But there is a growing research consensus that underemployment (a.k.a. as underutilization, overqualification, overeducation or overskilling) is the most substantial and significant of these mismatches (McGuiness, Pouliakas and Redmond 2017, 36).

The potential application of the specialized knowledge qualifications of post-secondary graduates and the actual application of the specialized knowledge of professional employees[ii] generally have been assumed to be of most strategic importance to the development of advanced capitalist knowledge economies The present study summarizes trends in dimensions of underemployment based on a unique time series of the general Canadian labour force from 1982 to 2016.[iii] Particular attention is devoted to the extent to which underemployment of highly qualified workers is related to their continuing learning practices and job-related attitudes.

Basic Dimensions of Underemployment

Participation in paid work has two basic dimensions: time employed and skill and knowledge use.

Time underemployment: At the extreme, there is total unemployment which includes those who have given up looking for employment, discouraged workers who look occasionally when opportunity occurs and the officially unemployed who have actively looked for employment in the past several weeks. Virtually all of these people would take employment if it were offered to them. Then there are those with part-time employment. This includes some who prefer part-time employment in combination with other unpaid work and other commitments, as well as involuntary part-timers who want or need full-time employment but cannot get it. It is the involuntary part-time employees who are most commonly identified as underemployed in terms

relatively small proportion of the employed labour force and varies with business cycles (e.g. Carnevale and Smith 2015; Warren 2015: ILO 2019). It will not be considered further in this analysis.

Skill and knowledge use in job: among those who have paid employment, there are wide variations in the extent to which workers are able to utilize their knowledge and skills to get jobs and perform them. Knowledge has commonly been measured in terms of formal educational qualifications while skill estimation has entailed various estimations of specific technical abilities. Overqualification and overskilling are both indicators of surplus human capital but they have been found to be weakly correlated in the few previous studies that have addressed multiple forms of educational and skill mismatch (e.g. Flisi et al. 2014). There is no necessary correspondence between formal educational qualifications and actual skills brought to and required for the job. In particular, it has been demonstrated that many workers with limited educational credentials have had deep practical skills to perform their jobs and that these skills may also be significantly underemployed (e.g. Livingstone and Sawchuk 2004). In the current study, we will focus on educational qualifications mismatches and specifically credential underemployment, the extent to which workers have at least one greater credential than required to enter their current jobs. In contrast to the cyclical nature of involuntary part-time employment, credential underemployment may now be increasing cumulatively in many advanced capitalist societies

There are various challenges to conceptualizing and measuring attainments, requirements and mismatches which have been scrutinized in prior literature (e.g. Desjardins and Rubenson 2011; Leuven and Oosterbeek 2011; McGuiness et al. 2017). In this paper we will concentrate on self-reports of educational attainments and credential requirements for jobs to construct a measure of credential underemployment, the extent to which highly qualified workers educational qualifications exceed the entry requirements for their current jobs, as well as their self-reported subjective overqualification and overskilling. In addition, we will assess relations of credential underemployment with involvement in continuing learning activities and job-related attitudes. The main focus will be on those who have attained post-secondary credentials.

At least since the 1970s, analysts have been expressing concerns about underemployed post-secondary graduates (e.g. O Toole 1975). In the 21st century era of mass higher education, such concerns are becoming more pervasive (e.g. Green and Henseke 2016). One of the few recent comparative surveys of trends (CEDEKOP 2018, 42) finds that: the prevailing trend in the data is one of recent job finders entering into jobs demanding fewer, rather than more, qualifications and skills than they have and that post-secondary graduates are predominantly affected (p. 68). The same survey (CEDEKOP 2018, 85) concludes that: 39% of EU employees have skills that are not being fully used in their jobs and so do not have potential to develop their skills further. Another comparative study has found overqualification averaging around 25 percent on various measures for the general labour force in mostly advanced capitalist countries (McGuiness et al. 2017, 22) Still another study found the incidence of credential underemployment self-reported to

addition to employers, as well as to mediations by governments. So, inevitably there have been gaps or mismatches between the qualifications expected by employers and the qualifications achieved by the potential labour force at any particular moment in capitalist economies. Such gaps have historically led to adjustments in qualifications required, more advanced forms of formal education or both, as argued, for example, in Bowles and Gintis (1976) correspondence thesis. However, we may now be reaching a tipping point at which the aggregate qualifications of the labour force irreversibly exceed the qualifications required by advanced capitalist workplaces, a condition we might term chronic underemployment.

Advanced capitalist economies today are generally characterized by the following features:

> dominance by large and increasingly concentrated private corporations of increasing global reach, with large commodity market shares, large managerial hierarchies, and capacity to draw on international labour markets increasingly beyond the effective reach of nationally organized labour and elected governments (Vitali et al. 2011; Hart-Landsberg 2015);
>
> continued ascendancy of capitalist owners over hired labour in terms of discretion in both hiring requirements and working conditions (Estanque and Costa 2012; Panitch and Gindin 2013);
>
> employed and potential labour forces that are rapidly becoming more highly qualified for paid labour in terms of educational credentials and other usable knowledge available through digital technology (Livingstone 2009).

French and reside in a private home in one of the 10 Canadian provinces. In all surveys, the data reported are weighted by the best available populatio

workers involved in basic clerical, sales and service jobs, industrial workers involved in basic material goods production and professional employees who are distinguished from other non-managerial employees by advanced post-secondary training in specialized occupations. Professional employees should also be distinguished from those in other professional classes (i.e. professional employers, self-employed professionals and professional managers) with whom

specific employment indicators. Unpaid household work along with community volunteer work still make up about half of the work Canadian adults do, but discretionary volunteer work appears to be declining in relation to increasing pressure and uncertainty of paid employment. Wage levels have stagnated while household debt levels have increased significantly. The general working conditions of the employed Canadian labour force have definitely become more unstable during the first part of this century.

Growth of post-secondary completion *and* credential underemployment

In the context of rapidly changing employment conditions, the popular demand for more advanced formal education to contend for jobs

1982 but post

digitally engaged and used computers in their jobs, a very rapid and inclusive dissemination of a new information technology. There were undoubtedly wide variations in the level of computer skill required

As Table 5 shows, similar declines are found among both post-secondary graduates and professional employees. It may be particularly notable that participation rates in further education have declined to minorities for post-secondary graduates. There is also a significant negative correlation between credential underemployment and participation in further education in all surveys between 1998 and 2016 for post-secondary graduates (_ -.148 to -.333, p= .000). We can posit that recent decline in further education is related to the increasing over-supply of post-secondary graduates who offer greater qualifications than employers need. There may be diminishing motivation for employers to provide time or material incentives for their employees to pursue further education. At the same time, highly qualified underemployed workers may have diminishing interest in pursuing courses offering little evident benefit in such jobs. The changing working conditions in this period also suggest an employed labour force increasingly preoccupied with coping with increasingly unstable job conditions, still compelled to take care of essential unpaid household work, and perhaps with decreasing opportunities to engage in more discretionary activities including further education. It is also possible that, in workplaces increasingly immersed in computerized information networks, more continuing learning is occurring closely integrated with digitized labour processes and less visible to workers themselves knowledge work and learning becoming increasingly fused. What we can be reasonably sure of, as Table 5 shows, is that post-secondary graduates who are underemployed have had lower reported rates of participation in further education than matched or underqualified graduates and that their participation rates have continued to decline in recent times. Aggregate increases in credential underemployment do appear to have a general

benefits for participating in its most organized forms of further education, especially for those highly qualified workers with already identified surpluses of credentialled knowledge.

(Table 5 about here)

However, two distinct dimensions of lifelong continuing adult learning have often been conflated in many surveys and should be distinguished: organized further education courses and training programs on one hand and informal learning activities that people engage in through their own individual or collective initiative on the other (Livingstone 1999). Our research and many other studies have found that most participation in further education has been job-related, that informal job-related learning has been much more extensive than formal courses, and that those who engage in courses have also been more likely to engage in informal job-related learning (Livingstone 2009). What is most notable here is the finding in this series of Canadian surveys of work and learning that the incidence of informal job-related learning also appears to be declining in this period. Informal learning is much more diffuse than further education and harder to estimate. But, self-reported participation in job-related informal learning declined from 90 percent in 2010 to 75 percent in 2016. Further, as Table 6 summarizes, the estimated volume of time that workers report spending on job-related informal learning topicsatisfactions appears to have declined since 1998 for the general labour force, from around 7 hours per week to under 4 hours. Results for post-secondary graduates and professional employees are very similar, dropping from over 6 hours to 4 hours or less. The vital importance of on-the-job skill accumulation is recognized by most analysts (e.g. McGuiness et al. 2017, 28; Cedekop 2018, 87). The iceberg of informal job-related learning will presumably endure as the foundation of continuing renewal of the knowledge and skills of the labour force. But, if we assume that further education and informal job-related learning are both necessary for the continuing renewal of the

working knowledge and skills of the labour force and knowledge workers in particular, apparent declines in both further education and informal job-related learning are worrying.

(Table 6 about here)

Attitudes to Underemployment

Trends toward increasing credential underemployment may not be of much political or policy consequence unless coupled with more critical attitudes toward working conditions. Here we will consider links of reported credential underemployment with subjective attitudes toward underemployment and skill use, as well as job satisfaction and some indicators of critical attitudes toward working conditions.

One of the most relevant questions about skill use that has been asked in a number of countries in surveys over time in recent years

the general labour force (___.339 to .476, p= .000), post-secondary graduates (= .365 to .482, p= .000) and professional employees (___.387 to .461, p= .000). We conclude that those in the Canadian labour force in general and highly qualified labour in particular are becoming increasingly aware of both their credential and skill underemployment.

Job Satisfaction

Green and Henseke (2016, 531-33) found that, among post-secondary graduates across many advanced capitalist countries, credentially-matched graduates report significantly less dissatisfaction with their current job than underemployed graduates while in a few countries the differences are either not or only weakly statistically significant. An extensive review (McGuiness et al. 2017, 20) observes that some studies indicate that overeducation in terms of educational qualifications leads to lower job satisfaction while others find that is only the case when overeducation is also accompanied by overskilling (i.e. having skills to cope with more demanding jobs).

Standard measures of job satisfaction are available in the Canadian surveys between 2004 and 2016. There is a consistently significant association between this variable and employment class (2004: __ .165, p= .000; 2010: __ .120, p= .001; 2016: __ .162, p= .000). In 2016, for example, two-thirds of employers say they are *very* satisfied with their jobs compared with only one third of industrial and service workers; professional employees are closer to these other non-managerial workers at 40 percent. No significant relationships were found between credential underemployment and job satisfaction in earlier surveys for the general labour force or post-secondary graduates, but the relationship between these variables became significant in 2016 for both the general labour force (__ -.117, p= .000) and for post-secondary graduates (__ -.121, p=

.000)

more adherence to optimistic individualistic entitlements than collective rights (Derber 1979) and at least one more recent general survey has found similar expressions of individual optimism (Pew Research Center 2012).

One question that has been asked in our surveys from 1982 to 2016 is whether or not

increasing significantly in its general incidence in the labour force and among highly qualified workers in particular. Subjective perceptions of both overeducation and overskilling now appear to be widespread. Conditions of underemployment also now exhibit significant relations with declining engagement in further education courses and informal job-related learning. The most comparable recent study of trends in European countries concluded that:

> Overskilled employees are usually found in jobs with [relatively] limited task complexity (given their higher overall skill level) and this inhibits their further -makers should be greatly concerned by high overskilling rates in labour markets, as they are a sign of stagnant growth in skills and skill needs (Cedekop 2018, 14, 74).

The declines of participation in both further education and informal job-

recent Cedekop study (2018, 74) advises: Policy-makers should seek to improve workplace innovation and job quality.

However, there has been very little research to date that has assessed the effects of underemployment, overeducation or overskilling on macroeconomic indicators (see

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Table 1. Post-secondary completion and credential underemployment, employed labour force, Canada, 1982-2016 (%)

	1982	1998	2004	2010	2016
Post-secondary attainment	25	49	56	64	68
Credential underemployment	24	28	34	31	39

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

Table 2. Trends in credential underemployment, employed labour force, Canada, 1982-2016 (% underemployed)

Employment class	1982	1998	2004	2010	2016
Post-secondary graduates	34	43	43	38	45
Professional employees	14	19	21	22	26
Service workers	26	30	39	39	49
Industrial workers	29	33	35	39	42
Total					

Table 3. Computer skill requirements and skill underemployment, employed labour force, Canada, 1989-2016 (%)

	1989	1994	2000	2004	2010	2016
Required to use computer on job	38	51	77	85	95	97
Have greater computer skill than required by job	-	-	-	51	49	49

Sources: Statistics Canada 1989, 1994, 2000; WALL I 2004; WALL II 2010; CWKE 2016.

Table 4. Post-secondary educational attainment and annual participation in further education, employed labour force, Canada, 1982-2016 (%)

	1982	1998	2004	2010	2016
Post-secondary completion	22	49	56	61	68
Further education	24	49	55	54	42

Sources: CCS 1982; Devereaux 1985; NALL 1998; WALL I 2004; WALL II 2010; CWKE 2016.

Table 5. Credential underemployment and annual participation in further education, employed labour force with post-secondary credentials, and professional employees' participation in further education, Canada, 1998-2016 (%)

Post-secondary graduates	1998	2004	2010	2016
Underemployed	64	55	52	39
Match	76	63	66	50
Underqualified	77	74	76	49

All graduates	71	61	61	45
N	*365*	*2885*	*750*	*1879*
Professional employees	75	67	72	51

Sources: NALL 1998; WALL I 2004; WALL II 2010; CWKE 2016

Table 6. Informal job-related learning, employed labour force, Canada, 1998-2016 (average estimated hours per week)

	1998	**2004**	**2010**	**2016**
General labour force	6.9	5.2	5.5	3.5
Post-secondary grads	6.2	3.8	4.9	4.1
Profess. employees	6.5	5.0	4.7	2.9

Sources: NALL 1998; WALL I 2004; WALL II 2010; CWKE 2016

United Kingdom	40	58
EU	32	57
Greece	47	56
Spain	37	55
France	30	56
Sweden	34	55
Denmark	25	55
Germany	27	53
Canada	51	44

Sources: Eurofound 2018; WALL II. 2010; CWKE. 2016.

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