

Patterns of Workplace Supervisory Roles: Experiences of Canadian Workers

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Abstract

This paper explores the incidence of four supervisory duties and several factors influencing the likelihood of having experience with such responsibilities in the workplace. Supervisory experiences of working Canadians are investigated through secondary analysis of longitudinal panel data from the *Survey of Labour and Income Dynamics* (SLID) over a six-year time frame (1996 to 2001). Over this period, a majority reported at least some workplace experience with supervisory roles, with male workers, university-educated workers, and those from management and certain professional occupational sectors exhibiting markedly higher profiles of supervisory duty experience over time. Two trivariate interactions (university education by occupational sector by supervisory experience, and sex by occupational sector by supervisory experience) are identified as important through multivariate log-linear modelling, and examined further through percentage tables. The strengths of associations between education and supervisory experience, and gender and supervisory experience were mediated to some degree by occupational sector of employment.

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Recent transformations across a wide range of contemporary work organizations are evident in flattened hierarchies with fewer levels of graded authority, reduced ranks of middle managers and smaller core workforces (Foot and Venne, 1990; Leicht, 1998; McBrier and Wilson, 2004). Given such transformations, it is reasonable to expect an increasing proportion of regular full-time workers to assume supervisory roles in the workplace, as evolving organizational demography dictates revised divi-

sions of labour with many such responsibilities being assigned to non-managers. Accordingly, the specific form/content and span of control of supervisory responsibilities will likely become even more important for the career development and progress of large numbers of workers. This paper investigates four dimensions of supervisory duties as experienced by Canadian workers over a six-year period, through the secondary analysis of longitudinal panel data from the *Survey of Labour and Income Dynamics* (SLID, Panel 2, covering 1996 to 2001 inclusive). An analysis of specific dimensions of supervisory duties is essential since position or job titles may not accurately reflect the actual supervisory roles of workers (Pergamit and Veum, 1999; Rosenfeld, Van Buren and Kalleberg, 1998; Rothstein, 2001). Beyond this, the four dimensions were combined into a basic supervisory duty experience scale to distinguish broad levels of experience (from none to high). Log-linear modelling techniques were applied to explore the interactive effects of sex of worker, university education and occupational sector for first-reported job (at the beginning of the longitudinal panel) upon supervisory duty experience. Significant bivariate and trivariate interaction effects were also explored through percentage tables to reveal the complexity of these associations.

Supervisory Roles in the Contemporary Workplace

Previous empirical research has documented considerable numbers and proportions of workers assuming supervisory roles in the workplace, especially in terms of supervising the work of others (Jacobs, 1992; Rothstein, 2001; Pergamit and Veum, 1999, Rosenfeld, Van Buren and Kalleberg, 1998, Maume, 2006). While employee-oriented supervision may represent only

one of many possible skill dimensions associated with management work (Schippman, Prien and Hughes, 1991), supervising other workers represents a common and important dimension of supervisory responsibilities in the modern workplace. Yet this form of duty is often distinct from managerial or true decision-making authority within the workplace (Rosenfeld, Van Buren and Kalleberg, 1998; Rothstein, 2001; Smith, 2002). To illustrate, drawing on US *General Social Survey* data, Rothstein (2001:666) found large percentages of workers reported supervising the work of others, but much lower proportions of these same workers indicated that they had full responsibility for setting pay or determining promotions of subordinate workers, leading him to conclude that control over pay and promotions likely represents "... a higher grade of responsibility than control over their job tasks, and may be associated with a higher rung on the job ladder." Beyond supervising other workers, the present research explored three other supervisory duty dimensions captured in Canadian SLID data, including influencing budget and staffing, influencing pay and promotions, and deciding work for others. Together, these four dimensions of supervisory responsibility represent useful indicators of the scope of supervisory experiences of workers in the modern workplace.

Given recent transformations within work organizations, supervisory roles in the workplace are expected to assume even greater importance for worker careers paths and progression over time. Accepting one or more supervisory duties in the workplace may potentially reduce negative consequences for workers associated with "career blockage" (Foot and Venne, 1990, Rothman, 1998), or may reduce the risk of reaching a "professional plateau" in the course of a career (Lee, 2002), as new

responsibilities would help workers to develop additional skills to remain employable, marketable and current in their occupations or professions. Assuming supervisory roles in the workplace is consistent with the emergence of the “boundaryless career” (Arthur, Khapova and Wilderom, 2005), which highlights individual worker accountability for career development and progress in an era of downsized organizations and flattened hierarchies. It is also consistent with emerging “spiral career trajectories” (entailing multiple lateral changes and fewer upward moves within flattened work organizations – Foot and Venne, 1990), supplanting traditional linear career paths of upward status mobility via formal promotions in the workplace. Assuming supervisory responsibilities may alter workers’ subjective assessment of “career plateau” reflected in their perceived prospects for advancement within an organization (Nachbagauer and Riedl, 2002). Further, taking on supervisory duties in the workplace may reduce the destruction of individual worker “human capital” (experience within a given occupation or industry) ensuing from high levels of occupational / industrial mobility (Kambourov and Manovskii, 2004), and may reduce the negative economic consequences associated with high external mobility over time (Dwyer, 2004; le Grand and Tählin, 2002; Kambourov and Manovskii, 2004).

Factors Influencing Supervisory Responsibility Experiences

This analysis focused on three important factors expected to influence the supervisory responsibility experiences of Canadian workers – gender, attainment of university-level education, and initial occupational sector of employment (for the first-reported job of workers at the beginning of the survey panel in 1996). Beginning with gender effects, previous research has documented that female workers are less likely to assume supervisory duties relative to their male counterparts (Jacobs, 1992; Smith, 2002; Rosenfeld, Van Buren and Kalleberg, 1998, Maume, 2006), and also less likely to attain higher levels of supervisory responsibility (Smith, 2002; Rothstein, 2001). Despite the trend of

growing female employment in a range of traditional male-dominated professional and managerial occupations (Hughes, 1995; Jacobs, 1992; Cooke-Reynolds and Zukewich, 2004), there remains a high degree of gender occupational segregation in post-industrial labour markets which limit career advancement opportunities for females to positions of authority in the workplace. “Glass ceiling” effects continue to limit female workers’ success in terms of workplace authority level, with relatively few women attaining senior management positions (Jacobs, 1992; Smith, 2002). Smith (2002:532) identified gender differences in workplace authority as a significant source of gender inequality, arguing that “The relative location of men and women within the structure of the economy, and their proportional representation within such structures, account for more of the gender gap in authority than the human capital attributes of workers”. For the present research, it was hypothesized that female workers would be more likely to report no supervisory duty experience in the workplace over the six-year period relative to their male counterparts. Conversely, male workers were hypothesized to exhibit ‘high’ levels of supervisory duty experience (signified by at least some experience on all four duty dimensions over time), relative to female workers.

The human capital model is a useful perspective for interpreting and understanding supervisory responsibility experiences of workers over time. Personal investments in human capital (such as university education) impact employment outcomes (such as occupational sector), which in turn can influence the likelihood of attaining supervisory roles in the workplace. Canary and Canary (2006) found that within personal career narratives of supervisors, most interviewees identified individual-level determinants of education and training as contributing to their career development and impacting one or more career moves over time. Previous research has demonstrated that personal investments in different forms of human capital (including education, training and development, career tenure, and hours of work) enhances prospects for attaining supervisory authority in the

workplace (Smith, 2002; Metz and Tharenou, 2001). For the present research, it was hypothesized that workers with any university-level education would be more likely to report ‘high’ levels of supervisory duty experience, while those without any university education would be more likely to have no supervisory duty experience over the six-year period.

Occupational sector of employment was used in this analysis as a basic indicator of occupational status within the labour force, broadly distinguishing management, professional, white collar and blue collar occupations. Previous empirical research has not specifically explored the relationship between occupational sector and supervisory duty experience in the workplace, although hypotheses were articulated drawing on an understanding of the content of each of these broad sectors. For the present research, it was hypothesized that workers initially employed in the management occupational sector would be most likely to exhibit ‘high’ levels of supervisory duty experience over time, given the obvious linkage between managerial authority and supervisory roles in the workplace. Second, workers initially employed in professional occupational sectors (such as natural and applied sciences, social sciences and related, and health occupations sectors) were hypothesized to be more likely to report ‘high’ levels of supervisory duty experience. Third, workers from white collar (sales and service) and blue collar occupational sectors were hypothesized to be most likely to have no supervisory duty experience over time.

While there are many other factors which may influence or impact supervisory responsibility experiences over time, the present research concentrated on these three variables investigating interactions with the dependent variable of level of supervisory duty experience of workers. Beyond testing hypothesized relationships between each of these three influencing factors (gender, university education and occupational sector) and the level of supervisory duty experience of workers over time, trivariate interactions involving pairs of factors and the dependent variable of supervisory duty experience were also explored. Although formal hypotheses

were not specified for trivariate interactions, it was generally expected that the nature and strength of associations between gender and supervisory duties, and university education and supervisory duties, would be mediated by occupational sector. Multivariate log-linear modelling techniques were applied to statistically prioritize relationships, accompanied with interpretation of specific associations found within both bivariate and trivariate percentage tables.

Research Methods

The research methodology employed was secondary analysis of longitudinal survey data from the *Survey of Labour and Income Dynamics* (SLID, Panel 2, 1996-2001). This is a national survey collected by Statistics Canada, designed and stratified to be broadly representative of the Canadian labour force (excluding residents of the northern territories, residents of institutions and persons living on Indian reserves). Each SLID longitudinal panel is comprised of approximately 30,000 individual Canadians with multiple interviews conducted with the same survey respondents over a six-year time period. As noted by Giles (2001:365), "In SLID, the focus extends from static measures to the whole range of transitions, durations and repeat occurrences of people's financial and work situations." The scope, breadth of content and large sample size of SLID, along with its longitudinal design made it ideal for exploring the dynamic nature of experiences of Canadian workers with respect to supervisory roles in the workplace. Four distinct supervisory duties were recorded in SLID for employment positions held at the end of each year of the panel (1996 to 2001 inclusive). Only Canadian workers with a valid occupation code for all six years of the SLID panel (signifying employment in all years) were included in this secondary data analysis. Data presented in tables below were weighted to produce estimates of the Canadian working population, in accordance with SLID data release guidelines.

The four facets of supervisory duties captured in SLID data include influencing budget and staffing, influencing pay and promotions, deciding work for others, and supervising others. For each

of these four dimensions, end-of-year states were binary coded to indicate either not having or having the supervisory role (coded '0' or '1' respectively). These binary variables were then aggregated across all panel years to capture the 64 possible permutations of binary outcomes across the six years (2⁶), ranging from '000000' signifying no supervisory experience on a given dimension, to '111111' denoting continuous experience with that duty. Given sample size limitations, it was not practical to examine each of the 64 distinct permutations representing stability and mobility in supervisory duty experiences, so permutations were collapsed into a smaller set of logically-coherent categories reflecting broader patterns. The collapsed supervisory experience scales were anchored by two stable end categories of no experience and continuous experience over time. Intermediate scale categories represented different forms of mobility including being promoted to the duty, demoted from the duty, and a residual category for various forms of irregular or mixed mobility. The constructed supervisory duty experience scale represents a continuum of the form and extent of supervisory experience on each of these four dimensions, depicting both stability and mobility in experience, and trends over time (promotion, demotion and irregular patterns).

The supervisory duty experience scales are presented in Table 1 for each of the four duty dimensions. About two-thirds of Canadian workers had no duty experience over the six-year period with influencing budget and staffing or pay and promotions, while less than half had no experience with deciding work for others and supervising others. Conversely, only about a third of the population had experience with influencing budget and staffing or pay and promotions, duties which are typically associated with more senior managerial occupations. At the other end of the continuum, continuous supervisory experience over the six-year period ranged from about one in 31 workers influencing budget and staffing, to about one in ten workers supervising others. These two end categories of no experience and continuous experience represent true stability on these supervisory duty di-

mensions (no change over time). In total, these two categories accounted for between half of workers (51.8 percent) for supervising others, to over two-thirds (71.1 percent) for influencing pay and promotions. Conversely, between 28.9 and 48.2 percent of all workers exhibited at least some degree of mobility or change over time across these four dimensions of supervisory duties.

There is a relatively tight range in promotion percentages, from almost one in thirteen for influencing pay and promotions, to one in nine for supervising others. 'Promoted to duty' signified that workers did not hold the duty at the beginning of the survey panel (1996), but assumed the role sometime after and continued to hold the duty to 2001. Demotions from duties ranged from about one in 24 workers for influencing pay and promotions, to about one in twelve for supervising others. 'Demoted from duty' indicated that workers held the duty initially in 1996, but dropped the role some time after that, and did not resume the duty. Unfortunately, demotions could not be broken down further to distinguish voluntary or involuntary demotions – whether the decision to give up a supervisory role was that of the worker, or his/her employer. Canadian workers were more likely to be promoted to than demoted from a given duty, with a difference of about three percentage points across the four dimensions. This implies a net gain or increase in experience on each of these duty dimensions over time.

When Canadian workers are mobile with respect to these supervisory duties, they are less likely to follow a standard path (either promotion or demotion), and more likely to exhibit an irregular form of mobility. Mixed mobility refers very broadly to all forms of irregular mobility in relation to given roles, and in total exceeds the combined percentages for the more pure forms of mobility – promoted to and demoted from duty. Between about one in six and over one-quarter of workers exhibited mixed mobility across these four dimensions. Within the residual mixed mobility category (not shown in Table 1), the most common occurrence was short-term limited experience (Out-In-Out) with each of these four roles. Canadian workers were more likely to test or try out a

Table 1
Supervisory Experience Scale for Four Supervisory Duties
for Canadian Working Population (1996-2001)

Supervisory Duty	No Experience	Demoted from Duty ¹	Mixed Mobility ²	Promoted to Duty ³	Continuous Experience	Canadian Working Population ⁴
Influence Budget and Staffing	65.1%	4.4	19.3	8.0	3.2	8,691,400
Influence Pay and Promotions	66.9%	4.2	17.2	7.5	4.2	8,691,400
Decide Work for Others	47.8%	7.0	27.2	10.9	7.2	8,691,400
Supervise Others	41.9%	8.1	28.6	11.5	9.9	8,691,400

* Data from Survey of Labour and Income Dynamics (SLID) Panel 2 (1996-2001)

- 1 Held duty in 1996, but was demoted from duty sometime after 1996 and did not assume duty again.
- 2 All irregular patterns of mobility, of both promotion to and demotion from supervisory duty during 6-year time frame.
- 3 Promoted to supervisory duty sometime after 1996 and continued to perform duty up to 2001
- 4 Includes only Canadian workers reporting an occupation in each of the SLID survey years – 1996 to 2001 inclusive.

Out pattern), than to have a temporary interruption from a given duty (the reverse In-Out-In path). All other irregular mobility (involving multiple promotions to and demotions from a given duty over six years) accounted for about one in ten workers at most. Data in Table 1 revealed both stability and mobility, and complex patterns of experience with respect to these four supervisory duty dimensions.

Data Analysis

Having introduced supervisory duty experience on these four dimensions in an aggregate profile, the focus of subsequent analysis is on a collapsed, basic scale reflecting the degree of experience across all four duties, with categories of ‘none’ (no experience with any of the four duties between 1996 and 2001), ‘some’ (indicating experience with at least one of the four duties over time), and ‘high’ (at least some experience on all four of these duties). The effects of gender, university education and occupational sector for first reported jobs of Canadian workers upon the collapsed supervisory experience scale are explored initially using bivariate percentage tables (Tables 2 and 3). Log linear modelling is then applied as a heuristic technique to statistically prioritize relationships or interactions between the three independent variables and the dependent variable of supervisory duty experience (Table 4). This leads to the identification of two important trivariate

gated more closely through trivariate percentage tables (Tables 5 and 6).

In aggregate terms (first panel of Table 2), over a third of all Canadian workers had no supervisory duty experience, while about two in five exhibited some experience, and less than a quarter of the population reported ‘high’ supervisory duty experience. In terms of gender effects, over a quarter of male workers exhibited ‘high’ supervisory duty experience compared to about one in six female workers (8.9 percentage point difference). Conversely, female workers were much more likely to report no supervisory duty experience relative to male workers (12.1 percentage point difference). Hence at the bivariate level, there is a clear gender distinction in supervisory duty experience in favour of male workers. This is entirely consistent with gender differences in supervisory roles reported in previous empirical research. With respect to university education, there is a stronger association with supervisory duty experience at the bivariate level. Over a third of Canadian workers with at least some university exhibited ‘high’ supervisory duty experience compared to less than one in five without any university education (16.2 percentage point difference). Conversely, two in five workers without any university education had no supervisory duty experience over time compared to about one-quarter of workers with some university education (14.8 percentage point difference). Hence, education does

education has a markedly positive impact on the likelihood of assuming supervisory roles in the workplace.

The third determinant of supervisory duty experience explored in this paper is occupational sector of employment, reflected in the classification of the first reported job of Canadian workers in 1996, as coded using the 1991 Standard Occupational Classification or SOC (Statistics Canada, 2005). Although SLID survey data revealed significant occupational mobility over the course of the six-year panel period, the focus for this analysis is on the first reported occupation in 1996 since this would represent a starting or reference point and serve as a potential springboard for subsequent supervisory duty experiences over time. Table 3 profiles the collapsed supervisory experience scale for ten broad occupational sectors of employment. There are substantial differences in supervisory duty experiences across the ten occupational sectors profiled, with management occupations being the most obviously distinct sector. About three in five workers in management occupations exhibited high supervisory duty experience, and over 90 percent reported at least some experience over time. This is an expected finding since authority and control associated with managerial positions generally entails direct supervisory responsibilities such as those captured in the SLID survey. The next highest supervisory duty experience profile was

Table 2
Summary Supervisory Experience Scale (1996-2001)
By Sex and Education of Canadian Worker*

Supervisory Duty Variable / Category	None ¹	Some	High ²	Working Population ³
Working Population	37.4%	40.4	22.2	8,691,400
Sex of Worker				
Female	44.2%	38.6	17.2	3,812,000
Male	32.1%	41.8	26.1	4,879,400
Education of Worker				
No University Education	40.9%	40.7	18.5	6,678,300
Yes, Some University	26.1%	39.3	34.7	2,013,200

*Data from Survey of Labour and Income Dynamics (SLID) PANEL 2 (1996-2001)

- 1 No experience on any of four supervisory dimensions between 1996 and 2001.
- 2 Experience on all four supervisory dimensions for at least some time between 1996 and 2001
- 3 SLID sample data weighted to produce working population estimates.

found for the natural and applied sciences occupational sector (which would include engineers, architects, and related professional and technical occupations). About a third exhibited 'high' supervisory duty experience, and fully three-quarters of workers from this sector reported at least some experience over time. Other professional-oriented

sectors also had high supervisory experience profiles including social sciences and related occupations, as well as art, culture, recreation and sport occupations.

Workers from traditional blue collar occupational sectors (the last three sectors in Table 3) exhibited the lowest profiles of supervisory duty experiences

with the highest percentages of no supervisory experience, along with those from the white collar sales and services occupational sector. Conversely, workers starting out in managerial or professional occupational sectors exhibited much stronger profiles of experience, and were generally less likely to report no supervisory duty experience. One

Table 3
Summary Supervisory Experience Scale (1996-2001)
By Occupational Sector in 1996 (First Reported Job)*

Supervisory Duty SOC Sector in 1996	None	Some	High	Working Population
Management Occupations	7.1%	31.9	61.1	843,000
Business, Finance and Administrative Occupations	38.6%	40.0	21.3	1,600,700
Natural and Applied Science and Related Occupations	23.9%	44.1	32.0	449,000
Health Occupations	40.2%	46.7	13.1	461,500
Occup. in Social Science, Education, Government Service and Religion	33.6%	44.1	22.3	585,800
Occup. In Art, Culture, Recreation and Sport	34.9%	39.2	25.9	238,800
Sales and Service Occup.	41.9%	41.0	17.1	2,101,000
Trades, Transport and Equipment Operator Occup.	45.6%	40.3	14.1	1,302,900
Occupations Unique to Primary Industry	42.9%	44.6	12.5	432,700
Occup. Unique to Process, Manufacturing and Utilities	50.8%	37.2	12.0	676,000
Working Population	37.4%	40.4	22.2	8,691,400

*Data from Survey of Labour and Income Dynamics (SLID) PANEL 2 (1996-2001)

sample size drawn from SLID Panel 2 for analysis, virtually any statistical contrast of maximum likelihood estimates (simply comparing L^2 statistics) would be deemed statistically significant at conventional alpha criteria levels. To avoid this complication in statistical contrasts, the unique effect of each interactive term inclusion at each stage is assessed using an R^2 analog statistic (so named because it takes on the properties of a multiple R^2 with values ranging from zero for no improvement in fit, to 1.0 for a perfect fit, attained only with the saturated log-linear model containing all possible interaction terms involving the dependent variable). Model building continues until the inclusion of additional interaction terms yields modest reductions to maximum likelihood estimates reflected in negligible change to R^2 analog values.

Moving beyond the model of structural independence (first block of Table 4), the most significant bivariate interaction term is occupational sector by supervisory duty experience (O^*D – the last row of block 2), which reduces the maximum likelihood statistic by 67 percent (as revealed by the R^2 analog statistic). The next stage of model building (block 3) tests the remaining two bivariate interaction terms, and identifies sex by supervisory duty experience (S^*D) as a highly significant term, resulting in a further 15.8 percent reduction in maximum likelihood estimate, above and beyond that contributed by the interaction of occupational sector by supervisory duty experience – this is shown as ΔR^2 which quantifies statistical improvement between the optimal models at block 2 and 3 stages. Beyond this, the university education by supervisory duty experience interaction term (U^*D) yields a smaller reduction to maximum likelihood estimates, with a ΔR^2 of only 7.9 percent, above and beyond the previous model. The block 4 log-linear model (including all possible bivariate interaction terms involving the dependent variable) is selected as the optimal bivariate model to serve as a baseline for subsequent testing of trivariate interaction terms.

Trivariate interaction terms are tested in subsequent blocks presented in Table 4 to determine if more complex terms should be included to define the

optimal model. Inclusion of the trivariate interaction term of university education by occupational sector by supervisory duty experience (U^*O^*D) results in the greatest reduction in maximum likelihood estimates, with a ΔR^2 of 3.1 percent above and beyond the best bivariate interaction model. The addition of the interaction term of sex by occupational sector by supervisory duty experience (S^*O^*D) results in another 2.3 percent improvement, and this log-linear model is selected as optimal for explaining relationships between this set of variables. The final block shown in Table 4 tests the last of the three trivariate interaction terms of sex by university education by supervisory responsibility (S^*U^*D) with negligible improvement of 1.0 percent.

Previous tables (2 and 3) profiled bivariate relationships with the dependent variable corresponding to each of the three bivariate interaction terms included in the optimal log-linear model. The two trivariate interaction terms contained in the optimal model are profiled in percentage form in Tables 5 and 6 below. Beginning with the interaction between education, occupation and supervisory duty experience, Table 5 reveals that Canadian workers with some university education consistently had higher supervisory duty experience profiles across all ten of the SOC occupational sectors. However, the education effect varied markedly in magnitude across these ten sectors. Differences between workers with and without university education in ‘high’ supervisory experience percentages ranged across the sectors from 2.9 to 33.3 percentage points for workers from social sciences and related occupations, and those from processing, manufacturing and utilities occupations sectors, respectively. Percentage differences between workers with and without university education with no supervisory duty experience ranged from 6.1 to 29.5 percentage points for workers from these same two occupational sectors, respectively. However, caution should be exercised with the interpretation of results for the blue collar processing, manufacturing and utilities occupational sector, given the relatively small number (both in unweighted sample size and working population estimate) of workers in this

sector with any university education. Beyond this, the largest percentage point differences between workers with and without university education were found for natural and applied sciences, and health occupations sectors, with ‘high’ supervisory duty experience differences in the order of 19 percentage points.

For workers without any university education, levels of ‘high’ supervisory duty experience ranged from as low as one in ten workers (10.8 percent for workers in the processing, manufacturing and utilities occupations sector) to over half (56.0 percent for workers in management occupations). Levels of high supervisory duty experience were markedly higher for workers with some university education, ranging from about one in five (20.1 percent for workers in primary industry occupations) to almost three-quarters (70.7 percent for workers in management occupations). Once again, workers starting out in management occupations were distinct from workers from all other occupational sectors with a markedly higher profile of supervisory duty experience. For the ‘high’ supervisory experience category, the percentage of workers from management occupations is 26.6 to 31.4 percentage points greater than the second highest occupational sector, for workers with and without university education, respectively. This confirms that workers starting out in management occupations – with or without university education – are much more likely to have had experience involving all four of the supervisory duties examined over the six-year time frame.

Turning to the interaction between sex, occupation and supervisory duty experience, Table 6 shows that male workers had higher supervisory duty experience profiles relative to female workers across all ten SOC occupational sectors. Male workers consistently exhibited higher percentages in the ‘high’ supervisory experience category, while female workers consistently had greater percentages in the ‘none’ category. However, beyond this general pattern there was marked variation in the magnitude of gender differences across the ten occupational sectors. Differences between male and female workers in

Table 5
Summary Supervisory Experience Scale (1996-2001)
By Occupational Sector in 1996 (First Reported Job) By Education of Worker *

Any University Education		No	Univ.			Some	Univ.	
Supervisory Responsibility	None	Some	High	Canadian Working Population	None	Some	High	Canadian Working Population
SOC Occupational Sector (1996)								
Management Occupations	9.3%	34.6	56.0	555,200	2.7%	26.6	70.7	287,900
Business, Finance, Admin. Occup.	42.6%	39.3	18.1	1,240,400	24.9%	42.6	32.5	360,300
Natural & Applied Science Occup.	27.5%	48.8	23.7	253,800	19.3%	38.0	42.7	195,300
Health Occupations	44.1%	50.1	5.8	282,400	34.0%	41.4	24.7	179,100
Soc.Sci., Educ., Govt. Serv., Relig.	38.3%	37.1	24.6	131,100	32.2%	46.1	21.7	454,800
Art, Culture, Recreation, Sport Occ.	38.8%	39.1	22.0	136,000	29.8%	39.2	31.0	102,800
Sales & Service Occupations	42.9%	42.1	15.1	1,777,000	36.5%	35.5	28.0	324,000
Trades, Transport, Equipment Oper.	46.2%	40.0	13.8	1,255,600	32.0%	47.2	20.8	47,300
Primary Industry Occupations	43.6%	44.6	11.8	395,900	34.9%	45.0	20.1	36,800
Processing, Mfg., Utilities Occup.	51.9%	37.3	10.8	651,100	22.4%	33.5	44.1	25,000
Working Population	40.9%	40.7	18.5	6,678,300	26.1%	39.3	34.7	2,013,200

* Data from Survey of Labour and Income Dynamics (SLID) Panel 2 (1996-2001)

'high' supervisory experience percentages ranged from 1.5 to 18.6 percentage points for workers from primary industry occupations, and those from social sciences and related occupations sectors, respectively. Percentage differences between male and female workers with no supervisory duty experience ranged from 2.1 to 23.4 percentage points for workers from health occupations, and those from social science and related occupational sectors, respectively. Male workers from social science

and related occupations, and from business, finance and administrative occupations were much more likely to exhibit 'high' supervisory duty experience relative to female workers from these same occupational sectors, with differences of 18.6 and 17.6 percentage points, respectively. Conversely, female workers from social science and related occupations, and processing, manufacturing and utilities occupations were much more likely to have no supervisory duty experience relative to male workers, with differ-

ences of 23.4 and 22.3 percentage points, respectively.

For male workers, levels of 'high' supervisory duty experience ranged from about one in eight workers (12.9 percent for workers from primary industry occupations) to almost two-thirds (65.1 percent for workers from management occupations). For female workers, 'high' supervisory experience levels ranged from as low as one in 16 workers (6.2 percent for workers from processing, manufacturing and utilities

Table 6
Summary Supervisory Experience Scale (1996-2001)
By Occupational Sector in 1996 (First Reported Job) By Sex of Worker *

Sex of Worker		Female	Worker			Male	Worker	
Supervisory Responsibility	None	Some	High	Canadian Working Population	None	Some	High	Canadian Working Population
SOC Occupational Sector (1996)								
Management Occupations	10.3%	37.0	52.7	273,700	5.5%	29.4	65.1	569,300
Business, Finance, Admin. Occup.	44.1%	39.8	16.1	1,124,500	25.8%	40.6	33.7	476,200
Natural & Applied Science Occup.	28.2%	44.5	27.4	84,600	23.0%	44.0	33.0	364,400
Health Occupations	40.6%	47.2	12.3	376,500	38.5%	44.8	16.7	85,000
Soc.Sci., Educ., Govt. Serv., Relig.	43.0%	42.2	14.8	350,200	19.6%	47.0	33.4	235,700
Art, Culture, Recreation, Sport Occ.	42.0%	33.6	24.4	129,700	26.5%	45.8	27.7	109,100
Sales & Service Occupations	50.4%	36.4	13.2	1,141,200	31.8%	46.6	21.7	959,800
Trades, Transport, Equipment Oper.	62.9%	29.3	7.8	67,500	44.7%	40.9	14.4	1,235,400
Primary Industry Occupations	51.7%	36.9	11.4	96,200	40.4%	46.8	12.9	336,500
Processing, Mfg., Utilities Occup.	67.6%	26.1	6.2	168,100	45.3%	40.8	13.9	507,900
Working Population	44.2%	38.6	17.2	3,812,000	32.1%	41.8	26.1	4,879,400

* Data from Survey of Labour and Income Dynamics (SLID) Panel 2 (1996-2001)

occupations) to just over half (52.7 percent for workers from management occupations). Consistent with previous findings, both male and female workers starting out in management occupations exhibited markedly greater supervisory duty experience relative to workers from the remaining nine occupational sectors. The percentage of workers with 'high' supervisory duty experience for workers from management occupations is 25.3 and 31.4 percent greater than that found for the second highest occupational sector for female and male workers, respectively. While significant gender differences remain, both male and female workers starting out in management occupations were much more likely to report experience with all four supervisory duty dimensions over time.

Discussion and Conclusions

Over three in five Canadian workers reported at least some supervisory duty experience between 1996 and 2001, with more than half deciding work for, and supervising other workers, and about a third influencing budget and staffing, and pay and promotions in the workplace. Beyond the prevalence of supervisory responsibilities revealed by the aggregate profile, the multivariate log-linear modelling results and analysis of percentage tables provided support for each of the bivariate hypotheses stated above. Specifically, male workers, workers with any university education, and workers from management (especially) and certain professional occupational sectors exhibited markedly higher profiles of supervisory duty experience over the six-year time frame. Conversely, female workers, those without any university education, and workers from both blue and white collar occupational sectors were more likely to report no supervisory duty experience over time. Based on the cumulative R^2 analog statistic from the optimal bivariate stage model (Table 4), log-linear modelling confirmed that approximately 90 percent of variation found in the 120-cell, four-variable data array could be accounted for through the inclusion of these three bivariate interaction terms (of gender, university education and occupational sector, each by supervisory duty experience of workers).

Log-linear modelling also identi-

fied two trivariate interactions (university education by occupational sector by supervisory experience, and sex by occupational sector by supervisory experience) as statistically important, accounting for an additional five percent of explained variation within the data array, yielding a cumulative total R^2 analog value of 96.1 percent (Table 4). Closer inspection of the percentage tables for these two trivariate interaction terms (Tables 5 and 6) revealed that associations between university education and supervisory experience, and sex and supervisory experience were mediated to some degree by occupational sector of employment. The strengths of the bivariate associations were clearly impacted by the occupational sector where workers were initially employed at the beginning of the survey panel.

In terms of notable interactive combinations, male workers from management occupations were the most likely to report experience on all four supervisory duty dimensions over time (70.7 percent), followed by university-educated workers from the same occupational sector (65.1 percent). University-educated workers from natural sciences and related occupations also exhibited a 'high' supervisory experience profile (42.7 percent), along with male workers from business, finance and administrative occupations, and social sciences and related occupations sectors (33.7 and 33.4 percent, respectively). Conversely, workers without any university education from the health occupations sector were the least likely to report a 'high' level of supervisory experience over time (5.8 percent), as well as female workers from blue collar occupational sectors (ranging from 6.2 to 11.4 percent across the three sectors). From the other end of the scale, female workers from each of the three blue collar occupational sectors were most likely to report no supervisory duty experience (ranging from 51.7 to 67.6 percent across sectors), along with female workers from white collar sales and services occupations (50.4 percent). As well, workers without university education from blue collar sectors of processing, manufacturing and utilities occupations, and trades, transport and equipment operator occupations were most likely to have no supervisory duty

experience over time (at 51.9 and 46.2 percent, respectively).

This analysis focused on four distinct dimensions of supervisory responsibilities in the workplace (influencing budget and staffing, pay and promotions, deciding work for others, and supervising others), as captured in SLID longitudinal panel data, and subsequently reduced to a basic supervisory duty experience scale. While these four dimensions are clearly important in defining workplace supervisory roles, they are certainly not exhaustive. There are other facets of supervisory responsibilities in the workplace – these would include the number of subordinates supervised, relative position within the organizational hierarchy, the scope or extent of decision-making responsibilities within organizations, and whether decision-making authority is exclusive or shared. These facets were not captured through SLID and accordingly could not be investigated. Future research could explore these and other dimensions of workplace supervisory roles to better appreciate the full scope and context of such duties. The temporal design of the SLID longitudinal panel (covering a six-year period between 1996 and 2001) restricted the analysis of supervisory duty experiences to a relatively short time span. Given typical career durations of thirty or more years, the panel design covers only a small segment of total career experiences of workers. If feasible, future research could broaden the scope of investigating supervisory experiences and career outcomes either through the use of more extended longitudinal panel surveys, or through survey methodologies which gather more retrospective data encompassing a broader time frame. For research on the many and varied forms of job mobility, Rosenfeld (1992) highlighted the importance of examining complete work histories, which would go well beyond the limited time frame afforded by SLID longitudinal data. Ideally, future research could address the full career histories of workers, from the school-to-work transition to currently-held positions. Despite the aforementioned limitations to the measurement of supervisory duty experiences, these SLID data did reflect the prevalence of such experiences among

Canadian workers, and also exposed the dynamic and evolving nature of such duties over even a relatively brief time span in the careers of workers.

While log-linear modelling techniques applied in this paper were very useful for identifying and statistically prioritizing both bivariate and trivariate interaction effects involving the dependent scale of supervisory duty experience, this analysis was clearly restricted in terms of the number of factors or determinants which could feasibly be included in the model. Even working with the large-scale national sample captured in SLID, higher dimension data arrays (more than the four-variable/120-cell array explored here) would produce serious statistical complications with unacceptable numbers of 'sampling zero cells' and associated inflated sampling errors. Other multivariate techniques (such as multinomial logistic regression to investigate a three-category ordinal dependent variable) could certainly accommodate greater numbers of independent variables in a given model, but are far less suited to exploring complex interaction effects among determinants or factors within the model. The primary purpose of this analysis was to explore complex interactive effects with supervisory duty experience. This was accomplished through the application of log-linear modelling techniques to a limited set of variables, supplemented by assessing and interpreting identified interaction effects within percentage tables.

Future research could explore other factors or determinants which may influence or impact supervisory responsibility experiences over time, going beyond the gender, university education and occupational sector effects investigated here. Differences in work time arrangements (employment status, working hours, weeks worked) between male and female workers may impact supervisory duty experiences in the workplace, with consequences for career progression and mobility. Among workers with some post-secondary education, the field or discipline of study, or possession of specific educational credentials may directly influence subsequent supervisory responsibility experiences in the workplace. Other career-related factors such as tenure with a

given organization, occupational and industrial mobility, as well as career interruptions may alter supervisory duty experiences. As well, individual-level socio-demographic attributes such as age, race or ethnicity (and gender interactions with these characteristics) may also have some bearing on the likelihood of assuming supervisory duties in the workplace. Future research investigating these and other factors or determinants is important given the prevalence of supervisory roles among workers, and the consequences for longer-term career development and progress for workers.

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