Labour / Le Travail
ISSUE 84 (2019)
ISSN: 1911-4842

ARTICLE

Proletarianization of Professional Employees and Underemployment of General Intellect in a "Knowledge Economy": Canada, 1982–2016

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The freedom we have to plan our own work has decreased. I can sort of propose a work plan at the beginning, but then the project managers break that down into individual tasks that will last no more than a week let's say. So, if I don't deliver the deliverable from last week on time, there are often awkward questions. I deal with project managers who don't necessarily have a technical background. … We are salaried employees, wage slaves really, and we're no different from any other worker.
—Owen, automation engineering employee, 2017

Since ancient Roman times, when proletarius referred to citizens who served the state only by fathering children, derivative terms have been used to designate those regarded by dominant elites as of the lowest rank, unworthy of recognition for their efforts. Today the term "proletariat" may be seen by many as antiquated or used to caricature a dwindling group of industrial workers reliant on manual skills. "Proletarianization" is now used by some to describe a process whereby professional workers are claimed to be losing established authority or status.[1] But this process is much disputed. Others have argued conversely that professionals are becoming part of a new ruling

1. For example, see Martin Oppenheimer, "The Proletarianization of the Professional," in Paul Halmos, ed., "Sociological Review Monograph Series: Professionalisation and Social Change," special issue, *Sociological Review* 20, S1 (1973): 213–237; John McKinlay & Lisa Marceau, "The End of the Golden Age of Doctoring," *International Journal of Health Services* 32, 2 (2002): 379–416; John R. Pulskamp, "Proletarianization of Professional Work and Changed Workplace Relationships," in E. Paul Durrenberger & Judith E. Marti, eds., *Labor in Cross-Cultural Perspective* (Lanham, Maryland: Rowman & Littlefield, 2006), 175–192.

D. W. Livingstone, "Proletarianization of Professional Employees and Underemployment of General Intellect in a 'Knowledge Economy': Canada, 1982–2016," *Labour/Le Travail* 84 (Fall 2019): 141–166, https://doi.org/10.1353/llt.2019.0035.

class in advanced capitalist societies.[2] Still others suggest that "professionals are neither new mandarins nor new proletariat, but blend qualities of both."[3] In this inquiry, we will focus on professional employees as non-managerial hired employees requiring specialized abstract knowledge, as do all professionals, but distinct from professionals in other classes with greater authority (i.e. professional employers, self-employed professionals, and professional managers). We will examine recent trend evidence on working conditions, job control, and political attitudes of professional employees to assess whether or not they generally have been experiencing a process of declining authority, or proletarianization, and compare them with both other non-managerial workers and those in other employment classes. I argue that professional employees should be understood as among the direct producers of profits (i.e. collective labour) in capitalism and suggest that the changing working conditions of professional employees could be beginning to shape them as part of a "new working class."

Class relations can be volatile in capitalism, the most dynamic and global mode of production the world has ever experienced. The essence of capitalism is the production and sale of more and more goods and services commodities for private profit by business owners while growing proportions of the world population are compelled to seek hired employment for the means to sustain themselves, increasingly through consumption of some of these commodities. Driven by inter-firm competition for markets, struggles between owners and employees over division of profits and wages, and consequent modification of production techniques, the working conditions of hired labour are continually changing. Since at least the 1970s, this mode of production has been characterized by rapid diffusion of computerized and automated working conditions, rapidly increasing educational attainment by potential labour forces, and increasing emphasis on the strategic import of the minds of workers rather than their manual capacities, leading some to herald the birth of a "knowledge economy." Such claims are hotly contested.[4] But it is clear that the occupational structure in advanced capitalist countries has been shifting away from traditional working-class jobs in heavy industry, and more recently in the service sectors, toward professional and managerial occupations.[5] The working

2. For example, see Daniel Bell, *The Coming of Post-Industrial Society* (New York: Basic Books, 1973).

3. Charles Derber, William A. Schwartz & Yale Magrass, *Power in the Highest Degree: Professionals and the Rise of a New Mandarin Order* (New York: Oxford University Press, 1990), 139.

4. See D. W. Livingstone & David Guile, eds., *The Knowledge Economy and Lifelong Learning: A Critical Reader* (Rotterdam: Sense Publishers, 2012).

5. Charles Derber, "Managing Professionals: Ideological Proletarianization and Postindustrial Labor," *Theory and Society* 12 (1983): 309–341; John H. Goldthorpe, "Social Class Mobility in Modern Britain: Changing Structure, Constant Process," *Journal of the British Academy* 4 (2016): 89–111; D. W. Livingstone & Antonie Scholtz, "Reconnecting Class and Production Relations in an Advanced Capitalist 'Knowledge Economy': Changing Class Structure and

DOI: https://doi.org/10.1353/llt.2019.0035

conditions and orientations of these growing occupations are of central pertinence to the continuing economic development of these countries. Of course, other social conditions intersect with these economic relations, including systemic racism and sexism as well as interplay between working conditions in the centre and periphery of this global system.[6] The primary focus of this article is on professionals and particularly on the changing conditions of professional employees compared with other non-managerial employees within the advanced capitalist setting of Canada.

Conflating Professional Classes

Professionals can be defined generally as practitioners of specialized bodies of abstract knowledge that significant numbers of others take as applicable or needed for their own lives. In pre-capitalist societies, specialized abstract knowledge was commonly associated with a small number of "learned professions" such as priests, medicine men, and law-keepers working on their own or allied with ruling classes to offer useful guidance. Throughout the 19th century in most capitalist countries, established professions such as physicians and lawyers continued to work independently. With the rise of industrial capitalism, the numbers of workers required to develop and apply specialized bodies of systemic knowledge in a widening array of disciplines for production of a growing array of goods and services commodities grew significantly, as did the condition of becoming hired workers.[7] Employees designated as "professional" have become increasingly pivotal to the design, performance, review, and adaptation of the information-based production technologies that pervade the corporate workplaces of capitalist economies today.

The following standard criteria have come to be used in recent times to distinguish professionals from other occupations: completion of post-secondary educational programs for advanced training in the systematic knowledge of the occupation; membership in associations that represent the general interests of those in the occupation; and the presence of regulating bodies that administer codes of practice and licensing.[8] By these criteria, the professionalization

Class Consciousness," *Capital & Class* 40, 3 (2016): 469–493; D. W. Livingstone & Brendan Watts, "The Changing Class Structure and Pivotal Role of Professional Employees in an Advanced Capitalist 'Knowledge Economy': Canada, 1982–2016," *Studies in Political Economy* 99, 1 (2018): 79–96.

6. Pietro Basso, *Modern Times, Ancient Hours: Working Lives in the Twenty-First Century* (London: Verso, 2003).

7. Harold J. Perkin, *The Rise of Professional Society: England since 1880* (London: Routledge, 1989).

8. See Tracey L. Adams, "Profession: A Useful Concept for Sociological Analysis?," *Canadian Review of Sociology* 47, 1 (2010): 49–70. By these criteria, three different levels of professional occupations are now commonly distinguished in terms of the extent of post-secondary education and the breadth of technical skills required (see Peter C. Pineo, John Porter & Hugh

of a growing proportion of the Canadian labour force over the past century has been substantial. The proportion of Canadians in professional occupations grew from about 5 percent to 25 percent from 1901 to 2016.[9] Conversely, the proportions in other "blue-collar" and "white-collar" occupations declined from the vast majority to around half of the labour force. More recently, professional occupations roughly doubled in size between 1982 and 2016 as use of information and communications technologies rapidly infused most forms of paid employment and "knowledge workers" became more pivotal to productivity.[10] But occupations should not be conflated with classes and, as we shall see, professionals are found within several distinct classes.[11]

The rise of industrial capitalist factories and modern corporations also saw a growth in the number of managers to carry out the increasing array of control and coordinating activities required in organizations of increasing size, complexity, and separate nodes of production – from the extraction of raw materials to the sale of finished products. The development of joint-stock companies with many shareholders led to the separation of formal ownership from the direction of such companies by "princes of industry" who assumed more and more operational control of organizational activities.[12] There has been much dispute over the extent to which managers have usurped operational control from large owners of capital, but managerial hierarchies have continued to take on a widening array of forecasting, planning, organizing, commanding, coordinating, and controlling duties in large private and public organizations. By the 1930s, the increasing presence of both professionals and managers provoked critical analyses of their significance. Ever since, leading analysts have frequently conflated professionals and managers into a

A. McRoberts, "The 1971 Census and the Socioeconomic Classification of Occupations," *Canadian Review of Sociology and Anthropology* 14, 1 [1977]: 91–102): established professionals (e.g. physicians, lawyers, architects, engineers), semi-professionals (e.g. nurses, social workers, pilots, computer programmers, optometrists, physiotherapists), and technicians (e.g. engineering technologists, radiological technologists, air traffic controllers, dental hygienists). But all three occupational groups are clearly professional according to these criteria in that they all typically receive advanced training in post-secondary educational programs, commonly join organizations representing their specialty, and are subject to licensing and/or practice codes (Livingstone & Watts, "Changing Class Structure"). The analysis in this article summarizes patterns for all three levels of professional occupations, but similar trends are found for each of them.

9. Statistics Canada, "Workforce by Occupation and Sex, Census Years, 1891 to 1961," Series D86-106, *Historical Statistics of Canada, Section D: The Labour Force*, https://www.statcan.gc.ca/pub/11-516-x/sectiond/D86_106-eng.csv; Livingstone & Watts, "Changing Class Structure."

10. Livingstone & Watts, "Changing Class Structure."

11. Erik Olin Wright, "Class and Occupation," *Politics and Society* 9, 1 (1980): 177–214.

12. Adolf A. Berle Jr. & Gardiner C. Means, *The Modern Corporation and Private Property* (New York: Macmillan, 1932).

DOI: https://doi.org/10.1353/llt.2019.0035

new dominant class that they saw as becoming central to the operation of corporate capitalism.[13] The terms of such presumed dominance have shifted, from directive managerial control to strategic coordination of information and different "estates," and primary spheres of state or market action may be identified, but professionals and managers remain conflated in these accounts of a new leading class.

With the growth of professional occupations since the 1960s, advanced capitalist economies witnessed the development of both professionalization and proletarianization theses. Some researchers, focusing on the increasing numbers of occupations attempting to establish themselves on the basis of work requiring courses of specialized intellectual instruction in institutes of higher learning, argued a dominant tendency toward professionalization in much of the labour force.[14] Others focused on the loss of control in professional occupations that had established some prior autonomy. Studies from a Marxian perspective suggested that professionals had lost control of the labour process in terms of proletarianization.[15] Mainstream studies suggesting deprofessionalization began to appear around the same time.[16] The emergence of such studies may have marked the beginning of the end of a "golden age" of research on professional work that had emphasized the roles of autonomous experts with very high status serving the public good.[17]

The most relevant Canadian historical studies, by David Coburn,[18] documented ways that physicians gained control over the emerging division of labour in the health field until the 1960s, when state regulation and technological routinization began a longer-term process of their proletarianization;

13. For examples, see James Burnham, *The Managerial Revolution: What Is Happening in the World* (New York: Day, 1941); Bell, *Post-Industrial Society*; Barbara Ehrenreich & John Ehrenreich, "The Professional-Managerial Class," *Radical America* 11, 2 (1977): 7–32; Manuel Castells, *The Information Age: Economy, Society, and Culture*, vol. 1, *The Rise of the Network Society*, 2nd ed. (Oxford: Blackwell, 2000); Gérard Duménil & Dominique Lévy, *Managerial Capitalism: Ownership, Management, and the Coming New Mode of Production* (London: Pluto Press, 2018).

14. Harold L. Wilensky, "The Professionalization of Everyone?," *American Journal of Sociology* 70, 2 (1964): 137–158; Richard H. Hall, "Professionalization and Bureaucratization," *American Sociological Review* 33, 1 (1968): 92–104.

15. For examples, see Oppenheimer, "Proletarianization of the Professional"; Magali Sarfatti Larson, "Proletarianization and Educated Labor," *Theory and Society* 9, 1 (1980): 131–175.

16. See Marie R. Haug, "The Deprofessionalization of Everyone?," *Sociological Focus* 8, 3 (1975): 197–213; George Ritzer & David Walczak, "Rationalization and the Deprofessionalization of Physicians," *Social Forces* 67, 1 (1988): 1–22.

17. Elizabeth Gorman & Rebecca Sandefur, "'Golden Age,' Quiescence, and Revival: How the Sociology of Professions Became the Study of Knowledge-Based Work," *Work and Occupations* 38, 3 (2011): 275–302.

18. David Coburn, "Professionalization and Proletarianization: Medicine, Nursing, and Chiropractic in Historical Perspective," *Labour/Le Travail* 34 (1994): 139–162.

nurses have increasingly sought both professional regulation and unionization to contend with their subordination to hospital administrators and physicians. Coburn concluded that "proletarianization is not only produced by the general drive for profits or efficiency but also by inter-occupational conflict. Whatever the fate of individual occupations, proletarianization is clearly evident at the level of the health division of labour."[19]

Subsequently, professional stratification became a more prominent perspective as variations with internal control hierarchies became more evident with the growth of professionals in bureaucracies.[20] Some distinguished between independent liberal professions, organizational-managerial professionals, and more esoteric knowledge consultants.[21] More recently, with the continuing professionalization of management, the notions of "organizing professionals" and "hybridity" have become more prominent. Much of the research on professions in the past decade or so has identified two contrasting forms of professionalism in knowledge base-economies: "occupational professionalism," by which collegial groups of professionals, such as physicians and lawyers in private practice, primarily exercise their own discretionary judgement and regulate themselves guided by collegial codes of practice, versus "organizational professionalism," which is a form of regulation and control of professionals' work by a managerial hierarchy.[22] Some analysts have observed increasing, though unstable, hybrid professional-managerial roles and argued for the development of "organizing professionals" for whom organizing would become a normal part of professional work.[23] There have also been further analyses that begin to recognize internal economic, political, and cultural differences among professionals, between managers and non-managers, but still treat these as variations within a single "professional class."[24]

19. Coburn, "Professionalization and Proletarianization," 161.

20. Eliot Freidson, "The Changing Nature of Professional Control," *Annual Review of Sociology* 10, 1 (1984): 1–20; Justin Waring, "Restratification, Hybridity and Professional Elites: Questions of Power, Identity, and Relational Contingency at the Points of 'Professional-Organisational Intersection,'" *Sociology Compass* 8, 5 (2014): 688–704.

21. Michael I. Reed, "Expert Power and Control in Late Modernity: An Empirical Review and Theoretical Synthesis," *Organization Studies* 17, 4 (1996): 573–597.

22. Julia Evetts, "Professionalism: Value and Ideology," *Current Sociology* 61, 5/6 (2013): 788.

23. For examples, see Mirko Noordegraaf, "From Pure to Hybrid Professionalism: Present-Day Professionalism in Ambiguous Public Domains," *Administration & Society* 39, 6 (2007): 761–785; Noordegraaf, "Hybrid Professionalism and Beyond: (New) Forms of Public Professionalism in Changing Organizational and Societal Contexts," *Journal of Professions and Organization* 2 (2015): 187–206.

24. For examples, see Brigitte Le Roux, Henry Rouanet, Mike Savage & Alan Warde, "Class and Cultural Division in the UK," *Sociology* 42, 6 (2008): 1049–1071; Magne Flemmen, "The Politics of the Service Class: The Homology of Positions and Position-Takings," *European Societies* 16, 4 (2014): 543–569; Crawford Spence, Georgios Voulgaris & Mairi Maclean, "Politics and the Professions in a Time of Crisis," *Journal of Professions and Organization* 4, 3 (2017): 261–281.

DOI: https://doi.org/10.1353/llt.2019.0035

Virtually all prominent perspectives examining class location have failed to identify professionals in different class positions. But, in the same fashion as those originating in skilled-trades occupations have often gone on to establish their own self-employed businesses, occasionally become employers of hired labour, or become managers in larger enterprises as well as being non-managerial hired labour, those with specialized professional training may do so as well. They may continue for some purposes to identify themselves as professionals or skilled trades per se and with the respective organizations set up to speak for said occupations. But I will argue that, once embedded in these different class positions, they tend to take on different class interests.

In contrast to the persistent tendency to conflate professionals and managers into a single class with or without internal fractions, Terence Johnson has observed that those in professional occupations in advanced capitalist economies may be located in several different classes depending on whether they are primarily part of the global ownership function of capital, primarily part of collective labour[25] in a complex cooperative labour process, or a combination of both functions.[26] Some other researchers have clearly recognized the importance of some of these class distinctions among professionals,[27] but the conflation persists in most of the recent literature. Building on Johnson's observations about professional classes, I contend that there are actually four distinct types of professional class positions in advanced capitalism: professional employers, self-employed professionals, professional employees, and professional managers.[28]

Professional employers typically run small businesses and continue to contribute their labour to the development of these enterprises. *Self-employed professionals* work for themselves utilizing their own specialized knowledge. *Professional employees*, like other non-managerial employees, are hired to do a wide variety of forms of labour under the control of employers and managers but all primarily contribute to the collective labour process. In spite of some conceptual discussion of professional employees as occupying

25. Collective labour refers to work conducted within a labour process that is based on machinery and in which the disciplined coordinated activity of various workers becomes a technical necessity. For elaboration on Marx's original insights, see Paul S. Adler, "Marx, Machines, and Skill," *Technology and Culture* 31, 4 (1990): 780–812.

26. Terence J. Johnson, "The Professions in the Class Structure," in Richard Scase, ed., *Industrial Society: Class, Cleavage and Control* (London: Allen & Unwin, 1977), 93–110.

27. Anthony G. Puxty, "The Accountancy Profession in the Class Structure," in David J. Cooper & Trevor M. Hopper, eds., *Critical Accounts* (London: MacMillan, 1990), 332–365; Steven Brint, "Professionals and the Knowledge Economy: Rethinking the Theory of Postindustrial Society," *Current Sociology* 49, 4 (2001): 151.

28. D. W. Livingstone, "Interrogating Professional Power and Recognition of Specialized Knowledge: A Class Analysis," *European Journal for Research on the Education and Learning of Adults* 5, 1 (2014): 13–29.

relatively autonomous and powerful class positions because of their specialized knowledge,[29] they remain primarily part of collective labour. *Professional managers* may be hired as professional employees but once they become managers they, like other managers, simultaneously serve to control other hired employees on behalf of owners and coordinate the collective labour process. All of these professional classes are embedded within the more general employment class structure grounded in the production relations of advanced capitalist economies that distinguishes between owners of the means of production with employees and other owners who work by themselves in self-employment, as well as non-managerial employees and managerial employees.

The general class positions identified in the employed labour force of advanced capitalist societies by Marxist scholars include most of the following: *employers* (including corporate capitalists, large employers, and small employers); the *self-employed*; *managerial employees*, who combine capital and labour functions; and *non-managerial labour* (including professional employees, service workers, and industrial workers).[30] Industrial workers produce material goods in extractive, manufacturing, and construction sectors. Service workers create or deliver a wide array of sales, business, social, and other services. I have argued elsewhere the theoretical case for understanding professional employees, along with service workers and industrial workers, as components of collective labour in advanced capitalism.[31] It should be registered here that the class positions of professionals remain controversial among Marxist scholars. Among those who do distinguish professional employees from managers, there has been a tendency to treat the former vaguely as a "new middle class." But, as Jonathan Pratschke's recent review suggests, "In theoretical terms, … it is more coherent to consider the possibility of classifying at least some 'professionals' as skilled labourers, if they are not in self-employment, do not have managerial responsibilities in relation to workers and are not expert advisers to capital."[32] With the caveat that small numbers of professional employees

29. Erik Olin Wright, ed., *Approaches to Class Analysis* (Cambridge: Cambridge University Press, 2005).

30. For a general discussion, see Guglielmo Carchedi, *On the Economic Identification of Social Classes* (London: Routledge and Kegan Paul, 1977). For a more recent, detailed review, see Livingstone & Scholtz, "Reconnecting Class." For earlier Canadian reviews of class positions and related attitudes, see William Johnston & Michael D. Ornstein, "Class, Work and Politics," *Canadian Review of Sociology and Anthropology* 19, 2 (1982): 196–21; D. W. Livingstone & John Marshall Mangan, "Men's Employment Classes and Class Consciousness: An Empirical Comparison of Marxist and Weberian Class Distinctions," in D. W. Livingstone & John Marshall Mangan, eds., *Recast Dreams: Class and Gender Consciousness in Steeltown* (Toronto: Garamond, 1996): 15–51.

31. See Livingstone & Watts, "Changing Class Structure."

32. Jonathan Pratschke, "Marxist Class Theory: Competition, Contingency and Intermediate Class Positions," in Deirdre O'Neill & Mike Wayne, eds., *Considering Class: Theory, Culture and the Media in the 21st Century* (Boston: Brill, 2018), 59.

DOI: https://doi.org/10.1353/llt.2019.0035

may indeed be expert advisers to capital without managerial authority, I proceed to assess the assumption that *most* professional employees are indeed skilled labourers.

The *class-based* positions of employer, self-employed, manager, and non-managerial employee among professionals, as well as in the labour force generally, are indicative of differential capacities to exercise power for recognition and reward. The extent of job control exercised in these respective class positions can generally be expected to be greatest for owners and least for non-managerial employees, regardless of their specific occupational designations. Our own recent research has found significant differences in job control between these respective professionals in different class positions.[33] By the same token, while professional employees may be primarily part of collective labour, they should not be conflated with non-managerial industrial and service workers at this stage in assessing trends in their working conditions. Most prior research on professionals has either ignored or downplayed the underlying relations of workplace power among employment classes. The remainder of this paper focuses on professional employees and, in particular, on changes in their working conditions in comparison with other non-managerial employees in Canada.

Subdominance or Proletarianization of Professional Employees

There are arguably three stages in the development of the capitalist labour process. Marx traced the *formal appropriation* of the end products of independent skilled tradesworkers by merchant capitalists through the "putting out" system, where control of the labour process remained with the tradespeople themselves.[34] With the rise of more extensive divisions of labour and factory machinofacture, primary ownership of the tools of production and directive control of the labour process were taken over from the skilled trades by capitalist owners and their managerial staffs – a development Marx called *real subsumption* of labour. A century after Marx, Harry Braverman revitalized attention to hired labour's subsumption within the capitalist labour process, registering the extent to which the routinization and standardization inherent in this process was taking over the work of even those "middle layers" of the non-managerial labour force with specialized professional knowledge.[35]

But Marx originally and various analysts recently have also suggested a third phase in the development of labour in the highly automated production system of advanced capitalism, the diffusion of what Marx termed "general

33. Livingstone & Watts, "Changing Class Structure."

34. Karl Marx, *Capital*, vols. 1 and 3 (1867; New York: International Publishers, 1967).

35. Harry Braverman, *Labor and Monopoly Capital* (New York: New York Monthly Review Press, 1974).

intellect."[36] Capitalists continue to try to replace mere labour time with general scientific labour as mediator and regulator of increasingly automated production while also seeking to exploit living labour elsewhere in pursuit of ever more profitable commodities. Marx suggested that general scientific and social knowledge was becoming "a direct force of production and … the conditions of the process of social life itself have come under the control of the general intellect."[37] However speculative or premature this suggestion might have been at the time, it is arguable that the socialization of human knowledge through such means as public education systems, the internet, and social media has, in recent decades, served to greatly expand the demonstrable social knowledge of the potential labour force while automated production has increased. At the same time, owners and top managers of private corporate means of production have increasingly aimed to restrict recognition and reward for the growing numbers of highly qualified workers in advanced capitalist automated production systems, a condition we can now see as *underemployment of the general intellect*.[38]

The general literature on non-managerial workers' job control in advanced capitalism in recent decades has been full of contradictory arguments. Many contemporary researchers have followed Braverman in stressing routinizing and de-skilling aspects of the capitalist labour process.[39] Other researchers have paid more attention to indications of "responsible autonomy" or "re-skilling."[40] Since at least the 1970s, the combination of declining numbers of industrial and service workers still needed in increasingly automated labour processes and the increasing qualifications of the available labour force has stimulated a wide array of job enrichment schemes intended to ensure

36. Karl Marx, *Grundrisse* (1857–58; Harmondsworth, England: Penguin, 1973), 690–743; Paul S. Adler, "Skill Trends under Capitalism and the Socialisation of Production," in Chris Warhust, Irena Grugulis & Ewart Keep, eds., *The Skills That Matter* (Houndmills, England: Macmillan Palgrave, 2004), 242–260; Carlo Vercellone, "From Formal Subsumption to General Intellect: Elements for a Marxist Reading of the Thesis of Cognitive Capitalism," *Historical Materialism* 15, 1 (2007): 13–36.

37. Marx, *Grundrisse*, 707.

38. D. W. Livingstone, *The Education-Jobs Gap: Underemployment or Economic Democracy* (Boulder, CO: Westview; Toronto: Garamond, 1998); D. W. Livingstone, ed., *Education and Jobs: Exploring the Gaps* (Toronto: University of Toronto Press, 2009).

39. Braverman, *Labor and Monopoly Capital*. Examples of such research more recently include James W. Rinehart, *The Tyranny of Work: Alienation and the Labour Process* (Toronto: Harcourt Brace Jovanovich, 1987); Vivian Shalla, "Technology and the Deskilling of Work: The Case of Passenger Agents at Air Canada," in Ann Duffy, Daniel Glenday & Norene Pupo, eds., *Good Jobs, Bad Jobs, No Jobs: The Transformation of Work in the 21st Century* (Toronto: Harcourt Brace, 1997), 76–96.

40. Andrew L. Friedman, *Industry and Labour: Class Struggle at Work and Monopoly Capitalism* (London: Macmillan, 1977); Adler, "Marx, Machines, and Skill."

DOI: https://doi.org/10.1353/llt.2019.0035

continuing integration through some increases in job autonomy.[41] Most studies of either de-skilling or re-skilling inclination have tended to focus selectively on particular workplaces rather than on industrial and service workers more generally. In any case, what Marx called the real subsumption of the industrial working class in the capitalist labour process is not likely the end of the story.

With specific regard to professional employees, Charles Derber provided a useful account of formal appropriation of the end products of their labour, a loss of control he termed "ideological proletarianization."[42] While numerous professional occupations may have historically begun in forms of self-employment, most professional employees today – in either private or state organizations – appear to retain relatively little control over the end products of their labour. The debate today is primarily about the extent to which professional employees have lost internal control of the labour process per se, the process Marx termed real appropriation and Derber called "technical proletarianization."

Those who conflate professionals and managers may still argue for increasing general control over the labour process by professionals in knowledge economies.[43] In spite of Derber's earlier focus on professionals as workers, his subsequent studies with colleagues based on a 1981–83 sample of doctors, attorneys, scientists, and engineers in the Boston area muddied the waters by conflating professional managers with non-managerial professional employees.[44] While it may be true that many professionals with managerial roles continue to mix these with worker roles, non-managerial professional employees have much less ambiguity. This conflation, as well as a focus on the most elite professions, led Derber and colleagues to a conclusion of "professional subdominance." That is, professionals were seen to be in ultimate subordination to employers but to hold "formidable mandarin autonomy and authority over nonprofessional employees."[45] Others have continued this line of argument of professional retention of institutional power while conflating professional classes.[46]

Those who more clearly distinguish professional employees are more likely to argue for their retention of power focused almost entirely on their

41. Charles Derber & William Schwartz, "Toward a Theory of Worker Participation," *Sociological Inquiry* 53, 1 (1983): 61–78; George S. Benson & Edward E. Lawlor III, *Employee Involvement: Research Foundation* (Los Angeles: Center for Effective Organizations, Marshall School of Business, University of Southern California, 2013).

42. Derber, "Managing Professionals."

43. Duménil & Lévy, *Managerial Capitalism*.

44. Charles Derber, *Professionals as Workers: Mental Labour in Advanced Capitalism* (Boston: GK Hall, 1982); Derber, Schwartz & Magrass, *Power in the Highest Degree*.

45. Derber, *Professionals as Workers*, 139.

46. For example, see W. Richard Scott, "Lords of the Dance: Professionals as Institutional Agents," *Organization Studies* 29, 2 (2008): 219–238.

continuing internal control of the labour process per se. From his professional stratification perspective, Eliot Freidson has been one of the strongest advocates for professionals' continuing retention of authority over other workers and their clients.[47] He recognizes professional employees as having a "special position" – paradoxical in that their work limits are set by management resource decisions, but with genuine privilege of exercising considerable discretion because of the specialized intellectual character of their work. Marli Diniz's extensive review of private- and public-sector professional employees' working conditions found that "even when the professional employee loses the control over his work conditions, he keeps the control over his own work, that is, he conserves his technical autonomy."[48] More recently, researchers have made even finer distinctions between dimensions of professional authority and argued that various professionals who are predominantly employees have retained significant personal or individual autonomy as larger organizational constraints have increased.[49]

But the dominant tendency in recent empirical research focused on control of the labour process among professionals who are primarily employees has been to register its loss or possible decline. Both Derber's earlier and later accounts of the demise of end product control focused on the relative retention of control of the labour process by and limited technical proletarianization of professionals. But he also initially recognized that the emergence of new information technologies "could be a basis for the mechanization or routinization of professional work and the undermining of professional monopolies of knowledge … [and] would suggest that ideological proletarianization represents simply the first stage of the same historical process of proletarianization experienced by craft workers."[50] And later, "Employers might seek to intensify the proletarianization of their junior partners, an effort that most professionals will surely resist."[51]

Even among some of those who earlier advocated the emergence of an influential professional-managerial class, views have since shifted dramatically. As Barbara Ehrenreich and John Ehrenreich note, "What has happened to the professional middle class has long since happened to the blue collar class. … [A]ll face the same kind of situation that confronted skilled craft-workers in

47. Eliot Freidson, *Professional Powers: A Study of the Institutionalization of Formal Knowledge* (Chicago: University of Chicago Press, 1986).

48. Marli Diniz, "Repensado a Teoria da Proletarização dos Profissionais" [Rethinking the theory of professionals' proletarianization], *Tempo Social* 10, 1 (1998): 165.

49. Examples include Magnus Frostenson, "Three Forms of Professional Autonomy: Deprofessionalisation of Teachers in a New Light," *Nordic Journal of Studies in Educational Policy* 2 (2015): 20–29; Chris Rønningstad, "A Tale of Two Autonomies," *Professions and Professionalism* 7, 3 (2017): 1–14.

50. Derber, "Managing Professionals," 335.

51. Derber, Schwartz & Magrass, *Power in the Highest Degree*, 139.

DOI: https://doi.org/10.1353/llt.2019.0035

the early 20th century and all American industrial workers in the late 20th century."[52] In any event, most recent studies of professional work, while generally continuing to conflate professional classes, have tended to focus on specific aspects of control of the labour process with increasing loss of control of most of these aspects for various professions.[53]

When the focus is on professional employees rather than undifferentiated professional occupations or a professional-managerial amalgam, accumulating evidence suggests that many current non-managerial professional employees may have begun to go through a technical proletarianization in relation to capital much as skilled tradesworkers did during the first Industrial Revolution. To date, few studies have distinguished professional employees from other professional classes and fewer have addressed professional employees' changing control of their work over time, particularly compared with other non-managerial workers. The remainder of this article addresses these gaps.

Trends in Professional Employees' and Other Non-Managerial Workers' Working Conditions

The primary empirical focus of this article is on the extent to which non-managerial professional employees perceive they are able to exercise job control and the extent to which this perception has changed over time. Proletarianization theses of job control apply most directly to professional employees, rather than to professionals with ownership or managerial positions, and professional employees should be distinguished as clearly as possible from these other professional classes in any empirical assessment. Operationally, respondents should identify whether they own their own businesses and, if so, the number of employees they have, if any. Second, respondents should indicate whether their jobs have formal managerial authority and, if so, at what level. Third, specific occupations need to be identified. With this information, employers and managers can be distinguished from non-managerial employees, and those in professions requiring specialized abstract knowledge can

52. Barbara Ehrenreich & John Ehrenreich, "The Real Story Behind the Crash and Burn of America's Managerial Class," *AlterNet*, 19 Feb 2013, https://www.alternet.org/economy/barbara-and-john-ehrenreich-real-story-behind-crash-and-burn-americas-managerial-class/.

53. For examples, see Lise Demailly & Patrice de la Broise, "The Implications of Deprofessionalisation: Case Studies and Possible Avenues for Future Research," *Socio-logos* 4 (2009): https://journals.openedition.org/socio-logos/2307; Timothy J. Fogarty, "The Bloom is Off the Rose: Deprofessionalization in Public Accounting," in Steven Mintz, ed., *Accounting for the Public Interest: Perspectives on Accountability, Professionalism and Role in Society* (Dordrecht, Netherlands: Springer, 2014), 51–72; Federico Toth, "Sovereigns under Siege: How the Medical Profession Is Changing in Italy," *Social Science & Medicine* 136/137 (2015): 128–134; Sabina Siebert, Stacey Bushfield, Graeme Martin & Brian Howieson, "Eroding 'Respectability': Deprofessionalization through Organizational Spaces," *Work, Employment and Society* 32, 2 (2018) 330–347.

be distinguished from occupations producing material goods in extractive, manufacturing, and construction sectors (industrial workers) and occupations creating or delivering sales, business, social, and other services (service workers) without such professional requirements.

The dimensions of job control of basic interest here are what Marx called the real subsumption of labour in the technical and social division of the labour process: (1) the exercise of technical autonomy and (2) participation in organizational decision-making. Technical autonomy refers to the extent to which one is able to plan and design the set of tasks that need to be performed in one's job. Involvement in organizational decision-making refers to whether or not one has any role in it and, if so, whether this is merely advisory or as a direct decision maker and, further, if one's role is as a direct decision maker, whether this includes involvement in such strategic decisions as hiring and firing or budget development.

Particularly under the impact of automation, credential proliferation, and globalization, I posit a dominant trend toward declining individual job control among the growing numbers of professional employees. Non-managerial professional employees' job control will continue to be constrained by the prerogatives of owners and managers over them. Further, as the distinctiveness of professional employees' specialized knowledge claims diminishes in this context, they could be becoming more similar to increasingly highly educated traditional working-class employees in terms of job control and other related working conditions. In the following analysis, trends in professional employee job control, other working conditions, and political attitudes will be compared with trends for the traditional working class of industrial and service workers. I will also compare these characteristics with those of employers and top managers.

Data Sources

Data sources include a series of five national surveys of the entire labour force in Canada, conducted in 1982, 1998, 2004, 2010, and 2016. All five national surveys have very similar design in terms of questions about occupation, production relations, working conditions, and economic attitudes. The Canadian Class Structure Survey (CCS) conducted in 1982 by Clement and Myles provided a basic template for the later surveys.[54] The later surveys began in 1998, with the New Approaches to Lifelong Learning Survey, and included a larger focus on unpaid as well as paid work and formal and informal

54. "Class Structure and Class Consciousness: Canada file, 1983," data set for Canadian Class Structure Survey (CCS), University of Toronto Data Library Service, accessed 24 Aug 2018, http://sda.chass.utoronto.ca/cgi-bin/sda/hsda?harcsda+cscc83; Wallace Clement & John Myles, *Relations of Ruling: Class and Gender in Post-Industrial Societies* (Montréal and Kingston: McGill-Queen's University Press, 1994).

DOI: https://doi.org/10.1353/llt.2019.0035

adult learning.[55] The national surveys that followed – the Work and Lifelong Learning (WALL) surveys in 2004 and 2010[56] – used the same format and permitted documentation of trends in relations between these dimensions of work and learning.[57] The 2016 survey was conducted as part of the SSHRC-funded Changing Workplaces in a Knowledge Economy (CWKE) project.[58] The 2016 survey focuses only on the employed labour force.[59] In all of these surveys, all respondents are over eighteen years of age and coverage is limited to those who speak English or French and reside in a private home in one of the ten Canadian provinces. In all surveys, the data reported are weighted by the best available population estimates for age, sex, educational attainment, and regional distributions. The differences between professional employees and other employment classes and the trends cited in the text are all significant on difference of proportions tests at the levels of statistical confidence indicated in the following tables. These patterns generally remain consistent with controls for age and sex as well as organizational size and private or public sector, where sample sizes permit assessment.[60]

Modern Canada, the origins of which are as a white settler colony, has had a branch plant economy highly dependent on Britain, France, and now the United States, with a primary basis in the harvesting and export of staple resources such as wheat and bitumen and with relatively less priority to diversify into more knowledge-based industries compared with many other advanced capitalist countries.[61] But Canada is now a fully developed capitalist

55. NALL, "Data Set for the New Approaches to Lifelong Learning Survey," 1998, accessed 24 Aug 2018, http://www.oise.utoronto.ca/clsew/Research; D. W. Livingstone, "Exploring the Icebergs of Adult Learning: Findings of the First Canadian Survey of Informal Learning Practices," *Canadian Journal for the Study of Adult Education* 13, 2 (1999): 49–72.

56. WALL I, "Data Set for the First Work and Lifelong Learning Survey," 2004, accessed 24 Aug 2018, http://www.oise.utoronto.ca/clsew/Research; WALL II, "Data Set for the Second Work and Lifelong Learning Survey," 2010, accessed 24 Aug 2018, http://www.oise.utoronto.ca/clsew/Research.

57. D. W. Livingstone, "Probing the Icebergs of Adult Learning: Comparative Findings and Implications of the 1998, 2004 and 2010 Canadian Surveys of Formal and Informal Learning Practices," *Canadian Journal for the Study of Adult Education* 25, 1 (2012): 47–71.

58. CWKE, "Data set for the Changing Workplaces in a Knowledge Economy Survey," 2016, accessed 24 Aug 2018, http://www.oise.utoronto.ca/clsew/Research.

59. D. W. Livingstone & Milosh Raykov, "The Growing Gap between Post-Secondary Schooling and Further Education: Findings of 1998, 2004, 2010, and 2016 Surveys of the Employed Canadian Labour Force," *Canadian Journal for the Study of Adult Education* 28, 2 (2016): 1–23.

60. For further information on the research design, data sources in this article, and related analyses, see the Centre for Learning, Social Economy and Work website: https://www.oise.utoronto.ca/clsew/Research/.

61. Gordon Laxer, *Open for Business: The Roots of Foreign Ownership in Canada* (Don Mills, ON: Oxford University Press, 1989); Ian Bell, "The Branch Plant Economy," Ian Andrew Bell website, 1 March 2012, https://ianbell.com/2012/03/01/the-branch-plant-economy/.

economy with a highly trained labour force. This labour force has the highest level of general post-secondary education completion in the world. The labour force has also retained a relatively high level of unionization compared to the declines since the 1970s in most advanced capitalist economies.[62]

Findings

The empirical findings presented here address changes in job control in terms of technical task autonomy and involvement in organizational decision-making, as well as other relevant working conditions, most notably underemployment. Possible shifts in political attitudes are also assessed. In all instances, conditions of professional employees are compared with those of the traditional working class of industrial and service workers, as well as with employers and top managers generally and with professional employers and professional top managers.[63] Before proceeding to these specific findings, it should be noted that the distribution of professionals among employer, self-employed, manager, and professional employee class positions remained quite similar throughout the period from 1982 to 2016, with professional employees continuing to make up around 60 per cent of all professions as the numbers of professionals in all class positions grew substantially.

Technical Task Control

The extent of planning and design control of their own work is a central dimension of professional employee autonomy. I posit that professional employees are experiencing more constraints on their task autonomy as a growing managerial hierarchy – including the presence of more professional owners and professional managers – gains more access to and scrutiny over their increasingly computerized specialized knowledge. Table 1 summarizes the extent to which professional employees as well as other employment class respondents perceive that they can plan and design their individual work. The reference here is to how much you think you can control your own job.

A word of explanation is in order here about reading the following tables. First, in addition to professional employees, the employment class groups include service and industrial workers – grouped together in most instances because no significant differences were found between them. Employers and top managers are also grouped together, because of their small numbers and presumed similarity of class interest.[64] Professional employers and professional

62. Milosh Raykov & D. W. Livingstone, "Interest in Unions and Associations in a Knowledge-Based Economy: Canadian Evidence," *Just Labour* 22 (2014): 3–23.

63. As indicated in the following tables, the numbers of employers and top managers in general and the numbers of professional employers and top managers in particular in the samples are relatively small and require grouping for useful comparisons.

64. Top managers are survey respondents who initially report their occupation as an executive

DOI: https://doi.org/10.1353/llt.2019.0035

Table 1: Plan or design own work by employment class, Canada, 1982–2016 (% design all or most of the time)

	1982		2004		2010		2016		1982–2016 change
Employment class	%	N	%	N	%	N	%	N	%
General employer or top manager	94	18	81	338	65	80	80	153	-15
Professional employer or professional top manager	100	9	93	112	74	19	76	41	-24
Professional employee	76[a]	228	63[a]	1,063	68	283	55[a]	597	-21*
Service or industrial worker	30[a,b]	1,099	47[a,b]	2,449	47[a,b]	477	47[a]	1,190	+17*

Source: CCS 1982; WALL I 2004, WALL II 2010; CWKE 2016.

Note: Tests of Significance: Two-sample Z-Test of Difference in Proportions (α=.05); Fisher's Exact Test has been used where sample size is less than 30.
[a] Significant difference (within year) from employer and top manager classes.
[b] Significant difference (within year) from professional employee class.
* $p < .001$

top managers are in even smaller grouped numbers but this grouping is needed to compare professional employees with other professional classes with greater authority. Self-employed professionals and lower managerial groups have been excluded as in more contradictory class positions. Secondly, the primary test of statistical significance is the difference in proportions. Any significant differences between the class groups in a given year are indicated by superscript symbols in the tables. Differences between 1982 and 2016 are indicated by asterisks.

As posited, a declining majority of professional employees believe they can plan their own work. The decline is from around three-quarters in 1982 to a small majority in 2016. Throughout this period, professional employees have usually been less likely to report design control than either employers and top managers in general or professional employers and top managers. No significant differences are found between employers and top managers in general and professional employers and professional top managers. There may have been some decline in employers' and top managers' perceived design control, particularly in the wake of the Great Recession in 2008, but in 2016 their sense of design control remained significantly greater than the declining sense of control among professional employees.

Conversely, *increasing* minorities of service workers and industrial workers express the ability to plan their own work, with the proportions increasing

or general manager and in addition identify themselves as a manager of a plant, branch, or division of an organization.

from around 30 per cent to 45 per cent or more between 1982 and 2016. The perceived increases in such technical autonomy among these traditional working-class employees may be a function of the increasing extent to which the declining numbers of industrial and service workers' jobs entail discretionary mediation of automated machinery rather than more manual tasks, the very substantial increase in educational qualifications of these workers over this period, and managerial strategies recognizing both factors. In any case, industrial and service workers' perceptions of task autonomy appear to be becoming more similar to those of professional employees, with no significant difference between their perceived task autonomy by 2016. This significant pattern of declining discretion for the growing numbers of professional employees and increasing discretion for the declining numbers of industrial and service workers is consistent with some other recent international surveys of "upper white-collar" workers and "blue-collar" workers.[65] As noted previously, some increase in discretion among industrial and service workers is consistent both with the growing qualifications of these workers and with job enrichment efforts by employers to ensure their integration in the capitalist labour process.[66]

However, such perceived task discretion has been highly circumscribed by managerial surveillance throughout this period for *all* non-managerial employees. In 1982 around 90 per cent of professional employees, service workers, and industrial workers had to report directly to a manager or supervisor. Along with some increase in technical autonomy for service and industrial workers, the managerial hierarchy has also been expanding. So, in 2016, around 90 per cent of professional employees as well as service and industrial workers still had to report to a manager or supervisor.

Organizational Decision-Making

The social division of labour is the extent of involvement in organizational decision-making, including whether one participates at all in decisions about organizational matters such as changes in work processes, workload, products delivered, hiring and firing, or budgeting, as well as whether one participates only in an advisory capacity or actually makes such decisions alone or with others. As distinct from task autonomy, this entails explicit power relations with others. Table 2 summarizes the basic findings.

Around half of professional employees indicated participation in organizational decisions in advisory terms through most of this period, but this has declined in recent years to around 30 per cent. Once again, I find that employers and top managers as well as professional employers and managers have

65. See Armi Mustosmaki, Tomi Oinas & Timo Anttila, "Abating Inequalities? Job Quality at the Intersection of Class and Gender in Finland 1977–2013," *Acta Sociologica* 60, 3 (2016): 228–245.

66. Derber & Schwartz, "Toward a Theory of Worker Participation."

DOI: https://doi.org/10.1353/llt.2019.0035

Table 2: Participation in organizational decision-making by employment class, Canada, 1982–2016 (% participate)

	1982		2004		2010		2016		1982–2016 change
Employment class	%	N	%	N	%	N	%	N	%
General employer or top manager	92	61	95	339	91	79	88	153	-4
Professional employer or professional top manager	83	12	87	111	90	19	74	39	-9
Professional employee	44[a]	228	53[a]	1,056	48[a]	283	31[a]	583	-13*
Service or industrial worker	16[a,b]	1,098	40[a,b]	2,433	39[a]	486	27[a]	1,197	+11*

Source: CCS 1982; WALL I 2004, WALL II 2010; CWKE 2016

Note: Tests of Significance: Two-sample Z-Test of Difference in Proportions (α=.05). Fisher's Exact Test has been used where sample size is less than 30.

[a] Significant difference (within year) from employer and top manager classes.

[b] Significant difference (within year) from professional employee class.

* $p < .001$

remained significantly more involved in organizational decisions than professional employees.

Only around 20 per cent of service workers and 10 per cent of industrial workers said they had *any* advisory involvement in organizational decision-making in 1982. In later years, the participation of both industrial and service workers first increased significantly to rival that of professional employees; then, involvement for all non-managerial employees began to decline. Very rapid diffusion of computerized work took place throughout the labour force between the early 1980s and the early 2000s. Between 1990 and 2010 the proportion of the employed Canadian labour force using computers in their jobs increased from under 40 per cent to over 90 per cent.[67] The development of standardized procedures during this period probably required relatively greater engagement – especially of the most knowledgeable service and industrial workers – in this process before routinization of modified labour processes became more common for all non-managerial employees, within the past decade.

Very generally, work on the cutting edge of a new technology means increasing numbers of workers will have opportunities for consultation regarding innovation and new methods to determine which one works best. As soon as a computer technology becomes fully applied, standardized, in widespread use,

67. Livingstone & Raykov, "Growing Gap."

software applications can enable less-skilled operators to do the job; then the opposite trend may unfold: job elimination, routinization, simplification, and repetition, as well as reduced involvement in organizational decision-making. It may be that as computerization increased rapidly in this period, the need for coordination of more interdependent labour processes required greater consultation regarding technical issues with and among the decreasing numbers of traditional working-class employees in increasingly capital-intensive settings. Conversely, the increasing numbers of professional employees may have struggled to retain coordinating control of their more specialized knowledge bases in such computerized labour processes versus management.

It should be emphasized here that general participation in organizational decisions by non-managerial employees does not reflect engagement in the *strategic* issues of hiring and firing or budget making. This remains the starkest dividing line for all non-managerial employees. Professional employees have remained almost totally excluded from strategic employment or budgeting decisions throughout this period, as have service workers and industrial workers.

Overall, the survey findings through the 1982 to 2016 period suggest declining technical design and organizational decision-making control for the increasing numbers of professional employees, in contrast to some increases in job control for the declining numbers of traditional working-class employees. There appears to be significant convergence of the extent of job control for professional employees and other non-managerial workers as well as very limited direct or strategic organizational decision-making power for any of them.

Other Working Conditions: Credential Underemployment

In terms of other working conditions relevant to job control, majorities of both professional employees and other non-managerial employees indicate that they have experienced increasing workloads over the past decade as well as increasing "job churning" in their workplaces (i.e. reduced numbers of employees, greater reliance on part-time or temporary workers, greater reliance on job rotation and/or multi-skilling, and increase in overtime hours). But perhaps the most significant change has been the increasing underemployment of workers' skills.

Underemployment refers to the incapacity of an economy to apply the available time and skills of the active labour force. There are various ways of measuring both time-based and skills-based underemployment.[68] The basic point here is that both time and skill aspects of underemployment have been increasing during this period in various advanced capitalist countries.[69]

68. Richard Desjardins & Kjell Rubenson, *An Analysis of Skill Mismatch using Direct Measures of Skills*, OECD Education Working Papers no. 63, Paris, 2011.

69. For examples, Francis Green, Alan Felstead, Duncan Gallie & Golo Henseke, "Skills and

DOI: https://doi.org/10.1353/llt.2019.0035

Between 1982 and 2016, the formal educational attainments of the potential labour force increased very rapidly in most advanced capitalist countries. In Canada, the proportion of individuals completing post-secondary education grew from about one-quarter to over 60 per cent over this period.[70] Credential underemployment refers to the extent to which the formal educational attainments of the active labour force exceed the education required to enter their jobs.[71] As Table 3 summarizes, the credential underemployment of professional employees as well as service and industrial workers in Canada increased significantly during this period.[72] Professional employees – whose jobs typically require advanced specialized qualification – increased their overqualification from 14 per cent to 27 per cent. Industrial and service workers, who are much less likely to have jobs that require advanced credentials, remain much more likely to have greater credentials than their jobs require. By 2016, over 40 per cent of industrial workers were overqualified and nearly half of service workers were. While overqualification of professional employees understandably remains lower than that of employees whose jobs have lower credential requirements, these high and increasing rates are all indicative of a serious waste of the talent of non-managerial Canadian workers.

As noted previously, Canada has one of the most highly schooled labour forces in the world, partly as a consequence of constructing a relatively accessible post-secondary educational system and partly as a result of selecting highly educated immigrants. Underemployment has clearly been increasing rapidly among Canadian post-secondary graduates in a still relatively staples-oriented economy. It may be that Canada now represents one of the advanced capitalist world's most extreme cases of underutilization of the qualifications of the employed labour force.[73] But the most pertinent point in terms of the

Work Organisation in Britain: A Quarter Century of Change," *Journal of Labour Market Research* 49, 2 (2016): 121–132; D. W. Livingstone, "Skill Underutilization," in John Buchanan, David Finegold, Ken Mayhew & Christopher Warhurst, eds., *Oxford Handbook of Skills and Training* (Oxford: Oxford University Press, 2017), 281–300.

70. Livingstone, *Education-Jobs Gap*; Livingstone & Raykov, "Growing Gap."

71. Respondents were asked to report their highest formal educational credential and to indicate the level of credential required to get their job. Those who held at least one credential higher than required were deemed to be credentially underemployed.

72. Professionals in other employment class positions (i.e. professional employers, self-employed professionals, and professional top managers) are excluded from this analysis of credential underemployment, as are employers and top managers in general. Employers set the terms of their own employment and they delegate top managers to control working conditions of other hired employees. Hence, the matches between their qualifications and job requirements are not directly comparable with those of non-managerial employees and should not be confounded with the latter.

73. It should be noted that a recent international survey found that Canada along with Japan, the United Kingdom, and the United States all had relatively high levels of over 30 per cent on a similar measure of graduate underemployment. See Francis Green & Golo Henseke, "Should

Table 3: Credential underemployment by non-managerial employee class, Canada, 1982–2016 (% underemployed)

	1982		1998		2004		2010		2016		1982–2016 change
Employment class	%	N	%	N	%	N	%	N	%	N	%
Professional employees	14	236	19	156	21	1,039	22	300	27	615	+13*
Service workers	26[a]	566	30[a]	210	39[a]	1,054	39[a]	265	49[a]	673	+23*
Industrial workers	29[a]	517	33[a]	219	35[a]	1,103	39[a]	191	42a	482	+13*

Source: CCS 1982; NALL 1998; WALL I 2004, WALL II 2010; CWKE 2016.

Note: Tests of Significance: Two-sample Z-Test of Difference in Proportions (α=.05).
[a] Significant difference (within year) from professional employees.
* $p < .001$

possible proletarianization of professional employees is that their underemployment rates have nearly doubled during this period, to around a quarter of those who are employed. While their relative underemployment rates may remain lower than among those workers with less-specialized knowledge, this trend indicates a significant increase in the professional reserve army of labour.[74]

Political Attitudes: Labour Rights

If the working conditions of professional employees have shifted toward those of more traditional working-class employees, this raises the question of whether their political views have also become more similar. I leave aside here larger questions of levels of class consciousness and the influence of more specific material conditions.[75] The most basic right of hired workers in capitalist economies is the capacity to withhold their labour to negotiate for more tolerable working conditions. The right to strike has been as central to the sustainability of labour as profit maximization has been to the reproduction of capital. Support for the right to strike has been assessed in all these surveys

Governments of OECD Countries Worry about Graduate Underemployment?," *Oxford Review of Economic Policy* 32, 4 (2016): 514–537.

74. Brynne VanHettinga, "Professional Reserve Armies: Underemployment and Labor Degradation in Professional Occupations," PhD thesis, Walden University, 2015.

75. See, for example, Michael Mann, *Consciousness and Action among the Western Working Class* (London: Macmillan, 1973); Tom Langford, "Strikes and Class Consciousness," *Labour/Le Travail* 33 (1994): 107–137.

DOI: https://doi.org/10.1353/llt.2019.0035

Table 4: During a strike, management should be prohibited by law from hiring workers to take the place of strikers, by employment class, Canada, 1982–2016 (% agree)

	1982		2004		2010		2016		1982–2016 change
Employment class	%	N	%	N	%	N	%	N	%
General employer or top manager	26	61	31	152	50	71	36	114	+10
Professional employer or professional top manager	27	11	47	47	43	14	55	31	+27*
Professional employee	68[a]	227	68[a]	425	80[a]	227	75[a]	487	+7*
Service or industrial worker	68[a]	1,073	69[a]	1,008	60[a]	401	75a	948	+7**

Source: CCS 1982; WALL I 2004, WALL II 2010; CWKE 2016.

Note: Tests of Significance: Two-sample Z-Test of Difference in Proportions (α=.05). Fisher's Exact Test has been used where sample size is less than 30.
[a] Significant difference (within year) from employer and top manager classes.
* $p < .05$
** $p < .001$

by extent of agreement with the following statement: "During a strike, management should be prohibited by law from hiring workers to take the place of strikers." As Table 4 shows, opposition to the hiring of "scab" workers has drawn the support of the strong majority of both professional employees and service and industrial workers throughout this period. Employers and top managers might be expected to be solidary in support of using replacement workers in pursuit of flexibility in their labour forces, and strong support has been consistent among large employers. But smaller employers express more opposition to scabs and more sympathy for workers with whom they must work closely in competition with larger enterprises.[76] Similarly, professional employers and managers who share their initial training programs with professional employees, and are more likely to work with them in smaller firms, express growing opposition to "scabs."

The finding that opposition to "scabs" has been strong and increasing among both professional employees and service and industrial workers over this period is consistent with the increasing instability of their working conditions and growing underemployment. It suggests that the reverse changes that have occurred in their perceived job control have not altered the support of either professional employees or service and industrial workers for basic labour rights. Indeed, it might be argued that perceptions of declining job

76. See Livingstone & Scholtz, "Reconnecting Class."

control among professional employees coupled with their now greater levels of organization through membership in unions as well as associations could offer quite significant potential for leading further struggles for workers' rights.

There have been significant gains over this period in opposition to the profit motive for professional employees, as well as for service workers who have experienced the largest increases in underemployment.[77] These are still minority views. None of this is sufficient evidence to suggest the emergence of coherent oppositional class consciousness among non-managerial employees. But these data do indicate a convergence in the political attitudes of professional employees and more traditional working-class employees.

Conclusion

As professional occupations grow more prevalent in the labour force, it becomes more pertinent to understand the extent to which those in these occupations control their jobs so widely heralded as strategic to productivity and sustainability of advanced capitalist "knowledge economies." Theses about increasing professionalization of the labour force presume growth in job control; conversely, proletarianization theses assume decreasing control. For both the labour force in general and professional occupations in particular, the class position one is in must be considered to assess these theses with regard to the dimensions of task autonomy and organizational decision-making that are the focus of this article.

Between 1982 and 2016, according to our Canadian evidence, professional employees – as distinct from professional employers, professional managers, and self-employed professionals – generally have had declining task autonomy as well as very limited and decreasing involvement in organizational decision-making, plus increasing underemployment and a general worsening of other relevant working conditions. On the basis of this time series of national labour force surveys in one advanced capitalist country, I conclude that proletarianization is the dominant recent trend among professional employees.

Increasing task autonomy and some increased participation in decision-making among the decreasing numbers of industrial and service workers has been an equally notable change, consistent with their increasing levels of educational qualifications and demonstrable knowledge. The perceived working conditions of professional employees are converging with those of more traditional working-class workers. The evidence here also suggests that professional employees' political attitudes may be more similar to those of traditional working-class employees and more distinct from those of employers and top managers than has previously been assumed. These trends could be

77. Livingstone & Watts, "Changing Class Structure."

DOI: https://doi.org/10.1353/llt.2019.0035

a pivotal factor in the future of the labour movement in advanced capitalist economies.[78]

In addressing the "middle layers" of employment in advanced capitalism, Braverman suggested in 1974 that the likes of engineers, nurses, technicians, and other professional employees would become parts of mass labour markets with degradation of their labour processes, declining privileges, and growing reserve armies of labour.[79] There is support in this series of surveys that, as of 2016, Braverman's prediction of increasingly alienated labour and critical attitudes among professional employees has merit.

But with his emphasis on pervasive degradation of labour by capital, Braverman paid virtually no attention to the combined development of the polyvalent knowledge of collective labour in highly automated production systems and the broader impact of the increasing socialization of knowledge in advanced capitalism. This is the emergence of the "general intellect" that Marx glimpsed in his notes on machines. Marx suggested that, with the development of scientific labour and automated machinofacture, expenditure of human energy in the labour process would be minimized while time for development of polyvalent workers – the collective worker with general intellect – could be furthered. Other scholars have begun to analyze this development in more depth in the context of emergent "high-technology capitalism" or "cognitive capitalism."[80] But these scholars have paid little attention to the distinction between the knowledge attained by workers and the knowledge required to perform existing jobs. By many measures, non-managerial workers' attained knowledge increasingly *exceeds* that required by their jobs, a condition we should increasingly recognize as the *underemployment of general intellect*.[81]

The basic point here is that, at least according to the Canadian survey evidence, remaining industrial and service workers are becoming much more highly educated and much more underemployed while remaining as supportive of workers' rights as professional employees. As professional employees and traditional working-class workers converge in their perceived working conditions and critical attitudes, a reserve army of highly qualified unemployed and underemployed labour becomes increasingly available in advanced capitalism for options such as development of alternatives to capitalism. Generations ago, a "new working class" to lead challenges to capitalism was heralded as

78. Livingstone & Watts, "Changing Class Structure."

79. Braverman, *Labor and Monopoly Capital*, 403–409.

80. For examples, see Nick Dyer-Witheford, *Cyber-Marx: Cycles and Circuits of Struggle in High-Technology Capitalism* (Chicago: University of Illinois Press, 1999); Adler, "Skill Trends under Capitalism"; Vercellone, "From Formal Subsumption"; Christian Fuchs, *Reading Marx in the Information Age: A Media and Communication Studies Perspective on Capital*, vol. 1 (New York: Routledge, 2016).

81. See Livingstone, *Education-Jobs Gap*; Livingstone, ed., *Education and Jobs*; Green et al., "Skills and Work Organisation."

emerging among technical workers with scientific knowledge and significant mediating roles in more highly automated industrial sectors in France.[82] Empirical researchers in other countries could find few traces.[83] I should not exaggerate the coherence of professional employees' conditions or minimize the obstacles to their effective mobilization. But it is just possible that professional employees could become a "new working class" to lead the labour movement in the 21st century.

To my knowledge, this is the first study to systematically investigate trends in the working conditions and political attitudes of professional employees (as distinct from professionals in other class positions) in comparison with the traditional working class of industrial workers and service workers in recent times. Any conclusions must remain tentative until further investigations – with a wider range of populations and measures of job control, related working conditions, and attitudes – are conducted going forward. But two things are becoming clearer. Rather than continuing to ignore or conflate professional employees with professionals in other classes, further investigations of the job control, other working conditions, and attitudes of professionals should become much more sensitive to these class distinctions. Second, the apparent increasing convergence in conditions of professional employees and other nonmanagerial workers in an emergent advanced capitalist "knowledge economy" should be examined much more fully by analysts and workers themselves as a potentially pivotal development.

Funding

This work was supported by the Social Sciences and Humanities Research Council of Canada, primarily under grant number 435-2015-0732.

A prior version of this paper was presented to the Research Committee on Sociology of Professional Groups at the xix isa World Congress of Sociology, Toronto, July 2018. I am grateful to Tracey Adams and Peter Sawchuk as project co-investigators, to Anders Blok, Raewyn Connell, David Guile, and Wally Seccombe and to the anonymous reviewers for comments on the paper, and to Brendan Watts for statistical work.

82. Serge Mallet, *The New Working Class* (Nottingham, England: Spokesman, 1975).

83. For example, see Duncan Gallie, *In Search of the New Working Class: Automation and Social Integration within the Capitalist Enterprise* (London: Cambridge University Press, 1978).

DOI: https://doi.org/10.1353/llt.2019.0035