian Newcomers** (73; 1.3%)
High density city block groups with high percentage of Asian Americans (40 percent average) and a sizeable African American population. Moderate income and levels of poverty, though with high rates of service sector employment. Fairly even age distribution. One-quarter of the population speak English less than "very well" and 40 percent of the households use a language other than English in the home (these are both the second highest rates of all clusters).

10. **African American Urban Core** (66; 1.0%)
Urban block groups in downtown Seattle and Tacoma with African Americans comprising half the population and another

fifth Asian. More than one-third live in poverty and one in seven are unemployed. Very high rates of service sector employment, low rates of education and many families with children. Highest rate of single parent households of any cluster (21 percent).

11. **Suburban Retirement** (651; 15.5%)
Very high median income, high rates of professional and managerial employment, but also high rates of service sector employment. Nearly one-third have a bachelor's degree, but also another 36 percent have some college. One of the largest percents of retirees. Geographically dispersed in suburbs and some urban areas around the larger cities and towns and throughout Puget Sound. Similar to Family Dream, but a slightly older population and many retirees.

12. **Family Dream** (337; 7.8%)
Highest median income and highest rates of professional and managerial employment, and bachelor's degrees. Concentrated in the most desirable suburbs around larger cities and Puget Sound, including many block groups in the Richland area. Many families with children.

13. **Young Professionals** (453; 11.8%)
Fairly high income urban and suburban communities (with particular concentrations in Seattle and east of Lake Washington) with very high rates of persons in their 20s and 30s, though low rates of children. Includes higher rates of African and Asian Americans, though the actual percentages are below 7 percent for each. A well-educated and professional population.

14. **Early Gentrification** (118; 2.0%)
Very poor, mostly city fringe communities with more than one-quarter of the households in poverty. Fairly well-educated population with one-quarter with a bachelor's degree and another third with some college and only one in six persons without a high school diploma. At 30 percent, this cluster has the highest rate of persons in their 20s. Also has another 16 percent from 18 to 21. These patterns suggest a young population with a mix of students, perhaps some young professionals, and other low-income persons living in less desirable city and nearby communities. Includes many military bases.

15. **Campus Communities** (25; 0.4%)
The few block groups clustered around the major four-year colleges and universities in the state. Nearly two-thirds of the persons in this cluster are age 18 to 21; another fifth are adults under 30. Very low rates of income and poverty and high rates of service sector employment, but these figures are all driven by the student population. Half of those over 25 in this cluster have at least a bachelor's degree.

### 2000 WA Clusters

1. **Forests, Mountains, and Plains** (349 block groups; 6.3% of all households)
Overwhelmingly rural, White block groups of the Olympic Peninsula, east slope of the Cascades, and other rural corners of the state. Slightly impoverished from the long slump in the forestry and extraction economies on which these areas depend. Lack of economic opportunity has left these communities with very low proportions of persons in their 20s and 30s. Moderate to low levels of education, as fewer than one in five persons 25 or older hold a bachelor's degree and nearly half have a high school diploma or less. These block groups have the farthest average distance to a community college.

2. **Older Middle-Class Empty Nesters** (682; 15.1%)
Block groups with the largest proportion of older residents – one-fifth of this cluster's population are 65 or older, with another 15 percent between 50 and 64. Includes some working "empty nesters" whose incomes or lack of mobility never allowed them to move to more desirable communities. This cluster generally has a comfortable middle-class lifestyle with a large mixture of occupational groups, though it includes a relatively high proportion of service sector workers. Shares similar economic and educational characteristics as Forests, Mountains, and Plains, but has a wider geographic dispersion of block groups across both rural, exurban, and some city fringe areas and slightly higher racial/ethnic diversity.

3. **Campus Communities** (42; 0.8%)
Student and young professional enclaves located around the major four-year colleges and universities in the state. Nearly half the population of these block groups are between age 18 and 21, with another quarter between age 22 and 29 (and the smallest proportion of children under 18). Economic anomalies abound in this cluster. Half the population over age 25 hold a bachelor's degree and very few are without a high school diploma, but most of the employed population is in the service sector. The cluster has the lowest median household income, and nearly half the households are below the poverty line. While these numbers are driven by the overwhelming student population, over one-third of those employed are professionals. These block groups include relatively high concentrations of Asian Americans.

4. **Exurban Expansion** (600; 11.9%)
Overwhelmingly White and fairly high income cluster with few households in poverty. Strong presence of well-paid blue collar workers in these successful suburbs of older families with many teenage children. Most of these block groups encircle the larger cities around the state while keeping their distance from the dense urban sectors. Modest levels of education as there are relatively low proportions of persons without a high school diploma or with a bachelor's degree.

5. **Climbing the Ladder** (712; 14.8%)
This cluster with many young professional families includes the largest number of block groups, most of which incorporate the inner suburbs around the cities hugging Puget Sound, Spokane, and along the Columbia River in Vancouver and Kelso/Longview. Above average rates of education (over 70 percent have attended college and nearly one-third have at least

a bachelor's degree). Very high median income and very low unemployment and poverty rates.

6. **Blue Collar Bedrock** (528; 11.3%)
Block groups of hard-working, predominantly White, blue collar, and service sector employees making modest wages. This cluster has average poverty and unemployment rates, many households with young children, and high rates of single parents. Located in city and town fringe communities. Levels of education include low rates of persons age 25 or older with a bachelor's degree, but one of the highest rates of persons with some college education or with a high school diploma, which suggests communities of skilled tradespeople and technicians.

7. **Mixed Success** (442; 10.8%)
This cluster contains a mixture of city and suburban block groups, including those around military bases in the state. Also has a racial/ethnic mix that includes around 10 percent each African American, Hispanic, and Asian American populations. The cluster also has high proportions of individuals age 18 to 39 and many households with young children. Incomes in this cluster are above average and poverty and unemployment rates are below average, though the percentage of adults with a bachelor's degree is below average (but so is the rate of those without a high school diploma).

8. **African American Urban Core** (40; 0.6%)
South Seattle and downtown Tacoma high density urban block groups with large proportions of African Americans (44 percent) and moderate percentages of other minority populations. Average income and poverty rates, but slightly lower than average unemployment rates. Most persons employed in either professional or service employment. Evenly distributed levels of education as about one-fourth have a bachelor's degree or higher, another 30 percent have some college, and slightly more than one-fifth each with and without a high school diploma. This cluster includes a large number of early career young professionals who may be priced out of more desirable city neighborhoods.

9. **Asian Newcomers** (73; 1.2%)
Geographically (i.e., located in Seattle and Tacoma) and economically similar to African American Urban Core except that these block groups are predominantly Asian (46 percent) and contain the lowest percentage of Whites of any cluster. More than two out of every five persons are foreign born – the highest rate of any cluster. More than half of the households use a language other than English and one-third of persons speak English less than "very well." Befitting this mixed cluster, the component block groups have moderate to low incomes, rates of poverty and unemployment above the mean, low levels of education with one-third of the population without a high school diploma, and the most even distribution across age cohorts of all the clusters.

10. **Rural Core** (185; 3.5%)
Solidly rural and poor block groups, though not as dependent on farm work as the Farmworker Communities cluster. Also, an older, more permanent population with higher rates of English use and ability. High rates of poverty and unemployment, suggesting that persons are barely getting by economically. May include many former farmworkers who have found permanent and more stable, albeit low-paying, jobs in rural communities. One-third of the population are Hispanic.

11. **Farmworker Communities** (62; 1.3%)
Columbia Plateau agricultural communities with very low median incomes and nearly one-third of the households are below the poverty line. Highest rate of farm employment and lowest rate of professional or managerial employment of any cluster. These block groups average the lowest levels of education – only 6 percent of the adult population have a bachelor's degree while 60 percent do not have a high school diploma. This cluster has a very young population: over half the households are families with children, nearly 40 percent of the population are under age 18, and relatively few persons are over age 40. Nearly three-fourths of the population are Hispanic, nearly two-thirds of all households use a language other than English, 40 percent of the population speak English less than "very well," and over one-third are foreign born.

12. **Native American Communities** (47; 0.7%)
This cluster includes block groups on Native American reservations and other block groups with large proportions of Native American populations. Mostly rural communities located far from community colleges. Extremely poor cluster with over one-fifth of the population living below the poverty line and one in six adults unemployed. Low levels of education, high rates of single parent households, and a fairly young population with one-third under age 18.

13. **Well-Stocked Empty Nest** (421; 8.5%)
These are the older established wealthy communities (some with median incomes over $100,000) in the cities and proximate suburbs around the larger cities and towns in the state. This population is well-educated and has high rates of persons working in managerial and professional occupations. With well over half the population over 40 and 22 percent between 50 and 64, these block groups consist of many empty nesters. Compared with Family Dream, this cluster has less racial diversity and higher proportions of persons in non-professional occupations.

14. **Family Dream** (213; 3.6%)
At nearly $100,000, this cluster has by far the highest median annual household income. Nearly half the households have children under age 18. These communities consist of the most desirable secluded urban neighborhoods, new wealthy suburbs on suburban fringes, and island communities throughout Puget Sound, as well as around Spokane, Vancouver, and other cities that can support pockets of wealth. The majority

# CLUSTER DESCRIPTIVE STATISTICS

## 1990 Clusters

| Cluster Numbers | Number of Block Groups | Median HH Income | % HH in Poverty | Unemploy-ment Rate | % Hispanic | % White | % Black | % Asian | % American Indian | % Professional & Managerial | % Service Sector | % in Fishing, Forestry, Farming | % Blue Collar | Rural-Urban Commuting Area | % HH w/ Children Less Than 18 Years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 349 | $ 35,524.46 | 14.0% | 8.6% | 4.3% | 90.3% | 0.3% | 0.8% | 2.0% | 30.2% | 39.9% | 4.7% | 25.0% | 8.04 | 27.9% |
| 2 | 682 | $ 36,922.31 | 13.6% | 7.2% | 5.4% | 82.7% | 2.9% | 4.4% | 1.3% | 29.2% | 45.7% | 0.7% | 22.7% | 1.43 | 23.6% |
| 3 | 42 | $ 20,645.93 | 43.3% | 17.7% | 4.5% | 79.6% | 1.9% | 9.3% | 0.7% | 35.7% | 53.6% | 0.9% | 9.2% | 3.00 | 13.8% |
| 4 | 600 | $ 49,291.63 | 7.4% | 5.5% | 3.6% | 90.5% | 0.6% | 1.6% | 1.2% | 27.5% | 39.4% | 1.5% | 30.9% | 2.12 | 36.2% |
| 5 | 712 | $ 64,885.50 | 4.1% | 3.8% | 3.4% | 84.8% | 1.6% | 6.5% | 0.7% | 40.0% | 38.7% | 0.5% | 19.8% | 1.21 | 43.5% |
| 6 | 528 | $ 39,099.16 | 14.9% | 8.3% | 6.8% | 81.4% | 2.4% | 3.4% | 1.6% | 22.8% | 43.9% | 0.8% | 31.2% | 1.30 | 40.5% |
| 7 | 442 | $ 42,790.89 | 12.2% | 6.1% | 9.1% | 62.7% | 9.2% | 12.3% | 1.1% | 26.7% | 44.2% | 0.4% | 25.0% | 1.12 | 36.5% |
| 8 | 40 | $ 39,768.70 | 17.4% | 6.6% | 6.6% | 32.7% | 44.0% | 10.0% | 1.1% | 33.8% | 44.4% | 0.7% | 20.9% | 1.00 | 30.4% |
| 9 | 73 | $ 35,449.93 | 22.9% | 10.6% | 7.2% | 21.3% | 18.4% | 45.5% | 1.0% | 23.4% | 48.8% | 0.5% | 26.9% | 1.00 | 37.8% |
| 10 | 185 | $ 34,232.18 | 19.6% | 11.5% | 31.7% | 63.0% | 0.6% | 1.2% | 1.6% | 24.5% | 38.4% | 10.9% | 26.0% | 3.80 | 41.0% |
| 11 | 62 | $ 26,682.69 | 32.3% | 18.3% | 72.5% | 22.3% | 1.2% | 1.0% | 1.7% | 14.4% | 31.0% | 26.4% | 28.1% | 3.89 | 56.3% |
| 12 | 47 | $ 35,223.87 | 21.8% | 17.4% | 10.7% | 38.7% | 0.7% | 1.7% | 44.2% | 28.3% | 39.4% | 6.5% | 23.4% | 6.13 | 38.1% |
| 13 | 421 | $ 66,063.63 | 3.9% | 3.2% | 2.1% | 89.5% | 0.9% | 4.2% | 0.6% | 48.7% | 35.3% | 0.5% | 14.9% | 1.32 | 28.7% |
| 14 | 213 | $ 97,218.46 | 2.8% | 2.2% | 2.3% | 83.6% | 2.2% | 8.6% | 0.4% | 62.5% | 28.4% | 0.2% | 8.5% | 1.01 | 45.7% |
| 15 | 429 | $ 52,300.57 | 8.6% | 4.0% | 4.1% | 81.4% | 2.7% | 7.6% | 0.6% | 53.1% | 35.6% | 0.2% | 10.8% | 1.07 | 18.9% |

| Cluster Numbers | % With BA | % With Some College | % With Only HSD | % Without HS Diploma | % Under 5 years old | % Age 5 to 17 | % Age 18 to 21 | % Age 22 to 29 | % Age 30 to 39 | % Age 40 to 49 | % Age 50 to 64 | % Over 65 years old | % HH Speaking Foreign Language | % Single Parent HH | Min. Dist. To CTC | % of HH speaking ESL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 18.7% | 33.8% | 31.6% | 15.9% | 5.0% | 18.5% | 3.9% | 6.3% | 11.2% | 16.5% | 20.4% | 18.2% | 8.0% | 7.5% | 35.07766 | 2.4% |
| 2 | 21.7% | 34.1% | 28.7% | 15.4% | 5.5% | 13.5% | 5.6% | 12.3% | 14.7% | 14.0% | 14.8% | 19.5% | 12.6% | 8.2% | 5.822208 | 5.1% |
| 3 | 47.6% | 33.4% | 12.4% | 6.6% | 2.2% | 4.7% | 47.6% | 26.0% | 6.9% | 4.6% | 3.7% | 4.4% | 19.0% | 4.5% | 22.65274 | 5.4% |
| 4 | 17.1% | 37.4% | 32.5% | 13.0% | 5.7% | 21.3% | 4.3% | 7.2% | 15.1% | 18.0% | 17.3% | 11.1% | 8.9% | 7.3% | 11.36098 | 2.1% |
| 5 | 32.3% | 38.8% | 21.8% | 7.1% | 6.6% | 22.5% | 4.3% | 7.0% | 16.1% | 19.7% | 16.2% | 7.5% | 14.5% | 6.9% | 6.233003 | 4.1% |
| 6 | 13.0% | 38.5% | 32.1% | 16.4% | 9.1% | 21.0% | 5.7% | 12.6% | 17.4% | 14.3% | 11.5% | 8.4% | 13.4% | 15.4% | 5.821981 | 5.4% |
| 7 | 20.6% | 37.3% | 27.1% | 14.9% | 8.0% | 18.5% | 6.2% | 14.7% | 18.4% | 14.8% | 11.7% | 7.6% | 23.6% | 12.2% | 3.819346 | 10.9% |
| 8 | 26.7% | 29.5% | 22.7% | 21.1% | 6.3% | 18.8% | 4.6% | 13.6% | 18.1% | 16.0% | 11.6% | 11.0% | 21.0% | 16.2% | 1.536792 | 10.9% |
| 9 | 17.5% | 25.2% | 24.7% | 32.7% | 6.9% | 20.1% | 5.5% | 11.1% | 14.7% | 15.8% | 13.7% | 12.2% | 52.1% | 14.6% | 2.706117 | 33.6% |
| 10 | 12.6% | 27.9% | 28.6% | 30.9% | 8.4% | 22.9% | 6.5% | 11.1% | 14.4% | 14.1% | 12.3% | 10.4% | 27.2% | 10.8% | 15.73058 | 17.1% |
| 11 | 5.5% | 14.8% | 20.7% | 59.0% | 12.7% | 26.9% | 7.4% | 13.6% | 14.3% | 10.5% | 8.4% | 6.3% | 63.4% | 17.7% | 16.80803 | 39.0% |
| 12 | 15.2% | 31.0% | 30.0% | 23.8% | 7.5% | 24.3% | 5.1% | 8.5% | 13.5% | 16.7% | 14.9% | 9.5% | 18.4% | 14.9% | 27.69873 | 4.9% |
| 13 | 44.1% | 32.6% | 17.7% | 5.6% | 4.2% | 17.2% | 3.5% | 5.6% | 11.4% | 18.8% | 22.4% | 16.9% | 11.6% | 4.1% | 5.837416 | 2.6% |
| 14 | 63.3% | 24.2% | 9.7% | 2.7% | 7.0% | 21.9% | 2.9% | 5.4% | 16.4% | 21.3% | 17.1% | 8.0% | 16.0% | 4.5% | 4.161543 | 3.6% |
| 15 | 53.2% | 28.3% | 13.0% | 5.5% | 4.4% | 9.9% | 4.1% | 18.0% | 21.3% | 15.9% | 14.9% | 11.5% | 15.7% | 4.6% | 3.615526 | 4.9% |

## 2000 Clusters

| Cluster Numbers | Number of Block Groups | Median HH Income | % HH in Poverty | Unemploy-ment Rate | % Hispanic | % White | % Black | % Asian | % American Indian | % Professional & Managerial | % Service Sector | % in Fishing, Forestry, Farming | % Blue Collar | Rural-Urban Commuting Area | % HH w/ Children Less Than 18 Years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 502 | $ 32,680.08 | 14.5% | 8.1% | 2.9% | 94.2% | 0.3% | 0.7% | 1.8% | 19.1% | 38.3% | 11.4% | 30.8% | 7.78 | 32.6% |
| 2 | 189 | $ 27,998.97 | 27.0% | 13.8% | 17.6% | 72.8% | 1.9% | 1.6% | 6.0% | 15.3% | 35.3% | 18.6% | 29.9% | 4.03 | 32.2% |
| 3 | 474 | $ 30,950.98 | 12.9% | 6.5% | 2.4% | 91.5% | 2.1% | 2.5% | 1.4% | 22.1% | 47.1% | 2.0% | 26.9% | 1.72 | 20.7% |
| 4 | 551 | $ 44,489.93 | 7.9% | 5.1% | 2.3% | 94.5% | 0.6% | 1.4% | 1.1% | 21.9% | 38.5% | 5.6% | 32.8% | 2.27 | 35.7% |
| 5 | 695 | $ 47,723.27 | 7.5% | 5.1% | 3.1% | 88.1% | 3.0% | 4.4% | 1.3% | 21.7% | 44.5% | 1.8% | 29.3% | 1.30 | 44.7% |
| 6 | 391 | $ 30,567.18 | 20.7% | 8.9% | 4.0% | 87.0% | 3.6% | 3.2% | 2.1% | 15.7% | 45.0% | 2.3% | 34.3% | 1.57 | 40.1% |
| 7 | 69 | $ 25,059.80 | 33.2% | 15.4% | 56.3% | 38.0% | 1.7% | 0.7% | 3.1% | 9.7% | 28.0% | 31.2% | 31.2% | 3.97 | 46.1% |
| 8 | 26 | $ 25,762.40 | 33.7% | 18.5% | 3.5% | 23.4% | 0.1% | 0.6% | 72.2% | 19.1% | 38.1% | 15.9% | 26.0% | 7.04 | 49.9% |
| 9 | 73 | $ 35,703.35 | 17.0% | 7.9% | 3.7% | 37.7% | 15.9% | 40.6% | 1.8% | 17.1% | 48.3% | 1.7% | 30.0% | 1.08 | 31.6% |
| 10 | 66 | $ 23,923.16 | 35.2% | 14.3% | 4.2% | 24.5% | 50.1% | 18.7% | 2.4% | 19.3% | 54.6% | 2.0% | 23.7% | 1.00 | 37.4% |
| 11 | 651 | $ 52,794.20 | 5.2% | 3.9% | 2.2% | 93.1% | 1.1% | 2.7% | 0.8% | 35.6% | 43.9% | 1.6% | 18.0% | 1.46 | 32.6% |
| 12 | 337 | $ 78,325.60 | 2.8% | 3.1% | 1.7% | 92.2% | 0.8% | 4.8% | 0.4% | 47.4% | 39.3% | 1.0% | 11.9% | 1.08 | 40.9% |
| 13 | 453 | $ 44,343.66 | 9.1% | 4.1% | 2.6% | 85.2% | 4.7% | 6.5% | 1.0% | 38.9% | 44.3% | 1.1% | 14.6% | 1.13 | 19.5% |
| 14 | 118 | $ 23,528.77 | 26.4% | 5.8% | 4.0% | 85.4% | 3.5% | 4.8% | 2.1% | 24.1% | 40.6% | 2.3% | 22.3% | 1.86 | 15.3% |
| 15 | 25 | $ 18,041.45 | 43.0% | 7.5% | 3.0% | 85.5% | 1.8% | 9.1% | 0.5% | 25.0% | 59.2% | 1.7% | 9.5% | 2.80 | 11.4% |

| Cluster Numbers | % With BA | % With Some College | % With Only HSD | % Without HS Diploma | % Under 5 years old | % Age 5 to 17 | % Age 18 to 21 | % Age 22 to 29 | % Age 30 to 39 | % Age 40 to 49 | % Age 50 to 64 | % Over 65 years old | % HH Speaking Foreign Language | % Single Parent HH | Min. Dist. To CTC | % of HH speaking ESL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 13.6% | 29.1% | 34.4% | 22.9% | 6.7% | 19.3% | 3.9% | 8.8% | 15.9% | 13.4% | 15.3% | 16.8% | 7.5% | 7.1% | 30.45985 | 1.8% |
| 2 | 10.7% | 26.1% | 28.2% | 35.0% | 8.0% | 18.1% | 5.4% | 12.1% | 16.1% | 11.2% | 15.4% | 13.6% | 19.0% | 8.1% | 19.51715 | 9.8% |
| 3 | 15.4% | 29.8% | 32.2% | 22.6% | 5.4% | 11.6% | 4.5% | 12.1% | 13.7% | 10.7% | 15.8% | 26.1% | 8.7% | 6.5% | 5.957511 | 2.4% |
| 4 | 14.4% | 32.1% | 34.8% | 18.6% | 6.6% | 20.2% | 4.5% | 9.3% | 17.1% | 15.1% | 15.2% | 12.1% | 7.7% | 5.5% | 10.58317 | 1.5% |
| 5 | 16.8% | 38.5% | 31.2% | 13.5% | 9.0% | 21.4% | 4.9% | 12.8% | 20.7% | 13.3% | 10.4% | 7.5% | 10.9% | 8.2% | 5.496701 | 2.8% |
| 6 | 9.2% | 31.1% | 35.8% | 23.9% | 10.1% | 20.0% | 5.7% | 15.5% | 17.3% | 10.6% | 10.0% | 10.6% | 10.3% | 15.7% | 6.097236 | 2.9% |
| 7 | 6.4% | 17.6% | 23.2% | 52.8% | 11.1% | 25.1% | 7.2% | 13.4% | 16.3% | 10.1% | 9.1% | 7.7% | 47.7% | 12.4% | 19.53773 | 28.5% |
| 8 | 8.6% | 26.2% | 31.7% | 33.5% | 12.4% | 25.1% | 5.4% | 14.0% | 15.6% | 11.1% | 9.6% | 6.7% | 14.1% | 20.4% | 36.9298 | 2.0% |
| 9 | 17.3% | 25.9% | 26.5% | 30.3% | 6.6% | 16.8% | 5.3% | 14.7% | 17.1% | 11.0% | 14.3% | 14.2% | 40.3% | 9.8% | 2.371509 | 25.4% |
| 10 | 14.3% | 28.7% | 25.4% | 31.6% | 9.9% | 22.0% | 5.3% | 12.3% | 18.2% | 11.0% | 9.3% | 11.9% | 24.3% | 21.8% | 1.572021 | 14.0% |
| 11 | 30.0% | 35.7% | 24.3% | 10.0% | 6.0% | 17.8% | 4.4% | 9.3% | 17.2% | 16.4% | 14.7% | 14.3% | 9.0% | 5.3% | 5.163963 | 1.9% |
| 12 | 49.6% | 30.9% | 14.9% | 4.7% | 6.9% | 20.0% | 3.8% | 7.0% | 18.0% | 19.5% | 15.2% | 9.5% | 11.1% | 4.1% | 4.623264 | 2.4% |
| 13 | 41.7% | 30.7% | 18.2% | 9.4% | 5.4% | 9.8% | 4.8% | 18.6% | 23.9% | 14.2% | 10.4% | 12.9% | 12.1% | 4.5% | 4.090153 | 3.9% |
| 14 | 25.1% | 33.4% | 23.8% | 16.8% | 4.5% | 7.0% | 16.1% | 29.8% | 15.6% | 10.7% | 7.6% | 8.7% | 13.0% | 5.9% | 7.166746 | 4.5% |
| 15 | 49.2% | 31.5% | 8.1% | 7.2% | 1.3% | 2.0% | 63.0% | 21.2% | 4.5% | 3.0% | 2.0% | 2.9% | 17.7% | 2.7% | 24.85156 | 4.8% |

of persons work in professional and managerial positions and have bachelor's or higher degrees (highest rates of any cluster for both of these measures). The population is predominantly White, with moderately high rates of Asians as well.

15. **Young Professionals** (429; 9.8%)
Urban, professional, high-income block groups with the largest proportion of persons between age 22 and 39 of any cluster and few persons age 21 or under. Although this cluster has a higher than average median age (36.3 years), it has low rates of children, suggesting a population enjoying a single (or at least childless) lifestyle. Very well-educated population with more than half working in professional and managerial occupations. These block groups are located primarily in trendy urban areas, though the cluster includes a few suburban neighborhoods in high tech communities east of Lake Washington. More racially diverse than most clusters.

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## ENDNOTES

1. For more in-depth discussions on Census data to proxy for SES, see Beveridge (2005), Geronimus and Bound (1998), and Geronimus, Bound, and Neidert (1996).
2. Note that although some of the cluster names for 1990 and 2000 are the same, the two sets do not necessarily include the same block groups since the block groups changed from Census to Census. The names are similar or the same because the 1990 and the 2000 clusters exhibit very similar characteristics.
3. The cluster names in these tables, as well as in the Appendix, were created by CCRC and are designed to convey concisely each cluster's chief characteristics.


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