

A Socioeconomic Scale for Canada: Measuring Occupational Status from the Census

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Cet article présente une nouvelle échelle professionnelle pour la classification nationale des professions (CNP) au Canada. En premier, l'on discute le contexte historique dans lequel la production des échelles des professions, faites par des sociologues au Canada et aux États-Unis, s'est réalisée. La méthodologie de la récente échelle Nam-Powers-Boyd utilisée aux États-Unis est ensuite appliquée au recensement des professions de 2001. Celle-ci sert à créer des scores des statuts professionnels pour les titres professionnels de la classification nationale des professions (CNP 2001) à Statistiques Canada. Ces scores soulignent les inégalités démographiques et socio-économiques qui existent parmi les groupes au Canada. L'article se termine par une discussion des débats courants concernant l'utilisation des scores composites professionnels.

This paper provides a new occupational scale for the Canadian National Occupational Classification system. The historical context for occupational scales produced by sociologists in Canada and the United States is first discussed. The methodology used in the recent Nam-Powers-Boyd scale in the United States then is applied to the 2001 census of occupations to construct occupational status scores for the occupational titles found in the National Occupational Classification for Statistics (2001) at Statistics Canada. The occupational status scores highlight inequalities existing among groups in Canada along demographic and socioeconomic dimensions. The paper concludes with a discussion of current debates over the use of composite occupational scores.

THE CONCEPTUAL AND EMPIRICAL CENTRALITY OF occupations in many domains of sociology, along with the inclusion of occupational

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information in other social science fields, has fueled the development of occupation-based measures of socioeconomic status. The latter is a term for the relative position of persons, families, households, and other aggregates with respect to social and economic factors, particularly the capacity to create or consume the goods valued in postindustrial societies (Nam and Terrie 1982; Hauser and Warren 1997). In this paper, I apply a methodology used in the recent Nam–Powers–Boyd scaling of the U.S. census occupations to generate a scale for the measurement of the socioeconomic status of occupations, one that builds on the detailed occupational titles found in the recently revised Canadian census classification of occupations (the National Occupational Classification for Statistics [NOCS]). In order to justify the construction of such a measure, and to clarify the methods used, I begin with an overview of previous occupational scaling exercises. Following this overview, I turn to the construction of the new occupational scale and highlight some of its unique features for capturing dimensions of the occupational hierarchy in Canada. I conclude with a review of the more salient criticisms voiced in recent years against the use of composite occupational scales in studies of inequality and intergenerational mobility. In light of these criticisms, I also provide separate occupational educational scores and occupational earnings scores for those working in the occupations enumerated in the 2001 census.

HISTORICAL ORIGINS OF THE DEMAND FOR OCCUPATIONAL STATUS SCALES

In the early to mid-1900s, North American sociologists and political scientists created social maps of social relations and stratification hierarchies by studying small communities. In these studies, social scientists created hierarchies of social standing in two primary ways: by asking respondents to indicate the most important persons in their communities, or by asking respondents to sort a limited number of occupations into no more than 9–10 slots indicating high social standing, intermediate and lower social standing. These procedures permitted social scientists to develop profiles of occupational hierarchies that captured the social standing of these occupations in small communities.

Over time, two important events altered the emphasis placed on community-specific studies. First, the growth of large cities that accompanied twentieth-century urbanization made asking respondents to indicate important persons or to sort occupations less tenable as methods for describing the social stratification system of any given area. The capacity to know all members of a geographical community, and hence the ability to rank them, disappeared in larger towns and cities. Furthermore, the number of different occupations found in any one geographic place increased, while the familiarity of its occupants with the full range of likely occupations declined, particularly in large communities with diverse industrial structures (Reiss

1961; Nam and Terrie 1982). Second, larger surveys became possible, fueled by the increasing use and funding of social science research and by technological improvements in data capture, which today include telephone interviewing and computer-assisted interviewing. Instead of the holistic study of one community, using approaches that today would be described as akin to social anthropology, focused surveys emerged that were often national in scope.

One concomitant development in North America was the fielding of national surveys in which respondents were asked to rank the social standing of occupations. While the term “social standing” was often left undefined, the methodology sought to capture the prestige of any given occupation based on respondents’ perceptions of the underlying status and power dimensions. The 1947 North–Hatt study in the United States was one of the first such studies, and was replicated in 1964 by the National Opinion Research Center (NORC). Then, in 1971, several survey-based scales were combined to produce a comprehensive prestige scale covering 203 occupations (Siegel 1971). Subsequent extensions include those by Nakao and Treas (1994) and by Treiman (1977), who developed the Standard International Occupational Prestige Scale and subsequently revised it (Ganzeboom and Treiman 1996). In Canada, early prestige studies were geographically constrained: in the late 1940s, Tuchman asked college students and job applicants to rank 25 occupations (Blishen 1958, 1967), while Rocher developed a scale for Quebec in the 1950s (Langlois 2002). Studies undertaken by Guppy and Siltanen (1977) in 1975 and by Goyder and colleagues (Goyder, Guppy, and Thompson 2003; Goyder 2005) focused on the local community of Kitchener-Waterloo in Ontario. In 1965, Pineo and Porter (1967) fielded the first national rankings of occupations; it remained the only national study until 2005, when a new SSHRC-funded survey was launched by John Goyder (see Goyder and Frank 2007).

The growth of larger and often national surveys of occupational prestige rankings occurred alongside increasing publication of detailed census-based occupational profiles. However, analysts face several problems with these census classification systems. First, these classifications have their own logics and rationales, and they do not automatically represent the monotonically increasing statuses of occupations. Thus, using a census classification often forces researchers to adhere to assumptions of nominal or, at best, ordinal data. Second, large numbers of categories (over 500 titles in recent census classifications) present statistical problems for researchers who wish to preserve the classification detail in their multivariate models. A large number of dummy variables must be created for regression analysis, and many empty cells are likely to be generated in log-linear or multinomial statistical techniques. Third, classification systems used by federal agencies tend to be quickly incorporated into other survey research designs because the classification systems carry with them the legitimating imprimatur of the state, and the rules associated with sorting data into categories often are

freely available. Consequently, these rules provide a protocol for researchers on how to code their own data, and often incite use.

Taken together, these developments generated demand for ways in which detailed occupational data available at national or regional levels could be incorporated into research. Fueled by a theoretically based emphasis on social status and social class that rested on the writings of Max Weber (Blisshen and Carroll 1982b; Nam 2000), a pragmatic question emerged: how could one handle the occupational detail generated by surveys and censuses? To answer this question, two main approaches developed.

THE OPTIONS: REDUCING CATEGORIES

The earliest efforts involved the development of ordinal classification schemes that parsimoniously collapsed occupational titles into a limited number of categories (generally <20) along one or more relevant dimensions. Although earlier time points are noted for Britain (Jones and McMillan 2001), in North America the most full-blown early construction of a parsimonious ordinal classification of occupations was the Edwards classification system in the United States, published in 1917. This classification grouped census occupational titles according to “skill” (Powers 1982; also see Nam and Boyd 2004). In 1977, Pineo, Porter, and McRoberts introduced a widely used ordinal scale of 17 occupational categories that captured general educational development and skill properties of occupations (Pineo, Porter, and McRoberts 1977; Jones 1980). Other later initiatives include those by Drouilly and Brunelle (1988) and Bernard et al. (1994).

Both conceptually and theoretically, the aggregation of occupational titles into ordinal classifications is different from later initiatives that generated classifications representing social class (e.g., of the latter, see Wright 1979; Erikson and Goldthorpe 1993; Clement and Myles 1994; Goldthorpe 2000). The social class approach seeks to represent asymmetrical relationships of power that exist between groups and the individuals in them that result from economic-based interactions in the workplace. In addition to occupation, information about managerial and supervisory roles, the degree of autonomy and decision making, size of the workplace, and number of employees is often used to construct classifications of social classes. In contrast, the ordinal classification of occupations ranks individuals or the positions they hold within a hierarchy defined by social or socioeconomic status; it thus represents distributional aspects of stratification, commonly expressed as “who gets what” (Kerckhoff 1984).

THE OPTIONS: PRESTIGE-BASED SCALES AND PURE SOCIOECONOMIC SCALES

The second approach also focuses on existing occupational classifications, albeit those with numerous occupational titles, and transforms them into

interval scales. It too represents the distributional aspects of stratification because it ranks occupational positions according to a socioeconomic hierarchy. In scaling occupations, two procedures dominate North American research although more can be identified (Nam and Terrie 1982; Miller 1991; Nam 2000; Miller and Salkind 2002). The first approach incorporates the results of surveys that ask respondents to rank a number of occupations according to perceived social standing, creating prestige-based scales. The second rests solely on the educational and income/earnings characteristics of occupations.

Prestige-Based Scales

Before 1950, most studies of occupational status assumed that the source of prestige of an occupation lay in the opinions of people rather than in the characteristics of the occupations, and that people could estimate and articulate the prestige levels (Treiman 1977; Powers 1982). Small community studies lent credence to the belief that prestige rankings could be readily produced by asking raters to rank a relatively small number of occupations. This methodology of ranking was employed in national surveys, such as the 1947 North–Hatt study in the United States, the 1965 Pineo–Porter (1967) study and the recent national survey by John Goyder (Goyder and Frank 2007).

In these ranking studies, the occupational titles are limited in number, reflecting efforts to reduce respondent burden associated with ranking large numbers of occupations and to avoid rankings of occupations not well known to respondents. The North–Hatt study has 90 occupational titles, while the Pineo–Porter (1967) study uses 208. A subset of these titles is often similar to titles found in the census classifications. This similarity permits a procedure in which the original rankings of occupations are used to transform the much larger array of census occupational titles into “prestige” rankings.

The first step in such a procedure is to match titles found in “prestige” studies to those used in census classifications of occupations. Once a match is obtained, census data on the educational and income characteristics of the labor force are obtained for those “matched” occupational titles. Then, a data set is generated that contains the prestige rankings for the subset of occupational titles that match with the census classification titles along with the census-generated educational and earnings or income characteristics for the incumbents of each occupation. Using this database, a prediction equation is obtained for a limited number of occupations, the number determined by the possible matches that exist between the prestige study and the census occupational titles.

$$Y(\text{prestige ranking}) = a + b_1 \text{ education} + b_2 \text{ income} + \text{error term} \quad (1)$$

Once the parameters of the equation are generated, the educational and income characteristics for the full array of census occupational titles can be

substituted into Equation 1, thereby generating “prestige” rankings for all census occupational titles.

First produced in the 1960s, North American prestige-based occupational scales were widely used and were routinely updated for successive censuses. One reason for the popularity of the scales in Canada and the United States was their centrality in national investigations of intergenerational mobility and status attainment, such as the 1962 American Occupational Change in a Generation survey (Blau and Duncan 1967) and the 1973 Canadian Mobility and Attainment survey (Boyd et al. 1985). Today, these scales are also used in diverse disciplines that study aspects of earnings determination, health, and crime. In Canada, scales resting on the 1965 Pineo–Porter study of prestige rankings (Pineo and Porter 1967) exist for 1961, 1971, and 1981 census occupational titles (Blishen 1967; Blishen and McRoberts 1976; Blishen, Carroll, and Moore 1987), although temporal variations exist with respect to the reference population (male or total), methodologies, and number of occupations (see Boyd 2002b, Table 1). Recently, Goyder and Frank (2007) have applied the results of a national survey on the social standing of occupations to 26 categories that aggregate over 500 detailed census occupational titles.¹

It should be noted that the early vocabulary of “prestige scores” has fallen into disuse, replaced by “socioeconomic status scores,” often shortened to “socioeconomic scores” or “socioeconomic indexes” (SEIs). The reason for the changing terminology partly comes from studies conducted in the 1970s and 1980s into what was actually being captured by respondent ranking of occupations. Most concluded that the central property is the “socioeconomic goodness” of an occupation, which reflects the credentials and economic rewards associated with occupations rather than prestige in the sense of deference, power, and authority (Shils 1970; Goldthorpe and Hope 1974; Featherman and Hauser 1976).

Despite extensive use of prestige-based occupational scales, critics noted several difficulties with these scales. For one thing, if high nonresponse characterizes surveys that ask people to rank occupations, the claim that prestige scores represent the opinions of the entire underlying population may be questionable. For example, in the most recent national survey of occupational social standing in Canada, the response rate was 51 percent;

¹ Building on an earlier survey in Kitchner-Waterloo (Goyder 2005) and presentation (Goyder, Thompson, and Dixon 2003), Goyder and Frank (2007) provide mean prestige scores for 26 occupational groups that correspond to the titles for the highly aggregated NOC Major Groups, developed initially by the federal government department of Human Resources and Development Canada in the late 1980s. Goyder and Frank also analyze the high nonresponse rates and individual rater effects in the 2005 survey, study the relationship of four skill levels found in the 26 category NOC classification to prestige, and construct a “Blishen”-type scale for the 26 titles, but not for a much larger list of occupational titles. The prediction equation for the “Blishen”-type scale is not presented, but it is obtained by regressing 26 prestige values against 26 educational and income measure weighted by the number of full-time incumbents; the “Blishen” scores are presented as deviations around a mean of zero with a low of -2.6 and a high of 3.882 . The focus of the article is on the validity of the prestige measures and defending the survey response levels rather than on the construction of a “Blishen”-type occupational scale.

further, a subset of respondents who indicated that the term “social standing” had no real meaning rated a select group of occupations somewhat differently than did other respondents (Goyder and Frank 2007). In addition, groups of people may rate occupations they know, or are close to, somewhat differently than those with which they are less familiar; also the gender of the incumbents or the sex typing of the occupation may affect rankings. In their national study of prestige, Goyder and Frank (2007) find that women are more likely than men to overrate their own National Occupational Classification (NOC) occupational group; however, a local study found that the age and the sex of the rater made no difference and that ratings were not depressed by specifying female incumbents of occupational titles. In fact, in jobs dealing with people, specifying a female incumbent increased the ratings (Goyder et al. 2003).

Second, unless prestige ranking studies are frequently repeated using titles that reflect temporal changes in the occupational structure and in classification schemes, the numbers of matches between census titles and occupations that respondents rank in a prestige study are likely to decline over time. Out of the 204 occupations ranked in the Pineo–Porter study, the following numbers were matched, respectively, with the 1961, 1971, and 1981 censuses: 88, 85, and 75. In the recreation of a Blishen prestige-based scale for the Canadian Classification and Dictionary of Occupations (CCDO) classification in the 1991 census, only 72 occupations could be matched with census titles (Boyd 2002b). The selection of specific occupational titles, along with the declining number of matches, increases the possibility that the occupations used to regress “prestige” on education and income or earnings are unusual and thus affect the coefficients in the prediction equation. Temporal alterations in census classifications of occupations can also heighten this basic difficulty of merging titles used in earlier prestige studies with those used in more recent census classifications. The new 2005 Canadian national survey of occupational prestige may remedy this difficulty, although to date, results only apply to 26 aggregated occupational groups (Goyder and Frank 2007; also see note 1).

A third problem is highlighted by the debate among U.S. scholars as to what the resultant scale actually captures. Because education and income (or earnings) from the census are used as predictors, one interpretation is that prestige ratings are being predicted, and that the scores are proxies for the prestige scores of occupations (Nam and Terrie 1982; Nam 2000; Goyder and Frank 2007). However, in the United States, the originator of the Duncan SEI scale (Duncan 1961a, 1961b) initially fluctuated in his interpretation, ultimately announcing that his SEI was *not* a prediction of the prestige ratings that occupations excluded from the NORC North–Hatt study would receive if included in such a study (also see Hauser and Warren 1997:213). As one commentator notes, those comments leave open how the scale should be interpreted (Hodge 1981; also see Nam and Terrie 1982).

Notwithstanding the debate over what prestige-based scales measure, two properties of these scales must be acknowledged. First, like the socioeconomic scale discussed in the next section, the prestige-based scales are composite measures. They derive from weighted sums of the educational and income or earnings characteristics of incumbents in specific occupations, with the weights determined by regressing prestige rankings on occupational-specific education and income/earnings (see Equation 1). As discussed later, critics now caution against the use of composite occupational scales in stratification studies of intergenerational status transmission and social inequality. Second, if prestige-based occupational scales are not predicting prestige, it is still the case that they differ conceptually from the pure socioeconomic scales discussed below. Grusky and Van Rompaey (1992) note that scholars who work with prestige-based scales typically characterize the occupational structure as resting on two hierarchies: a simple economic hierarchy and an imperfectly correlated sociocultural one that captures perceptions and beliefs. That is, occupations can be ranked in terms of the education and income of their incumbents, but occupations are also stratified on the basis of their social standing (Blishen and Carroll 1982b). The implication, then, is that the Blishen occupational scale incorporates both the economic and subjective social opinion dimensions of occupations.

Socioeconomic Scales

The second major procedure for transforming occupational data into interval scales rests solely on the educational and income/earnings characteristics of occupations. Like the prestige-based occupational scaling method, this approach is not immune to debate over how to best scale occupations or whether to have a composite scale at all (Hauser and Warren 1997). However, this second method does break from the reliance on prestige studies in that there is no inclusion of the “prestige” or social standing of occupations obtained from studies in which respondents are asked to rank select titles. Heuristically, the method of scaling avoids potential problems that might arise if prestige studies of occupational rankings lack validity, or are not recent, or where the number of ranked occupations that can be matched with census occupational titles diminishes over time. Conceptually, the scale does not contain a subjective dimension resting on perceptions and beliefs. Rather, this approach rests on the notion that often a researcher wants a measure of class or of life chances or objective status conditions that is found by using pure socioeconomic indicators of occupations (Miller and Salkind 2002:460). A pure socioeconomic scale is produced that captures the level of living of those studied, measured by the aggregate educational and earnings characteristics of occupations (Nam 2000; Nam and Boyd 2004).

There are two different modes of calculating pure socioeconomic scores. Using the 1951 Canadian census classification, Bernard Blishen (1958) at

York University created a scale using a procedure that took the average educational and income characteristics of each occupational title, created standard (Z) scores, and averaged the results. However, his conceptual framing of occupational scales incorporated both the economic and subjective evaluations of occupations, and starting with the 1961 census, he moved to producing socioeconomic scores that incorporated the occupational rankings found in the Pineo–Porter (1967) prestige study (Boyd 2002b, Table 1).²

In a second, independent, and sustained development, Charles Nam, then at the U.S. Bureau of the Census, used the U.S. 1960 census classification of occupational titles to develop a socioeconomic scale. Mary Powers subsequently collaborated on the project, and the American scale became known as the Nam–Powers occupational status scale, undergoing regular updates associated with the decennial U.S. censuses (U.S. Department of Commerce 1964; Nam and Powers 1968; Nam and Terrie 1982; Nam and Terrie 1988; Nam and Boyd 2004). The occupational status scale correlates highly with Duncan’s prestige-based SEI, which is not surprising given the centrality of education and income in both measures. It is viewed as the major competitor to the Duncan SEI and its successors in the United States (Hauser and Warren 1997).

The starting assumption of the occupational socioeconomic scores developed by Nam and Powers and most recently updated by Nam and Boyd (2004) is that education and income are valid indicators of what is meant by occupational status. Calculating the scores rests on the following principles: (1) array the detailed list of census-detailed occupations in the experienced labor force according to the median educational level of the incumbents, from low to high; (2) array the same occupations separately according to the median income or earnings level of the incumbents, again from low to high;³ (3) using the number of persons engaged in each occupation, calculate the cumulative percent distribution for the educational rankings and again for the income/earnings rankings; and (4) average the two cumulative percentage distributions.

² However, the production of the 1981 Blishen–Carroll–Moore scale incorporated elements of the earliest scale produced by Blishen (1958). Rather than relying on percentages above a given level of education or income as was done in the 1961 and 1971 occupational scale (Boyd 2002b, table 1), medians and Z scores for education and earning were used. The prediction formulas also changed. Instead of regressing the prestige scores on education and income as separate variables, the prediction equation was determined by regressing the matched Pineo–Porter scores on to the standard score calculated from the average of the education and income scores. In the final step, which calculated scores for all census occupations, the aggregated standard score was used. The “Blishen”-type NOC scale for 26 occupational titles also used similar procedures (Goyder and Frank 2007, table 3). As a result, the Blishen–Carroll–Moore scale based on regressing prestige on occupations, the recent NOC scale for 26 categories, and the Nam–Powers approach all give equal weight to education and income or earnings.

³ Reflecting the data tabulation capabilities of the times, earlier versions of the occupational status scores used the total income of incumbents in any given occupation. The advent of powerful computers, software, and public use data sets in the United States removed these earlier limitations. In their scores produced from the 2000 census, Nam and Boyd (2004) used earnings of occupations, measured as wage and salary earnings, self-employment and business-related earnings, and farm earnings.

Operationally, the numbers of persons in a given occupational category are used to weight the median values for education and earnings or income, and the array is transformed into percentiles. In this sense, the derivation of each score depends on the score for all other occupations and on the resulting hierarchical structure (Nam 2000; Nam and Boyd 2004). As a result, the Nam–Powers–Boyd method takes into account the shape of the distribution (the density function) as well as the absolute difference between occupations in median education or income. The value for the *i*th occupation has a straightforward interpretation: it is the percentage of persons who are in occupations having combined average levels of (median) education and earnings/income lower than the *i*th occupation. The scores range between 0 and 100 (Nam 2000; Nam and Boyd 2004).

OCCUPATIONAL STATUS SCORES FOR CANADA

The Canadian equivalent of the Nam–Powers–Boyd occupational status scores can be easily calculated from the census master files available from Statistics Canada. An earlier analysis of 1991 census data used the CCDO classification to produce and to compare a scale based on the Nam–Powers methodology to a Blishen prestige-type scale. The latter matched 72 Pineo–Porter rankings to census titles. A Spearman rank order correlation of .94 exists between the two scales (Boyd 2002b), a result consistent with the high correlation found in the United States between the Duncan index and the Nam occupational scores (Hauser and Warren 1997).

Starting with the 1991 census, the earlier CCDO-based census occupational classification, called SOC80, was replaced by a dramatically new classification system, the Standard Occupational System, or 1991 SOC. The 1991 Standard Occupational Classification used to code the 1991 and 1996 census data was, in turn, modestly revised to become the 2001 NOCS. With minor adjustments via concordance tables, this detailed census classification of over 500 occupational titles corresponds to the NOC developed and used by the federal department of Human Resources and Social Development Canada.

There exist very minor changes in the occupational classification system between the 1991 and 1996 to 2001 censuses, as well as in the questions used to collect occupational data (Statistics Canada 2001, section 5; Statistics Canada 2004, section 1). In Canada's 2001 census, occupational data are collected by asking persons aged 15 and older who are not in institutions to describe the kind of work they were doing during the week before the census, and to indicate the main activities in their job. If the person did not have a job at that time, the data relate to the job of longest duration since January 1, 2000. Persons with two or more jobs were asked to report the information for the job at which they worked the most hours (Statistics Canada 2004, section 1).

The occupational status scores for the detailed occupational titles used in the 2001 census are found in Appendix A. Excel versions of the codes for 1991, 1996, and 2001 are available from the author. To reiterate the

methodology, the numbers of persons in a given occupational category for the experienced labor force (those having an occupation in 2000 and/or 2001) are used to weight the median values for education and earnings, and the arrays are transformed into percentiles. In order to provide the option of using the disaggregate components of the scores (Hauser and Warren 1997; Warren, Sheridan, and Hauser 1998), occupational-specific educational and income scores are also provided. The rank order correlation between the occupational-specific educational and earnings percentiles is .49, and the correlations between the overall occupational status scores and the education and earnings percentiles are .89 and .84, respectively. These associations suggest that, on the whole, the overall occupational status score captures the educational and earnings dimensions of occupations. Further, education and earnings make somewhat independent contributions to the overall scores.

In keeping with the methodology used to construct the scale, socioeconomic scores in Appendix A range from 0 to 100. Out of the 520 occupational titles used in the detailed 2001 census classification, the top five ranked occupational titles in 2001 are the following: Specialist Physicians; General Practitioners and Family Physicians; Dentists; Judges and Lawyers; and Quebec Notaries. The five lowest scored occupational titles are the following: Trappers and Hunters; Sports Officials and Referees;⁴ Harvesting Labourers; General Farm Workers; and Couriers, Messengers, and Door-to-Door Distributors. Occupations with titles such as “General Office Clerks” (NOCS2001 B511), “Dispatchers and Radio Operators” (NOCS2001 B511), “Ticket Agents, Cargo Service Representatives, and Related Clerks (Except Airline)” (NOCS2001 B511), and “Machining Tool Operators” (NOCS2001 B511) had scores of 50, indicating that 50 percent of the experienced labor force population are in occupations where the average of education and earnings medians is below those who were incumbents of these listed titles.

In order to preserve the confidentiality of respondents, Statistics Canada typically aggregates the detailed census occupational titles into many fewer occupational categories when releasing data sets for public use. In the past, researchers using public use data files from the census were forced to develop their own procedures for fitting a large array of scores to a more aggregated classification scheme. To circumvent this difficulty, scores can be calculated for the occupational groupings found in the Public Use

⁴ Although the low ranking of Sports Officials and Referees initially may appear strange, it should be noted that this occupational title is distinct from that of Coach. Further, it must be remembered that each *i*th score reflects the inputs of the education and annual earnings of the incumbents in the *i*th occupation. Analysis of the 2001 census reveals that persons reporting Sports Officials and Referees occupations are young, with an average age less than 23 years, and they worked 18 weeks in 2000 on average. Also, a few other anomalous combinations of educational and occupational scores exist. For example, NOCs title E112 “Postsecondary Research and Teaching Assistants” has an overall score of 55, as a result of being in the 98th percentile on education but in the 11th percentile on earnings. Less easily understood is J174 “Tobacco Machine Operators” with only a very few workers, but where the score for education is very low and that for earnings is very high. Subsequent investigations determined that many of the high earning workers are in their 50s and 60s. This occupational category also includes workers who hand-roll cigars.

Microdata Files of Individuals. The results are presented in Appendix B. These scores are calculated from the master census database, using the methodology used to generate scores for the entire range of titles found in the census classification.

OCCUPATIONAL SCORES AND INEQUALITY

Given that early interest in occupational scales rested on the ability of scales to map social and economic inequalities in a population, how well do the 2001 occupational status scores capture differences among groups in Canada? A quick answer to this question is obtained by attaching the occupational status scores found in Appendix A to 2001 census data for the Canadian population aged 15 and older, and calculating the average scores and the percentage distributions across five categories for a number of demographic, social, and economic characteristics (Table 1). These calculations reveal clear differences in occupational status scores between groups in Canada on a number of dimensions that can be considered bases of stratification and which, in Weberian terms, can be linked to the unequal possession of goods and opportunities for income: sex, age, place of residence, period of immigration, generational status, visible minority group membership, marital status and family type, official language knowledge and home usage, educational attainment, unemployment and full- or part-time status, and living below the low-income cutoff lines.

On average, scores are lowest for those aged 15–24 years of age, those not living in CMAs, those living in the Maritimes, Saskatchewan, and Nunavut, those who are foreign born and arriving from 1991 on, those who are third-plus generation (see Boyd 2002a for explanations of the latter finding), those who are members of Latin American or South East Asian visible minority groups, or those who are self-reporting Aboriginals. Scores are highest for the population aged 25–64 years old, living in CMAs, living in Ontario, the foreign born arriving before 1980, the second generation (Canadian born with one or both parents foreign born), and those who are either members of nonvisible minority groups, excluding Aboriginals, or members of the Japanese, Arab, or Chinese minority groups. The percentage distributions tell a similar story.

The scores sharply distinguish between groups defined by social and economic characteristics. There are lower occupational status scores for those who are single (this includes many younger Canadians), women who are lone parents or living common law, those who do not know either English or French, and those who live in home settings where languages other than English and/or French are spoken. Canadians with less than a grade 9 education have the lowest occupational scores, as do those who are unemployed, working part time, or living in households below Statistics Canada's low-income cutoffs. Conversely, higher occupational status scores characterize those Canadians who are currently married or common law

Table 1

Characteristics	Average Boyd-NP score	Percent distribution					
		Total	0-19	20-39	40-59	60-79	80-100
<i>Sex</i>							
Female	49.1	100.0	16.9	19.8	28.3	15.9	19.2
Males	51.1	100.0	15.5	25.8	18.7	19.4	20.6
<i>Age</i>							
15-24	33.7	100.0	33.9	33.5	18.5	9.4	4.6
25-64	53.9	100.0	11.9	20.7	24.4	19.6	23.4
65 plus	46.3	100.0	26.0	20.6	19.7	15.8	17.9
<i>Place of residence</i>							
Not in CMA	44.7	100.0	22.3	25.1	22.9	15.3	14.3
In CMA	53.0	100.0	12.9	21.8	23.4	19.0	22.9
<i>Province of residence</i>							
Nfld	44.4	100.0	25.8	23.5	19.6	14.8	16.3
PEI	41.7	100.0	29.4	22.6	20.6	13.7	13.6
Nova Scotia	47.6	100.0	19.9	23.2	21.9	17.1	17.9
New Brunswick	46.0	100.0	21.2	24.6	21.9	16.4	16.0
Quebec	50.2	100.0	15.3	23.5	24.2	17.1	19.9
Ontario	52.0	100.0	13.9	22.5	23.4	18.4	21.8
Manitoba	47.5	100.0	18.9	23.1	24.6	16.2	17.2
Saskatchewan	44.4	100.0	26.5	21.3	21.7	14.9	15.6
Alberta	49.7	100.0	17.2	22.6	22.7	18.6	18.9
BC	49.7	100.0	16.5	23.4	22.7	18.4	18.9
Yukon	51.2	100.0	16.8	20.7	23.3	18.9	20.3
N.W. Territories	53.2	100.0	16.6	18.0	22.3	19.5	23.5
Nunavut	48.8	100.0	23.4	19.4	21.5	15.0	20.7

Table 1. (Continued).

Characteristics	Average Boyd-NP score	Percent distribution					
		Total	0-19	20-39	40-59	60-79	80-100
<i>Period of immigration</i>							
Nonimmigrant	49.9	100.0	16.4	23.1	23.1	18.0	19.4
Immigrant, before 1971	55.6	100.0	11.6	18.9	23.5	19.7	26.3
Immigrant, 1971 to 1980	54.7	100.0	11.7	19.1	25.1	19.5	24.7
Immigrant, 1981 to 1990	49.0	100.0	16.4	24.1	24.5	15.9	19.0
Immigrant, 1991 to 2001	47.5	100.0	18.9	25.6	22.4	13.9	19.3
<i>Generation status^b</i>							
Foreign born, arrived 15 +	50.8	100.0	15.6	22.5	23.8	16.3	21.8
Foreign born, arrived 0-14	52.8	100.0	13.6	21.5	23.3	18.7	22.8
Second generation	52.5	100.0	14.4	21.3	22.9	19.2	22.2
Third-plus generation	49.3	100.0	16.9	23.5	23.2	17.6	18.7
<i>Visible minority group</i>							
Chinese	53.4	100.0	15.5	18.4	23.4	16.6	26.1
South Asian	48.3	100.0	16.2	26.8	23.2	14.8	19.0
Black	46.8	100.0	16.0	27.3	25.1	15.6	16.0
Filipino	44.9	100.0	21.0	22.3	26.8	15.5	14.3
Latin American	41.8	100.0	23.8	29.1	22.3	13.6	11.3
Southeast Asian	42.9	100.0	22.7	29.1	22.7	11.5	14.0
Arab	51.7	100.0	14.8	23.3	24.1	14.0	23.8
West Asian	48.9	100.0	16.0	27.5	22.4	13.6	20.4
Korean	50.3	100.0	17.5	17.4	31.5	14.5	19.1
Japanese	56.0	100.0	11.7	17.8	23.9	20.0	26.7
Visible minority Nie	50.0	100.0	12.3	25.4	27.0	17.6	17.7
Multiple visible minorities	49.9	100.0	15.3	23.6	24.4	17.4	19.3
Other	50.6	100.0	15.7	22.6	23.2	18.2	20.2
Aboriginal self-reporting	41.9	100.0	25.4	27.6	21.3	14.6	11.1
<i>Marital status</i>							
Single	41.9	100.0	25.2	28.8	20.0	13.8	12.3
Married ^c	53.9	100.0	12.3	20.3	24.5	19.4	23.5
Other	51.1	100.0	13.6	22.5	25.3	19.0	19.6

<i>Family type</i>													
Husband	56.7	100.0	10.5	22.2	18.9	22.0	26.4						
Male common law	51.6	100.0	11.3	28.6	20.9	20.7	18.5						
Male lone parent	51.5	100.0	12.5	27.7	20.3	20.3	19.2						
Wife	52.2	100.0	14.2	15.8	30.8	16.6	22.6						
Female common law	49.9	100.0	14.5	20.7	29.0	17.3	18.5						
Female lone parent	48.6	100.0	15.9	20.4	29.4	17.0	17.4						
<i>Official languages</i>													
English only	49.8	100.0	16.4	23.1	23.4	18.0	19.1						
French only	43.2	100.0	21.0	28.1	25.4	13.6	12.0						
Both English and French	55.6	100.0	12.0	19.6	22.1	19.3	26.9						
Neither English, French	29.4	100.0	44.3	29.1	16.5	5.4	4.7						
<i>Home language</i>													
English and/or French only	50.7	100.0	15.6	22.6	23.3	18.2	20.3						
English and/or French and other	45.2	100.0	18.9	26.8	25.6	14.5	14.2						
Other only (not English or French)	45.3	100.0	21.3	26.0	22.9	13.3	16.5						
<i>Educational attainment</i>													
Grade 0-8	29.7	100.0	39.5	35.8	16.9	5.7	2.2						
Some HS	33.2	100.0	33.4	34.6	20.0	8.6	3.4						
HS certificate, postsecondary	42.3	100.0	18.7	29.9	28.5	15.7	7.2						
Nonuniversity postsecondary	51.1	100.0	11.3	21.4	28.5	23.9	14.9						
Some university	54.3	100.0	11.1	19.7	24.5	22.1	22.7						
Bachelors or higher	74.3	100.0	3.0	6.7	13.6	18.7	58.0						
<i>Unemployment status</i>													
Employed	51.6	100.0	14.6	22.0	23.6	18.5	21.2						
Unemployed	40.2	100.0	25.2	31.5	21.1	13.0	9.2						
<i>Full part-time status, 2000</i>													
Full time	54.0	100.0	11.8	21.0	23.9	20.2	23.0						
Part time	38.6	100.0	29.1	28.7	21.6	10.1	10.7						
<i>Living below low-income cutoffs</i>													
No	51.6	100.0	14.9	21.8	23.4	18.6	21.4						
Yes	38.7	100.0	26.0	32.1	22.2	11.3	8.4						

^a Excludes nonpermanent residents.
^b Second generation are Canadian-born with one or both foreign-born parents; third-plus generation are Canadian born with both parents Canadian born.
^c Includes both legal marriages and common-law unions.
 Source: Appendix A and Statistics Canada (2001) census of population.

husbands, those who speak either English only or English and French, those who hold university degrees or higher, and those who are currently employed, working full time or living in households above the low-income cutoffs.

ISSUES IN USING OCCUPATIONAL SCALES

Table 1 also shows that women aged 15 and older have on average an occupational status score that is two points lower than the average score observed for men. While consistent with findings that women may do less well in the labor market than men with respect to any number of indicators ranging from earnings to glass ceilings, this pattern reverses the tendency of prestige-based occupational scales to generate the same or higher average values for women than for men (Boyd et al. 1985; Boyd 1986, Tables 7.3 and 7.6; Warren et al. 1998, Tables 5 and 6).

Using occupational scales to study gender inequality has generated two sets of research questions during the past 30 years. The first set focused on the early prestige-based scales that were calculated only for the male population, asking if it was appropriate to use male-derived SEIs to map the occupational achievements of women and/or to compare men and women. Conceptually, one issue was whether a single socioeconomic hierarchy existed or if it was sex specific. The North American response was to produce both female-specific scales using educational and occupational data only for the female population and scales that were based on the characteristics of the total population (for early examples, see Blishen and Carroll 1982a, 1982b; Powers 1982; Featherman and Stevens 1982; Boyd 1986). The general conclusion was that using a female-specific scale to study gender differences simply perpetuated the difficulties of using a male-specific scale, and that using one scale for women and another for men obviated gender comparisons. As a result, using scales derived from the educational and income/earnings characteristics of the total population became the dominant practice.

However, heuristically derived as it was, this resolution did not remove concerns over the conclusions about gender inequalities that relied on scales referencing the total population. Within the field of social stratification, the second set of questions thus raise possibilities that other indicators are also suitable, and that total population-based scales misrepresent processes of occupational attainment and inheritance across generations. Occupational scales, of course, are only one way of representing labor market hierarchies. Fueled by the growth of surveys, researchers today can choose among a variety of workplace measures with which to examine gender inequality, including features such as autonomy, supervisory responsibilities, and decision-making capacities, as well as occupational scales.

In their comparisons of prestige-based and the pure socioeconomic scales used in the United States, Hauser and Warren (1997) and Warren et al. (1998) argue that composite scales are particularly problematic when

examining gender differences in occupational status. They note that scores produced by composite scales reflect the weights applied to the educational and earnings components of any given scale. Yet women tend to occupy jobs with higher education than men and to be paid less. Depending on the weights applied to education and earnings of occupations, composite scores for women may be higher or lower than those for men. Much of their analyses involves comparing results produced by a variety of prestige-based and the Nam–Powers types of scales, which use different weights for education and occupation. What a comparable study would show for Canada remains an empirical question. As noted in footnote 2, the 1981 Blishen–Carroll–Moore scale based on regressing prestige on occupations, the recent Goyder and Frank “Blishen”-type NOC scale for 26 categories, and the Nam–Powers approach adopted in this paper all give equal weight to education and income/earnings.

Warren et al. (1998) conclude that there is no one scalar concept or measure of occupational standing that will satisfy all research uses of the concept of occupational standing. However, they recommend that dimension-specific scales be used, emphasizing that occupational educational scores be used when studying intergenerational persistence, and that occupational wages/earnings scales be used if one wants to look at gender differences in earnings. In addition to presenting composite scores, Appendix A includes these specific scales for researchers wishing to use them.

CONCLUSION AND DISCUSSION

Almost 50 years ago, the creator of one of the most widely used occupational scales in North America commented that “there can be no such thing as a single index of socioeconomic status suitable for all purposes of social research in a modern complex society” (Duncan 1961a:139). Two distinctive methodologies predominate in the construction of North American occupational scales: (1) using the results of prestige studies to transform occupational data into occupational prestige scales; and (2) converting occupational data into occupational status scores that represent a pure socioeconomic scale. Both approaches have long histories, and the use of one metric over another generally reflects availability, the conceptual framework of the research, and the intended analysis (Nam and Boyd 2004). In this paper, a new socioeconomic scale is produced from the occupational data collected in the Canadian 2001 census of population, using only the educational and earnings properties of specific occupational titles and following the Nam–Powers methodology. This scale ranks the occupational propositions held by individuals along a socioeconomic hierarchy that captures the level of living of those studied. In addition to producing a pure socioeconomic scale, another contribution of the research reported in this paper is the creation of educational and earnings scales specific to occupations. These education- or earnings-specific occupational scales can be used

by researchers wishing to study intergenerational inheritance or gender inequality, following the recommendations of Hauser and Warren (1997) and Warren et al. (1998).

Nonetheless, composite scores continue to have their uses and appeals for several reasons. First, their use is long standing, and the weight of tradition alone continues their appeal for some researchers. Second, while the use of occupationally based scales has faded in some areas of sociology (Goyder and Frank 2007), they continue to be exploited to good effect in the disciplines of psychology, criminology, health sciences, and childhood development (Boyd 2002b).

Third, it is useful to emphasize that composite occupational scales are not properties of individuals but rather are a collective property of the occupational groups in which individuals are located—the institutionalized work environments in which individual human capital is utilized, accumulated, and rewarded. Individuals who have identical levels of education and earnings at a specific point in time may be employed in very different occupations characterized by very different patterns of lifetime earnings and human capital acquisition. There are at least two ways in which composite occupationally based scores capture information on life chances that remain invisible to measures of current levels of education and earnings that characterize a particular individual in a specific occupation. First, while educational achievement remains relatively fixed over the life course of most adults, acquisition of additional experience-based human capital does not. The ways in which workers use their educational skills and the acquisition of additional work-based experience are contingent on the occupations in which they are employed. Second, earnings are not fixed but instead tend to rise over the life course. The fact that a young lawyer or accountant *currently* earns less than an experienced auto assembler is hardly indicative of the differential economic life chances embedded in their respective occupational careers. To reiterate, occupations provide the institutional context within which individual human capital is exercised, accumulated, and rewarded. Sociologists have long made strong claims about the causal significance of such institutional contexts. The challenge for future research is to establish the range of outcomes for which such strong claims are correct.

Appendix A

Boyd-NP Occupational Scores for the Experience Labor Force, Canada 2001

Code	Census NOCS 2001 titles	Boyd-NP			Boyd-NP Scores for 2000	
		Scores	Rank ^a	Education	Earnings	Earnings
A	Management Occupations					
A011	Legislators	66	218	73		58
A012	Senior Government Managers and Officials	93	36	88		98
A013	Senior Managers—Financial, Communications and Other Business Services	94	26	89		99
A014	Senior Managers—Health, Education, Social and Community Services and Membership Organizations	93	34	91		94
A015	Senior Managers—Trade, Broadcasting and Other Services, n.e.c.	84	88	75		93
A016	Senior Managers—Goods Production, Utilities, Transportation and Construction	88	61	77		98
A111	Financial Managers	90	50	86		94
A112	Human Resources Managers	91	47	86		96
A113	Purchasing Managers	84	86	74		94
A114	Other Administrative Services Managers	84	90	79		89
A121	Engineering Managers	96	15	92		99
A122	Computer and Information Systems Managers	93	32	88		98
A123	Architecture and Science Managers	97	10	96		97
A131	Sales, Marketing and Advertising Managers	86	68	81		92
A141	Facility Operation and Maintenance Managers	68	194	57		80
A211	Retail Trade Managers	54	286	52		56
A221	Restaurant and Food Service Managers	43	359	49		37
A222	Accommodation Service Managers	48	329	61		35
A301	Insurance, Real Estate and Financial Brokerage Managers	83	95	77		90
A302	Banking, Credit and Other Investment Managers	84	87	78		90
A303	Other Business Services Managers	84	82	81		88

Appendix A. (Continued).

Code	Census NOCS 2001 titles	Boyd-NP			Boyd-NP Scores for	
		Scores	Rank ^a	Education	2000 Earnings	
A311	Telecommunication Carriers Managers	89	54	81	97	
A312	Postal and Courier Services Managers	72	163	57	87	
A321	Managers in Health Care	89	53	88	90	
A322	Administrators—Post-Secondary Education and Vocational Training	91	45	93	90	
A323	School Principals and Administrators of Elementary and Secondary Education	99	6	98	99	
A324	Managers in Social, Community and Correctional Services	80	110	85	75	
A331	Government Managers—Health and Social Policy Development and Program Administration	94	22	91	97	
A332	Government Managers—Economic Analysis, Policy Development and Program Administration	94	24	91	97	
A333	Government Managers—Education Policy Development and Program Administration	94	25	92	96	
A334	Other Managers in Public Administration	91	48	86	96	
A341	Library, Archive, Museum and Art Gallery Managers	87	65	92	82	
A342	Managers—Publishing, Motion Pictures, Broadcasting and Performing Arts	83	98	82	84	
A343	Recreation and Sports Program and Service Directors	68	195	80	57	
A351	Commissioned Police Officers	87	66	74	99	
A352	Fire Chiefs and Senior Firefighting Officers	83	94	68	98	
A353	Commissioned Officers, Armed Forces	90	49	85	96	
A361	Other Services Managers	61	246	64	58	
A371	Construction Managers	73	157	61	85	
A372	Residential Home Builders and Renovators	42	366	35	49	
A373	Transportation Managers	73	158	56	89	
A381	Primary Production Managers (Except Agriculture)	75	143	54	96	
A391	Manufacturing Managers	83	93	73	93	
A392	Utilities Managers	87	64	76	98	

B	Business, Finance and Administrative Occupations			
B011	Financial Auditors and Accountants	82	101	90
B012	Financial and Investment Analysts	89	55	91
B013	Securities Agents, Investment Dealers and Brokers	80	109	85
B014	Other Financial Officers	79	116	88
B021	Specialists in Human Resources	86	73	83
B022	Professional Occupations in Business Services to Management	86	72	90
B111	Bookkeepers	43	362	54
B112	Loan Officers	69	188	71
B113	Insurance Adjusters and Claims Examiners	73	156	74
B114	Insurance Underwriters	72	162	73
B115	Assessors, Valuators and Appraisers	78	121	80
B116	Customs, Ship and Other Brokers	65	222	67
B211	Secretaries (Except Legal and Medical)	45	350	47
B212	Legal Secretaries	60	253	63
B213	Medical Secretaries	53	295	59
B214	Court Recorders and Medical Transcriptionists	60	254	67
B311	Administrative Officers	67	208	70
B312	Executive Assistants	70	180	71
B313	Personnel and Recruitment Officers	76	139	82
B314	Property Administrators	60	259	66
B315	Purchasing Agents and Officers	72	168	68
B316	Conference and Event Planners	65	221	81
B317	Court Officers and Justices of the Peace	72	173	71
B318	Immigration, Employment Insurance and Revenue Officers	79	115	75
B411	Supervisors, General Office and Administrative Support Clerks	69	191	68
B412	Supervisors, Finance and Insurance Clerks	72	170	70
B413	Supervisors, Library, Correspondence and Related Information Clerks	69	189	74
B414	Supervisors, Mail and Message Distribution Occupations	52	302	34
B415	Supervisors, Recording, Distributing and Scheduling Occupations	58	270	45
B511	General Office Clerks	50	314	56
B513	Records Management and Filing Clerks	48	328	57
B514	Receptionists and Switchboard Operators	38	394	48
B522	Data Entry Clerks	45	347	58

Appendix A. (Continued).

Code	Census NOCS 2001 titles	Boyd-NP			Boyd-NP Scores for	
		Scores	Rank ^a	Education	Education	2000 Earnings
B523	Desktop Publishing Operators and Related Occupations	53	299	57	48	48
B524	Telephone Operators	39	386	48	30	30
B531	Accounting and Related Clerks	58	269	65	51	51
B532	Payroll Clerks	60	258	57	63	63
B533	Customer Service Representatives—Financial Services	46	344	58	33	33
B534	Banking, Insurance and Other Financial Clerks	61	248	69	53	53
B535	Collectors	60	250	62	58	58
B541	Administrative Clerks	60	252	64	57	57
B542	Personnel Clerks	68	197	72	64	64
B543	Court Clerks	59	265	58	60	60
B551	Library Clerks	35	412	59	12	12
B552	Correspondence, Publication and Related Clerks	63	238	77	48	48
B553	Customer Service, Information and Related Clerks	49	321	60	38	38
B554	Survey Interviewers and Statistical Clerks	36	408	68	4	4
B561	Mail, Postal and Related Clerks	42	370	35	48	48
B562	Letter Carriers	54	285	33	76	76
B563	Couriers, Messengers and Door-to-Door Distributors	4	516	4	5	5
B571	Shippers and Receivers	37	395	29	46	46
B572	Storekeepers and Parts Clerks	42	367	32	51	51
B573	Production Clerks	63	237	59	66	66
B574	Purchasing and Inventory Clerks	50	317	49	51	51
B575	Dispatchers and Radio Operators	50	316	38	62	62
B576	Transportation Route and Crew Schedulers	68	201	63	72	72
C	Natural and Applied Sciences and Related Occupations					
C011	Physicists and Astronomers	96	11	99	93	93
C012	Chemists	91	44	98	85	85
C013	Geologists, Geochemists and Geophysicists	96	12	97	95	95

C014	Meteorologists	97	9	96	97
C015	Other Professional Occupations in Physical Sciences	92	39	96	88
C021	Biologists and Related Scientists	86	67	99	74
C022	Forestry Professionals	43	43	93	90
C023	Agricultural Representatives, Consultants and Specialists	83	100	91	74
C031	Civil Engineers	94	28	96	92
C032	Mechanical Engineers	93	33	92	94
C033	Electrical and Electronics Engineers	95	21	93	97
C034	Chemical Engineers	96	13	96	96
C041	Industrial and Manufacturing Engineers	93	30	92	94
C042	Metallurgical and Materials Engineers	96	16	96	95
C043	Mining Engineers	95	20	93	97
C044	Geological Engineers	93	35	96	89
C045	Petroleum Engineers	95	19	91	99
C046	Aerospace Engineers	96	14	96	96
C047	Computer Engineers (Except Software Engineers)	93	31	92	95
C048	Other Professional Engineers, n.e.c.	92	42	92	92
C051	Architects	91	46	98	83
C052	Landscape Architects	84	91	96	71
C053	Urban and Land Use Planners	92	41	96	88
C054	Land Surveyors	74	153	75	72
C061	Mathematicians, Statisticians and Actuaries	94	29	94	94
C071	Information Systems Analysts and Consultants	89	56	87	91
C072	Database Analysts and Data Administrators	85	74	87	84
C073	Software Engineers	96	17	96	95
C074	Computer Programmers and Interactive Media Developers	86	69	91	81
C075	Web Designers and Developers	66	213	85	48
C111	Chemical Technologists and Technicians	76	140	81	70
C112	Geological and Mineral Technologists and Technicians	74	152	74	73
C113	Meteorological Technicians	68	200	68	67
C121	Biological Technologists and Technicians	69	192	84	53
C122	Agricultural and Fish Products Inspectors	63	233	56	70
C123	Forestry Technologists and Technicians	69	186	74	65
C124	Conservation and Fishery Officers	72	166	73	71
C125	Landscape and Horticultural Technicians and Specialists	49	322	68	30

Appendix A. (Continued).

Code	Census NOCS 2001 titles	Boyd-NP			Boyd-NP Scores for	
		Scores	Rank ^a	Education	Education	2000 Earnings
C131	Civil Engineering Technologists and Technicians	78	126	79	76	76
C132	Mechanical Engineering Technologists and Technicians	82	104	79	84	84
C133	Industrial Engineering and Manufacturing Technologists and Technicians	77	128	76	79	79
C134	Construction Estimators	77	133	74	80	80
C141	Electrical and Electronics Engineering Technologists and Technicians	78	124	79	77	77
C142	Electronic Service Technicians (Household and Business Equipment)	66	217	72	60	60
C143	Industrial Instrument Technicians and Mechanics	84	89	74	93	93
C144	Aircraft Instrument, Electrical and Avionics Mechanics, Technicians and Inspectors	81	106	74	88	88
C151	Architectural Technologists and Technicians	74	151	82	66	66
C152	Industrial Designers	78	123	84	71	71
C153	Drafting Technologists and Technicians	73	155	77	70	70
C154	Land Survey Technologists and Technicians	60	249	70	51	51
C155	Mapping and Related Technologists and Technicians	78	125	86	70	70
C161	Nondestructive Testers and Inspectors	69	190	59	79	79
C162	Engineering Inspectors and Regulatory Officers	80	114	72	88	88
C163	Inspectors in Public and Environmental Health and Occupational Health and Safety	85	79	82	87	87
C164	Construction Inspectors	75	144	74	76	76
C171	Air Pilots, Flight Engineers and Flying Instructors	85	78	75	95	95
C172	Air Traffic Control and Related Occupations	84	81	72	96	96
C173	Deck Officers, Water Transport	80	111	71	89	89
C174	Engineer Officers, Water Transport	83	96	72	94	94
C175	Railway Traffic Controllers and Marine Traffic Regulators	73	159	50	95	95
C181	Computer and Network Operators and Web Technicians	75	146	78	72	72

C182	User Support Technicians	72	164	79	66
C183	Systems Testing Technicians	77	135	82	72
D	Health Occupations				
D011	Specialist Physicians	100	1	100	100
D012	General Practitioners and Family Physicians	100	2	100	100
D013	Dentists	99	3	99	100
D014	Veterinarians	94	27	99	89
D021	Optometrists	98	8	99	97
D022	Chiropractors	89	52	99	79
D023	Other Professional Occupations in Health Diagnosing and Treating	73	161	96	50
D031	Pharmacists	94	23	96	92
D032	Dietitians and Nutritionists	78	120	91	65
D041	Audiologists and Speech-Language Pathologists	92	38	99	85
D042	Physiotherapists	88	59	96	80
D043	Occupational Therapists	86	70	96	75
D044	Other Professional Occupations in Therapy and Assessment	72	167	91	53
D111	Head Nurses and Supervisors	87	62	87	88
D112	Registered Nurses	82	103	84	79
D211	Medical Laboratory Technologists and Pathologists' Assistants	80	113	82	77
D212	Medical Laboratory Technicians	70	185	80	60
D213	Veterinary and Animal Health Technologists and Technicians	53	300	74	31
D214	Respiratory Therapists, Clinical Perfusionists and Cardio-Pulmonary Technologists	85	77	86	84
D215	Medical Radiation Technologists	80	112	81	79
D216	Medical Sonographers	85	75	87	84
D217	Cardiology Technologists	68	199	76	60
D218	Electroencephalographic and Other Diagnostic Technologists, n.e.c.	75	147	79	70
D219	Other Medical Technologists and Technicians (Except Dental Health)	68	196	76	60
D221	Denturists	75	148	81	68
D222	Dental Hygienists and Dental Therapists	75	145	82	68
D223	Dental Technologists, Technicians and Laboratory Bench Workers	64	230	71	57
D231	Opticians	67	205	76	58

Appendix A. (Continued).

Code	Census NOCS 2001 titles	Boyd-NP			Boyd-NP Scores for	
		Scores	Rank ^a	Education	Education	2000 Earnings
D232	Midwives and Practitioners of Natural Healing	54	292	85	85	22
D233	Licensed Practical Nurses	60	256	66	66	54
D234	Ambulance Attendants and Other Paramedical Occupations	75	142	71	71	79
D235	Other Technical Occupations in Therapy and Assessment	54	284	79	79	29
D311	Dental Assistants	53	297	67	67	39
D312	Nurse Aides, Orderlies and Patient Service Associates	40	379	44	44	36
D313	Other Assisting Occupations in Support of Health Services	47	339	61	61	33
E	Occupations in Social Science, Education, Government Service and Religion					
E011	Judges	99	4	99	99	100
E012	Lawyers and Quebec Notaries	99	5	99	99	99
E021	Psychologists	92	40	99	99	85
E022	Social Workers	83	99	93	93	73
E023	Family, Marriage and Other Related Counsellors	72	172	86	86	57
E024	Ministers of Religion	77	131	98	98	56
E025	Probation and Parole Officers and Related Occupations	88	60	90	90	86
E031	Natural and Applied Science Policy Researchers, Consultants and Program Officers	88	57	93	93	84
E032	Economists and Economic Policy Researchers and Analysts	95	18	98	98	93
E033	Business Development Officers and Marketing Researchers and Consultants	79	117	88	88	70
E034	Social Policy Researchers, Consultants and Program Officers	85	76	91	91	79
E035	Education Policy Researchers, Consultants and Program Officers	88	58	96	96	79
E036	Recreation, Sports and Fitness Program Supervisors and Consultants	66	214	86	86	46
E037	Program Officers Unique to Government	85	80	85	85	84
E038	Other Professional Occupations in Social Science, n.e.c.	81	107	98	98	63
E039	Health Policy Researchers, Consultants and Program Officers	84	83	95	95	73

E111	University Professors	98	7	100	96
E112	Post-Secondary Teaching and Research Assistants	55	281	98	11
E121	College and Other Vocational Instructors	87	63	94	81
E131	Secondary School Teachers	92	37	97	87
E132	Elementary School and Kindergarten Teachers	89	51	95	83
E133	Educational Counsellors	84	85	95	73
E211	Paralegal and Related Occupations	67	204	75	59
E212	Community and Social Service Workers	62	240	78	47
E213	Employment Counsellors	74	150	87	62
E214	Instructors and Teachers of Persons with Disabilities	69	187	85	53
E215	Other Instructors	47	338	76	19
E216	Other Religious Occupations	55	282	85	24
E217	Early Childhood Educators and Assistants	43	357	67	20
F	Occupations in Art, Culture, Recreation and Sport				
F011	Librarians	82	102	96	68
F012	Conservators and Curators	78	119	96	60
F013	Archivists	75	149	92	57
F021	Authors and Writers	66	215	92	41
F022	Editors	77	134	91	63
F023	Journalists	77	132	91	63
F024	Professional Occupations in Public Relations and Communications	77	129	86	68
F025	Translators, Terminologists and Interpreters	73	160	92	53
F031	Producers, Directors, Choreographers and Related Occupations	77	127	85	70
F032	Conductors, Composers and Arrangers	59	262	89	30
F033	Musicians and Singers	47	341	82	12
F034	Dancers	35	413	58	11
F035	Actors and Comedians	48	332	76	20
F036	Painters, Sculptors and Other Visual Artists	45	348	79	11
F111	Library and Archive Technicians and Assistants	64	231	80	48
F112	Technical Occupations Related to Museums and Art Galleries	48	331	79	17
F121	Photographers	52	306	73	30
F122	Film and Video Camera Operators	68	198	76	60
F123	Graphic Arts Technicians	59	267	72	46
F124	Broadcast Technicians	76	141	76	141
F125	Audio and Video Recording Technicians	64	226	75	53

Appendix A. (Continued).

Code	Census NOCS 2001 titles	Boyd-NP		Boyd-NP Scores for	
		Scores	Rank ^a	Education	2000 Earnings
F126	Other Technical and Co-ordinating Occupations in Motion Pictures, Broadcasting and the Performing Arts	67	209	76	58
F127	Support Occupations in Motion Pictures, Broadcasting and the Performing Arts	54	289	72	36
F131	Announcers and Other Broadcasters	53	296	71	35
F132	Other Performers	31	436	50	11
F141	Graphic Designers and Illustrators	67	210	81	52
F142	Interior Designers	66	220	83	49
F143	Theatre, Fashion, Exhibit and Other Creative Designers	58	271	77	39
F144	Artisans and Craftspersons	30	441	50	11
F145	Patternmakers—Textile, Leather and Fur Products	60	261	71	48
F151	Athletes	38	391	52	24
F152	Coaches	37	403	68	5
F153	Sports Officials and Referees	1	519	1	0
F154	Program Leaders and Instructors in Recreation and Sport	32	428	63	1
G	Sales and Service Occupations				
G011	Retail Trade Supervisors	42	368	39	45
G012	Food Service Supervisors	31	435	39	23
G013	Executive Housekeepers	36	411	29	43
G014	Dry Cleaning and Laundry Supervisors	33	424	25	41
G015	Cleaning Supervisors	38	390	25	52
G016	Other Service Supervisors	52	303	56	49
G111	Sales Representatives—Wholesale Trade (Non-Technical)	66	216	62	69
G121	Technical Sales Specialists—Wholesale Trade	80	108	76	85
G131	Insurance Agents and Brokers	68	202	70	65
G132	Real Estate Agents and Salespersons	70	184	72	68
G133	Retail and Wholesale Buyers	60	260	59	60
G134	Grain Elevator Operators	51	311	22	80

G211	Retail Salespersons and Sales Clerks	30	443	43	17
G311	Cashiers	19	487	31	7
G411	Chefs	46	342	53	39
G412	Cooks	18	490	18	18
G511	Maitres d'hôtel and Hosts/Hostesses	18	488	33	3
G512	Bartenders	29	447	39	18
G513	Food and Beverage Servers	24	468	37	11
G611	Police Officers (Except Commissioned)	86	71	75	97
G612	Firefighters	78	118	61	95
G621	Sheriffs and Bailiffs	57	274	50	64
G622	Correctional Service Officers	77	130	70	84
G623	By-law Enforcement and Other Regulatory Officers, n.e.c.	67	203	64	71
G624	Occupations Unique to the Armed Forces	60	257	38	82
G625	Other Protective Service Occupations	60	255	64	56
G631	Security Guards and Related Occupations	32	434	37	26
G711	Travel Counsellors	56	277	72	41
G712	Pursers and Flight Attendants	70	182	72	68
G713	Airline Sales and Service Agents	63	236	66	59
G714	Ticket Agents, Cargo Service Representatives and Related Clerks (Except Airline)	50	318	53	46
G715	Hotel Front Desk Clerks	42	374	60	23
G721	Tour and Travel Guides	40	378	73	7
G722	Outdoor Sport and Recreational Guides	19	484	27	11
G723	Casino Occupations	55	280	57	53
G731	Operators and Attendants in Amusement, Recreation and Sport	12	507	20	3
G732	Other Attendants in Accommodation and Travel	35	415	43	26
G811	Visiting Homemakers, Housekeepers and Related Occupations	28	450	33	23
G812	Elementary and Secondary School Teacher Assistants	44	353	66	22
G814	Babysitters, Nannies and Parents' Helpers	9	511	18	1
G911	Hairstylists and Barbers	29	446	34	24
G912	Funeral Directors and Embalmers	71	174	73	70
G921	Image, Social and Other Personal Consultants	42	372	59	24
G922	Estheticians, Electrolgists and Related Occupations	37	397	54	20
G923	Pet Groomers and Animal Care Workers	23	473	35	11
G924	Other Personal Service Occupations	28	453	37	19

Appendix A. (Continued).

Code	Census NOCS 2001 titles	Boyd-NP		Boyd-NP Scores for	
		Scores	Rank ^a	Education	2000 Earnings
G931	Light Duty Cleaners	10	510	6	13
G932	Specialized Cleaners	15	496	12	19
G933	Janitors, Caretakers and Building Superintendents	19	482	9	29
G941	Butchers and Meat Cutters—Retail and Wholesale	23	471	14	32
G942	Bakers	25	462	26	24
G961	Food Counter Attendants, Kitchen Helpers and Related Occupations	9	512	14	3
G971	Service Station Attendants	11	509	18	4
G972	Grocery Clerks and Store Shelf Stockers	16	494	24	9
G973	Other Elemental Sales Occupations	22	474	38	7
G981	Dry Cleaning and Laundry Occupations	17	493	8	26
G982	Ironing, Pressing and Finishing Occupations	13	502	1	25
G983	Other Elemental Service Occupations	20	481	32	8
H	Trades, Transport and Equipment Operators and Related Occupations				
H011	Supervisors, Machinists and Related Occupations	71	175	54	89
H012	Contractors and Supervisors, Electrical Trades and Telecommunications Occupations	81	105	70	92
H013	Contractors and Supervisors, Pipefitting/Trades	72	169	56	87
H014	Contractors and Supervisors, Metal Forming, Shaping and Erecting Trades	61	247	33	88
H015	Contractors and Supervisors, Carpentry Trades	50	315	32	68
H016	Contractors and Supervisors, Mechanic Trades	67	211	49	84
H017	Contractors and Supervisors, Heavy Construction Equipment Crews	52	308	19	84
H018	Supervisors, Printing and Related Occupations	61	243	50	72
H019	Contractors and Supervisors, Other Construction Trades, Installers, Repairers and Servicers	43	363	25	60

H021	Supervisors, Railway Transport Operations	63	232	32	95
H022	Supervisors, Motor Transport and Other Ground Transit Operators	57	273	34	80
H111	Plumbers	58	268	50	66
H112	Steamfitters, Pipefitters and Sprinkler System Installers	68	193	50	87
H113	Gas Fitters	62	241	48	75
H121	Carpenters	37	399	26	47
H122	Cabinetmakers	36	409	31	41
H131	Bricklayers	33	421	8	58
H132	Concrete Finishers	30	439	3	58
H133	Tiles setters	37	402	23	51
H134	Plasterers, Drywall Installers and Finishers and Lathers	28	452	7	49
H141	Roofers and Shinglers	19	486	3	35
H142	Glaziers	36	404	22	51
H143	Insulators	39	385	19	60
H144	Painters and Decorators	26	457	22	30
H145	Floor Covering Installers	27	455	11	43
H211	Electricians (Except Industrial and Power System)	71	177	71	72
H212	Industrial Electricians	83	97	74	92
H213	Power System Electricians	83	92	72	95
H214	Electrical Power Line and Cable Workers	71	176	50	93
H215	Telecommunications Line and Cable Workers	67	206	50	84
H216	Telecommunications Installation and Repair Workers	77	137	68	86
H217	Cable Television Service and Maintenance Technicians	66	219	58	73
H221	Stationary Engineers and Auxiliary Equipment Operators	74	154	59	88
H222	Power Systems and Power Station Operators	84	84	71	97
H311	Machinists and Machining and Tooling Inspectors	63	239	53	72
H312	Tool and Die Makers	77	136	68	86
H321	Sheet Metal Workers	51	310	35	67
H322	Boilermakers	64	227	45	83
H323	Structural Metal and Platework Fabricators and Fitters	52	309	33	70
H324	Ironworkers	45	349	19	71
H325	Blacksmiths and Die Setters	52	307	31	72
H326	Welders and Related Machine Operators	47	340	28	66

Appendix A. (Continued).

Code	Census NOCS 2001 titles	Boyd-NP			Boyd-NP Scores for	
		Scores	Rank ^a	Education	2000 Earnings	
H411	Construction Millwrights and Industrial Mechanics (Except Textile)	72	171	54	89	
H412	Heavy-Duty Equipment Mechanics	63	235	48	77	
H413	Refrigeration and Air Conditioning Mechanics	70	179	67	73	
H414	Railway Carmen/women	57	275	26	87	
H415	Aircraft Mechanics and Aircraft Inspectors	78	122	68	88	
H416	Machine Fitters	54	293	35	73	
H417	Textile Machinery Mechanics and Repairers	38	393	16	60	
H418	Elevator Constructors and Mechanics	70	183	45	95	
H421	Automotive Service Technicians, Truck Mechanics and Mechanical Repairers	52	305	45	59	
H422	Motor Vehicle Body Repairers	36	410	21	51	
H431	Oil and Solid Fuel Heating Mechanics	40	380	27	53	
H432	Electric Appliance Servicers and Repairers	44	356	38	49	
H433	Electrical Mechanics	67	207	63	71	
H434	Motorcycle and Other Related Mechanics	46	345	34	57	
H435	Other Small Engine and Equipment Mechanics	33	418	26	40	
H511	Upholsterers	22	475	8	36	
H512	Tailors, Dressmakers, Furriers and Milliners	12	506	2	22	
H513	Shoe Repairers and Shoemakers	13	501	3	24	
H514	Jewellers, Watch Repairers and Related Occupations	32	432	32	32	
H521	Printing Press Operators	48	335	27	68	
H522	Commercial Divers	53	298	56	50	
H523	Other Trades and Related Occupations	43	361	28	58	
H531	Residential and Commercial Installers and Servicers	29	448	19	38	
H532	Waterworks and Gas Maintenance Workers	58	272	35	80	
H533	Automotive Mechanical Installers and Servicers	25	464	19	31	
H534	Pest Controllers and Fumigators	48	330	49	48	

H535	Other Repairers and Servicers	33	419	31	35
H611	Heavy Equipment Operators (Except Crane)	35	414	3	67
H612	Public Works Maintenance Equipment Operators	33	423	3	62
H621	Crane Operators	48	325	10	87
H622	Drillers and Blasters—Surface Mining, Quarrying and Construction	40	383	7	73
H623	Water Well Drillers	28	451	8	48
H711	Truck Drivers	34	417	5	62
H712	Bus Drivers and Subway and Other Transit Operators	28	449	21	35
H713	Taxi and Limousine Drivers and Chauffeurs	26	459	27	24
H714	Delivery and Courier Service Drivers	29	445	24	34
H721	Railway and Yard Locomotive Engineers	64	229	31	97
H722	Railway Conductors and Brakemen/women	61	245	27	96
H731	Railway Yard Workers	55	279	25	85
H732	Railway Track Maintenance Workers	42	373	8	76
H733	Deck Crew, Water Transport	44	355	21	66
H734	Engine Room Crew, Water Transport	48	326	25	72
H735	Lock and Cable Ferry Operators and Related Occupations	48	336	29	66
H736	Boat Operators	40	381	32	48
H737	Air Transport Ramp Attendants	48	334	38	57
H811	Longshore Workers	38	392	8	68
H812	Material Handlers	30	440	20	40
H821	Construction Trades Helpers and Labourers	17	491	8	27
H822	Other Trades Helpers and Labourers	23	470	21	25
H831	Public Works and Maintenance Labourers	20	477	10	31
H832	Railway and Motor Transport Labourers	19	483	8	31
I	Occupations Unique to Primary Industry				
I011	Farmers and Farm Managers	16	495	11	21
I012	Agricultural and Related Service Contractors and Managers	41	377	32	49
I013	Farm Supervisors and Specialized Livestock Workers	27	454	27	28
I014	Nursery and Greenhouse Operators and Managers	39	388	48	29
I015	Landscaping and Grounds Maintenance Contractors and Managers	32	427	34	31
I016	Supervisors, Landscape and Horticulture	42	364	44	41
I017	Aquaculture Operators and Managers	52	304	48	56

Appendix A. (Continued).

Code	Census NOCS 2001 titles	Boyd-NP		Boyd-NP Scores for	
		Scores	Rank ^a	Education	2000 Earnings
I021	General Farm Workers	3	517	2	5
I022	Nursery and Greenhouse Workers	12	505	16	8
I111	Supervisors, Logging and Forestry	53	301	35	70
I121	Supervisors, Mining and Quarrying	65	223	32	98
I122	Supervisors, Oil and Gas Drilling and Service	61	244	25	97
I131	Underground Production and Development Miners	51	312	7	95
I132	Oil and Gas Well Drillers, Servicers, Testers and Related Workers	55	283	21	89
I141	Underground Mine Service and Support Workers	48	333	7	89
I142	Oil and Gas Well Drilling Workers and Services Operators	53	294	22	84
I151	Logging Machinery Operators	33	425	1	64
I161	Chainsaw and Skidder Operators	14	500	0	28
I162	Silviculture and Forestry Workers	11	508	3	20
I171	Fishing Masters and Officers	33	420	1	65
I172	Fishing Vessel Skippers and Fishermen/women	14	499	0	28
I181	Fishing Vessel Deckhands	12	504	1	23
I182	Trappers and Hunters	0	520	0	0
I211	Harvesting Labourers	2	518	0	3
I212	Landscaping and Grounds Maintenance Labourers	15	498	22	8
I213	Aquaculture and Marine Harvest Labourers	7	513	3	12
I214	Mine Labourers	45	351	16	74
I215	Oil and Gas Drilling, Servicing and Related Labourers	30	437	16	45
I216	Logging and Forestry Labourers	18	489	25	12
J	Occupations Unique to Processing, Manufacturing and Utilities				
J011	Supervisors, Mineral and Metal Processing	64	228	35	94
J012	Supervisors, Petroleum, Gas and Chemical Processing and Utilities	76	138	57	96
J013	Supervisors, Food, Beverage and Tobacco Processing	54	287	35	73

J014	Supervisors, Plastic and Rubber Products Manufacturing	54	291	34	73
J015	Supervisors, Forest Products Processing	64	225	34	95
J016	Supervisors, Textile Processing	43	358	27	60
J021	Supervisors, Motor Vehicle Assembling	72	165	50	95
J022	Supervisors, Electronics Manufacturing	70	181	70	71
J023	Supervisors, Electrical Products Manufacturing	59	264	45	74
J024	Supervisors, Furniture and Fixtures Manufacturing	48	327	29	68
J025	Supervisors, Fabric, Fur and Leather Products Manufacturing	32	433	15	48
J026	Supervisors, Other Mechanical and Metal Products Manufacturing	63	234	39	88
J027	Supervisors, Other Products Manufacturing and Assembly	51	313	34	67
J111	Central Control and Process Operators, Mineral and Metal Processing	59	266	27	92
J112	Petroleum, Gas and Chemical Process Operators	71	178	45	96
J113	Pulping Control Operators	65	224	32	97
J114	Papermaking and Coating Control Operators	60	251	25	96
J121	Machine Operators, Mineral and Metal Processing	47	337	21	74
J122	Foundry Workers	49	323	27	71
J123	Glass Forming and Finishing Machine Operators and Glass Cutters	36	407	25	48
J124	Concrete, Clay and Stone Forming Operators	33	426	12	53
J125	Inspectors and Testers, Mineral and Metal Processing	57	276	39	74
J131	Chemical Plant Machine Operators	49	324	32	66
J132	Plastics Processing Machine Operators	37	398	25	49
J133	Rubber Processing Machine Operators and Related Workers	46	346	25	66
J134	Water and Waste Plant Operators	59	263	45	74
J141	Sawmill Machine Operators	30	438	3	58
J142	Pulp Mill Machine Operators	61	242	29	94
J143	Papermaking and Finishing Machine Operators	56	278	26	85
J144	Other Wood Processing Machine Operators	33	422	8	58
J145	Paper Converting Machine Operators	41	376	19	63
J146	Lumber Graders and Other Wood Processing Inspectors and Graders	43	360	24	62
J151	Textile Fibre and Yarn Preparation Machine Operators	26	456	9	43
J152	Weavers, Knitters and Other Fabric-Making Occupations	20	478	10	30
J153	Textile Dyeing and Finishing Machine Operators	26	460	15	36

Appendix A. (Continued).

Code	Census NOCS 2001 titles	Boyd-NP			Boyd-NP Scores for	
		Scores	Rank ^a	Education	2000 Earnings	
J154	Textile Inspectors, Graders and Samplers	25	465	19	31	
J161	Sewing Machine Operators	13	503	1	25	
J162	Fabric, Fur and Leather Cutters	17	492	3	31	
J163	Hide and Pelt Processing Workers	19	485	8	30	
J164	Inspectors and Testers, Fabric, Fur and Leather Products Manufacturing	20	480	14	26	
J171	Process Control and Machine Operators, Food and Beverage Processing	37	396	23	52	
J172	Industrial Butchers and Meat Cutters, Poultry Preparers and Related Workers	25	461	8	43	
J173	Fish Plant Workers	6	514	0	11	
J174	Tobacco Processing Machine Operators	50	319	3	96	
J175	Testers and Graders, Food and Beverage Processing	32	430	32	32	
J181	Printing Machine Operators	39	387	28	49	
J182	Camera, Platemaking and Other Pre-Press Occupations	54	290	48	60	
J183	Binding and Finishing Machine Operators	25	463	15	35	
J184	Photographic and Film Processors	36	406	50	23	
J191	Machining Tool Operators	50	320	32	67	
J192	Forging Machine Operators	42	369	24	60	
J193	Woodworking Machine Operators	23	469	10	37	
J194	Metalworking Machine Operators	42	365	21	63	
J196	Other Metal Products Machine Operators	36	405	16	57	
J197	Other Products Machine Operators	39	384	26	53	
J211	Aircraft Assemblers and Aircraft Assembly Inspectors	67	212	57	76	
J212	Motor Vehicle Assemblers, Inspectors and Testers	54	288	31	77	
J213	Electronics Assemblers, Fabricators, Inspectors and Testers	44	354	48	39	
J214	Assemblers and Inspectors, Electrical Appliance, Apparatus and Equipment Manufacturing	40	382	32	48	

J215	Assemblers, Fabricators and Inspectors, Industrial Electrical Motors and Transformers	44	352	32	56
J216	Mechanical Assemblers and Inspectors	46	343	27	65
J217	Machine Operators and Inspectors, Electrical Apparatus Manufacturing	42	371	32	51
J221	Boat Assemblers and Inspectors	30	444	25	35
J222	Furniture and Fixture Assemblers and Inspectors	24	467	15	33
J223	Other Wood Products Assemblers and Inspectors	23	472	11	34
J224	Furniture Finishers and Refinishers	25	466	16	33
J225	Plastic Products Assemblers, Finishers and Inspectors	32	429	24	41
J226	Painters and Coaters—Industrial	37	400	16	57
J227	Plating, Metal Spraying and Related Operators	39	389	19	58
J228	Other Assemblers and Inspectors	30	442	25	35
J311	Labourers in Mineral and Metal Processing	41	375	19	63
J312	Labourers in Metal Fabrication	32	431	15	49
J313	Labourers in Chemical Products Processing and Utilities	37	401	27	46
J314	Labourers in Wood, Pulp and Paper Processing	34	416	16	52
J315	Labourers in Rubber and Plastic Products Manufacturing	26	458	16	36
J316	Labourers in Textile Processing	15	497	7	24
J317	Labourers in Food, Beverage and Tobacco Processing	21	476	12	30
J318	Labourers in Fish Processing	4	515	1	8
J319	Other Labourers in Processing, Manufacturing and Utilities	20	479	15	25

^a Ranking based on values carried to fourth decimal places.

Appendix B

**Boyd-NP Scores and Ranks for Occupational Variables NOCS01P
on 2001 Public Use Microdata File of Individuals, 2001 Canadian
Census of Population**

NOCS01P PUMF code	Occupational title	Boyd- NP score	Rank of score
1	Senior management occupations (A0)	91	4
2	Other management occupations (A1, A2, A3)	80	6
3	Professional occupations in business and finance (B0)	89	5
4	Financial, secretarial and administrative occupations (B1, B2, B3)	62	10
5	Clerical occupations and clerical supervisors (B4, B5)	49	15
6	Occupations in natural and applied sciences (C0, C1)	92	3
7	Professional occupations in health, registered nurses and supervisors (D0, D1)	97	1
8	Technical, assisting and related occupations in health (D2, D3)	56	13
9	Occupations in social science, government services and religion (E0, E2)	73	7
10	Teachers and professors (E1)	94	2
11	Occupations in art, culture, recreation and sport (F0, F1)	54	14
12	Wholesale, technical, insurance, real estate B13 sales specialists, and retail, wholesale and grain buyers (G1)	69	8
13	Retail trade supervisors, salespersons, sales clerks and cashiers (G2, G3, G011)	25	19
14	Chefs and cooks, supervisors, and other occupations in food and beverage service (G4, G5, G012)	22	21
15	Occupations in protective services (G6)	66	9
16	Childcare and home support workers (G8)	18	24
17	Service supervisors, occupations in travel and accommodation, attendants in recreation and sport and sales and service occupations, n.e.c. (G7, G9, G013, G014, G015, G016)	21	22
18	Contractors and supervisors in trades and transportation (H0)	61	11
19	Construction trades (H1)	35	18
20	Other trades occupations (H2, H3, H4, H5)	58	12
21	Transport and equipment operators (H6, H7)	37	17
22	Trades helpers, construction, and transportation labourers and related occupations (H8)	22	20
23	Occupations unique to primary industries (I0, I1, I2)	15	25
24	Supervisors, machine operators and assemblers in manufacturing (J0, J1, J2)	40	16
25	Labourers in processing, manufacturing and utilities (J3)	20	23

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