OCCUPATIONAL DETERMINANTS OF PROFESSIONAL UNION MEMBERSHIP

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OCTOBRE 1994   DOCUMENT 94-10

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ABSTRACT

Empirical union membership studies usually group all professionals together in one occupational category. This study uses a simultaneous equations approach to analyze the union membership status of a sample of 9,417 employed Canadian professionals and managers from 16 different occupational groups. The results support the hypothesis that there are significant differences among professions in their propensity to unionize; the relative differences are explicable by reference to the characteristics of the professions concerned.

INTRODUCTION

Strikes and other forms of collective action usually associated with blue-collar workers and their unions are now being employed by Canadian professionals. Strikes and go-slows by nurses and teachers are commonplace but these groups are being joined by higher status professionals such as physicians and even members of the judiciary.

The employed professional faces many of the problems faced by other employed workers in the relationship with the employer. Since "exit" opportunities (Hirschman, 1970) are limited in recessionary job markets, it is expected that professionals would turn toward Hirschman's "voice" option in the form of unions or some other means of collective representation. What is surprising is that their aggregate level of union density is almost equal to those of traditionally highly unionized occupations such as processing and construction. For professionals the union density in 1989 was 45.4% of all those who worked, for managers it was 13.9%, and for the combined category it was 32.6% (table 1). These numbers compare with 53% for machining and related workers and 7.3% for sales staff (White, 1993b).

Most union membership studies treat professionals as a homogeneous group, however, as illustrated in table 1, there is substantial variation in union density and collective agreement coverage among professional groups, ranging from 8.9% combined coverage for members of religious orders to 86.6% for elementary and secondary teachers. These simple univariate differences in union density suggest that it is inappropriate to group all professionals together.

The occupational determinants of professional union membership have policy implications for unions planning organizing strategies; for managers who are attempting to implement human resource policies for professional staff; and for

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Table 1:   UNION DENSITIES BY PROFESSIONAL AND MANAGERIAL CATEGORIES, CANADA, 1989

Occupation	% Employed Profnl. & Mgrl. Work Force	Union Density %	Non - union Covered by Collective Agreement %	Combined Coverage i.e. Unionized & Covered by Collective Agreement %
Managerial and related				
Government administration	1.6	58.8	9.7	68.5
Other managers	26.8	10.2	3.8	14.0
Related to management	12.4	16.2	4.9	21.2
sub-total	40.8	13.9	4.4	18.3
All other professions				
Physical & life sciences	2.4	40.0	11.7	51.7
Maths, stats & related	3.4	19.3	4.8	24.0
Architects & engineers	3.8	18.0	5.6	23.6
Engineering and architectural technicians	2.9	25.9	4.9	30.8
Social science & related	6.4	38.9	6.3	45.2
Religion	0.8	3.9	4.9	8.9
University teaching	2.4	39.0	9.3	48.3
Elementary/secondary teaching	9.9	79.4	7.3	86.6
Other teaching	3.5	49.6	5.2	54.8
Health diagnosing & treating	2.1	16.4	3.4	19.9
Nursing, therapy & related	10.8	75.9	6.0	81.9
Other medicine & health	3.4	37.3	4.6	41.9
Artistic, literary & recrnl	7.4	14.1	3.3	17.5
sub-total	59.2	45.4	5.9	51.9
Total	100.0	32.6	5.3	37.9

Source: Weighted cross-tabulations of all professionals in the 1989 Labour Market Activity Survey who worked during the year (see section III).

governments, such as the Government of Ontario that has recently changed its labour relations legislation to eliminate the exclusion of certain professionals from union membership.

This paper examines the effect of membership in various professional occupations on the probability of union membership using a sample of employed professionals and managers from the 1989 Labour Market Activity Survey (LMAS) (Canada, 1991). The major thesis is that professions have different characteristics and should not be grouped together in union membership studies.

The paper is organized into six sections. Section I defines professionals, discusses why they join unions and reviews the literature on professional union membership. Section II introduces the theoretical model of Lee (1978) and lists the major hypotheses. Section III describes the data subsample drawn from the LMAS. Section IV describes the empirical procedure. Section V presents and discusses the empirical results. Section VI makes concluding observations and lists some areas for further research.

I.   **REVIEW OF THE LITERATURE**

A.   Definition of Professionals

There is no widely accepted theoretical definition of professionals. Freidson (1983, p. 33) refers to professions as an "empirical entity" and adopts a highly pragmatic approach when he says (p. 34):

> In the selection of individual occupations for study, therefore, loose recognition as a profession by the general public, and even the occupation's own claim (so long as it is taken seriously by some consequential audience) may be employed to locate cases.

The categorization of professionals in this study is that adopted in the Standard Occupational Classification (SOC), (Statistics Canada, 1981) and can be considered to conform with Freidson's pragmatic approach.

Apart from the obvious differences of higher income and lengthier period of training, Raelin (1986) lists seven differences between the work of professionals and others: strong desire for autonomy; quality control implicit in the performance of the task; a large element of personal judgement; a focus on the long term aspects of the task; an expectation of satisfying work arising from the processes of education and professional socialization; a potential clash between loyalty to the profession and to the organization; and the nature of the process of socialization into the professional culture, which, according to Spangler et al (1982, p. 67) "takes naive outsiders and turns them into knowledgeable insiders."

B.   Why Professionals Join Unions

Freedman (1976), in a study of forms of protection of earnings, found that licensing coverage and collective bargaining coverage were the major determinants of income. Licensing is an effective form of protection for individuals or firms offering professional services in the marketplace. However, more than 92% of professionals are employees[1] who, in common with other workers, need protection in their relationship with the employer.

Thompson (1982) classifies the theoretical reasons why professionals join unions into offensive and defensive. Offensive reasons are essentially the same as those of other occupational groups; that is to pursue their economic or social objectives through collective as opposed to individual bargaining. Defensive reasons reflect the distinctive nature of professional occupations and include avoiding being included in a bargaining unit dominated by non-professionals and guarding against being in a weak bargaining position relative to other groups within the same organization.

This paper is concerned with cross-sectional studies of union membership among professionals, i.e. whether an individual professional is a member of a union or other group which bargains collectively with the employer. It thus includes persons who, while not members of a formally certified union, are *de facto* union members in that they have some form of structured collective representation, albeit without the protection of the prevailing labour legislation. Union membership studies in Canada and the U.S. take the form either of direct studies of membership (Kumar and Cowan, 1989; Martinello and Meng, 1992) or of studies arising from exploration of the union/non-union earnings differential (Robinson and Tomes, 1984; Simpson, 1985; Grant *et al*, 1987; Abbott and Stengos, 1987). Although there are several union membership studies for Canada, there are none which focus on professionals *per se*. This may be because of limited data availability or because professionals are usually considered to be in a relatively prosperous socio-economic category with access to other means of protection such as licensing or control of entry to the profession. The situation is similar in other English-speaking countries. The only membership study of professionals was an Australian study by Crockett and Hall (1987). This study, however, drew all of the cases from graduates of the same training institution, did not differentiate among professions and used a single equation approach. There is thus a gap in the empirical union membership literature in that professionals are often treated as a homogeneous group and are rarely the major focus of a membership study.

II.   THEORY, ANALYTICAL FRAMEWORK AND MODEL

A.   The Theoretical Model

To examine the probability of professionals being union members the model developed by Lee (1978), which takes into account the simultaneous nature of

union membership and earnings, is used. Unions usually cause higher earnings as part of their *raison d'être*. However, unionism may also result from workers in a high wage sector wanting to stay in that sector. When there are aspects of the work situation that they do not like they are more likely to exercise the "voice" option to obtain better representation, than the "exit" option (Gunderson and Riddell, 1988; Gunderson, 1989).

The derivation of the theoretical model is described in detail in Lee (1978) and it consists of the following equations:

(1) the structural probit unionization equation

$$I_i^* = b_0 + b_1(lnW_{ui} - lnW_{ni}) + b_2X_i + b_3Z_i - e_i$$

(2) the structural earnings equations

Union: $\quad ln\ W_{ui} = p_{u0} + p_{u1}X_{ui} + p_{u2}Z_{ui} + e_{ui}$

Nonunion: $ln\ W_{ni} = p_{n0} + p_{n1}X_{ni} + p_{n2}Z_{ni} + e_{ni}$

Where: I_i^* is an indicator variable equal to 1 for union members and 0 for non-members; X_i and Z_i are, respectively, generalized vectors of individual and industry characteristics; and W_{ui} and W_{ni} are the earnings of each individual in each of the union and non-union sectors. X_i and Z_i are often expressed as a single vector for estimation purposes.

B.   The Union Membership Equation for Professionals

To decide which variables are appropriate in this equation a review of the empirical union membership literature was performed. Hypotheses were set up for each variable based on the findings in the unionization and union membership literature but modified where necessary to reflect the special circumstances of professionals. Only those variables that pose unique problems or for which the hypotheses adopted differ from the norm in the literature are discussed here. For

a detailed review of the union membership literature and the choice of variables see White (1993b).

The variables selected to operationalize the generalized vectors X_i and Z_i consist of three main groups of variables or their proxies: variables used by Lee (1978); variables added in later studies that used the same model; and variables that were available in the LMAS and that were included in the analysis on an exploratory basis or, in the case of the detailed professional occupation variables, constituted the major focus of this study.

1.   Variables used by Lee (1978)

The Potential Union/Non-Union Earnings Differential faced by each individual has two possible theoretical effects. It increases interest in unionization by non-union workers (Lee, 1978; Duncan and Leigh, 1980), but this increased interest in unionization on the part of employees, reflected in a positive sign for the coefficient, is likely to be matched by an increased level of resistance by management (Hirsch and Addison, 1986), reflected in a negative value for the regression coefficient. The theoretical expectation is thus ambiguous. Empirical studies that have used this variable, usually in the context of correcting for self-selection into the union or non-union sector, have generally found it to have a significant positive effect on union membership, suggesting that the increased interest in unionization on the part of employees outweighs the increased resistance from management. In this study the pattern of prior studies is followed and it is hypothesized that the potential earnings differential will have a significant positive effect on union membership of professionals.

The literature on Gender suggests that women are considered to be less likely to be unionized because: they have a weaker attachment to the work force

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due to their child rearing responsibilities (Fiorito et al, 1986); they are less likely to favour conflictual activities such as strikes (Fiorito et al, 1986); they are often ghettoized into less unionized occupations and industries; they are more likely to work in part-time jobs; and they may be victims of discrimination (Antos et al, 1980; Hirsch, 1980). Empirical results for the effect of gender on union membership for the work force in general are mixed. Kumar and Cowan (1989) found that female professionals were significantly more likely to be unionized than are males. This study, however, did not examine earnings. The hypothesis adopted here is that, since female professionals have made a considerable investment in human capital, they will have as strong a commitment to the work force as their male counterparts and so gender will have no significant effect on professional union membership.

Canadian Province is used in place of Region of the United States. In general it is hypothesized that the effects of province of residence on the union membership of professionals will be the same as that for other workers, i.e. all provinces are more highly unionized than Alberta.

Tenure in the job has been used in place of Market Experience as used by Lee (1978). There is a possible relation with the Age variable (see below) but tests indicated no significant correlation. Depending on the membership specification used, tenure was specified as linear and/or non-linear with the hypothesis that the probability of union membership increases with tenure and decreases with the square of tenure.

In place of the Number of Weeks Worked as an indicator of Full- or Part-Time Status in the work force, a variable available in the LMAS was used which indicates Desire for Full-Time Employment. All full-time workers and those part-timers indicating a desire for full-time work were coded as wanting full-time

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work. Desire for full-time employment was hypothesized as increasing the probability of union membership for professionals.

No variable was available in the data set to indicate Urban or Rural. The omission of this variable is compensated for by the fact that Canada is more highly urban than is the U.S. and by the fact that ten detailed province variables are used in place of the four general U.S. regions used by Lee (1978).

Lee (1978) used the Industry Concentration Ratio on the basis that it is easier to organize firms that are more concentrated. The Major Industry Sector dummies used in this study capture several characteristics of each industry, reflected in various studies and including: level of firm concentration (Lee, 1978; Hirsch, 1980); extent of unionization in the industry (Robinson and Tomes, 1984; Bain and Elias, 1985); capital intensity (Hundley, 1989); whether regulated or not (Hundley, 1989); and extent of union activity (Neumann and Rissman 1984; Dickens and Leonard, 1985; Kumar, 1986; Freeman, 1988; Verma and Meltz, 1990). In general it is hypothesized that the same effects by major industry sector will apply for the unionization of professionals as have been found in prior union membership studies of other workers (see White, 1993b for a detailed discussion of industry dummies).

2.   Variables introduced in other union membership studies

Education is a particularly important variable in this study, given the fact that it is one of the key factors that distinguish professionals from other workers. Its theoretical effect on union membership is ambiguous. It may act to increase both identification with management and individual bargaining power, thus reducing the likelihood of unionization. Conversely, it may increase the desire for a voice in the management of the work place (Fiorito et al., 1986) and thus the desire for unionization, which may be the only mechanism available.

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Empirical studies indicate a predominantly negative effect for education and training (Scoville, 1971; Schmidt and Strauss, 1976; Antos *et al.*, 1980; Hirsch, 1980; Fiorito and Dauffenbach, 1982; Robinson and Tomes, 1984; Simpson, 1985; Bain and Elias, 1985; Hundley, 1989; Kumar and Cowan, 1989). The hypothesis adopted here is that, given the tradition among professionals of independence and autonomy, education will increase the perception of individual bargaining power and thus decrease the likelihood of union membership.

For Age, older workers are more likely to appreciate the accomplishments of unions while younger workers are more likely to be more militant and thus to present management with a more effective bargaining opponent (Fiorito *et al.*, 1986). The theoretical effect is thus not clear. The empirical evidence seems to indicate a positive effect of age on union membership (Scoville, 1971; Antos *et al.*, 1980; Abbott and Stengos, 1987; Moore and Newman, 1988; Hundley, 1989; Kumar and Cowan, 1989). The hypothesis adopted in this study is that age, measured categorically, will have a positive effect on union membership.

3.   Additional variables available in the LMAS

The major thesis of this study is that the probability of being unionized will vary according to Professional Occupation. Hypotheses are thus necessary for each of the professional occupations in the study. In each case the reference category is Engineering and Architectural Technicians. This group would not usually be considered professionals by Freidson's (1983) general public. However, because they are classified as such by Statistics Canada (1981), and because their union density at 25.9% is fairly close to the average of 32.6% for all professionals and managers (table 1) and because the group consists entirely of technicians they have been used as the reference category.

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(1)   Officials and Administrators in Government[2] are hypothesized to be more highly unionized than the reference category because legal exclusions apply only to higher levels of the civil service and because there is a long tradition of association-consultation in the public service, which will predispose these workers to collective activity.

(2)   Other Managers and Administrators[3] will be strongly less unionized than the reference category because of managerial exclusions but also because the socialization of managers is toward business values and individual performance.

(3)   Management and Administration Related professionals[4] will be non-unionized because their socialization is in management values and they will not wish to risk alienating their management clientele by adopting unionization. However, a coefficient less strongly negative than that expected for other managers and administrators is hypothesized since not all can enter the upper ranks of management.

(4)   Physical and Life Scientists[5] are assumed to be relatively neutral as regards the activities and values of management. No hypothetical expectation is set up for this group relative to the reference category.

(5)   Some professionals in Mathematics, Statistics, Systems Analysis and Related[6] perform functions that are very close to those of management, e.g. actuaries and systems analysts. Others such as computer programmers perform functions that may be little more than clerical in nature. The hypothesis adopted is that management values predominate in this group and it will be significantly less likely to be unionized than the reference category.

(6)   Architects and Engineers[7]. Engineers, have traditionally been part of the management structure (Larson, 1977; Derber, 1982) dating back to F.W. Taylor. Their work involves a strong element of control of the rest of the work force via

the technology it uses. However, they often work in large organizations and thus face the possibility of alienation from management values. Despite isolated pockets of collective bargaining among engineers, the hypothesis adopted is that membership in the engineering profession will reduce the tendency to be unionized.

(7)   Social Science and Related[8] Clearly the legal sub-group differs from all the other professions in this category, not only in the fact that some provinces specifically exclude them from unionization, but also in terms of their professional conditioning. Given that members of the legal profession constitute less than one quarter of this category, the hypothesis adopted is that the level of unionization will be higher than that of the reference category. The reasons include: the fact that social workers as a group have the title of profession without the usual benefits of professional status; the fact that their clientele is usually not elites; and the fact that they are not particularly highly paid (Cohen et al., 1982). Librarians and archivists and social scientists fall between the extremes represented by lawyers and social workers.

(8) Members of Religious Organizations[9] are usually considered to be following a vocation in which a preparedness to reject material possessions and to demonstrate obedience are considered the norm; they are hypothesized to have a very low relative probability of unionization.

(9)   University and Related Teachers are hypothesized to have a level of unionization at or below the reference category, despite the relatively high density in Kumar's (1988) bivariate analysis because: due to the tradition of "academic freedom", university teachers have a relatively high level of autonomy, at least in deciding what subjects they will research; tenured professors have an above average level of job security and the opportunity, depending on the

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field of specialization, to earn extra income from outside consulting; they have a high degree of freedom in setting their schedules, subject to teaching and administrative duties; and can periodically take sabbatical leaves albeit frequently used for research, course preparation and community service.

(10) Elementary and Secondary Teachers, including kindergarten teachers, are hypothesized to have a level of unionization above that of the reference category. First, some provinces such as Ontario require teachers to join a union as a condition of employment. Second, they are subject to a high level of control by members of other occupations, namely school board managers and administrators. Third, they have not had a tradition of management-oriented service or of fee-for-service practice.

(11) Other Teachers[10] may also be expected to have a relatively high level of union membership. Their occupation is similar to that of elementary and secondary teachers while incorporating some of the autonomy of university teachers.

(12) Health Diagnosing and Treating[11]. With the exception of veterinarians and chiropractors, this category consists mainly of members of "prototype" professions, on which many of the other professions have modelled their professionalizing activities. They have an extensive tradition of fee-for-service practice and, in many jurisdictions, have been able to influence the political process in their favour (Abbott, 1988). It is therefore, hypothesized that, notwithstanding specific legal exclusions, it is highly unlikely that they will be unionized.

(13) Nursing, Therapy and Related[12] is dominated by nursing professionals and therapists so an above average level of unionization is hypothesized for this group. The major reason is that, like teaching, this occupation is defined by its close employment connection with the institution and has no tradition of fee-for-

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service practice. The profession is engaged in a continuing campaign to establish its reputation as a profession (Meltz, 1988) by throwing off the dominance of physicians and obtaining recognition of the monetary value of their work. It could be argued that this would dispose them against unionism and toward professionalism, however, many nurses do not see unionization as incompatible with professionalism (Wetzel et al., 1989). Overall, the tendency toward unionism is hypothesized to dominate concerns over professionalism.

(14) Medicine and Health Related professions[13]. The hypothesis adopted is that this group will have a propensity to unionize not significantly different from that of the reference category; it is mixed in composition and does not have the homogeneous nature of, for instance, the nursing and therapy category.

(15) The final professional category is Artistic and Recreation[14]. The hypothesis adopted is that, because of its heterogeneity, membership in this group will not have an effect on professional union membership significantly different from that of the reference category.

The LMAS contains numerous variables which have not been included in previous studies including Childhood Language. Speakers of French and English are hypothesized to be more likely to unionize than others.

C.   The earnings equations

Since the focus of this study is the union membership equation, no hypotheses are posited for the earnings equations. The variables in the earnings equations were obtained from a review of those used in the earnings equations of other authors (Duncan and Leigh, 1980; Hirsch and Berger, 1984; Robinson and Tomes, 1984; Simpson, 1985; Grant et al, 1987; Abbott and Stengos, 1987) and from use of the additional variables available in the LMAS.

III. DATA

The data subsample was drawn from the 1989 LMAS (Canada, 1991), which comprises the civilian, non-institutionalized population aged 16 and over except for residents of Yukon and the North West Territory and residents of Indian reserves. For more complete details of the data set see White (1993b).

All employed individuals classified as professionals or managers were selected from the survey. After elimination of observations with missing data a total of 9,417 useable observations remained, based on the last job held by the individual during 1989. There are three reasons for the addition of managers to the subsample of workers classified as professionals: to take account of the argument that management is a profession; to broaden the range of occupations examined; and, while most private sector managers are specifically excluded from union membership, many public sector managers are not.

IV. EMPIRICAL PROCEDURE

Empirical methods of studying individual union membership have rapidly evolved from the cross-sectional method used by Kornhauser (1961) to Lee's method (1978) which Maddala (1983) has described as a general model of which other methods such as the conditional Logit model of Schmidt and Strauss (1976) are special cases. Several studies have used this method including recently that of Martinello and Meng (1992).

While Lee's method addresses the problems of self-selectivity and heteroskedasticity, it is very sensitive to the functional form of the specification (Lewis, 1986). To address this issue two specifications were used: (1) Lee's method in full with selectivity correction; (2) Lee's method without correction for selectivity.

Two main specifications of the model were used for the earnings analysis. The first or "detailed" specification is the broader of the two and uses both endogenous and exogenous variables to determine the earnings of the individual. The rationale is that, while endogenous factors such as marital status, number of jobs held, family workforce characteristics and other sources of income are not chosen by the individual with the express purpose of influencing the level of income, these variables may nonetheless have an effect on the level of income. The second or "parsimonious" specification includes only those variables that are considered to be exogenously determined or to be exogenous in the short term such as province of residence and tenure. A similar approach was used for the membership equations.

V.   EMPIRICAL RESULTS AND DISCUSSION

Table 2[15] reports the principal empirical results[16]. The three specifications reported all use Lee's method but without the selectivity correction[17]. As described by Green (1991), using the 1986 version of the LMAS, there is a high degree of correlation between the estimated selectivity correction variable and the firm size variable (not reported here), leading to unrealistic values of the union/non-union earnings differential. Except for the difference in the earnings variable used and the unrealistic values obtained using the selectivity correction, Lee's method with the selectivity correction gave results similar to those reported here.

1.   The coefficient on the Potential Earnings Differential, originally hypothesized to be positive, was significantly negative, indicating that the negative effect of management opposition to the unionization of professionals exceeds the positive incentive of a higher wage. Several authors have recognized the increasing importance of management opposition as a determinant of changes

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TABLE 2: PROBIT ESTIMATES OF UNION MEMBERSHIP FOR THE SUBSAMPLE OF PROFESSIONALS AND MANAGERS N = 9,417

	Detailed Earnings and Membership Equations	Parsimonious Earnings Equations With Detailed Membership Equation	Parsimonious Earnings Equations With Parsimonious Membership Equation
Potential Earnings Differential	-1.2716 ***	-1.1760 ***	-1.4628 ***
Male	-0.0450 **	-0.0707 *	-0.0979 ***
Education:			
0 to 8 Years(a)	-	-	-
Some Secondary	0.0921	0.0430	0.0510
High School Graduate	-0.1206 ++	-0.1651 ++	-0.1846 +++
Some Post Secondary	-0.0316	-0.0802 +	-0.0827 +
Trade Certificate or Diploma	0.0313	-0.0339	-0.0292
Post Secondary Certificate or Diploma	0.0196	-0.0371	-0.0334
University Degree	0.0089	-0.0385	-0.0316
Member of Visible Minority	-0.1847 ***	-0.1885 ***	-0.2183 ***
Disabled	0.0761 ***	0.0916 ***	0.0983 ***
Childhood Language:			
Other(a)	-	-	-
English	-0.0582 **	-0.0596 **	-0.0768 ***
French	-0.0032	-0.0162	-0.0387
Professional Occupation:			
Religion	-0.5233 +++	-0.6136 +++	-0.6904 +++
Other Managers and Administrators	-0.2228 +++	-0.2091 +++	-0.2019 +++
Architects and Engineers	-0.2027 +++	-0.1937 +++	-0.2038 +++
Health Diagnosing and Treating	-0.1617 ++	-0.1409 +	-0.1770 ++
Management and Administration Related	-0.1221 +++	-0.1160 +++	-0.1094 +++
Physical and Life Scientists	-0.0692	-0.0758	-0.1062 *
Administrators, Government	-0.0407	-0.0135	-0.0144
Architecture and Engineering Technicians(a)	-	-	-
Artistic and Recreation	0.0113	0.0264	0.0329
University and Related Teachers	0.0323	0.0406	0.0870
Mathematics, Statistics and Computer	0.0347	0.0317	0.0655
Medicine and Health Related	0.0620	0.0479	0.0544
Other Teachers	0.0714 +	0.0856 ++	0.0855 ++
Social Science	0.1227 +++	0.1438 ++	0.1688 +++
Elementary and Secondary Teachers	0.3467 +++	0.3470 +++	0.3715 +++
Nursing and Therapy	0.4542 +++	0.4888 +++	0.5329 +++
$\partial U/\partial$(Earnings differential)(b)	-0.0068	-0.0062	-0.0077
Log likelihood	-3898.5	-3894.5	-3910.5
Percentage correct predictions	82.2	82.3	82.1

+, ++, +++   significant at the 10%, 5% and 1% levels in a one-tailed test
*, **, ***   significant at the 10%, 5% and 1% levels in a two-tailed test
(a)   reference category
(b)   change in the marginal probability of union membership per 1% change in the union/non-union wage differential.

in union density: (Kochan, Katz and McKersie, 1986; Freeman, 1988; and Chaison and Rose, 1991). The latter cite Blanchflower and Freeman's hypothesis (1990, p. 22) that, in the context of the higher differentials prevailing in the United States, "increases in the union differential should eventually reduce density by increasing employer opposition more than they increase the monetary benefits of unionism to workers." The result is surprising for Canada given the lower earnings differentials and that, as Chaison and Rose (1991, p. 24) point out: "union acceptance remains the norm among large Canadian employers."

2. Contrary to the results for Gender in some other membership studies and to the results hypothesized, males in the professional subsample are less likely to be unionized than females. Approximately 32% of the subsample consisted of elementary and secondary teachers and nurses and therapists, two professions dominated by women, although profession and industry were controlled for in the analysis. This result is consistent with that of Kumar and Cowan (1989).

3. In contrast with prior studies, for Education only the high school graduate variable had a significant effect for professionals. This was not the result of insufficient variation among categories of education since the earnings equations for professionals (not reported) showed significant effects on earnings for each education category. Chi-square tests on the block of education variables to determine their combined effect were inconclusive and varied with specification. There were, however, some common effects omitting the education variables: the magnitude of the coefficient on the estimated earnings differential decreased; the coefficients on age increased; the coefficients on firm size increased; some of the industry coefficients increased. Two possible explanations are: there may be significant interactions between education and these other variables; and the

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effect of education on union membership is of less importance for a group all of whose members are highly educated.

4.   Members of Visible Minorities, for whom no significant effect had been hypothesized, were found to be significantly less likely to be union members. The theoretical effect of visible minority status on union membership is ambiguous. Visible minorities would be expected to favour unions because they serve to limit the effects of discrimination by employers; conversely, discrimination by unions and employers would be expected to limit the access of minorities to the better paying unionized jobs (Fiorito et al., 1986), as appears to be the case for this study. Previous studies have shown mixed results for the race or visible minority variable.   Some have found significant positive effects (Scoville, 1971; Antos et al., 1980); others significant negative effects (Lee, 1978); and yet others no significant effect (Schmidt and Strauss, 1976; Hirsch, 1980; Fiorito and Dauffenbach, 1982; Hirsch and Berger, 1984; Moore and Newman, 1988; Hundley, 1989).

5.   In contrast with members of visible minorities,the Disabled were found to be consistently more likely to be unionized than others. The theoretical reasoning for the effect of being disabled on union membership is similar to that for visible minority status and provides similarly ambiguous predictions (Fiorito et al., 1986). The only empirical study which addressed disability was Lee (1978) in which a health limitation had a significantly negative effect on union membership. This study, however, related to semi-skilled operatives for whom a health limitation would constitute a greater disadvantage in the performance of the job and, hence, in access to unionized work. It would appear that a disability is less of an impediment to access to unionized work for professionals and managers. Comparison of this result with that obtained for visible minority

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status suggests that unions perhaps better serve the needs of professionals and managers who are disabled than they do those who are in visible minorities.

6.   Contrary to expectation, those who spoke French or English as their Childhood Language were less likely than others to be union members although the result was not significant for French speakers. The implication is that professionals from other cultural backgrounds may have different perceptions of professions and professionalism.

7.   The general hypothesis that the probability of union membership varies with Professional Occupation was supported. There was also considerable support for the hypotheses for particular professions (occupations arranged in ascending order of coefficients). (a) Other Managers and Administrators, the group of mainstream managers was, as hypothesized, significantly less likely to be unionized. (b) Architects and Engineers, as hypothesized, were significantly less likely to be union members and the coefficients were of the same order of magnitude as those for the category of other managers and administrators, reflecting the close historical association of engineering with the management function. (c) Health Diagnosing and Treating professionals illustrate the separate effects of sector and occupation. The coefficients are consistently negative but the level of statistical significance varies with specification. (d) Management and Administration Related professionals were, as hypothesized, less likely to be unionized than the reference category. They were slightly more likely to be unionized than other managers and administrators to whom they frequently provide support services but whose values they may not share as strongly. e) Officials and Administrators unique to government were not significantly more likely to be unionized perhaps because the category consists of higher levels of government managers who, after correction for being in the

public sector, may be subject to legal exclusions. (f) University Related Teachers, despite being in the highly unionized educational services sector, were not significantly different from the reference category although the coefficients were consistently positive. (g) Other Teaching and Related professionals, while also in a highly unionized sector, were only marginally more likely to be unionized than the reference category, and as hypothesized, the regression coefficients for this category consistently fell between those for the group consisting of elementary and secondary teachers and the group of university teachers.

8.   Other variables

The results for other variables commonly used in union membership studies such as Age, Marital Status, Province of Residence, Firm Size, Tenure, and Desire for Full-Time Employment (not reported) were generally consistent with the findings of prior studies. The Major Industry Group conformed with prior studies except for Accommodation, Food and Other Services. Low levels of market concentration, of union organizing activity, of union saturation and of capital intensity in this sector led to the hypothesis of a low level of union membership among professionals. This was supported by bivariate cross-tabulations (not reported) but the multi-variate results suggest that the level of unionization among professionals in this sector is between 19 and 35% higher than for the reference category. It is not clear why this should be the case.

VI.   SUMMARY, CONCLUDING OBSERVATIONS AND RESEARCH NEEDS

The key finding of this study is the significant effect of professional occupation on the probability of union membership. Hypotheses for each occupation were based on a review of the sociological literature on the professions and on the nature of each profession as regards (a) its socialization and (b) its

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proximity to the management function. The implication for theory in industrial relations is that the characteristics of each profession in terms of these two aspects must be taken into account in membership studies.

The empirical results suggest that increased effect of management opposition to unionization of professionals outweighs the increased benefit to workers of unionization. Similar results were obtained in an analysis of the work force as a whole in 1989 although the coefficients obtained were consistently less negative than those for the subsample of professionals and managers (White, 1993a). The implication for theory is that management resistance to unionization may vary with occupational group.

The variation of the statistical significance of education along with the finding that, for professionals and managers, its negative effect on the probability of union membership did not increase with level of education suggests that the theoretical effect of education may be markedly different for groups which are collectively highly educated.

Several policy implications arise from this research. First, the organizing efforts of private sector unions should take into account the propensity for union membership of each profession. Unions should study the socialization of a profession to determine whether it is likely to be a suitable target for organization. Engineers, for example, are often seen as ripe for unionization but the results obtained here suggest that *ceteris paribus* this is not the case. The policy implication for management is to be aware of which groups of professionals and managers are more prone to unionization and to adjust their human resource policies accordingly. The Government of Ontario has recently made changes to the Ontario Labour Relations Act to remove the exclusion of certain professionals from unionization (Gauvin and Brennan, 1993). This study suggests that the

effects of these changes will be minimal since some of the target groups such as physicians, dentists and architects have a low *ceteris paribus* probability of unionization.

The results suggest several areas for further research on union membership including: (1) measurement of and changes in management resistance for various occupational groups and over time; (2) the effects of gender on unionization, also recommended by Kumar and Cowan (1989); (3) the effect of education by occupational group; (4) discrimination by unions and employers in terms of access to unionized jobs by members of visible minorities and the disabled; (5) the effect of cultural origins on union status; (6) the effects of the detailed characteristics of each profession on unionization; and (7) the use of interactions between several of the variables such as gender and occupation, gender and industry, education and age, education and firm size, education and industry. As regards detailed occupational characteristics, the single dummy variable to describe a profession could be substantially extended to cover specific measures such as socialization; nature of the work; and labour market supply and demand factors.

Given the increasing role of professionals in the work force and the fact that they now face many of the same problems as other workers, but with higher expectations engendered by their higher level of investment in training, the determinants of professional union membership are of growing importance. This study has sought to broaden the understanding of those determinants.

NOTES

1.   Statistics Canada, *The Labour Force*, Catalogue 71-001; Statistics Canada, *Labour Force Annual Averages*, Catalogue 71-220; Statistics Canada, *Labour Force Annual Averages 1981-1988*, Catalogue 71-529; and calculations by the author.

2.   Persons such as government administrators, post office managers and officials unique to government.

3.   Those in occupations in general management and management in: the natural sciences and engineering; social sciences; teaching and related fields; medicine and health; finance; personnel and industrial relations; sales and advertising; purchasing; services; production; construction; farming; and transportation and communications.

4.   Professionals in auxiliary management functions such as accounting and finance.Based on the 1986 census, accountants, auditors and other financial officers were 57.5% of this group (Canada, 1988).

5.   Chemists; geologists; physicists; meteorologists; agriculturists; biologists; and related technicians.

6.   Mathematicians; statisticians; actuaries; systems analysts; and computer programmers.

7.   Chemical, civil, electrical, industrial, agricultural, mechanical, metallurgical, mining, petroleum, aerospace, and nuclear engineers; architects; and community planners. 1986 census data (Canada, 1988) suggests that engineers constitute 94.5% of this category.

8.   Professionals in a wide range of social science related areas: social scientists such as economists, sociologists, anthropologists and psychologists; welfare, community and social workers; judges, magistrates, lawyers and notaries; librarians, archivists, conservators and their related technicians; and other social science related professionals such as educational and vocational counsellors. In the data set used in this study it is difficult to separate lawyers from the other groups. Census data from 1986 (Canada, 1988), indicated that this category consisted of the following: legal profession 22.5%; social scientists 14.0%; social workers 46.8%; occupations in library, museum and archival sciences 10.8%; other occupations in social sciences and related fields 5.9%.

9.   Ministers in religion and nuns and brothers.

10.   Teachers in community colleges and vocational schools; instructors and training officers; and teachers not elsewhere classified.

11.   The higher status medical professionals: physicians and surgeons; dentists; osteopaths and chiropractors; and veterinarians. In 1986 this category consisted of the following: physicians and surgeons 66.5%; dentists 17.1%; veterinarians 5.9%; osteopaths and chiropractors 4.1%; others 6.4% (Canada, 1988).

12.   Supervisors in nursing and therapy; registered nurses, nursing assistants and nurses-in-training; audio and speech therapists; physiotherapists; occupational therapists; and nursing attendants and orderlies. Clearly the latter category are not generally considered professionals. In 1986 this group consisted of the following: nursing supervisors, registered

nurses both graduate and in training, and registered nursing assistants 68.5%; nursing attendants and orderlies 20.1%; various therapists and others 11.4% (Canada, 1988).

13. Pharmacists; dietitians and nutritionists; optometrists; opticians; denturists, dental hygienists and dental assistants; and radiological and medical laboratory technologists and technicians. The group is heterogeneous in terms of such factors as education and earnings. Figures from the 1986 census (Canada, 1988) suggest that the lower status groups such as opticians dominate the higher status groups such as optometrists (2% of the category in 1986) who often have a doctoral diploma and are self-employed.

14. Occupations in fine and commercial art and photography such as painters, sculptors, photographers and advertizing illustrators; occupations in the performing and visual arts such as producers, conductors, composers, arrangers, musicians, singers, dancers, actors and radio and TV announcers; occupations in writing such as writers, editors, translators and interpreters; and occupations in sports and recreation such as coaches, trainers, instructors, referees, athletes, and sports and recreation attendants. In 1986 the composition of the group was as follows (Canada, 1988): occupations in fine and commercial art, photography and related fields 35.6%; performing and visual arts 23.0%; occupations in writing 20.9%; occupations in sports and recreation 20.5%. Levels of unionization may be expected to be very low for high profile members such as orchestra conductors and well known solo musicians but relatively high for some professional athletes such as hockey players.

15. All coefficients are expressed in the form of derivatives obtained from the probit estimation as follows:

$$\partial P / \partial X_i = f(Z)\beta_i$$

Where P   is the probability of being a union member;

X_i is the ith independent variable in the equation

Z $= X\beta$

X   is the vector (usually evaluated at the means) of the independent variables in the equation

β is the vector of coefficients from the probit estimation

f( )   is the normal probability density function.

16. Complete tables of results for the three specifications reported may be obtained from the author on request.

17. This analysis is based on Statistics Canada microdata tape 7468NT which contains anonymized data collected in the 1989 Labour Market Activity Survey. All computations on these microdata were prepared by the author and responsibility for the use and interpretation of these data is entirely that of the author.

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