21

Is Shorter Better? An Analysis of Gender, Race, and Industrial Segmentation in San Francisco Bay Area Commuting Patterns

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IS SHORTER BETTER? AN ANALYSIS OF GENDER, RACE, AND INDUSTRIAL SEGMENTATION IN SAN FRANCISCO BAY AREA COMMUTING PATTERNS

There is a growing consensus that poor spatial access to employment opportunities is a critical factor in minority inner-city unemployment (Kain 1992; Holzer 1991; Ihlanfeldt & Sjoquist 1989, 1990; Peterson & Vroman 1992) and a major mobility disadvantage for the minority inner-city employed. Conspicuous by their absence from this "spatial mismatch" debate are the issues of female access to employment opportunities and sex-based differences in commuting patterns. Although women often have higher unemployment rates than men (England & Farkas 1986), female employment is not considered part of the mismatch problem, as women are not spatially concentrated in the way that many minority groups are. In fact, women's labor force participation is increasing, in part because the restructuring of the economy has increased the number of low-paid, dead-end secondary service sector jobs, the type of jobs which women historically have held. Furthermore, since journey-to-work travel times for women are lower than travel times for men, the spatial accessibility of employment for women is not generally considered problematic.

In this paper, we examine the possibility that the shorter travel times for women indicate not the absence of an employment problem, but the presence of individual choices and/or structural constraints. Specifically, using data from the San Francisco Bay Area, we evaluate the two dominant theories used to explain sex-based differences in commuting time: the theory that women minimize travel times due to preference and/or responsibilities in the household, and the theory that the types of industries in which women are concentrated locate in a dispersed pattern which facilitates spatial access. After establishing the theoretical context of labor markets and reviewing the literature specific to women and travel time to work, we attempt to explain the differences in journey-to-work travel time across the dimensions of race/ethnicity, residential density, household responsibility, employment in male- and female-dominated industries, and the combination of residential and industrial locations. Although travel time patterns vary considerably among the population subgroups under study, we find that sex-based differences remain within the different dimensions analyzed. The analysis suggests that neither the economic rationality argument nor the industrial location approach provides an adequate explanation of why women spend less time commuting.

THEORIES OF LABOR MARKETS

Labor economists have generally attempted to explain sex-based differences in commuting time in terms of either human capital or labor market segmentation theories. Human capital theory suggests that since women are likely to drop out of the labor force at different stages of their lives, it is neither in their interest nor in the interest of potential employers to invest in the education or training which would lead to higher-paid jobs. Since women are thus overrepresented in low-paid occupations, it would not be economically rational for them to travel as far as men do. Consistent with this idea is the notion that women, especially those with young children, would want and need to work nearer to their homes, because they have greater household responsibilities than their male partners. As a consequence, this theory suggests, women limit the radii of their job searches, and are therefore more likely to be employed in female-domi-

nated industries or occupations. Some theorists have critiqued the human capital perspective for its implication that women are employed in segmented occupations by their own preference or sex-role socialization; they suggest rather that women's perceptions of opportunity structure determine both preferences and outcomes (e.g., Pratt & Hanson 1991; Reskin & Hartmann 1986). Other empirical work has shown that the career ladders of women who take time out of the labor force are not dissimilar from those with more continuous experience: i.e., women with more continuous experience are no more apt than other women to be employed in predominantly male occupations, and women in female-dominated occupations aren't penalized less than those in male-dominated occupations for taking time out of the labor force (Wolf & Rosenfeld 1978; England 1982).

The other dominant idea, labor market segmentation theory, suggests that the labor market is divided into a primary sector with high-wage jobs, good working conditions, job stability and internal career ladders, and a secondary sector with low-wage jobs of poor quality and little job stability; within the primary sector, segmentation also occurs between independent jobs requiring a high level of skills and responsibility, and subordinate jobs of lower skills and status (Doeringer & Piore 1971). Because of employer preference (specifically, according to Edwards, Gordon & Reich (1982), the need to divide the labor force to prevent the broad-based development of class consciousness), as well as the simultaneous growth of these secondary or subordinate primary sector jobs and female labor force participation, women are slotted into many of these occupations, which become, by definition, 'female-dominated'.

Critics of this perspective (e.g. Hanson & Pratt 1995) suggest that it veils the complex socio-spatial factors, i.e. the space-time constraints on women's work, that may lead women to search for jobs close to home. Moreover, the concentration of females in these jobs may increase as industrial sectors with high proportions of traditionally female-dominated occupations, such as consumer services, tend to disperse throughout the metropolitan area, co-locating with their client populations. In contrast, sectors with fewer female-dominated occupations, such as the transportation, manufacturing, and advanced business service sectors, tend to concentrate in selected downtown or suburban areas. As a result, women are more likely to find jobs in the female-dominated occupations within female-dominated industries in closer proximity to their homes. In other words, labor market segmentation is both a cause and a consequence of women's spatial access to employment – a cause, for instance, as specific types of firms locate near "captive" female labor markets (Nelson 1986), but a consequence also, as women, especially those with young children, are expected to have shorter labor market radii and are thus more likely to be concentrated in certain occupations.

EMPIRICAL RESEARCH ON GENDER AND TRAVEL TIME

Most research on gender and travel time has emerged from the discipline of geography, exploring the possibility that patterns of occupational or industrial segmentation in space are reinforcing overall patterns of labor market segmentation. In particular, Pratt and Hanson found, in an extensive series of in-depth interviews, that suburban women with household responsibilities experience day-to-day space-time constraints which make them "heavily dependent on a relatively restricted range of local employment opportunities, to an extent that men are not" (Pratt & Hanson 1991:65). In a similar vein, Nelson (1986) suggests that the concentrations of firms near female labor pools in suburbia (e.g., back offices for financial service firms) or the inner city (e.g., government offices) affect the types of occupations such women select.

Within the spatial mismatch literature, researchers initially looked at employment outcomes as a function of residential location and distance from employment (e.g. Kain 1968). These studies typically used residential segregation and job decentralization as independent variables to measure the dependent variable of employment probability or wages. Later studies typically used travel time as an independent variable, as a more precise measure of the actual relationship between residence and workplace location (e.g., Ihlanfeldt & Sjoquist 1990; Straszheim 1980). Recently, researchers (Taylor & Ong 1993, McLafferty & Preston 1992) have used travel time as the dependent variable, hypothesizing that if commute times are higher for inner-city minority workers, the mismatch phenomenon is occurring—although, as Taylor & Ong (1993) suggest, it may be more of a mode mismatch than a spatial mismatch.

This focus on travel time as a measure of spatial access to employment is adopted by the extensive literature on women's travel patterns. This literature typically focuses on the issue of mobility, seeking to explain the general finding that women spend less time traveling to work than men do. Theorists generally agree that travel time to work is a function of mode choice, income, proximity to work, and household responsibilities, suggesting that women's work trips are shorter than men's primarily because they concentrate in work locations nearer to home because they have greater household responsibilities than men do. Research on gender and travel time has focused generally on four different aspects: comparing the worktrips of men and women; evaluating the relationship between gender and travel time using workplace/residence location; modeling household responsibility; and examining differences in travel times for different racial/ethnic sub-groups.

Research comparing women's and men's worktrips generally indicates that labor market differences are critical in explaining the shorter worktrips for women. Hanson & Johnston (1985) found that the most important factors explaining shorter travel times for women were their lower incomes, concentration in female-dominated occupations, and greater reliance on bus and auto passenger modes, and Madden (1981) suggests that if women had the same jobs, hours, and wages as their male counterparts, their work trips would be the same or longer.

Gender differences in both workplace and residential location may play an important role in determining travel time: job opportunities for women may be more uniformly distributed over the metropolitan area, reducing trip distance (Blumen & Kellerman 1990; Hanson & Johnston 1985); or located in suburban areas with a "captive" female labor force with significant household responsibilities (Nelson 1986; Rutherford & Wekerle 1988); or concentrated in CBDs, as with clerical work (Hwang & Fitzpatrick 1992). Women may also be more likely than men to rely on spatially-situated social networks in their job searches, networks which may reinforce the concentration of women in certain types of jobs (Hanson & Pratt 1995). The decentralization of jobs in the manufacturing and consumer service sectors is also an important determinant of shorter travel times, particularly for minority women (McLafferty & Preston 1992).

A number of researchers suggest that greater household responsibilities lead to shorter travel times for women (Preston, McLafferty & Hamilton 1993; Madden 1981; Johnston-Anumonwo 1992; but see Hanson & Johnston 1985). While women typically assume greater household responsibility when children are present, they also have more household obligations—and shorter worktrips—in two-worker households without children (Johnston-Anumonwo 1992). However, other research has presented contradictory evidence, suggesting that married women with or without children may have the longest commutes (White 1986, England 1993).

Still others have suggested that race or ethnicity may play a more significant role than gender in commuting time, even when controlling for income, occupation, and industry of employment (McLafferty & Preston 1991). Research has shown that African-American and Latina women commute longer than black and Latino men and all whites, and the presence of children is less likely to reduce their commuting time than it is for whites (Preston, McLafferty & Hamilton 1993). Furthermore, at least in the New York metropolitan area, spatial access to employment is poorer for African-American than Latina women, because of the greater reliance of African-American women on mass transit to get to work and the more localized labor markets of Latina women (McLafferty & Preston 1992).

This paper essentially combines elements of the four approaches. We first compare men's and women's travel times in the San Francisco Bay Area controlling for a variety of factors, including race/ethnicity and household responsibility. Typically, researchers have modeled household responsibility by using workers per household or presence of children as a proxy for responsibility; we modify this approach herein by developing a variable representing the share of household income provided by the worker. We then examine in detail the industries in which Bay Area women find themselves employed and the effect of those work decisions as reflected in travel times. Finally, we evaluate these travel time differences in terms of the two theories of economic rationality/household responsibility and industrial location. The next section details the methodology and data set used.

METHODOLOGY AND DATA

In this analysis we study differences in journey to work travel times between men and women in five counties of the San Francisco Bay Area (San Francisco, Alameda, San Mateo, Contra Costa, and Marin counties). We use data from the 1980 and 1990 Public Use Microsample (PUMS) of the U.S. Bureau of the Census. The five-county PUMS data provides detailed demographic information for a five percent sample of residents of 30 Public Use Micro Areas (PUMAs) of approximately 100,000 in population. The sub-set of this data that we use contains approximately 88,000 records and represents 1.84 million people employed in the regular civilian labor force. This dataset provides information on occupation and industry at the three-digit level, as well as variables describing travel time, place-of-work, hours worked per week, and income from wages. One important limitation however, is that place of work is reported at a much higher level of aggregation than place of residence. Place of Work PUMAs (POWPUMAs) are aggregates of as many as nine PUMAs in some cases. They follow the county lines exactly for Marin, San Mateo, San Francisco, and Santa Clara, which is not a residential PUMA that we analyze, but still a work destination for 5.9 percent of the five-county labor force. Contra Costa and Alameda are each partitioned into two POWPUMAs, which we identify as Richmond/San Pablo and Contra Costa (b) and Berkeley/Emeryville/Albany and Alameda (b) (which includes the city of Oakland). Appendix A contains a map of the PUMAs and POWPUMAs, as well as a description of the variables.

In addition to the male-female dichotomy, average journey-to-work travel times vary across four other dimensions: race, residential density, household responsibility, and a characteristic of industries which we call sex-based dominance. We look at race and Spanish origin, by creating five mutually exclusive categories from the two discrete variables: non-Hispanic white, black, Asian, Hispanic and other.[1] For ease of analysis, residential density is simply divided into urban and suburban categories, with PUMAs of more than 3,000 persons per square mile considered urban, otherwise suburban. We use 'income burden,' which is the individual's share of household income, as an inverse proxy for household maintenance and childcare responsibility. We hypothesize that this variable will be positively correlated with travel

time for three, sometimes seemingly contradictory reasons: 1) we assume that the higher opportunity cost makes it more likely that the higher breadwinner will assume a secondary role with respect to direct household maintenance activities, and thus is less restricted geographically in his/her job search; 2) the greater responsibility an individual has for his/her household's income (approaching or equal to 1), the greater importance is placed on finding a job regardless of distance or proximity to home, regardless of whether it is considered economically rational or not to travel a given distance; and 3) we assume that a higher share of household income is often a function of higher wages, in which case it may be considered economically rational to travel a longer distance for greater compensation. Our final variable, industry type, is defined by the division of industries into one of three possible groupings, 'female-dominated,' 'neutral,' or 'male-dominated,' according to the following rule: female-dominated if , male-dominated if , otherwise neutral. By basing this variable on industry rather than occupation, as well as using a location quotient approach which creates a standardized index rather than a cutoff point (i.e., female-dominated if more than 70 percent of the workers are women), we have diverged from the method most often used by other researchers in this area. The focus on segregation by industry allows us to look at sex-based differences in travel times in terms of industrial location, which we believe has a more determinant geographic pattern than occupational location. Moreover, in this PUMS dataset, the percent of women employed in female-dominated industries is comparable to the percent of women in female-dominated occupations.[2]

In the current study we use an array of difference of means tests to explore the relationships between travel time to work and race, sex, household responsibility, and residential density for Bay Area residents. We also explore the travel time implications which result from the segregation of women to certain industries and men to others; although they are likely related, we do not investigate the causal forces underlying such segregation.

LABOR FORCE PARTICIPATION

Of all women over the age of sixteen living in the Bay Area, 56.7 percent are active, employed participants in the civilian labor force, three percent are unemployed, and 38.5 percent described themselves as 'not in the labor force.' Of the 56.7 percent employed, 71.3 percent worked full-time in 1989, an increase of 1.7 percentage points over 1979. Bay Area men work at the higher rate of 69.5 percent, while four percent are unemployed and 23.6 percent are not in the labor force. Of the employed men, 85.4 percent reported working full-time in 1989, an increase of .9 percentage points from the previous census.

The Bay Area labor force is reasonably well educated. Among men, 87 percent have completed high school or higher degrees and among women 89.5 percent are so educated. Women are more likely than men to hold two- and four-year college degrees (33.3 percent versus 30.3 percent). Men are more likely (15.4 percent) than women (10.8 percent) to hold professional, Ph.D. and master's degrees.

PLACE OF RESIDENCE AND PLACE OF WORK

The residential distribution of labor force participants in the Bay Area counties and sub-counties under study is described in the following table:

Table 1
Labor Force Participation by County/Sub-County of Residence

Residence	Women	% of women	Men	% of men	Total	Total
Marin County	58,396	6.8	64,938	6.5	123,334	6.7
Richmond/San Pablo	22,896	2.7	24,186	2.4	47,802	2.6
Contra Costa County (b)	156,627	18.3	190,950	19.2	347,577	18.8
San Francisco County	172,017	20.3	198,113	20.2	370,130	20.1
Berkeley Emeryville Albany	30,290	3.7	32,830	3.5	63,120	3.4
Alameda (b)	256,671	30	292,007	29.4	548,678	29.8
San Mateo County	156,506	18.2	184,946	18.7	341,452	18.5
Total	853,403	100	987,970	99.9	1,841,373	100.0

While the proportionate rates of labor force participation for men and women residing in the same county are very similar* (statistical differences notwithstanding), the distribution of place of work shows greater variation (Table 2). Most notably, women work in greater proportions in the POWPUMAs identified as Marin, Contra Costa, San Francisco, and Alameda (b). One of the more interesting things to note is that women in the labor force are less likely than men to reside in Contra Costa County, 18.3 percent versus 19.2 percent, yet they are more likely to work there, 14.8 percent versus 12.4 percent. However, 58 percent of women and 57 percent of men in the labor force work in either San Francisco or Alameda counties, suggesting that the differences are perhaps not so pronounced. And, in fact, a cell by cell analysis of the origin and destination matrix of PUMA by POWPUMA shows that the proportional differences between men and women are statistically significantly different at a = .01 in only 17 of the 210 possible O&D pairs and significant at a = .1 in only six more.

Table 2
Labor Force Participation by County/Sub-County of Work

POWPUMA	Women	% women	Total	Men	% men	Total
Marin County	43,649	5.1	42,066	4.3	85,715	4.7
Richmond/San Pablo	16,448	1.9	20,909	2.1	37,357	2.0
Contra Costa County (b)	126,367	14.8	122,727	12.4	249,094	13.5
San Francisco County	241,642	28.3	273,110	27.6	514,752	28.0
Berkeley Emeryville Albany	37,805	4.4	45,709	4.6	83,514	4.5
Alameda (b)	216,576	25.4	245,610	24.86	462,186	25.1
San Mateo County	120,240	14.1	145,768	14.75	266,008	14.4
Santa Clara County	39,392	4.6	69,268	7.0	108,660	5.9
Other Locations	11,284	1.3	22,803	2.3	34,087	1.9
Total	853,403	100.0	987,970	99.9	1,841,373	100.0

In general, women are more likely to work and live in the same POWPUMA than are men. When considering all workers, 60.3 percent of the Bay Area's employed men reside and work in the same POWPUMA, and 68.5 percent of the Bay Area's women reside in the same POWPUMA. Among the full-time employed these percentages change to 58.2 percent and 64.3 percent respectively. Table 3 shows the likelihood of living and working in the same POWPUMA for full-time employed women and men respectively. [A complete table listing likelihood of working and living in the same POWPUMA across race and sex is given in Appendix B.]

Of the 17 O&D pairs significantly different at a=.01, 12 have higher proportions of women living in PUMAs that are bounded by their POWPUMAs. This might suggest that the difference in travel times is explained as a function of this particular travel pattern. However, the assumption is confounded by the fact that while men are more likely to leave their county of residence they are often traveling to adjacent POWPUMAs.

Table 3
Men & Women Working and Residing in Same POWPUMA

POWPUMA	**Women**	**Men**
Marin County	.594	.494
Richmond/San Pablo	.299	.269
Contra Costa County (b)	.620	.488
San Francisco County	.833	.760
Berkeley Emeryville Albany	.398	.456
Alameda (b)	.647	.613
San Mateo County	.556	.539
Total	.643	.582

INDUSTRIAL SEGMENTATION

The idea has been advanced that women's travel times are shorter because the industries that employ women locate in some fundamentally different pattern than do industries that employ men. In this section we discuss the industrial segmentation of men and women workers in the Bay Area. Based on the 1990 PUMS, 102 industries were classified as male-dominated, 87 as neutral, and 46 as female-dominated. The pattern of concentration is clearly far more intense for women than it is for men. Of the female labor force, 43.4 percent have found employment in the 46 female-dominated industries. The twelve largest female-dominated industries employ 75 percent of the women and men employed in female-dominated industries (Table 4); typical female-dominated industries include hospitals, elementary schools, banking and insurance, department stores, and private household services.

Table 4
Industries Employing 75 % of Men and Women in Male- and Female-Dominated Industries

	Male-dominated industries	Female-dominated industries
1	Construction	Hospitals
2	Air transportation	Elementary and secondary schools
3	Trucking service	Banking
4	Justice, public order, and safety	Insurance
5	Engineering, architectural, & surveying services	Department stores
6	Automotive repair and related services	Health services, n.e.c.
7	Electrical machinery, equip., and supplies, n.e.c.	Apparel and accessory stores, except shoe
8	Landscape and horticultural services	Offices and clinics of physicians
9	Wholesale trade/groceries and related products	Private households
10	Motor vehicle dealers	Apparel and other finished textiles (manuf.)
11	Radio, TV, and computer stores	Social services, n.e.c.
12	Detective and protective services	Accounting, auditing, and bookkeeping services
13	Machinery, except electrical, n.e.c.	
14	Electric and gas, and other combinations	
15	Bus service and urban transit	
16	Gasoline service stations	
17	Guided missiles, space vehicles, and parts	
18	Industrial and miscellaneous chemicals	
19	Petroleum refining	
20	Lumber and building material retailing	
21	Motor vehicles and motor vehicle equipment	
22	Water transportation	
23	Warehousing and storage	
24	Miscellaneous repair services	

Conversely, only 37.3 percent of men are concentrated in male-dominated industries, which include 102 industries. The 24 largest male-dominated industries employ 75 percent of the people employed in male-dominated industries (Table 4); typical male-dominated industries include construction, transportation, utilities, engineering services, and wholesale trade. Sixteen percent of the male labor force has found employment in female-dominated industries (and those tend to be in the highest paying occupations, as shown in Table 11), while only 12 percent of women have found employment in the 102 male-dominated industries. The histograms shown in figure 1 illustrate these differences.

Figure 1
Distribution of Workers Across Industry Groups, by Sex

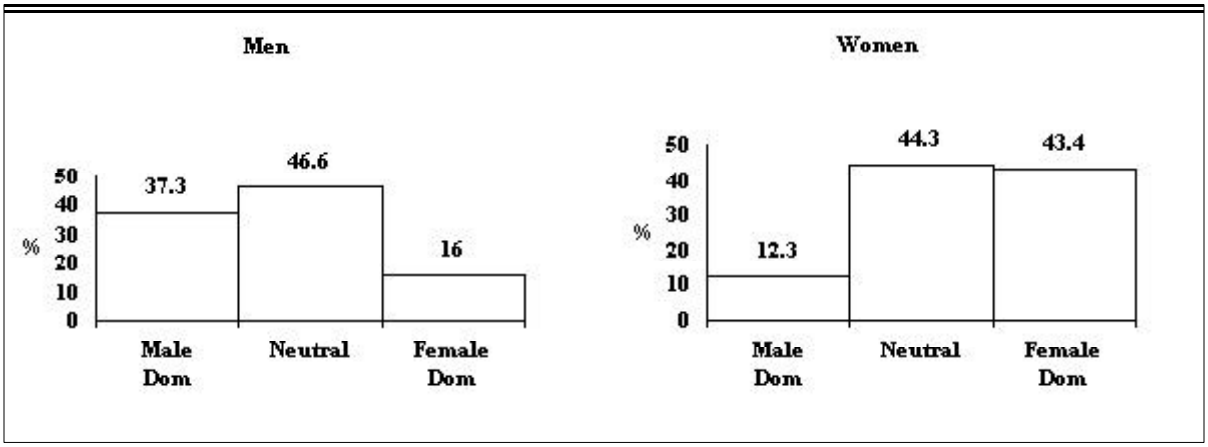
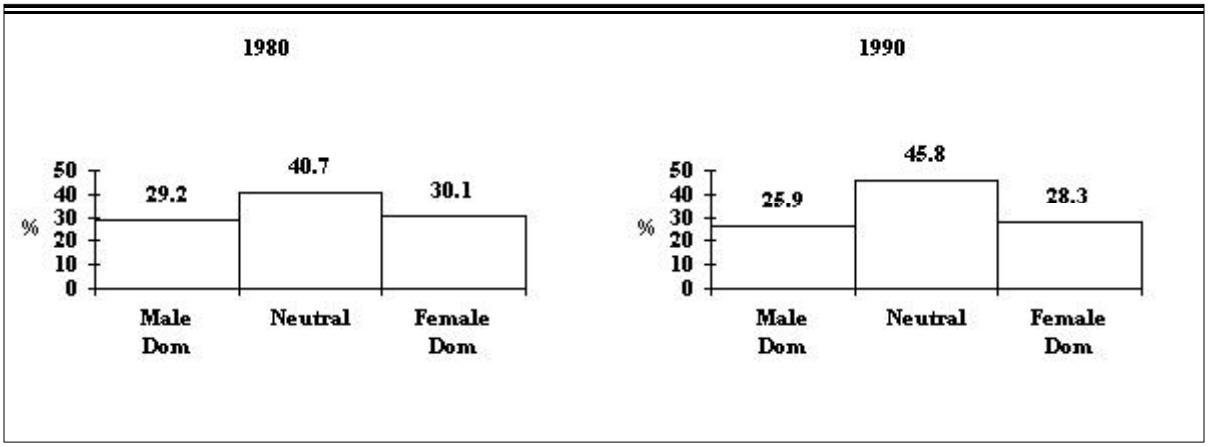


Figure 2
Distribution of Workers Across Industry Groups, 1980 and 1990



Over time, industrial segmentation has diminished from 1980 to 1990 (Figure 2). While the number of industries classified as female/male-dominated or neutral is roughly the same, the distribution of workers in those industries is converging, i.e., more people are employed in neutral industries and fewer are employed in the segregated industries.

FINDINGS

TRAVEL TIME

As expected, our findings indicate that women spend less time commuting to work than men do. For all workers in our sample in 1990, men traveled approximately 2.55 minutes longer than women (Table 5). Looking at only full-time workers, the difference narrows substantially: men working full-time spent only 1.5 more minutes than women in the journey-to-work. The difference in male and female travel times decreased slightly (less than 10 percent) from 1980 to 1990. However, for both men and women, travel times increased by over a minute from 1980 to 1990.

TRAVEL TIME BY INCOME, DENSITY, RACE/ETHNICITY, AND MODE CHOICE

When travel time differences are examined in the context of income, residential density, race/ethnicity, and mode choice, men working full-time still tend to travel longer than women (Table 6).[3] Exceptions are urban women, who travel 0.13 minutes longer than urban men, and women who use public transportation (or walk), who travel 1.64 minutes longer than men who use public transportation (or walk). The difference in male and female travel times widens beyond the average 1.5 minute difference for suburban residents, workers of white or 'other' race/ethnicity, and workers traveling to work via automobile. Income and means of transportation to work correspond closely to differences in travel time: women in the top 20 percent income category for women (with personal income from wages of more than $36,000) travel over five minutes longer than women in the lowest 20 percent income group for women (with income of less than $14,400), and women using public transportation travel over seven minutes longer than those using autos.[4]

Table 5
Mean Travel Time, 1980 and 1990

	All Workers		Women-Men	
Sex	**1980**	**1990**	**1980**	**1990**
Men	25.76	26.99		
Women	23.02	24.44	-2.74	-2.55
	Full-time Workers			
Men	26.43	27.80		
Women	24.70	26.30	-1.73	-1.50

For all differences, p<.0001

Certain subgroups of women are likely to have *longer* travel times than men. When traveling via public transportation, urban white and Asian women, suburban black women, and both urban and suburban Hispanic women travel longer than their male counterparts. When traveling by automobile, the pattern of shorter travel times for women is consistent across subgroups. However, the difference in travel times increases for men and women living in suburban PUMAs. Table 1 in Appendix C shows travel times for men and women by mode, race/ethnicity, and residential density.

Table 6
Travel Times for Subgroups of Men and Women

		Men		Women		Men-Women
		Mean	**SD**	**Mean**	**SD**	**Difference**
Income	Low-income quintile	25.55	17.92	24.24	18.15	1.31
	High-income quintile	30.67	19.66	29.57	19.47	1.10
Residential	Urban	25.72	17.19	25.85	17.53	-0.13
Density	Suburban	30.00	20.45	26.82	19.57	3.18
Race/	Non-Hispanic white	27.79	19.34	25.60	18.58	2.19
Ethnicity	Black	28.02	18.76	27.10	18.19	0.92
	Non-Black Hispanic	26.23	17.85	26.18	18.32	0.05
	Asian	29.06	17.95	28.69	18.36	0.37
	Other	28.80	19.96	24.54	17.78	4.26
Mode	Public transportation/walked	30.14	23.40	31.78	23.20	-1.64
	Automobile	27.26	17.73	24.51	16.29	2.75

For all differences p<.0001.

TRAVEL TIME AND HOUSEHOLD RESPONSIBILITY

We compared men's and women's average travel times across the income burden variable and found that men and women who earn less than half of their respective households' income exhibit approximately the same travel time pattern as we have observed throughout: men travel 0.8 minutes longer than women. When comparing men and women who are responsible for more than half but not all of their household's income, the difference widens to over one and a half minutes. However, travel time differences virtually disappear between men and women who are fully responsible for the income earned in their households. Since the mean income for female sole wage-earners is substantially lower than that for men ($26,300 versus $36,200)—while their commute times are comparable—it appears that the trade-off between travel time and income pays much better for men than for women, and that wage-earner responsibility has more of an effect on commute time than income level.[5]

Table 7
Travel Time by Sex and Income Burden

		Men		Women		Men-Women
		Mean	**SD**	**Mean**	**SD**	**Difference**
Burden	<.5 of household income	27.18	18.30	26.35	18.21	0.83
	.5-.99 of household income	29.39	19.28	27.79	18.70	1.60
	>.99 of household income*	26.87	18.81	26.72	18.18	0.15

*Not significant – other differences p< .0001

Historically, the presence and age of children have been used to look at household responsibility. For this analysis, however, we were only able to compare the travel times of women with children against women without children.[6] As shown in Table 8, women who work full-time and have young children (under six years of age) travel more than a minute longer than women without. In fact, the difference is even more extreme for women with children in the lowest and highest income quintiles, who travel 2.33 and 2.45 minutes more, respectively, than women without children. This again contradicts the economic rational-

ity argument, which suggests that women with the household responsibility incumbent in rearing young children are constrained in the amount of time they can spend commuting.

Table 8
Travel Times for Women With and Without Children

	Family Status	Mean	SD	Difference
All women	Without children under 6	25.81	18.10	
	With children under 6	26.99	18.27	1.18
Low-income quintile	Without children under 6	24.05	18.00	
	With children under 6	26.38	19.16	2.33
High-income quintile	Without children under 6	29.38	19.40	
	With children under 6	31.83	19.40	2.45

*Not significant - other differences p<.0001

TRAVEL TIME, INCOME, AND RACE

Table 9 shows that travel time differences between low- and high-income women (using personal income) are much greater for those using public transportation than for those driving, across all racial/ethnic groups. However, the difference between low- and high-income groups narrows for black and Hispanic women using transit. In general, white women using transit spend less time traveling to work than women in other racial/ethnic groups. For women using the auto, low- and high-income white women show the greatest disparity in travel times, followed by Hispanic women. In contrast, for black women, the travel times of low- and high-income women differ by only a minute. Thus, race seems to prevail over income in determining travel times. This is probably a reflection of both the residential and industrial segregation of black women, and suggests that structural disadvantage is constraining economic rationality in this case.

Table 9
Travel Times for Racial/Ethnic Subgroup of Women, by Income and Mode

Mode	Race/ethnicity	Income quintile	Mean	SD	Difference
Public transportation	Non-Hispanic white	Low-income	22.98	23.43	
		High-income	36.93	23.01	13.95
	Black	Low-income	31.80	25.74	
		High-income	39.88	24.47	8.08
	Non-black Hispanic	Low-income	31.07	22.97	
		High-income	39.95	22.73	8.88
	Asian	Low-income	28.39	18.07	
		High-income	42.14	22.21	13.75
Automobile	Non-Hispanic white	Low-income	21.20	14.95	
		High-income	27.47	17.70	6.27
	Black	Low-income	24.92	16.41	
		High-income	25.78	15.58	0.86
	Non-black Hispanic	Low-income	20.45	12.90	
		High-income	26.16	16.78	5.71
	Asian	Low-income	24.51	17.05	
		High-income	27.45	17.07	2.94

For all differences, $p<.0001$.

TRAVEL TIME AND INDUSTRY TYPE

Whether employed in male-dominated, neutral, or female-dominated industries, women still have shorter travel times than men (Table 10). While the difference narrows to 0.80 minutes for neutral industries, women in female-dominated industries travel 1.81 minutes less than men in female-dominated industries, and women in male-dominated industries travel 1.41 minutes less than their male counterparts. In neutral and female-dominated industries, the difference between male and female travel times has been decreasing over time (since 1980), while in male-dominated industries, the difference has increased slightly. Since women in different industry types consistently have shorter commute times than men, sex membership seems to override industry type, contradicting the hypothesis that concentration in female-dominated industries is a major factor in the shorter travel times for women.

When comparing within sex categories, it is interesting to note that women's travel times in 1990 are decreasing in the order neutral, male-dominated, female-dominated, while men's are decreasing in the order male-dominated, neutral, female-dominated. Also interesting to note is that average income for women is decreasing in the same order as their travel time but men's income follows an order in the exact reverse of their travel time: it is highest for those working in female-dominated industries and lowest for those in male-dominated industries (Table 11). In other words, men are apparently not making the same sort of trade-off between income and travel time as women are.

Table 10
Travel Time by Industry Type, 1980 and 1990

		1980				1990			
Industry Type	**Sex**	**Mean**	**SD**	**%**	**Difference**	**Mean**	**SD**	**%**	**Difference**
Male-dominated	M	26.79	18.01	100.0%		28.15	18.73	100.0%	
	F	25.79	17.00	95.5%	-1.20	26.74	18.08	95.0%	-1.41
Neutral		M	26.01	18.66	100.0%	27.65	19.17	100.0%	
	F	24.69	17.64	94.9%	-1.32	26.85	18.67	91.1%	-0.80
Female-dominated	M	26.49	18.44	100.0%		27.33	18.96	100.0%	
	F	24.36	17.40	92.0%	-2.13	25.52	18.44	93.4%	-1.81

For all differences, p<.0001.

Table 11
Income by Industry Type, 1980 and 1990

		1980				1990			
Industry Type	**Sex**	**Mean**	**SD**	**%**	**Difference**	**Mean**	**SD**	**%**	**Difference**
Male-dominated	M	$19,130	$13,001	100.0		$36,954	$25,962	100.0	
	F	$12,263	$7,516	64.1	-$6,867	$26,701	$14,329	72.3	-$10,253
Neutral	M	$18,130	$14,238	100.0		$27,859	$34,913	100.0	
	F	$11,286	$ 7,885	62.4	-$6,808	$40,407	$20,231	68.9	-$12,548
Female-dominated	M	$18,343	$15,095	100.0		$43,907	$40,173	100.0	
	F	$11,030	$ 7,212	60.1	-$3,313	$25,840	$16,898	58.9	-$18,067

For all differences,p<.0001.

Table 2 in Appendix C shows travel time differences between men and women in male-dominated, neutral, and female-dominated industries controlling for mode choice, race/ethnicity, and density. Perhaps the most striking travel time difference is between those workers traveling via public transportation versus via automobile: regardless of the industry type in which they are employed, urban women almost always travel longer than men when both travel by public transportation. Another difference which is generally consistent across racial/ethnic subgroup is between urban and suburban areas, for both auto and transit users: the gender gap in travel time is typically wider in suburban areas than in urban areas. However, whether women live in the city or suburbs, and whether they commute via auto or transit, travel times are longer for black, Asian, and Hispanic women traveling to female-dominated industries than for white women traveling to female-dominated industries, indicating that the factor of race/ ethnicity may play a more important role than industry location in shaping travel time for women.

Looking only at automobile users, several other findings stand out: in male-dominated industries, suburban white, Hispanic, and Asian women spend less time traveling to work than their male counterparts, while black women travel *longer*. In the suburbs, the gender gap in travel time to female-dominated industries is generally wider for whites and Asians than for blacks and Hispanics. In urban areas, however, blacks and Hispanics generally have wider gaps in travel time to male-dominated industries than do whites and Asians.

LOCATION OF FEMALE- AND MALE-DOMINATED INDUSTRIES

Because of the variation in travel patterns for different racial/ethnic and density subgroup within the same industry type, a more detailed examination of industry location patterns for male-dominated, neutral, and female-dominated industries is warranted. Table 12 shows location quotients for jobs in the largest male- and female-dominated industries (those employing 75 percent of the workers) in each of eight counties or county subareas (the POWPUMAs). As it turns out, female- and male-dominated industries have different patterns of concentration among the POWPUMAs: female-dominated industries are relatively concentrated in San Francisco County (LQ = = 1.20), while male-dominated industries are relatively concentrated in San Mateo County (LQ=1.18) and the area outside the five counties under study (principally Santa Clara County) (LQ=1.37).

Moreover, location quotients vary considerably between men and women in the same industry type in the same POWPUMA: for instance, in San Francisco female-dominated industries, the location quotient for men () is 1.46 but for women is only 1.07, indicating that men are relatively more likely to travel to female-dominated industries in the regional downtown area. Both of these findings conflict with the premises of the industrial location hypothesis: not only are certain female-dominated industries concentrating instead of dispersing, but also within female-dominated industries O&D patterns vary.

Even within the female- and male-dominated industry categories, there is considerable variation in location quotients within different POWPUMAs (Table 3 in Appendix C). For instance, San Francisco, which contains a relative concentration of female-dominated industries (LQ=1.20), has a relative concentration of (female-dominated) apparel manufacturing, banking, and hospitals, but a relative scarcity of (female-dominated) elementary and secondary schools and health services. Likewise, male-dominated industries in general are scarce in San Francisco (LQ=0.78), but some specific male-dominated industries, such as electric and gas, and engineering, architectural, and surveying services, are relatively concentrated in the city.

Table 12
Location Quotients for Jobs in Female and Male Dominated Industries

Table 12
Location quotients for jobs in female- and male-dominated industries

Fem.-dom. industries (top 75%)*		Marin Cnty. #	LQ	Richmond area #	LQ	Contra Costa Cnty. #	LQ	SF Cnty. #
Men		5007	1.03	2012	0.75	15601	0.94	43801
Women	14417	1.06	6710	0.96	44721	1.04	85127	1.07
Total		19424	1.05	8722	0.92	60322	1.03	128928
		Berkeley area		**Alameda Cnty.**		**San Mateo Cnty.**		**Other**
		#	LQ	#	LQ	#	LQ	#
Men		3705	1.08	25175	0.87	13452	0.72	6813
Women	8127	1.01	69509	0.97	35893	0.94	12657	0.81
Total		11832	1.03	94684	0.95	49345	0.84	19470
Male-dom. industries (top 75%)*		**Marin Cnty.** #	LQ	**Richmond area** #	LQ	**Contra Costa Cnty.** #	LQ	**SF Cnty.** #
Men		11629	0.99	7143	1.10	41133	1.03	58776
Women	2941	0.79	2227	1.16	9851	0.84	16656	0.76
Total		14570	0.90	9370	1.11	50984	0.97	75432
		Berkeley area		**Alameda Cnty.**		**San Mateo Cnty.**		**Other**
		#	LQ	#	LQ	#	LQ	#
Men		7965	0.97	73166	1.05	49925	1.11	29035
Women	2170	0.98	22031	1.12	12884	1.23	7288	1.70
Total		10135	0.97	95197	1.06	62809	1.18	36323

*Includes the 12 female- and 24 male-dominated industries which employ 75 percent of all worke
dominated industries.

TRAVEL TIME AND ORIGIN-DESTINATION PAIRS

One of our most startling findings is that women who work in San Francisco, as opposed to other Bay Area locations, overwhelmingly report *longer* travel times to work—and lower incomes—than their male counterparts, even controlling for mode choice. For all but 4 of the 30 PUMAs we studied, women report statistically significantly (at a= .99) longer travel times to San Francisco. In the four PUMAs for which men reported longer travel times, only one was significantly different; this is in large measure due to the limited number of observations for those four origin and destination pairs. This again contradicts the theory that women are acting out of rational choice in making trade-offs between travel time and income.

DISCUSSION

Traditionally, the two theories used to explain sex-based differences in travel time to work are that (1) because women earn less, it is not economically rational for them to spend as much time travelling to work as men do; and (2) women are occupationally segregated, and their occupations tend to concentrate in particular industries, which locate in some fundamentally different pattern than male-dominated or neutral industries. Within these theories, variations in travel time are understood as a function of mode choice, income, race/ethnicity, and household responsibilities. This empirical analysis yields contradictory evidence and provides little support for either of these theories.

This analysis found that with the exception of urban women, women using public transportation, and women destined for San Francisco, women have significantly shorter worktrips than men do. However, the difference is small, and decreasing. As this difference is generally narrower than those found by studies of other areas, our study suggests that in the Bay Area counties under study, commuters experience relative gender equality in their commutes. The following assess our findings in terms of the two theories outlined above.

ECONOMIC RATIONALITY/HOUSEHOLD RESPONSIBILITY ARGUMENT

On average, women do spend less time in travel and earn less than men. In fact, men and women both exhibit behavior consistent with the economic rationality argument: men and women in low-income quintiles both travel approximately five minutes less than those in high-income quintiles. However, five distinct findings contradict the economic rationality/household responsibility perspective:

- When comparing women who travel to San Francisco, the regional downtown area, with other women, their behavior is consistent, i.e. when they spend more time commuting they earn more. However, the theory does not hold when comparing women to men who work in San Francisco: women traveling to work in San Francisco spend *more* time traveling but earn *less* than men. Thus, their behavior is consistent with this theory of economic rationality *within* but not *across* sex categories.

- Likewise, when comparing women to men across industry types, men consistently have greater travel times and incomes than women. However, men working in female-dominated industries spend *less* time traveling but earn *more* than men in male-dominated or neutral industries. Therefore, men's behavior is considered economically rational when comparing *across* sex, but not *within* sex.

- Although high-income women have longer travel times than low-income women across both the race/ethnicity and mode choice variables, the difference narrows to less than a minute for black women who travel via automobile. That race prevails over income in this case is likely a reflection of both the residential and industrial segregation of black women. In other words, structural disadvantage places a serious constraint on "economic rationality."

- Men or women who bear sole responsibility for their household's income display no difference in travel time, despite the lower incomes for women. Moreover, the travel times for these men and women are less than those of men and women who share the responsibility for household income with others. This surprising finding suggests that full responsibility for household earnings has more effect on travel time than actual earnings.

- Women with young children spend more time traveling to work than women without young children, regardless of income. This finding is counter to the theoretical construct which hypothesizes that women with household responsibilities will spend less time commuting. This apparent phenomenon may reflect the shortcoming of the data collection, which does not allow for the possibility of complex travel patterns, e.g., women with children may be more likely to make an intervening stop.

INDUSTRIAL LOCATION ARGUMENT

The industrial location argument suggests that women have shorter travel times to work because the industries in which they are disproportionately segmented locate in a relatively dispersed pattern, thereby facilitating access from residences throughout the metropolitan area. Again, the evidence we found both provides support for and contradicts this theory. The shortest travel times—for both women *and* men—are reported for workers in female-dominated industries. However, our analysis was unable to uncover any systematic pattern of dispersion in female-dominated industries which can account for the lower travel times for women. Five distinct findings contradict the industrial location argument:

- Women have shorter travel times than men whether they work in female-dominated, neutral, or male-dominated industries.

- Women and men travel in similar proportions to the vast majority of O-D pairs.

- The factor of race/ethnicity often plays a greater role than industry location, mode, gender, or density: whether they commute by car or transit, whether they live in urban or suburban areas, black, Asian and Hispanic women have longer commute times than white women to female-dominated industries, and black women spend more time traveling than black men to male-dominated industries.

- While it was expected that male-dominated industries would be concentrated in regional centers and sub-centers, and female-dominated industries would be located throughout the region, the analysis shows a contradictory pattern. For instance, San Francisco has a relative concentration of female-dominated industries, but a dearth of male-dominated industries.

- Moreover, men and women within female-dominated industries exhibit different O-D patterns. For instance, men are relatively concentrated in female-dominated industries in San Francisco, while women tend to be concentrated in female-dominated industries in more suburban areas.

DIRECTIONS FOR FURTHER STUDY

While the two approaches under study have some explanatory power for sex-based differences in travel times, this research has pointed to several inconsistencies of these theories with travel patterns in the San Francisco Bay Area. Overall, it appears that several structural constraints may be overriding "economic rationality" or industrial location as a determinant of travel times: for instance, belonging to the racial/ethnic groups which are segregated in urban areas, being employed in San Francisco, and lacking access to private automobiles all seem to result in contradictory longer travel times for women.

There are also several deficiencies which arise in attempting to evaluate the viability of these theories, particularly by using the PUMS dataset. One major question is to what extent is an average *1.5-minute* difference in travel times evidence that women are selecting shorter commutes in an economically rational manner? Moreover, this difference is substantially smaller than either differences found in other metropolitan areas or differences found in travel surveys in the Bay Area. This raises the question of

how accurately respondents answer the census long form used for PUMS, as opposed to surveys or interview questions more specifically focused on travel behavior. Finally, the PUMS variables undoubtedly provide an inappropriate measure of household responsibility, as they cannot capture the trip-chaining and responsibility-sharing that may occur. Activity analysis and in-depth interviews would be more appropriate methods to model household responsibility and determine the role of space-time or structural constraints on women.

APPENDIX A

Table 1
Description of PUMAs and PUMS Variables

Variable Name	Notes	Variable Type	Values
Age		continuous	
Burden	defined as personal income divided by household income	continuous	0 < burden < 1
Density	population divided by area of PUMA defines urban or suburban	dichotomous	urban if Population > 3,000 p sq. mile; suburban otherwise
Education		ordinal	
Household Income		continuous	
Industry Dominance	# of women in industry divided by # of women in labor force	continuous ⇒ discrete	-1 if < .75; 1 if > 1.25; 0 otherwise
Labor Force Participation	only records representing employed members of the civilian labor force were included	continuous ⇒ dichotomous	full time if hours worked > 39; part time otherwise
Mode		dichotomous	automobile (inc. pick-up truck or van) or other
Personal Income	capped at $140,000	continuous	
Race	compiled from variables representing race and Hispanic origin	discrete	
Sex		dichotomous	
Travel Time	intended to be continuous but often reported in steps, e.g., 5, 10, 20, 45, 60 minutes.	continuous	

APPENDIX B

Table 1
Working and Living in the Same POWPUMA, by Race and Sex

	White		Black	
	Women	**Men**	**Women**	**Men**
Marin County	.582	.484	.637	.584
Richmond/San Pablo	.316	.271	.279	.291
Contra Costa County (b)	.642	.499	.463	.407
San Francisco County	.808	.770	.866	.778
Berkeley Emeryville Albany	.425	.469	.265	.293
Alameda (b)	.644	.614	.658	.617
San Mateo County	.600	.547	.416	.462
	Non-Black Hispanic		**Asian**	
	Women	**Men**	**Women**	**Men**
Marin County	.758	.653	.557	.410
Richmond/San Pablo	.340	.274	.233	.198
Contra Costa County (b)	.661	.569	.468	.335
San Francisco County	.855	.744	.861	.742
Berkeley Emeryville Albany	.475	.491	.359	.440
Alameda (b)	.714	.687	.596	.534
San Mateo County	.601	.602	.418	.436

APPENDIX C

Table C-1
Travel Times for Men and Women by Mode, Race/Ethnicity, and Density

Mode	Race/ethnicity	Density	Sex	Mean	SD	Difference
Public transportation	Non-Hispanic white	Suburban	M	34.06	27.95	
			F	31.94	28.60	-2.12
		Urban	M	25.68	20.33	
			F	28.28	20.90	2.59
	Black	Suburban	M	35.24	25.48	
			F	40.27	26.60	5.03
		Urban	M	33.91	22.07	
			F	33.30	21.70	-0.61
	Non-black Hispanic	Suburban	M	29.76	23.06	
			F	33.87	24.60	4.11
		Urban	M	29.72	21.53	
			F	32.48	22.30	2.75
	Asian	Suburban	M	42.66	24.48	
			F	39.58	22.20	-3.08
		Urban	M	30.89	20.76	
			F	33.40	20.20	2.50
	Other	Suburban	M	36.54	27.60	
			F	26.62	24.10	-9.92
		Urban*	M	29.29	22.89	
			F	29.36	21.70	0.07
Automobile	Non-Hispanic white	Suburban	M	29.70	19.56	
			F	25.28	17.60	-4.43
		Urban	M	24.64	15.61	
			F	23.63	15.40	-1.01
	Black	Suburban	M	28.81	19.33	
			F	26.26	16.70	-2.55
		Urban	M	25.14	15.94	
			F	23.50	14.40	-1.64
	Non-black Hispanic	Suburban	M	26.59	17.73	
			F	24.08	15.90	-2.51
		Urban	M	24.18	15.37	
			F	22.83	14.10	-1.35
	Asian	Suburban	M	30.22	17.81	
			F	26.81	17.00	-3.42
		Urban	M	26.47	15.41	
			F	24.38	14.80	-2.09
	Other	Suburban	M	30.55	19.09	
			F	24.43	17.30	-6.12
		Urban	M	25.43	17.51	
			F	22.51	14.60	-2.92

*Not significant. For all other differences p<.0001.

Table C-2
Travel Times for Racial/Ethnic and Density Subgroup, by Industry Type and Mode

Mode	Race/ethnicity	Density	Industry Type	sex	mean	s.d	diff
Public	Non-Hispanic white	Suburban	Male-dom*	M	33.53	27.77	
Transportation				F	33.16	28.28	-0.37
			Neutral	M	32.43	27.9	
				F	33.57	28.1	1.14
			Female-dom	M	40.09	27.6	
				F	29.47	29.2	-10.62
		Urban	Male-dom	M	27.42	21.18	
				F	28.87	18.82	1.45
			Neutral*	M	24.43	20.46	
				F	28.47	21.3	4.04
			Female-dom	M	27.19	18.87	
				F	27.84	20.85	0.65
	Black	Suburban	Male-dom	M	32.04	23.78	
				F	50.10	28.92	18.06
			Neutral	M	32.81	25.73	
				F	39.87	25.46	7.06
			Female-dom	M	47.42	23.9	
				F	37.59	26.54	-9.83
		Urban	Male-dom	M	33.46	21.64	
				F	36.66	26.88	3.2
			Neutral	M	34.05	22.33	
				F	33.77	21.91	-0.28
			Female-dom	M	34.16	22.2	
				F	32.21	20.29	1.95
	Non-black Hispanic	Suburban	Male-dom	M	25.72	22.38	
				F	39.27	28.38	13.55
			Neutral	M	34.36	22.92	
				F	36.76	21.67	2.4
			Female-dom	M	22.56	21.61	
				F	30.25	25.34	7.69
		Urban	Male-dom	M	32.11	23.47	
				F	35.63	24.81	3.52
			Neutral	M	28.62	20.26	
				F	32.49	20.15	3.87
			Female-dom	M	28.88	21.69	
				F	31.96	24.06	3.08
	Asian	Suburban	Male-dom	M	48.96	23.52	
				F	37.97	20.53	-10.99
			Neutral	M	38.17	24.61	
				F	42.38	22.86	4.21
			Female-dom	M	45.19	23.11	
				F	37.70	22.01	-7.49
		Urban	Male-dom	M	36.21	19.54	
				F	33.70	19.44	-2.51
			Neutral	M	28.38	20.99	
				F	32.17	20.78	3.79
			Female-dom	M	33.84	19.78	
				F	34.22	19.94	0.38

Table C-2 (cont)

Mode	Race/ethnicity	Density	Industry Type	sex	mean	s.d	diff
Automobile	Non-Hispanic white	Suburban	Male-dom	M	30.20	19.58	
				F	27.18	18.15	-3.02
			Neutral	M	29.95	19.76	
				F	25.49	17.64	-4.46
			Female-dom	M	27.17	???	
				F	24.21	17.26	-2.96
		Urban	Male-dom	M	24.69	15.52	
				F	23.94	14.88	-0.75
			Neutral	M	25.07	15.85	
				F	24.70	16.23	-0.37
			Female-dom	M	23.15	15.03	
				F	22.11	14.56	-1.04
	Black	Suburban	Male-dom	M	28.07	18.16	
				F	29.40	17.13	1.33
			Neutral	M	30.33	20.89	
				F	26.59	17.24	-3.74
			Female-dom	M	26.70	17.69	
				F	24.69	15.93	-2.01
		Urban	Male-dom	M	26.22	16.64	
				F	24.12	13.59	-2.1
			Neutral*	M	24.59	15.36	
				F	24.74	14.46	0.15
			Female-dom	M	23.90	15.41	
				F	22.21	14.49	-1.69
	Non-black Hispanic	Suburban	Male-dom	M	27.19	17.18	
				F	23.97	15.62	-3.22
			Neutral	M	25.63	18.19	
				F	23.82	15.68	-1.81
			Female-dom	M	26.52	18.72	
				F	24.46	16.43	-2.06
		Urban	Male-dom	M	24.88	15.72	
				F	21.95	12.95	-2.93
			Neutral	M	23.40	14.78	
				F	22.53	13.96	-0.87
			Female-dom	M	24.28	16.23	
				F	23.55	14.71	-0.73
	Asian	Suburban	Male-dom	M	30.79	18.2	
				F	25.80	15.48	-4.99
			Neutral	M	29.65	16.91	
				F	27.77	17.49	-1.88
			Female-dom	M	30.79	19.43	
				F	26.06	17.07	-4.73
		Urban	Male-dom	M	26.46	14.91	
				F	26.23	16.36	-0.23
			Neutral	M	27.00	15.91	
				F	24.54	14.16	-2.46
			Female-dom	M	24.88	14.65	
				F	23.66	15.1	-1.22

*Not significant. For all other differences p<.0001.

Table C-3
Location of Female-Dominated and Male-Dominated Industries

Cnty.	Richmond area		Contra Costa Cnt		SF Cnty.		Berkeley area		Alameda Cty.		San Mateo Cty.		Other	
0.76	1894	0.99	8873	0.75	26421	1.22	2800	1.21	20752	1.03	9658	0.81	5928	1.00
1.38	2236	1.22	14465	1.28	13517	0.65	3082	1.38	23644	1.23	10580	0.93	3550	0.63
0.70	627	0.51	10514	1.39	24453	1.76	522	0.35	7581	0.59	3791	0.50	1617	0.43
1.62	545	0.51	7312	1.11	15452	1.28	594	0.46	8815	0.78	6768	1.02	1550	0.47
0.81	982	1.73	4029	1.15	6041	0.94	216	0.31	6291	1.05	4165	1.18	893	0.51
1.34	595	1.17	3202	1.03	5121	0.89	1084	1.76	5533	1.04	2476	0.79	1685	1.08
0.98	616	1.37	2199	0.79	6007	1.18	305	0.56	5637	1.19	2278	0.82	717	0.52
1.81	319	0.70	2745	0.98	4839	0.94	1046	1.90	4585	0.96	2525	0.90	1140	0.81
1.32	203	0.63	1879	0.94	4291	1.18	553	1.41	2590	0.76	2460	1.23	580	0.58
0.23	91	0.24	318	0.14	11191	2.66	628	1.39	2105	0.54	588	0.25	330	0.29
0.91	506	1.33	1990	0.85	5298	1.24	645	1.40	4206	1.06	1782	0.76	600	0.51
1.21	108	0.27	2796	1.13	6297	1.39	357	0.73	2945	0.70	2274	0.91	880	0.71
1.09	**8722**	**0.92**	**60322**	**1.03**	**128928**	**1.20**	**11832**	**1.03**	**94684**	**0.95**	**49345**	**0.84**	**19470**	**0.66**
Cnty.	**Richmond area**		**Contra Costa Cnt**		**SF Cnty.**		**Berkeley area**		**Alameda Cty.**		**San Mateo Cty.**		**Other**	
1.16	2123	0.82	19154	1.21	26705	0.92	2867	0.91	25830	0.95	15024	0.94	9360	1.18
0.09	41	0.07	370	0.10	3816	0.54	56	0.07	3574	0.55	16327	4.23	1408	0.73
0.54	924	1.77	1862	0.58	3830	0.65	252	0.40	8859	1.62	3205	0.99	2070	1.29
1.16	535	0.92	2596	0.73	7019	1.07	818	1.16	7198	1.18	3251	0.90	1284	0.72
1.05	395	0.82	3268	1.11	7302	1.35	1260	2.16	3687	0.73	1700	0.57	1287	0.87
0.85	412	1.17	2353	1.09	2731	0.69	641	1.50	4495	1.22	2676	1.23	670	0.62
0.58	59	0.14	1084	0.42	1087	0.23	476	0.94	3872	0.89	1966	0.76	8160	6.37
2.41	292	0.94	3065	1.60	1389	0.39	381	1.01	2768	0.85	2956	1.53	622	0.65
0.59	624	1.84	1137	0.55	2661	0.70	323	0.79	5299	1.49	2676	1.28	879	0.84
1.17	364	1.23	2083	1.14	1570	0.47	327	0.91	3707	1.19	2787	1.52	732	0.80
0.96	60	0.26	891	0.63	1830	0.70	606	2.15	2249	0.92	2001	1.39	1518	2.12
0.30	187	0.94	1201	0.98	2491	1.11	215	0.89	2475	1.18	1116	0.90	447	0.73
0.81	165	0.84	901	0.75	473	0.21	523	2.20	3472	1.69	1386	1.14	882	1.46
0.28	123	0.60	1195	0.95	4432	1.92	63	0.25	1519	0.71	702	0.55	292	0.46
0.79	229	1.18	708	0.60	2379	1.09	213	0.91	2866	1.41	1061	0.88	248	0.42
1.73	479	2.89	1802	1.77	891	0.48	144	0.72	1642	0.95	1127	1.10	214	0.42
0.00	56	0.41	208	0.24	65	0.04	41	0.24	470	0.32	260	0.30	4610	10.82
0.08	515	3.71	2532	2.96	32	0.02	258	1.53	1368	0.94	602	0.70	413	0.96
0.08	1303	10.38	2579	3.34	876	0.62	0	0.00	161	0.12	31	0.04	220	0.57
2.20	115	0.89	926	1.16	800	0.55	236	1.50	1532	1.13	863	1.08	335	0.84
0.24	179	1.44	328	0.43	326	0.23	187	1.24	3694	2.84	190	0.25	167	0.44
0.32	53	0.48	307	0.45	1889	1.52	13	0.10	1711	1.49	237	0.35	259	0.77
0.47	101	0.95	181	0.28	745	0.62	177	1.38	2381	2.15	529	0.81	162	0.50
1.66	36	1.34	253	1.53	93	0.31	58	1.77	368	1.30	136	0.82	84	1.01
0.90	**9370**	**1.09**	**50984**	**0.97**	**75432**	**0.78**	**10135**	**0.97**	**95197**	**1.06**	**62809**	**1.18**	**36323**	**1.37**
1.00	**18092**	**1.00**	**111306**	**1.00**	**204360**	**1.00**	**21967**	**1.00**	**189881**	**1.00**	**112154**	**1.00**	**55793**	**1.00**

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NOTES

[1] Analyses of this kind often separate Hispanic from non-Hispanic blacks. However, since the number of Hispanic blacks in the Bay Area is very low, we have chosen to leave the Hispanic blacks in the racial, rather than ethnic, category.

[2] Specifically, in terms of occupations, 24.5 percent of women are in male-dominated, 32.7 percent in neutral, and 42.7 percent in female-dominated, while for industries, 12.3 percent of women are in male-dominated, 44.3 percent in neutral, and 43.4 percent in female-dominated.

[*] In spite of the similar values, only San Francisco and Berkeley/Emeryville are not statistically significantly different.

[3] To facilitate comparison between men and women, all analysis from this point onward will be of full-time workers only.

[4] In our sample, 76.7 percent of women commute via auto, and 23.3 percent via public transportation or walking.

[5] The income burden variable is somewhat of a proxy for household structure, since the vast majority of households (62.7 percent) with sole wage-earners are people living alone (in addition, approximately 20 percent are married-couple households with a male wage-earner, and 10 percent are female heads of household). Since single person households tend to locate in residential areas of higher density (66 percent are urban), it is perhaps not surprising that burden type is more important than income level.

[6] The PUMS variable describing presence of children came up with no children for men in the dataset; although the dataset can be manipulated to show which households have children and male parents, we did not conduct this analysis.