

Gender Differences in Commuting at Suburban and Central Locations

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Women often work closer to home and have shorter commuting times than men. Recent evidence suggests that the gender differential in commuting depends significantly on the social and spatial contexts in which women live and work. Many women reduce commuting time by restricting their search for work to jobs available locally, regardless of wages and working conditions (Hanson and Pratt 1991). Others, who lack access to transportation or have few local job opportunities, may endure long commuting trips, trips equal to or exceeding those of male workers (Madden and Chiu 1990; McLafferty and Preston 1991; Wekerle and Rutherford 1989). In both cases, the local context, including such dimensions as transportation access and job availability mediates the gender-based disparity in work-trip length.

Within urban areas, some of the differences in the contexts of women's lives can be summarized by the distinction between central and suburban areas. There is growing evidence that, in general, the social construction of gender

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relations is different in each part of the urban area (Bondi 1991; Duncan 1991). For example, in London, England, households in which women are full-time homemakers or work part-time are concentrated in the southeastern commuter suburbs, while two wage-earner households predominate in the western inner city (Duncan 1991). Women's commuting patterns will be affected by the types and locations of paid employment available for women and the availability of public transit at central and suburban locations. Downtown, service sector job growth has improved employment opportunities for some women, while suburban back offices and manufacturing plants require skilled and semiskilled staff who tolerate routine tasks (Nelson 1986). The limited availability of public transit in suburban areas and reliance upon the car for commuting will also influence gender differences in commuting. Well known differences in household composition and social class between suburban and central areas may also affect women's employment decisions and subsequent commuting patterns.

This study explores the effects of context on gender differences in commuting by analyzing commuting times in central and suburban parts of two North American cities; Toronto and New York. In each city, we examine the magnitude and direction of the gender differential in each part of the urban region before exploring how income, occupation and the availability of transit influence the commuting times of men and women at each location. Detailed data for the New York urban region enable us to explore how household composition affects gender differences in commuting in suburban and central locations.

Toronto and New York provide an unusual opportunity to evaluate the extent and nature of locational variations in the gender differential. Both cities have similar economic bases, increasing social diversity, and unrivalled access to public transit. New York is the major financial centre of North America, while Toronto acts as the centre for all Canadian financial services (Gad 1991; Noyelle 1989). In both urban areas, manufacturing employment has relocated steadily to the suburbs while service employment, particularly office employment, has expanded rapidly downtown (Gad 1985; Norcliffe, Goldrick and Muszynski 1986). As major ports of entry for immigrants, Toronto and New York have populations of increasing social and ethnic diversity (Bogen 1987; Logan 1991). In both cities, public transit represents a viable and feasible means of transportation, at least in the central part of the region. Finally, the social geography of each city has been redrawn by reinvestment and gentrification as well paid professionals moved into central residential neighbourhoods nearby financial and business service jobs (Schaffer and Smith 1986; Murdie 1990; Harris 1991).

Similarities notwithstanding, there are also important differences between New York and Toronto that may influence gender differences in commuting. The sheer size of the New York urban region with a population of more than 17 million is likely to increase commuting times and thereby heighten gender differences in commuting time. There is less residential segregation of racial

groups in Toronto than New York, although both cities are ethnically diverse. We expect that gender differences in commuting may be heightened in the absence of a significant racial influence (McLafferty and Preston 1991). Toronto has also benefited from integrated regional planning that has attempted to direct the growth of service employment into suburban nodes accessible by public transit. Although the success of these initiatives is still being debated, there has been little equivalent intervention in the economic development of suburban areas in the New York urban region. As a result, employment is likely to be more dispersed and less accessible from public transit in New York than in Toronto, which may affect the gender difference in commuting times.¹

Only people employed in service industries are included in the empirical study. Service industries are the major employers of women, so gender differences in commuting are expected to be marked among these workers. Moreover, in both Toronto and New York, services account for more than half of all employment and the share continues to rise as deindustrialization proceeds.

A brief review of relevant literature about gender differences in commuting time provides the background for the empirical study. The data are described in Section two. In the third section, gender differences in commuting times in central and suburban parts of Toronto are compared and the effects of transportation mode and class are examined in detail. The fourth section presents a parallel analysis for New York. Section five investigates how household composition affects the gender differential in each part of New York. We explore the implications of our findings for gender differences in commuting in a brief conclusion.

Background

The gender differential in commuting is rooted in women's labour market experiences and access to employment as well as their responsibilities at home (Hanson and Johnston 1985; Gordon et al. 1990; McLafferty and Preston 1991).² Women often hold low-wage, part-time jobs that provide little payoff

1. The comparison is not based on the idea of a common North American urban form (Mercer 1991). Rather, recognizing the important differences between the two urban areas, we find strong similarities in their economic functions and recent history of economic restructuring that provide a basis for the comparison.
2. The magnitude of the gender differential depends on whether distance or time is used in measuring work-trip length. Studies that use distance as a measure show unequivocally that women work closer to home than men and thus have more localized labor markets (Fagnani 1983; Hanson and Johnston 1985; Madden 1981). When commuting time is analyzed, the results are generally consistent with those for commuting distance. Women typically spend less time in commuting than men, though the difference is proportionally less than that for

for commuting long distances (Madden 1981; Rutherford and Wekerle 1988; McLafferty and Preston 1991). The occupational and sectoral concentration of women's employment reinforces these patterns. In the United States and Canada, women make up a disproportionate share of the workforce in sales, clerical and service occupations characteristic of service industries (Bianchi and Spain 1986; Epstein 1988; Statistics Canada 1990). Jobs for female-dominated occupations are unevenly distributed over space. While many are concentrated at the centres of urban regions where business and financial services have expanded, others in retail and personal services are dispersed widely on the basis of income and population (Villeneuve and Rose 1988; Hanson and Pratt 1990). The intraurban spatial distribution of jobs in female-dominated occupations influences women's commuting trips in various ways depending upon each woman's residential location and occupational status (Fagnani 1983; Singell and Lillydahl 1986; Villeneuve and Rose 1988; Hanson and Pratt 1991).

Women who spend more time in child rearing and household work than men are less willing and able to devote time to commuting (Madden and White 1980; Johnston-Anumonwo 1992). For married mothers, the continuous demands of home and workplace add to the tensions of commuting (Michelson 1985, 1988). Women may also look for employment from residential locations that were chosen to accommodate the man's journey to work and the household's reproductive needs (Singell and Lillydahl 1986; Villeneuve and Rose 1988; Hanson and Pratt 1990).

Finally, women often have limited access to cars for commuting, particularly when compared with men (Pas 1984; Hanson 1986; Singell and Lillydahl 1986; Wekerle and Rutherford 1987). Reliance upon slow and infrequent public transit may increase women's commuting time (Wekerle and Rutherford 1987). Alternatively, to minimize commuting time, women may seek employment near home or at central locations well served by public transportation networks (Villeneuve and Rose 1988).

Each of the factors that contributes to gender differences in commuting times varies spatially within urban areas between suburban and central places of residence (Duncan 1991). The two locations differ on many dimensions, but for our understanding of gender differences in commuting, variations in employment opportunities for men and women, the availability of public transit, and the proximity of employment are important.

There are well known differences in the types of service industries in central and suburban locations (Daniels 1985; Gad 1990; Schwartz 1992). In addition to the dichotomy between producer services that concentrate downtown and consumer services that are more dispersed, there is further spatial separation of functions within service industries. In New York, producer service establishments in the suburbs provide data processing and other back

commuting distance (Hanson and Johnston 1985; Gordon et al. 1989).

office services to regional and local markets, while Manhattan-based firms are more likely to serve national and international markets (Schwartz 1992). The spatial distributions of service industries have both direct and indirect effects upon the gender differential in commuting. The occupational structure of each service industry is different. In the suburbs, many women are employed in poorly paid female-dominated occupations that provide little economic payoff for commuting. At central locations, there is more likely to be a mix of occupations in producer and public services (Duncan 1991; Villeneuve and Rose 1988). Consequently, we expect that women who live near downtown have better access to well paid full-time jobs than women living in the suburbs. In central locations, women may be willing to travel farther to better paid jobs than women living in the suburbs who may be unwilling to commute far to less remunerative jobs. As a result, the gender differential may be greater for suburban residents than for central residents.

Typically, public transit networks radiate from central areas so that the frequency and density of service peaks downtown and diminishes rapidly away from it (Hanson 1986). Inadequate public transit may have various effects on commuting behaviour depending upon a worker's gender and place of residence. Women living in the suburbs who rely upon public transit may spend prolonged periods of time travelling to work (Wekerle and Rutherford 1987). Alternatively, suburban women may drive to work, reducing commuting time (Johnston-Anumonwo 1988; Preston and McLafferty 1990). The gender differential will be heightened if suburban women respond to inadequate transit service by seeking employment near home regardless of wages and working conditions (Hanson and Pratt 1991). At the centre of the region, men and women use public transit to reach centrally located jobs, so gender differences in commuting time for these workers are likely to be influenced by other factors, specifically, differences in incomes. Well paid men are likely to commute longer times than poorly paid women.

Low densities and the spatial separation of land uses are the defining features of suburban environments. Both may reduce women's mobility and access to paid employment (Mackenzie 1988; Saegert 1981). Indeed, recent discussions of gentrification have highlighted the advantages of inner city neighbourhoods for women trying to satisfy the conflicting demands of paid employment and the household (Rose and Villeneuve 1988; Bondi 1991). In the suburbs, men and women must travel long distances between home and work and to any intermediate stops enroute. There is growing evidence that some suburban women reduce commuting times by seeking work near home (Fagnani 1987; Johnston-Anumonwo 1988).

Social cleavages between suburban and central locations may also influence gender differences in commuting. Women living in the suburbs are more likely to be married than women in central locations (White 1987; Bourne 1989). For married women, job search often depends on prior locational decisions concerning the spouse's employment and the household's residential

location (Singell and Lillydahl 1986). As a result, women in the suburbs may be more likely than their counterparts at central locations to seek employment after deciding upon a residential location (Hanson and Pratt 1991). They may also be more likely to choose a job because it is close to home (Dyck 1989; Hanson and Pratt 1991; Pratt 1993). The need for a conveniently located job has been linked to the tendency for women living in the suburbs to be employed in female-dominated occupations (Johnston-Anumnowo 1988). As mentioned earlier, the low wages typical of these occupations do not encourage long commuting trips. For married men and women, gender differences in commuting times may be more marked in the suburbs as a result of the residential decision and its impact upon women's occupational status and income.

Domestic responsibilities may also encourage suburban women to find work close to home (Madden 1981). The long-standing preference of North Americans to raise children in single-family detached housing means that suburban women are more likely than women living in central locations to be responsible for time-consuming child care and household tasks. In this situation, the opportunity to substitute convenience for other job attributes may well be more attractive to suburban women than to their central counterparts. State policies that concentrate day care and other supportive services at the workplace or in central locations far from suburban residences may also encourage suburban women to seek work close to home (Dyck 1989; Bowlby 1990). As a result, we hypothesized that the gender differential would be more pronounced in suburban locations than in central areas.

Class differences between suburban and central residents underpin many of our expectations about the spatial pattern of the gender differential within urban areas. To the extent that class is reflected in incomes and occupations, it is generally true that suburban residents are better off and have higher social status than residents of central neighbourhoods (Bourne 1989; White 1987). Of the many factors that complicate this pattern, two are particularly relevant for our analysis of gender differences in commuting. First, gentrification and the concomitant diversification of suburban areas have altered the distributions of incomes and occupational groups in many American and Canadian cities (Bourne 1989; Broadway 1992; Castells 1989). Neither suburban nor central areas are homogeneous. Second, women do not necessarily share the social class of their partners, yet much of our knowledge of spatial patterns of social class is based solely on consideration of the income and occupation of the head of household who has been assumed implicitly to be male (Pratt and Hanson 1988). Both these factors will be considered when interpreting the empirical findings.

To take account of contextual effects, gender differences in commuting times are evaluated separately for central and suburban locations. The analysis focuses on the economic determinants of commuting time to examine how class as described by occupation and income affects the commuting times of men and women. Given the important influence of transportation mode upon commuting

time, the availability of various modes of transportation is also considered. For New York, the effects of household composition on gender differences in commuting are also explored for central and suburban locations.

Data

Information about commuting in the Greater Toronto Area was obtained from a diary survey of Toronto travellers undertaken in the spring of 1987 (Tranplan Associates 1990). The sample comprises approximately 6,010 households in the Greater Toronto Area, the largest area for which regional transportation planning centred on the City of Toronto is undertaken, were surveyed. The travel diary data provide detailed information about travel patterns, labour force participation, and each person's social background. Commuting times, mode of transportation and the origins and destinations of trips are described in detail. For our analysis, the Greater Toronto Area is divided into two parts: Metropolitan Toronto, a regional municipality with integrated public services, and suburban Toronto which consists of four regional municipalities; Hamilton-Wentworth, Halton, Peel and Durham regions. The regional municipalities outside Metropolitan Toronto have experienced explosive population and employment growth without benefit of an integrated and dense transit system (Figure 1).

Similar information about commuting in New York was taken from the 1980 Public Use Microdata Sample which comprises individual records describing the social background, employment activities and commuting behaviour of a sample of urban residents. The sample includes over 125,000 individuals with detailed information about commuting time, income, occupation and industry of employment, and household characteristics such as marital status and the presence of children (McLafferty and Preston 1991). The data describe places of work and residence for 52 county and subcounty areas with approximately equal populations.

The New York urban region consists of three parts that have experienced distinct population and employment trends (Figure 2). In the city centre of Manhattan, population has been stable since 1960, while the number of jobs in service industries increased rapidly after 1977 (Harris 1991; Preston and McLafferty 1993). In contrast, the inner ring includes old industrial counties that have experienced devastating population and employment loss during much of the seventies and early eighties. Service industry jobs have not replaced manufacturing jobs that were lost through plant relocation and shutdown. Finally, in the suburbs, population and employment either increased or stabilized during the seventies.

Both data sets allow us to classify the occupations of workers in service industries. To ensure comparability, four major occupational groups were identified. Professionals include managers, administrators, and those holding

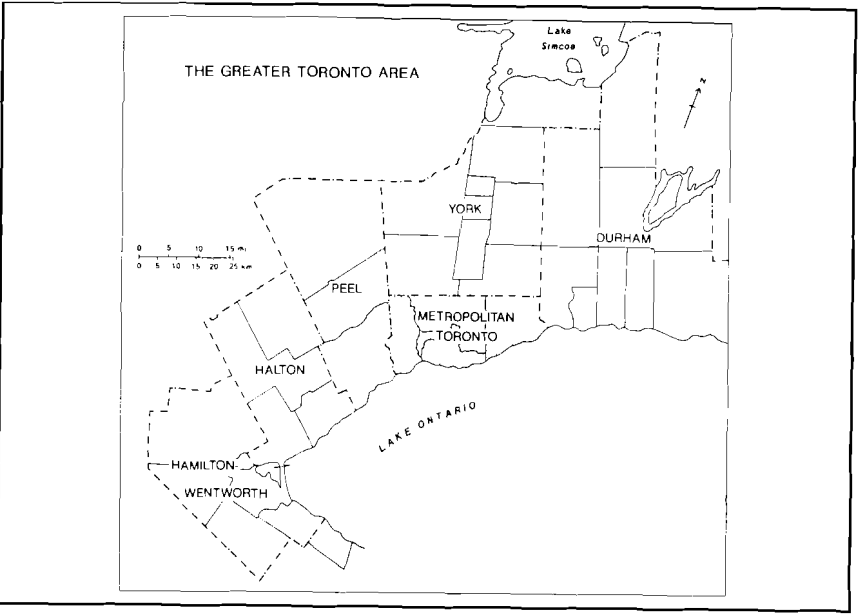


FIGURE 1 The Components of the Greater Toronto Area

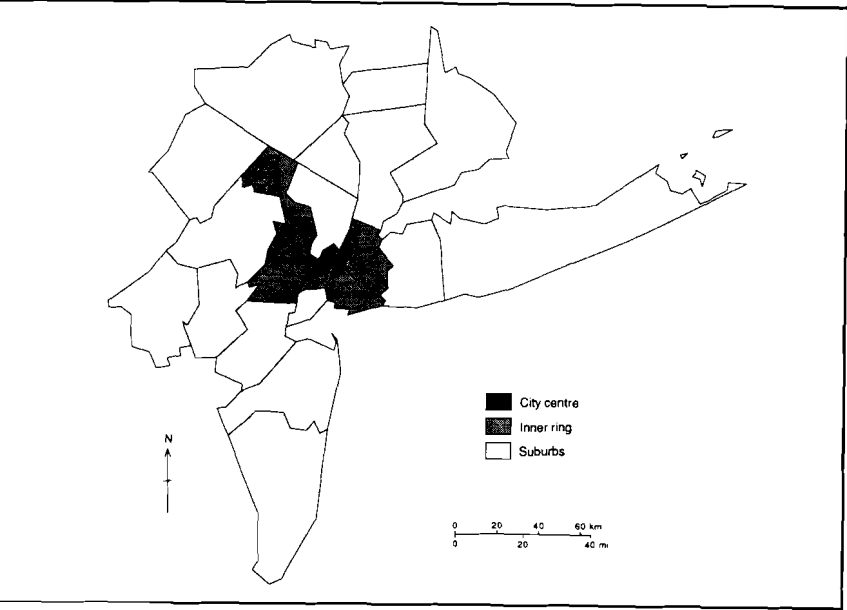


FIGURE 2 The Components of the New York Consolidated Statistical Metropolitan Area

professional qualifications obtained through postsecondary training, for example, teachers, social workers, and librarians. Sales occupations include relatively well paid sales people who deal with producer goods and large consumer durables and retail sales staff who are often poorly paid, part-time workers. Clerical occupations refer to the jobs of many office workers, while service occupations are diverse ranging from house cleaners and babysitters to barbers.

Gender Differences in Commuting in Toronto

For the Greater Toronto Area as a whole, gender differences in commuting are small. The decision to drive, use public transit or travel by some other form of transportation is the major influence upon a worker's commuting time, regardless of gender, occupation, and income (Preston and McLafferty 1990). Gender differences in commuting varied significantly within the Greater Toronto Area. The results from parallel analyses of variance for Metropolitan Toronto and the outlying areas revealed that gender, occupation, mode of transportation, and income had markedly different effects on commuting time in the two parts of the urban region (Table 1).

Within Metropolitan Toronto, gender was not related significantly to commuting time. This unexpected finding reflects the complex relationships among commuting time, income, occupation, and the use of public transit within Metropolitan Toronto. Income was inversely related to commuting time for service industry workers who lived within Metropolitan Toronto. As income increased, commuting time declined on average (Table 1).

The effects of income are reflected in the mean commuting times of various occupations. Better paid professionals commuted shorter times on average than clerical and service workers. The largest group of transit users were professionals of both sexes, who accounted for 46 percent of all transit users, followed by clerical workers accounting for another 41 percent. The preponderance of professionals among transit users would seem to contradict the significant inverse relationship between income and commuting time. However, professionals living in Metropolitan Toronto commuted shorter times than other transit users, an average of 37.1 minutes versus 49.0 minutes for clerical workers. Within Metropolitan Toronto, many well paid workers, both men and women, live close to downtown where they take advantage of a dense transit network. In contrast, clerical workers commute longer times from more distant and less accessible residential locations.

The unexpected pattern of class differences in commuting time within Metropolitan Toronto may reflect the recent history of Canadian cities (Mercer 1991). Overall, the central areas of most large Canadian cities have experienced population growth and economic improvement (Bourne 1989). In Toronto, the population moving into the central areas was younger, better educated and had

TABLE 1 Commuting Times for Service Industry Workers by Place of Residence in the Greater Toronto Area

Place of Residence						F	Sig.
Metropolitan Toronto							
Gender	Men	Women				1.93	NS
	30.9	33.8					
	(341)	(358)					
Occupation	Clerical	Sales	Service	Prof.		4.25	a
	38.5	28.6	31.7	30.2			
	(184)	(62)	(55)	(377)			
Mode of Transportation	Auto	Auto	Public	Auto &	Other	23.18	a
	Driver	Passenger	Transit	Public			
	27.6	17.8	43.6	41.0			
	(321)	(27)	(233)	(40)	(72)		
Income	-0.13						a
	(664)						
Outside Metropolitan Toronto							
Gender	Men	Women				7.29	a
	34.6	28.8					
	(473)	(514)					
Occupation	Clerical	Sales	Service	Prof.		1.19	NS
	30.8	31.5	25.9	33.1			
	(248)	(112)	(86)	(507)			
Mode of Transportation	Auto	Auto	Public	Auto &	Other	91.9	a
	Driver	Passenger	Transit	Public			
	25.1	32.0	61.8	88.0			
	(725)	(46)	(78)	(59)	(69)		
Income	0.12						a
	(951)						

a. p ≤ 0.01; NS: not significant.

higher incomes than that in more distant neighbourhoods (Murdie 1990; City of Toronto Planning and Development Department 1990). A well educated and well paid professional work force now lives in close proximity to employment in the central area. As a result, commuting time at the centre of the urban region is related inversely to income and occupation. In Paris, France, where high income households also live close to the city centre, well paid professionals use public transit to travel quickly to work (Fagnani, 1983).

Despite the willingness of all occupational groups to use public transit, mode of transportation had a significant influence upon commuting times. Driving to work still minimized commuting time even within Metropolitan Toronto. Workers who drove commuted significantly shorter times than those who relied upon public transit (Table 1).

Multivariate analysis of variance underscored the impact of central renewal on the gender differential in commuting. Means of transportation and income

TABLE 2 Multivariate Analysis of Variance of Commuting Times in Central and Suburban Locations: New York Consolidated Metropolitan Area and Greater Toronto Area

F Statistics ^a					
	Toronto		New York		
	Metropolitan Toronto	Outside Metropolitan Toronto	City Centre	Inner Ring	Suburbs
Gender	NS	NS	NS	40.95	354.91
Occupation	NS	NS	NS	21.39	204.34
Mode of Transportation	15.47	52.65	900.63	7,323.28	6,541.37
Gender and Occupation	NS	NS	NS	2.95	14.37
Gender & Mode	NS	NS	NS	28.02	45.65
Occupation & Mode	NS	NS	7.70	2.60	77.83
Gender, Occupation & Mode	NS	NS	NS	NS	15.55
Income	7.96	9.20	31.40	301.65	1,087.32
N	640	912	9,312	36,743	45,872

a. All listed F values are significant (p ≤ 0.05); NS: not significant.

were the only two variables that had significant effects upon commuting time within Metropolitan Toronto (Table 2). Gender differences in commuting time were insignificant once differences in income, mode of transportation and occupation were controlled.

The parameter estimates that indicate the magnitude of the effect of each variable after the separate and combined effects of all other variables have been controlled confirmed the important influence of transit use.³ Workers who used transit commuted 13.8 minutes longer on average than other workers, while those who drove saved 3.5 minutes from the average commuting time. In contrast, the parameter estimates for gender and occupation were not significantly different from zero.

A different set of relationships emerged in the suburbs outside Metropolitan Toronto where gender differences in commuting were significant. As expected, women commuted shorter times than men (Table 1). Means of transportation had the largest direct effect upon commuting time, so that people who drove to work had significantly shorter commuting times than those who used public transit. The disparity was pronounced, drivers commuted for an average of 25.1 minutes, whereas passengers on public transit travelled for an average of

3. Analogous to regression coefficients, deviation parameter estimates indicate the independent effect of each category of an explanatory variable on a dependent variable. Here, commuting is the dependent variable. Separate parameter estimates are calculated for each category of the explanatory variables; gender, occupation and mode of transportation.

61.8 minutes (Table 1).

The effects of income were significant and in the expected direction, so that commuting time increased as income rose. Outside Metropolitan Toronto, the economic return from each additional minute spent commuting is positive and significant. In light of the significant relationship between income and commuting time, it is noteworthy that occupation is not related significantly to commuting time outside Metropolitan Toronto (Table 1). The spatial distribution of jobs may contribute to the insignificant effects of occupation. Approximately equal proportions of workers in professional, clerical, and sales jobs travelled to work at central and suburban locations. The similarities in job locations for these occupations may reduce the direct effect of occupation on commuting time.

Despite the emergence of a significant gender differential in suburban areas, commuting times were influenced mainly by transportation mode and income. The results from a multivariate analysis of variance for workers living outside Metropolitan Toronto mirrored those described earlier for workers living within Metropolitan Toronto. Transportation mode and income had the only significant effects upon commuting time. The parameter estimates indicated the crucial impact of transportation mode; workers commuting on public transit travelled 30.6 minutes longer than the average, while those who drove travelled 17 minutes less than the average. Commuting times also increased with income. The direct effects of gender and occupation and all of the possible interaction effects were not significant (Table 2).

In the Greater Toronto Area, gender differences in commuting have a distinct spatial pattern. In the suburbs, women commute shorter times than men, while at the centre of the region, men and women commute approximately the same time.

Commuting Times in New York

In the New York Consolidated Metropolitan Area, the spatial pattern of gender differences in commuting time parallels that in the Greater Toronto Area. The gender differential is weak at the centre of the region and strengthens towards the periphery. The spatially disaggregated pattern of gender differences is more complex than that of the whole region (Preston and McLafferty 1990; McLafferty and Preston 1991).

The results of multivariate analysis of variance indicate that neither gender nor occupation is related significantly to the commuting times of service industry workers living at the centre of the New York urban region (Table 2). Once the effects of income and transportation mode are considered, gender and occupational differences disappear. As in Toronto, there is a significant negative correlation between income and commuting time at the centre. Manhattan, like central Toronto, is an attractive residential location for well paid pro-

TABLE 3 Commuting Times for Service Industry Workers by Place of Residence in the New York Consolidated Metropolitan Area

Place of Residence						F	Sig.
Centre	Gender	Men	Women				
		28.3	29.1			5.87	a
		(5560)	(5118)				
	Occupation	Clerical	Sales	Service	Prof.	21.69	b
		30.7	26.7	29.6	27.7		
		(2169)	(1209)	(1495)	(5056)		
	Mode	Auto	Public	Other		1374.25	b
		32.8	33.4	15.1			
		(1083)	(6866)	(2729)			
	Income	-0.06					b
		(10013)					
	Inner Ring	Gender	Men	Women			
			35.1	34.9		1.30	NS
			(23749)	(21561)			
	Occupation	Clerical	Sales	Service	Prof.	198.83	b
		39.3	30.8	34.3	34.5		
		(13227)	(4825)	(6985)	(12970)		
	Mode	Auto	Public	Other		1142.04	b
		25.7	49.5	12.6			
		(21643)	(19807)	(3860)			
	Income	0.08					b
		(43712)					
	Suburbs	Gender	Men	Women			
			33.4	22.2		3119.72	b
			(30303)	(26308)			
	Occupation	Clerical	Sales	Service	Prof.	658.21	b
		(27.6)	25.9	18.5	33.0		
		(12596)	(7905)	(7060)	(20532)		
	Mode	Auto	Public	Other		14957.74	b
		23.5	66.1	12.7			
		(46436)	(7004)	(3171)			
	Income	0.35					b
		(53988)					

NS Not Significant (p > 0.05)
a. p ≤ 0.05
b. p ≤ 0.01

professionals who use the dense and accessible transit network to travel quickly to work (Table 3). High incomes enable professionals to live closer to work than other occupational groups. As a result, professionals commute shorter times than clerical and service workers (Table 3).

The parameter estimates confirm that mode of transportation and income are the major influences upon commuting time at the centre of the New York

urban region. The use of public transit or the automobile adds 6.4 minutes and 5.8 minutes, respectively, to mean commuting times, while walking and other modes of transportation reduce mean commuting time by 12.2 minutes.

Workers in the inner ring commute longer than those living in any other part of the urban region. The mean commuting time in the inner ring is 35.3 minutes compared with 28.9 minutes and 28.3 minutes in the centre and suburbs (Table 3). The use of different transportation modes accounts for much of the variation in travel time among workers from the inner ring. According to the parameter estimates, public transit adds more than 20 minutes to the average trip, whereas driving reduces the average trip length by more than four minutes. Approximately half of all women workers, 49.8 percent, commute on public transit, whereas only 38 percent of male workers use transit. The economic segregation of women combined with their tendency to use transit increases travel times for specific groups of women. Clerical workers who are mainly women and mainly use public transit commute the longest times, 39.3 minutes versus approximately 34 minutes for professional and service workers (Table 3).

In suburban parts of the New York urban region, the expected pattern of gender differences emerges. Women commute significantly shorter times than men, 22.2 minutes on average versus 33.4 minutes for men (Table 2). Occupation also has a significant direct influence upon commuting times. Well paid professional workers commute longer than any other occupational group (Table 2). As a result, commuting time rises with income. The effects of means of transportation are dramatic. People who drove to work commuted less than 25 minutes, on average, while those who used public transit travelled more than an hour (Table 3).

The pervasive impact of transportation mode is underscored by the parameter estimate of 26.9 minutes for transit. Even after the effects of income, occupation, and gender are controlled, transit riders travel more than 25 minutes longer than other workers. In contrast, the gender differential is small once the effects of transportation mode, income and occupation are controlled, approximately 6.6 minutes. The same is true for the effects of occupation. The parameter estimates range from -6.9 minutes for service workers to -0.6 minutes for sales workers. The disparity in travel time by transportation mode is reflected in the proportions of workers in service industries using each mode. The vast majority, 82 percent, drive.

The spatial pattern of gender differences in commuting is the same in the New York and Toronto urban regions. Gender differences are negligible at the centre of each urban region where workers in service industries all use public transit regardless of income, occupation and gender. In the suburbs, gender has a significant direct influence upon commuting time even after we control for the effects of income, occupation and means of transportation. The absolute magnitude of gender differences in commuting increases steadily from the centre of each urban region to its periphery. The increase in the gender dif-

ferential is accompanied by reliance upon the car for commuting on the part of men and women and segmentation of the workforce between well paid professional jobs held by men and less remunerative clerical and service jobs held by women.

Household Composition in New York

The spatial pattern of the gender differential mirrors marked differences in household composition between central and suburban locations. The fact that suburban women are more likely to be married with children at home may account for their shorter work trips. Our information permitted us to account for the effects of household composition on commuting times in each part of the New York urban region, but not in Toronto. In New York, households were grouped into four categories: married couples with children at home, single parents with children, childless married couples, and childless single adults.

Single adults and childless couples predominate at the centre (Table 4). In the inner ring and suburbs, approximately equal numbers of workers in service industries live in single person households, however, other household types differ slightly. In the inner ring, approximately 40 percent of all households include children and another 28 percent consist of childless married couples, while in suburban counties, approximately 64 percent of households include children, but only 12 percent are childless married couples. Since the presence of children has greater influence upon women's commuting times than marriage (Preston, McLafferty and Hamilton 1993), we expect that the gender differential will be larger in the suburbs than in the inner ring.

Family status influences the commuting times of men and women who work in service industries, with stronger effects in the suburbs than at the centre. When commuting times for workers from different types of households were compared for each location, significant differences in commuting time emerged, however, the magnitude and direction of the effects of family status varied among locations and between men and women in complex ways.

On Manhattan, the effects of family status are small (Table 5). The maximum difference in mean commuting times is 3.7 minutes between workers who are single parents and those who are childless, single adults. Disaggregating the travel times of men and women alters the impact of family status only slightly. For both sexes, single parents commuted the longest times. Among women workers, those who were married with children at home commuted the shortest times while single men living in childless households had the shortest commuting times of all men. In all cases, differences in commuting time were very small.

In the inner ring, the effect of family status on commuting time depends upon gender. For all workers, family status has small but expected effects, with a maximum difference of 2.8 minutes in mean commuting time among the four

TABLE 4 Household Types in New York Consolidated Metropolitan Area

Household Type	City Centre ^a		Inner Ring		Suburbs	
Married with Children	1,494	(14.1)	12,668	(28.1)	20,416	(36.1)
Married Childless	2,273	(21.5)	12,611	(27.9)	6,868	(12.2)
Single Parents	651	(6.2)	5,417	(12.0)	16,043	(28.4)
Single Person	6,152	(58.2)	14,434	(32.0)	13,156	(23.3)
	10,570		45,130		56,483	

Source: Public use Microdata Sample.

a. The number in parentheses is the proportion of households.

TABLE 5 Commuting Time by Family Status, Place of Residence, and Gender in the New York Consolidated Metropolitan Area

	Married Children	Single Children	Married Childless	Single Childless
Centre				
Women	27.8	32.4	28.1	29.1
Men	28.9	31.4	28.8	27.6
Total	28.5	32.1	28.5	28.4
	(1494)	(651)	(2273)	(6152)
Inner Ring				
Women	30.7	34.5	34.1	37.8
Men	35.3	31.2	36.2	34.9
Total	33.7	33.4	35.3	36.5
	(12668)	(5417)	(12611)	(14434)
Suburbs				
Women	18.8	20.5	24.0	24.7
Men	38.7	20.5	34.2	26.7
Total	31.5	20.5	29.5	25.6
	(20416)	(6868)	(16043)	(13156)

family status groups (Table 5). Marriage and the presence of children both decrease commuting times so that single, childless adults commute the longest times and single parents commute least. The effects of family status are more complicated when men and women are considered separately. For women, marriage reduces commuting time, while for men, marriage increases commuting time. Married women workers living in the inner ring had shorter commuting times than single women, while married men commuted longer times on average than single men.

Among suburban men and women, commuting time is related significantly to family status with a large difference in mean commuting time of 11 minutes. On average, single workers, particularly single parents, commute shorter times than married workers (Table 5). The relationship is complex because of a

significant interaction between gender and family status. Men's commuting times were most influenced by marriage, whereas women's commuting times were most affected by the presence of children in the household. Married men commuted longer than single men, while single and married mothers commuted shorter times than their childless counterparts. Suburban gender differences in commuting times tend to support the hypothesis that married women work very close to home. Married mothers commuted almost 20 minutes less than married fathers, while in married childless couples, women commuted approximately 10 minutes less than men.

The results from multivariate analyses of variance that examined the separate and combined effects of family status and the other variables on commuting times in each part of the urban area underscored the important influence of family status at all three locations. In every part of the urban area, family status has a significant separate influence upon commuting times, albeit smaller than that of transportation mode.

Overall, the parameter estimates confirmed our expectation that the effects of family status are greater in the suburbs than at the centre of the urban region. The magnitudes of the differences in commuting time that can be attributed to family status are larger in absolute and relative terms at suburban locations, where the effects of family status are also consistent with our expectations. Marriage and the presence of children reduce suburban women's worktrips. The marked differences between the commuting times of married men and women in the suburbs are consistent with the hypothesis that married women seek work having already decided upon a residential location (Hanson and Pratt 1991). As the second wage earner in a household, wages may be only one of the criteria on which married suburban women base their employment decisions. They may be willing to accept a convenient job near home, regardless of wages and working conditions.

In the inner ring and at the centre, the effects of family status on commuting time are smaller and more complex. In the inner ring, the presence of children rather than marriage seems to influence commuting times, albeit in a minor way. The small magnitude of the effects of family status may be due to racial differences in the gender differential that are particularly relevant in the inner ring where New York's minority population is concentrated. Previous analysis (McLafferty and Preston 1991) has shown that on average, minority women do not commute less time than minority men. Since minority workers account for a high proportion of workers in service industries in the inner ring (McLafferty and Preston 1991), race may have a confounding influence upon commuting times.

On Manhattan, family status emerged as a significant, secondary influence upon commuting times after transportation mode and income. Marriage, rather than the presence of children, was the major influence upon commuting time. However, in contrast to the suburbs, married workers commuted less time on average than single workers. It appears that two wage-earner households on

Manhattan can afford expensive residential locations near their workplaces. The long commuting time of single parents is noteworthy. On Manhattan, single parents commuted longer than any other group, suggesting that they were seeking remunerative jobs far from home. High housing costs combined with the spatial concentration of jobs at the tip of Manhattan may force single parents to live far from work at the centre of the urban region. In contrast, single parents living in the suburbs may be better able to afford to live near work.

The spatial pattern of the gender differential in commuting times is related to the spatial pattern of household types and the gender relations embodied within them. In the suburbs where women commute shorter times than men, family status had a significant influence upon commuting times. The effects of family status diminished as the gender differential declined. Certainly these findings seem to confirm previous assertions that suburban women's employment decisions are more constrained by household considerations than those of women living at the centre of large urban regions (Bondi 1991; Duncan 1991). However, in all locations, transportation mode and income have an important influence upon commuting times even after controlling for family status. The effects of economic segregation and unequal access to transportation modes are least for women who live at the centre of the urban region. This residential choice is available mainly to professional women who earn relatively high incomes. For the majority of women in female-dominated occupations, domestic responsibilities reinforce the constraints resulting from incomes lower than those of men and less access to private cars.

Conclusions

The empirical findings reveal that the contexts in which women work and live alter gender differences in commuting. In both Toronto and New York, the extent and nature of gender differences in commuting time depended on relative location - at the centre of each urban region, gender differences in commuting were negligible while in suburban areas, they took on more importance. Women worked closer to home than men only in the suburban parts of New York and Toronto. The availability of public transit and the spatial distributions of jobs and residences contribute to variations in the gender effect. In the centre of each urban region, well paid professionals, both men and women, live in close proximity to their places of employment and take advantage of a dense transit network. In the suburban parts of each urban region, the spatial separation of jobs and residences differs for men and women who are more segregated into specific occupations on the basis of gender.

The parallels between our findings and those reported elsewhere (Fagnani 1983; Villeneuve and Rose 1988) are noteworthy. They suggest that the magnitude and direction of gender differences in commuting is influenced by the social geography of the urban area and the provision of transit. New York,

Toronto, Paris, and Montreal all share two important characteristics, a high income population living close to downtown and rapid and accessible public transit at the centre. For women, the benefits of employment are unevenly distributed across space and among occupational groups. Well paid professional women who can afford to live downtown enjoy the same access to employment as their male counterparts. Women who live in the suburbs work closer to home than suburban men.

In all parts of the urban regions studied, mode of transportation had the largest influence upon commuting time, regardless of gender. The effects of means of transportation cut across income and occupational groups. In all cases, drivers commuted shorter times than workers using public transit. Workers who walked to work or used some other mode of transportation commuted the shortest times. At the centre of the urban region, men and women are equally likely to use transit, thereby reducing the gender difference in commuting time. Elsewhere in the urban area, women are more likely than men to travel by transit, which may reduce their access to employment. However, improved access to private cars is only one of the factors needed to increase these women's access to employment. The large gender difference in commuting times in suburban areas where the largest proportions of women workers drive to work attests to the need to consider more broadly the economic and social position of suburban women. The persistence of the gender differential in cities where men and women are equally likely to drive to work (Hanson and Pratt 1990), also indicates that women's access to employment in the suburbs is not influenced solely by reliance upon public transit.

In Toronto and New York, income has complex effects on commuting. The wage gradient hypothesis was supported only in the suburban parts of the two urban regions where rising income was associated with longer commuting time. At the centre, rising incomes enabled commuters to reduce their travel times. The agglomeration of employment, particularly jobs in producer services (Gad 1991; Schwartz 1992), at the centre of each region encourages workers who can afford expensive housing to live nearby. Low-income women workers, who cannot afford expensive housing, make lengthy trips to jobs at the centre.

To the extent that descriptions of household structure capture family responsibilities, our findings confirm previous assertions (Hanson and Johnston 1985; Johnston-Anumnowo 1992), that the gender differential is rooted in part in women's domestic roles. Women's household responsibilities contributed to gender differences in commuting time in New York, although the magnitude and direction of their effects depended upon location. There is a large difference in the mean commuting times of married men and women in the suburbs. It has no equal in the inner ring and centre of the New York region, where the effects of household type were small. The complex spatial pattern is difficult to interpret. Women at the centre of the urban region whose commuting patterns are not influenced by household type may accommodate the competing demands of home and work by hiring domestic help (Susser 1991).

In the suburbs, working women may achieve the same accommodation by seeking employment close to home. Although social class clearly influences the impact of household responsibilities upon women's commuting times, further research is needed to specify the varied strategies women adopt to fulfil their domestic and work responsibilities in each part of the urban area.

Our preliminary analysis has demonstrated the need to consider differences among women, not only in terms of their social backgrounds, but also in terms of their residential locations. Gender relations in the household and workplace are linked in complex ways that vary spatially. England (1993) has commented on the spatial fixity of female clerical workers in Columbus, Ohio who preferred to commute across the city to workplaces that had relocated from downtown to the suburbs rather than disrupt their families and break local social ties. Duncan (1991) noted that female labour force participation rates peaked in central districts of London, home to well paid, single women, while declining to a trough in upper middle-class suburban districts where men are likely to commute long times to work.

The frequent admonition (Mackenzie 1988; Duncan 1991; Hanson and Pratt 1988, 1992) that gender relations are manifested within a web of spatial relations has been confirmed strongly; the extent and nature of gender differences in commuting vary within urban areas. This calls into question the notion of a unitary, metropolitan-wide labor market, a notion that persists in Regional Science and related disciplines. Women's labor markets are spatially segmented, with distinct differences in commuting and employment relations between central and suburban zones. Future research is warranted to examine the causes of this segmentation and its relationships to urban transportation, social policies, and gender inequalities at home and work.

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