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A Novel Measure of Work Stress: Identifying Work Stressor Patterns in Canada Using Latent Class Analysis

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A NOVEL MEASURE OF WORK STRESS: IDENTIFYING WORK STRESSOR
PATTERNS IN CANADA USING LATENT CLASS ANALYSIS

by

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ABSTRACT

This analysis utilizes data from the 2012 Mental Health component of the Canadian Community Health Survey (CCHS-MH) and latent class analysis to identify patterns of stressful work environments and their relationship with occupational and social location. Based on the intersection of 12 work stress measures, five classes of stressful work environments emerged that can be described as low stress, high stress, physical stress, monotonous, and chaotic environments. Results from models including covariates show that work stress exposure is stratified by occupation, socioeconomic status, age, gender, race/ethnicity, immigrant status, and marital status. Notably, blue- and pink-collar workers had higher odds of experiencing patterns of high stress and physical stress. With some exceptions, less educated, lower income workers, as well as women and younger workers, were more likely to experience all patterns of stressful work environments compared to experiencing low stress.

Keywords: work stress, work stressors, latent class analysis, workplace environment

INTRODUCTION

Work stress remains a salient and globally-prevalent phenomenon. Between 1997 and 2005, high

work stress was experienced by more than one-third of workers in several post-industrial and

industrial economies[1] (Steiber and Pichler 2015). Over 40% of these workers report feeling

exhausted after a day at work. Work stress is also important in the Canadian context. Just over a

quarter of working Canadians report daily high stress (Crompton 2011). Most (65%) identify their

work situation as the main source of this stress (Crompton 2011), and 28% report high stress in the

workplace (Mental Health Commission of Canada 2015). Feelings of work stress also seem to be

increasing: According to a Desjardins Financial Security National Health Survey, from 2009 to

2010 work stress among Canadians increased by nearly 30% (Mood Disorders Society of Canada

2016). Elsewhere in the Western world, work stress contributes to the already high stress levels

experienced by Americans and Britons (American Psychological Association 2009; Griffin and

Clarke 2011). The outcomes of work stress are numerous. In Canada, it is a main predictor of

psychological distress (Marchand, Demers, and Durand 2005) and its harmful effect on mental

health is estimated to cost employers $20 billion annually (Crompton 2011). It is also a significant

source of job burnout or exhaustion (Yu et al. 2015) and depression, anxiety, and other common

mental health disorders (Crompton 2011; Clark et al. 2012). Higher levels of work stress are also

associated with more physical health issues (Christie and Barling 2009; Crompton 2011; Health &

Safety Executive 2016; Goh, Pfeffer, and Zenios 2016). Work stress is financially taxing on

workers, employers, and the economy (Wallace et al. 2009; Väänänen, Murray, and Kuokkanen

2014). Clearly, work stress is a persistent social and personal issue. The present study contributes

to a contextual understanding of how work stress manifests in the Canadian context.

In contrast to psychological approaches, contextual and structural approaches to studying

work stress are currently underrepresented in the literature. As such, this paper examines data from

the 2012 Mental Health component of the Canadian Community Health Survey (CCHS-MH) to

contribute to this sparse body of work by (1) identifying a typology of stress, or the most common

patterns or combinations of stressors experienced by Canadian workers; and (2) determining how

these distinct patterns representing stressful work environments and experiences are stratified across

occupational and social groups. Generally, the Canadian occupational structure is stratified into

three occupational groupings: white-collar, characterized by management, professional, technical, or

executive positions; blue-collar, which includes trades, transport, manufacturing, and processing;

and pink-collar or sales and service work (Gallo et al. 2005; Crompton 2011). Because on-the-job

demands are highly stratified by occupation, it is expected that stressor patterns will be related to

occupational position. Education and income hierarchies closely follow occupational differences,

and are likely to be major determinants of stress experiences (Burke 2002), as are gender and

race/ethnicity as indicators of social stratification and exposure to similar social and economic

conditions (Pearlin 1989). Expanding contextual stress research helps identify salient points of

intervention in organizational culture and structure (Cavanaugh et al. 2000; Theorell 2003), and has

in fact proved to be successful in guiding such intervention on stress and well-being (Randall,

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1 This statistic is based on a study of 13 countries: the Czech Republic, Denmark, France, Germany, Great Britain, Hungary, Ireland, Norway, Portugal, Slovenia, Sweden, Switzerland, and the United States (Steiber and Pichler 2015).

Nielsen, and Tvedt 2009; Griffin and Clarke 2011).

THEORETICAL STRUCTURE

Sociological perspectives are valuable for expanding the scope of scholarly work on stress, despite this literature being currently dominated by psychological approaches (Pearlin 1989). In what follows, I synthesize contextually-oriented work stress theory and research with elements drawn from psycho-social theory. The latter are considered for (a) how these are useful for drawing attention to salient stressors, and (b) providing suggestions for how stressors may be combined to characterize everyday work environments. On the whole, a contextual account of work stress is proposed for theorizing how stress in general and stressors in particular may identify workplace structures and their distribution across social groups (Hobfoll 2001; Väänänen et al. 2014). Moreover, it is argued that this contextual approach better specifies the phenomenological stress experience of employees (Sikora, Beaty, and Forward 2004).

Generally, stress is conceptualized as comprising of two dimensions (Griffin and Clarke 2011; Ganster and Rosen 2013). The first is *strain*, a negative physical or emotional internal response to any external stimuli or factors that require behavioural change (Griffin and Clarke 2011; CCOHS 2012; MDSC 2016) or some "mobilization of energy" (Theorell 2003:202). The specific environmental factors inducing strain are *stressors* (Theorell 2003; Ganster and Rosen 2013) – the "primary drivers" of the stress process (Griffin and Clarke 2011:359). For example, common stressors include repetitive tasks (van der Doef, Maes, and Diekstra 2000), a hectic workplace (de Jonge et al. 2000), and low workplace social support (Crompton 2011). *Work stress* occurs when the individual has a negative internal response to the demands of the job environment; work

stressors are those specific demands (Theorell 2003; Griffin and Clarke 2011). As stress is both

environmentally induced and individually experienced, a consideration of both dimensions is

important for understanding overall stress (Hobfoll 2001; Griffin and Clarke 2011; Ganster and

Rosen 2013).

However, dominant theories of work stress are psychological in nature and thus

overwhelmingly oriented toward internal strain mechanisms (Hobfoll 2001). For example, such

studies focus on internal effort and feedback imbalances and the role of emotional intelligence

(Chang and Chang 2010), or how personality traits mediate stress outcomes (Näswall, Sverke, and

Hellgren 2005; Christie and Barling 2009).[2] The work environment and the societal and

organizational structure(s) that host such micro-processes have not been given as much analytic

attention (Väänänen et al. 2014). Väänänen, Murray, and Kuokkanen (2014) found support for this

criticism in a meta-analysis of the scholarly work stress literature:

> In the same way as Foucault talks about medicine locating illness within the physical interior of the
>
> individual, this scientific representation normally locates work stress within the individual, or the
>
> immediate working relations, and thus *evades concern about broader structural issues* [my emphasis]
>
> (P. 133).

This has led to the promotion of "occupational health consciousness," idealizing the "proactive" and

"action-oriented" employee and undermining the impact of organizational structure (Väänänen et al.

2014:132; see also Hobfoll 2001). Moreover, research has privileged the biomedical model which

is limited in accounting for the external factors that affect stress experience. Similarly, Pfeffer (2010)

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2 An overview of this literature is beyond the scope of this paper, and can be reviewed elsewhere (e.g. Chang
and Chang 2010; Bono et al. 2013; Griffin and Clarke 2011; Ganster and Rosen 2013).

argues that little attention has been paid to studying the effects of the social environment on individual stress.

Rather than arguing for the predominance of either a social or psychological perspective, both are needed to guide research to "develop a much richer appreciation of how organizational, social, and individual factors combine to influence what is experienced at work" and how this induces the stress process (Daniels 2006:268). Sociological research on stress is necessary to determine the extent to which structure affects well-being (Pearlin 1989), and to balance out current, internally-oriented studies (Hobfoll 2001). It can also help pinpoint much needed changes in organizational culture and structure (Cavanaugh et al. 2000; Theorell 2003) that are outside the control of employees, and has in fact proved to be successful in guiding workplace interventions for improving stress levels and well-being (Randall et al. 2009; Griffin and Clarke 2011). Past sociological and structural theories of work stress have focused on "the fit of [employees'] personal, social, economic, and environmental resources with external demands" when dealing with stress, as well as how this is connected to structural inequality (Hobfoll 2001:339). In addition, the literature includes work on organizational stress support mobilization (Lawrence, Jordan, and Callan 2015), cultural trends in scholarly publications on work stress (Väänänen et al. 2014), and the role of management and control over the work process or job design in defining stress experiences (Shuey, Gordon, and McMullin, forthcoming).

The current study contributes to this literature by calling attention to the immediate organizational structure and its relationships with patterns of widely acknowledged work stressors. Thus, stress is conceptualized as an external phenomenon arising from the work environment itself

(Hobfoll 2001; Pfeffer 2010), or an "environmental press" (Greenhalgh and Rosenblatt 1984:440). Identification of the organizational structure requires approximating typologies of work positions, job design, or immediate work environments, which are expected to be characterized by the differential nature, amount, and quality of work required of the individual (Marchand et al. 2005; Pfeffer 2010; Griffin and Clarke 2011). While my thematic interest is on stressors, there is a myriad of extant characteristics that shape employee experience such as healthcare and other benefits, or work-family (im)balance (Pfeffer 2010). Work stress was chosen because of its prevalence, significance to physical and mental well-being, and its existence as a defining feature of workplaces.

This undertaking emphasizes the phenomenological experience of employees as they interact with workplace structure (Sikora et al. 2004). The goal of this research is to modify current models of stress which "remain linear, simple and static while employee experience is nonlinear, complex, and dynamic" (Sikora et al. 2004:5). Approximating this complexity calls for methodological approaches that illuminate the simultaneity and multidimensionality of work characteristics as they are experienced by employees daily. This necessitates a break from common approaches that attempt to isolate the predominance of one stressor over all others in its contribution to overall stress, or models which conceptualize stress as a unidimensional construct and stressors as additive (Cavanaugh et al. 2000). In contrast, an alternative model of stress reflects their interactional nature, thus setting a framework that understands stress as the overall product of combinations, patterns, or arrays of stressors. This approach is consistent with the trend of modelling the inherent complexity of social life through identifying "local patterns and microprocesses" (Sikora et al. 2004:26). Pearlin (1989:248) suggested the study of "clusters" of

stressors to emphasize that these never occur in isolation, and that their effects may be multiplicative rather than cumulative. The idea of simultaneously occurring stressors with multiplicative effects is also introduced by the Asynchronous Multiple Overlapping Change (AMOC) model which aims to account for the increasing complexity of modern workplaces (Sikora et al. 2004). As suggested previously, these holistic approaches better approximate the "phenomenological experience" of workers (Sikora et al. 2004:5): "For [workers] who are chronically stressed, the new event is not just one minor demanding situation but is one more demanding thing on top of all the other demanding things: the proverbial straw that breaks the camel's back" (Sikora et al. 2004:9). While this approach is theoretically appealing, a research design that combines stressors empirically is currently missing from the literature. This has been approximated by studies of stressor interaction; however, the current study provides a more complete evaluation of the extent to which such an approach can provide meaningful stressor combinations.

The novelty of such an approach necessitates a partly exploratory research design as common stressor patterns are largely unknown. However, the current psycho-social literature on work stress can provide guidance on choice of stressors and potential stressor combinations. First, meaningful patterns can be discerned by considering conceptually and empirically distinct job characteristics or stressors (Daniels 2006). Overall, there are three dimensions of job characteristics: latent or 'objective' characteristics that are "embedded" in the organization and "independent of activity or perception" (Daniels 2006:275); enacted characteristics that manifest through the work done by employees; and perceived characteristics that are defined by workers' perceptions (Daniels 2006). Stressors belonging to the latter category are featured in this study for

their ability to determine employee experience. When aggregated, perceived job characteristics can point to *shared job strain*, which identifies stress common to all employees in a single occupational position (Semmer, Zapf, and Greif 1996). Choice of such commonly perceived stressors is based on their structural importance and empirical contribution to overall stress. While the latter is discussed in the following section, here I consider two prominent psychosocial models of work stress: the demand-control (DC) and the demand-control-support (DCS) or iso-strain models. Other widely-used theories could have been used – for instance, role stress theory would emphasize characteristics such as role overload, conflict, and ambiguity as major stressors; or the challenge-hindrance model would highlight 'positive' or 'negative' stressors (Griffin and Clarke 2011). However, I draw on elements from the DC and DCS models for several reasons: the models and their variants are commonly used in the stress literature (Ibrahim, Smith, and Muntaner 2009); the theories are built on understanding job design and the contextual factors of stress (de Jonge et al. 2000); and the models' main hypotheses provide some suggestion of what patterns of stressors may be observed (Karasek 1979; Karasek and Theorell 1990; Theorell 2003). It is important to stress that I do not test these hypotheses, but rather observe whether patterns of stressors may be consistent with prior literature.

In the original DC model, the amount of control or decision authority an employee has over the work process is important for determining how stress is experienced (Griffin and Clarke 2011). In fact, it is assumed that high stress situations are characterized by low control and a high number of demands, and that increasing control is effective for decreasing stress (Karasek and Theorell 1990; Theorell 2003). This model has been so influential in the stress literature that this combination

of control and demands is often worked right into the definition of work stress (de Jonge et al. 2000; CCOHS 2012). Thus, it is suggested that low control may be a salient stressor, and may co-occur with a high number of other stressors in a 'high stress' situation (Theorell 2003). Similarly, high control coupled with less stressors or demands may characterize a "relaxed" or low stress environment (Theorell 2003:205). High levels of control and a higher number of demands may co-occur in an 'active' job design; low control and a low number of demands is deemed a 'passive' work situation (Karasek 1979). Building on this, the DCS or iso-strain model also identifies lack of workplace social support as a definitive stressor, with work characterized by a high number of stressors, low control, and low support as indicative of a 'high stress' situation (de Jonge et al. 2000; van der Doef et al. 2000; Griffin and Clarke 2011). The addition of social support is also conceptually significant as it emphasizes the social dimension of occupational stress (van der Doef et al. 2000). Although the original DCS model included skill discretion as indicative of authority in the workplace, this concept was excluded from the current study for simplicity. Only job input is included as it is a direct indicator of control, and has proved to be a better predictor of overall stress (de Jonge et al. 2000). In sum, it is suggested that the stress pattern with the highest number of stressors will also exhibit low control/authority and social support; and the lowest number of demands will co-occur with both high authority and support.

EMPIRICAL REVIEW
The prevalence of work stress in the Western world has been extensively documented (APA 2009; Crompton 2011; Griffin and Clarke 2011; Steiber and Pichler 2015). Rates of work stress in post-industrial and industrial economies range from one-sixth to one-third of the working population and

as such are not inconsequential. As mentioned previously, it is also an issue for the 28.4% of

Canadians who experience it in the workplace daily (MHCC 2015). Given the high physical and

mental health costs of work stress (Marchand et al. 2005; Crompton 2011; Clark et al., 2012; Yu

et al. 2015; HSE 2016; Goh et al. 2016), as well as its social and economic costs (Wallace et al.

2009; Väänänen et al. 2014), expanding the sociological study of stress is a worthwhile endeavour.

In what follows, I outline prominent and socio-structurally-relevant findings from the general

literature to use as comparison points for the current study.

In 2011, just over one in four working Canadians felt 'extremely' or 'quite a bit' of daily

stress (Crompton 2011). Most (62%) also identify work as their main source of stress (Crompton

2011). The second and third highest sources of stress – concerns over finances and limited time –

followed behind at only 12% each. These statistics have remained relatively stable throughout the

millennium. Further, in 2011 and 2012, 28.4% of working Canadians aged 15-75 reported that

most of their working days are quite a bit or extremely stressful (MHCC 2015) – although this

figure has been on the decline since 2003. In the immediate work environment, stress manifests

through various stressors, although their co-occurrence has not been readily identified in the

empirical literature. The most prominent stressors are reviewed below.

Consistent with the DS model, some degree of employee *control*, autonomy, or authority

over the job process is associated with reduced stress (Karasek 1979). Thus, the stressor in

question is the general state of having little or no input over one's work. Various studies have

identified this stressor as strongly contributing to overall work stress (de Jonge et al. 2000; van der

Doef et al. 2000; Crompton 2011). In addition, a *negative social environment* is known to induce

stress: Low support from supervisors and/or colleagues is associated with increased stress (Crompton 2011), as is hostility and/or conflict with others (Burke 2002; Christie and Barling 2009). There has also been some empirical support for the moderating effects of social support on stress and high demands (Gallie et al. 2012; Steiber and Pichler 2015), and for a positive relationship between overall job satisfaction and working in teams (Gallie et al. 2012). In a sample of 1,278 workers, Melamed, Ben-Avi, Luz, and Green (1995) found that perceived *monotonous* or *repetitive work* was highly related to two outcomes of work stress – job satisfaction and psychological distress – over and above the effects of other stressors. Van der Doef et al. (2000) report similar findings. *Job insecurity* is defined as "perceived powerlessness to maintain desired continuity in a threatened job situation" (Greenhalgh and Rosenblatt 1984:438). There is a strong relationship between overall work stress and perceived job insecurity (de Witte 1999; Steiber and Pichler 2015), net of other stressors and individual factors (Näswall et al. 2005). Job insecurity also strongly reduces well-being, job satisfaction, and overall health (de Witte 1999; Sverke, Hellgren, and Näswall 2002), as well as attitudes toward the organization and employers (Sverke et al. 2002). The empirical literature shows that some elements of a *chaotic* or *disorganized* work environment are known to induce stress. For example, high stress is brought on by hectic work (Melamed et al. 1995; de Jonge et al. 2000) as well as conflicting requests or role ambiguity (de Jonge et al. 2000; van der Doef et al. 2000). Finally, *physical stressors* such as environmental hazards or physiological demands, for example, have negative outcomes for workers. Other than inducing work stress (MacDonald et al. 2001; Marchand et al. 2005), physical stressors are negatively related to overall health (Warren et al. 2004) and well-being (Burke 2002). These

common stressors or groups of stressors may combine in meaningful ways to identify work environments that are disproportionately experienced by subgroups of workers.

For example, research suggests that exposure to work stress environments differs by occupational location, as well as socioeconomic and demographic characteristics (MacDonald et al. 2001). Concerning occupation, some studies found that workers in lower occupational status positions experience higher stress and a higher number of stressors overall than those in higher status positions (Sverke et al. 2002; Warren et al. 2004; Gallo et al. 2005). Other studies, however, identified the reverse situation, in which those in positions of greater occupational prestige experience more stress. Indeed, Crompton (2011) found that Canadian workers in white-collar positions – such as in management, the professions, or clerical work – report higher stress than blue-collar workers and identify work as their main source of stress. However, those who report finances as their main source of stress were more likely to be in pink or blue-collar work (Crompton 2011). Other research shows little difference across occupations in the Quebec workforce (Marchand et al. 2005). Such inconsistencies in the empirical literature are paralleled when considering stress(or) differences by education. Christie and Barling (2009) found that lower education is associated with greater work stress, while in the Canadian context Crompton (2011) found that higher-educated workers were more likely to identify their job as highly stressful. Similarly, Steiber and Pichler (2015) found higher work stress among the higher educated in several post-industrial nations. In addition, greater work stress has been found among lower income workers (Christie and Barling 2009).

Disparate findings may be due to the use of unidimensional and additive measures of stress

(Sverke et al. 2002), while stress may differ qualitatively by overall patterns rather than level. Chan et al. (2000) found that Singaporean professionals – namely, nurses, engineers, and teachers – were unlikely to experience low control over the work process, as is consistent with research on white-collar workers in general (MacDonald et al. 2001). Additionally, interpersonal conflict and low social support were salient stressors for these professionals. In contrast, research has shown that blue-collar workers experience greater monotony (Melamed et al. 1995), more physical demands (MacDonald et al. 2001; Burke 2002), and job insecurity (Burke 2002; Ibrahim et al. 2009). To my knowledge, no scholarly work has been done to uncover stressors common to 'pink-collar' or service workers.

Other socio-demographic characteristics such as gender, age, and race/ethnicity may also shape the work stress experience, as these are known to be predictors for various other work characteristics (Melamed et al. 1995; de Jonge et al. 2000). In terms of gender, women are prone to higher overall stress levels than men (APA 2009; HSE 2016). In a longitudinal study from 1993-2005 on 13 countries, Steiber and Pichler (2015) found that women tend to experience higher work stress and after-work exhaustion. However, Crompton (2011) found that in Canada men made up the majority (55%) of those feeling on-the-job stress. Moreover, research has found job security to be more of a stressor for men (de Witte 1999), while monotony was more characteristic of women's work (Melamed et al. 1995). Those of prime working age (35-49) are more stressed at work than older or younger workers (Crompton 2011; Steiber and Pichler 2015). Finally, workers who are long term residents or born in Canada, white, and married or in common-law unions are more likely to be highly stressed compared to recent immigrants, non-white, and single workers,

respectively (Crompton 2011).

The current study contributes to the stress literature in three general ways. The first is by determining whether and to what degree the common stressors outlined above are important in the Canadian context. Additionally, this study will explore a novel approach to studying stress by identifying patterns or arrays of stressors, thereby offering a richer contextualization of the work environment. There has been a dearth of research on which stressors commonly intersect in the workplace. Finally, the potential significance of these stressor typologies to the social inequality literature will be explored through determining whether they are differentially distributed among various social groups. While some speculation as to the nature and distribution of stressor patterns was discussed above, this study is necessarily exploratory because common stressor patterns are as yet unknown. As such, the research questions remain open-ended and non-specific: What specific work stressors are experienced most by the Canadian working population? What are the most common combinations or patterns of such stressors? Which occupational locations are most likely to expose workers to a particular pattern of stressors and not others? Are work stress patterns stratified by social structural positions associated with class, gender, and race/ethnicity?

DATA & METHODS

Data

The 2012 Mental Health component of the Canadian Community Health Survey (CCHS-MH) is a cross-sectional survey that aims to "assess the mental health status of Canadians", including issues of substance abuse, access to services and perceived needs, and assessments of physical and mental functioning (Statistics Canada 2013:3). Issues with previous data collection methods on health

information necessitated the creation of the general Canadian Community Health Survey in 1991, and later the focused content surveys in 2007. The 2012 Mental Health component of the survey is the fourth, preceded by themes of mental health and wellbeing, nutrition, and healthy aging in 2002, 2004, and 2008/9, respectively. The CCHS-MH includes a large nationally representative sample of the Canadian population aged 15 years and older living in the provinces. People living in the territories, on Aboriginal reserves, full-time members of the Canadian Forces, and the institutionalized population are not represented. The CCHS-MH utilizes a multi-stage stratified sampling design, yielding a total of 25,113 cases (individual response rate = 86.3%).

The CCHS-MH was chosen for this study due to its comprehensive set of work stressor measures and the availability of relevant socioeconomic and demographic variables. The analytic sample was first limited to those who have worked in the past year (N = 14,087). After a listwise deletion of just over 1% of cases with missing values on covariates, the final analytic sample was further reduced to 12,590 cases.

Measures

Work Stressors - Choice of indicators for the latent class analysis was constrained by those available in the survey (Statistics Canada 2013). Nevertheless, the Mental Health Component of the 2012 Canadian Community Health Survey contained a comprehensive set of 12 work stressor measures, of which eight were chosen based on previous literature. These measures comprised a series of statements with five-point Likert scale responses ranging from "strongly agree" to "strongly disagree" and are based on common measures of work stress (Karasek and Theorell 1990; Christie and Barling 2009). Two measures – whether work required "learning new things" or a "high level of

skill" (Statistics Canada 2013) – were excluded due to these describing psychologically stimulating aspects of one's job, rather than *necessarily* being stressful as indicated by previous studies. Two measures of *social support*, indicating whether the supervisor or co-workers were helpful on the job, were combined due to low response rates. All indicators were reverse coded so that higher values indicated greater impact of the stressor, and further collapsed into binary indicators noting presence/absence of the stressor.

Occupation, education, income - Three common measures of socioeconomic status – occupation, education, and income (Boyd 2008) – were used as covariates to determine their corresponding work stressor patterns. The *occupational group* variable included the broad categories of "Management, health, education, and arts/culture," "Business, finance, and administration" (reference category in the multivariate analysis), "Sales and services," "Trades and transport," and "Primary industries and manufacturing." *Education* was included as a categorical variable with values "less than high school," "high school," and "post-secondary or higher." The original *income* measure was collapsed with responses indicating a personal yearly income of $19,000 or lower labelled "low income"; $20,000-49,999 "middle income"; and $50,000 or higher "high income." The highest categories of both education and income were used as reference groups in the multivariate analysis. Although these three measures are related, they are distinct and should not be collapsed a composite measure (Christie and Barling 2009). Weighted sample distributions are shown in Table 1 in the following section.

Demographic and control variables – Additional covariates were selected both for substantive interest and as controls based on previous literature on work stress. These include gender, age,

immigrant status, race, and relationship status. *Gender* is a dichotomous measure comparing men to

women. *Age* is collapsed into three categories of those aged 15-29 (younger workers), 30-49

(middle aged workers), and 50 + (older workers). *Immigrant status, race,* and *marital status* are

all dichotomous measures comparing non-immigrants to immigrants, white to non-white

respondents, and single to common-law/married respondents, respectively. Expanded measures of

age and *race* were not available in the CCHS-MH public use dataset. Weighted sample

distributions are shown in Table 1 in the following section.

Analytic Strategy

The goal of this analysis was to identify the unmeasured typologies of workers that experience

particular patterns of work stressors, and to further determine associated socio-structural and

demographic characteristics. In the first stage of analysis, latent class analysis (LCA) was used to

model subgroups of Canadian working adults, defined by their work stressor patterns (the

underlying latent variable). LCA is a finite mixture model that includes an iterative method on a set of

categorical indicators to identify latent subgroups of individuals based on response patterns (Collins

and Lanza 2010). Respondents are assigned maximum probabilities of membership in one of a

number of these exhaustive and mutually exclusive subgroups (Lanza and Rhoades 2013). A

strength of using LCA rather than traditional subgroup analyses is that it allows for examining higher-

order interactions between categorical indicators while exhibiting low probability of Type I error and

higher statistical power (Lanza and Rhoades 2013). The baseline LCA model – i.e. the final

measure of the latent variable – is chosen based on relative identification, parsimony, model fit, and

interpretive clarity (see following section).

In the second stage of analysis, membership in these stressor subgroups was regressed on occupation, education, and income, as well as various socio-demographic controls using a multinomial logit model to produce the log-odds of membership. Independent variables were included in a stepwise manner to determine contribution to model fit. Only cases with complete data (N = 12,590) on each of the latent class indicators and covariates were included in the final analysis. All statistical analyses were performed in Stata using the LCA Stata Plugin developed by The Methodology Center at Penn State University on the public use microdata files (PUMF) of the CCHS-MH 2012 (Lanza et al. 2015).

RESULTS

Descriptive Results

Table 1 presents sample characteristics, including the proportion of workers who have experienced each stressor in the workplace. In this sample of workers, stressor prevalence ranges widely. The three most common stressors are repetitive tasks (69.7%), a hectic environment (61.0%), and physical effort (44.6%). The least reported stressors are poor job security (10.4%), low workplace social support (12.6%), and having little or no input on the job process (16.0%). It is likely that the most reported stressors will be characteristic of the most common stressor subgroup, or that they will be common across more than one subgroup. The opposite is likely true for the least common stressors.

The majority of the sample is male (53.7%), white (77.3%), Canadian-born (76.1%), and married or in a common-law union (65.1%). The largest age group is comprised of those in their prime working years (i.e. middle-aged) at 44.6%, followed by older workers aged 50 and older at

Table 1. Distribution of work stressor measures, socioeconomic and demographic characteristics of workers aged 15-75, Canada, 2012

	Percentage of sample
Work stressors[b]	
Repetitive tasks	69.7
Hectic environment	61.0
Conflicting demands	37.6
Poor job security	10.4
Physical effort	44.6
Little or no job input	16.0
Hostility/conflict with others	25.0
Supervisor and/or coworkers unhelpful	12.6
Demographic characteristic	
Female	46.3
Age	
15-29	22.8
30-49	44.6
50+	32.7
Non-white	22.7
Immigrant	23.9
Married/Common-law	65.1
Occupation	
Management, health, education, & arts/culture	39.1
Business, finance, & administration	17.0
Sales & services	21.9
Trades, transport, & equipment operation	15.5
Primary industry & manufacturing	6.4
Education	
< High school	10.0
High school only	14.9
Some post-secondary or higher	75.1
Income ($)	
< 19,999	12.1
20,000 - 49,999	44.3
50,000 +	43.7

Source: Canadian Community Health Survey – Mental Health (CCHS-MH) 2012

Notes: Weighted $N = 12,560$. Statistics weighted to national level using sampling weights provided with the CCHS-MH 2012.

[b] Percentage of workers reporting exposure to the stressor.

32.7%. The largest occupation group is made up of white collar workers in management, health, education, or arts/culture (39.1%), followed by sales and service workers (21.9%). The smallest group is primary industry and manufacturing (6.4%). Most of the sample has at least some post-secondary education (75.1%), and are middle income (i.e. earn $20,000-49,999 per year; 44.3%). The latter is followed closely by higher earners at 43.7%.

Latent classes of stressful workplace environments

To identify a model of workplace stressor patterns, latent class models with one through seven latent classes were considered. All seven models reached a single maximum likelihood (ML) solution, and as such were sufficiently identified from these data. However, the G-squared statistic, information criteria (AIC, BIC, and adjusted BIC), and entropy index, as well as relative parsimony and interpretability of the latent classes, were compared to choose the optimum model (see Table 2). Information criteria, or "penalized fit statistics" are used to compare model fit and strike a

Table 2. Indicators of fit for work stressor models with one through seven latent classes ($N = 12,560$)

Number of Latent classes	df	G^2	AIC	BIC	aBIC	Enropy (Scaled)
1	247	3,963	3,979	4,039	4,014	1
2	238	2,094	2,128	2,254	2,200	0.52
3	229	1,323	1,375	1,568	1,486	0.46
4	220	705	775	1,035	924	0.48
5	**211**	**527**	**615**	**942**	**802**	**0.56**
6	202	363	469	864	695	0.47
7	193	309	433	704	704	0.51

balance between optimal fit and parsimony (Collins and Lanza 2010:88). Entropy is an index ranging from 0 to 1 used to determine how precisely latent class membership can be assigned.

Higher values indicate greater precision. For each successive model, the G-squared statistic, and AIC, BIC, and adjusted-BIC criteria become smaller with each additional latent class. The improvement becomes markedly smaller after the five-class model. Additionally, entropy values pointed to a five-class model (0.56 vs 0.47 for the six- and seven-class models, for example). The five-class solution was also preferable in terms of substantive interpretability and parsimony, with fewer latent classes and better class separation than the six- and seven-class models. Although the six-class model had lower G-squared, AIC, BIC, and adjusted-BIC values, item-response probabilities and latent class prevalence are unstable when adding covariates. In contrast, the five-class model remains relatively stable. Thus, the results suggest that a five-class model is best suited for identifying patterns of workplace stressors.

Table 3 details latent class prevalence and item-response probabilities from a latent class analysis with covariates. The item-response probabilities give the probability that an individual belonging to a latent class will experience a particular work stressor; thus each latent class constitutes a subgroup of workers who experience similar patterns of work stressors. The first class, labelled the *Low Stress* category, is characterized by low probabilities of exposure to all work stressors. In this work environment, there are very few demands beyond those required of the job at baseline. Compared to those in the other classes, these workers have the lowest probability of reporting physical effort as a stressor (3.5%).

In contrast, Class 2 is characterized by high probabilities of most stressors, with the exception of poor job security and physical effort. This subgroup experiences the highest number of stressors overall, with six stressors with item-response probabilities higher than 55%, compared to

the third class with only three prominent stressors. This class has the lowest prevalence (9.1%) and

Table 3. Item-response probabilities for a five latent class model of work stress, CCHS-MH 2012 ($N =$ 12,560)

	Low Stress	High Stress	Physical	Monotonous	Chaotic
Latent class prevalences	0.14	0.09	0.34	0.22	0.21
Item-response probabilities					
Repetitive tasks	0.35	**0.84**	**0.82**	**0.92**	0.57
Hectic environment	0.27	**0.78**	**0.66**	0.39	**0.90**
Conflicting demands	0.24	**0.79**	0.25	0.22	**0.64**
Poor job security	0.12	0.33	0.06	0.07	0.06
Physical effort	0.04	0.54	**0.99**	0.16	0.20
Little or no job input	0.06	**0.59**	0.11	0.30	0.05
Hostility/conflict with others	0.09	**0.65**	0.23	0.10	0.40
Supervisor and/or coworkers unhelpful	0.05	**0.60**	0.06	0.07	0.12

*Item-response probabilities > .55 bolded to facilitate interpretation.

is labelled *High Stress*. It's notable that this group is more likely than all others to experience poor

job security, despite this stressor's modest item-response probability (33.4% vs 12.2% or less for

all other classes). Notably, across latent classes the probability of experiencing low autonomy –

measured by having little or no input – is quite low, save for this category (59.3%). It is also

characterized by the least positive social environment in the workplace out of all other classes, with

hostility/conflict at 65.4% and social support 60.2%.

Next, the most prevalent class (33.8%) is extremely likely to experience physical stress

(98.8%), alongside monotonous (82.4%) and hectic (65.6%) work. This class is labelled *Physical*

Stress due to the physical effort item-response probability close to 1 – the highest out of all other

classes. Workers belonging to Class 3 also report the highest job security (6.1%) and social

support (6.0%) compared to those in all other classes (excepting the *Low Stress* category).

The fourth latent class is labelled *Monotonous* due to the high probability of these workers reporting repetitive tasks (92.4%) – the highest for this stressor both within this class and across all others. None of the other item-response probabilities for this class are above 40%.

The final class is comprised of workers who are likely to report hectic work (90.4%) and conflicting demands (64.2%), but are not likely to report high exposure to other stressors. This subgroup is labelled *Chaotic* to reflect the environment characteristics. Notably, this group has the lowest probability of experiencing little or no input on the job process (4.6%).

Predicting work stressor patterns by socioeconomic and demographic characteristics

Table 4 details the odds ratios and corresponding p-values from a multinomial logistic regression, showing the estimated effect of socio-economic and demographic covariates on predicting membership in latent classes of work stressor patterns. The *Low Stress* class is used as the reference category.

Of primary interest is determining how work stressor patterns are associated with occupational position. The results give insight into structural features of general occupational groupings. As opposed to business sector workers, service and blue-collar workers have substantially greater odds of experiencing a high number of stressors at work, particularly for workers in trades and transport (OR = 4.7) and primary industries (OR = 3.5). However, comparing the two white-collar categories, those in management, health, education, and arts/culture occupations are less likely to be in the *High Stress* category (OR = 0.63). These workers are also 75% less likely to experience *Monotonous* work (p < 0.001), while those working in the trades and transport are over twice as likely (p < 0.01). Although monotony appears to be somewhat

more characteristic of sales/service and primary industry work, these findings are not significant.

Table 4. Estimated odds ratios from a multinomial logistic regression of membership in latent classes of work stress on socioeconomic and demographic characteristics, CCHS-MH 2012 ($N = 12,560$)

	High Stress	Monotonous	Chaotic	Physical [a]
Intercept	0.00***	0.00***	13.77*	0.00***
Female	2.41***	1.71***	1.92***	1.53***
Age (50+)				
15-29	1.14	1.72***	1.36*	1.60***
30-49	1.49***	1.18	1.69***	1.55***
Non-white	1.54**	1.75***	0.90	1.63***
Immigrant	0.35***	0.63***	0.38***	0.54***
Married/Common-law	0.64***	1.01	1.37**	1.07
Occupation (Business & Finance)				
Management, health, education, & arts/culture	0.63**	0.25***	0.94	4.16***
Sales & services	2.41***	1.34	1.28	13.41***
Trades & transport	4.69***	2.22**	0.84	65.19***
Primary industry & manufact.	3.50***	1.47	1.18	34.37***
Education (Some post-secondary or higher)				
< High School	2.25***	2.97***	0.90	3.32***
High School only	2.38***	3.25***	1.37	3.35***
Income ($50,000 +)				
< 19,999	1.21	2.07***	0.09***	1.62**
20,000 - 49,999	1.85***	1.99***	0.33***	2.48***

[a] The *Low Stress* class is the reference category.

* $p < .05$, ** $p < .01$, *** $p < .001$

Chaotic work environments appear not to vary significantly by occupation type. Occupational

group is also a strong predictor of exposure to high physical stress at work. As compared to

business sector workers, working in all other occupation groups is strongly associated with

membership in the *Physical* stress category, with odds ratios ranging from 4.2 (management, health, etc.), 13.4 (service and sales), 34.4 (primary and manufacturing industries), and 65.2 (trades/transport; $p < 0.001$ for all). The exceptionally high odds ratios for the two blue-collar occupational groups suggest a robust identification of their workplace structure through stressors.

The results suggest that experiences of stress are also stratified by two other socioeconomic resources – education and income. For example, lower education is a significant predictor of membership in all but the *Chaotic* work stressor subgroup. Specifically, workers with less than or only a high school education are two to just over three times more likely than workers with at least some college to experience some pattern of stressors, as opposed to little or no stressors ($p < 0.001$ for all). Chaotic work environments – as opposed to low stress environments – are more common for higher earning workers than either middle- ($OR = 0.33$; $p < 0.001$) or lower-income workers ($OR = 0.09$; $p < 0.01$). Middle-income earners are more likely than higher earners to experience all other workplace stressors, particularly physically stressful work ($OR = 2.5$, $p < 0.001$). Excepting a *High Stress* environment, the lowest earners are about twice as likely to be exposed to monotony ($p < 0.001$) and 62% more likely to experience physical stress at work ($p < 0.01$) than the highest earners.

The analysis also gives some indication of the socio-demographic characteristics of workers disproportionately represented in each stress category. Women are significantly more likely than men to report experiencing all five categories of stressful work environments, as opposed to a *Low Stress* workplace. Notably, they are 2.4 times more likely than men to experience a *High Stress* environment, and nearly twice as likely to be exposed to chaos and disorganization ($p < 0.001$ for

both). In terms of age, both younger workers (15-29) and middle-aged workers (30-49) are significantly more likely to experience all types of stressful work environments than older workers (50+), with two exceptions. Compared to older workers, younger workers are about as likely to experience *High Stress*, and middle-aged workers to experience *Monotonous* work. While non-white workers are as likely as white workers to be exposed to a *Chaotic* workplace, they are more likely to experience *High Stress* (OR = 1.54; p < 0.01), *Monotonous* (OR = 1.75; p < 0.001), and *Physical* work (OR = 1.63; p < 0.001). In contrast, immigrants have lower odds of being exposed to all stressor patterns than Canadian-born workers, as opposed to little or no stressors in the workplace. In particular, they are 65% less likely to be exposed to many stressors, and 62% less likely to experience chaotic work (p < 0.001). Latent class membership by marital status varied widely in this sample: Those married or in a common-law union are 36% less likely than single workers to experience a high number of stressors (p < 0.001), and 37% more likely to experience chaotic work (p < 0.01), as opposed to little or no stressors. These findings give preliminary descriptive information on how workers experience work stress and how this is differentially experienced across their socio-economic and demographic characteristics. In the next section, these results are substantively compared to prior literature, including a discussion of the value of these findings for motivating future research questions.

DISCUSSION
This study helps expand understanding of adverse on-the-job experiences, adding to scholarly accounts that move beyond biomedical, psychological, and unidimensional approaches to acknowledge socio-structural factors of work stress (Pearlin 1989; Hobfoll 2001; Väänänen et al.

2014). Although the method used is novel in this area of research and necessitates a partially exploratory design, latent class analysis has proved to be promising for modelling shared or common sources of stress and their *de facto* co-occurrence in the workplace (Pearlin 1989; Sikora et al. 2004). Generally, the present findings confirm evidence from prior research that work stress remains prevalent among Canadian workers (Crompton 2011; MHCC 2015; Steiber and Pichler 2015). For example, it was estimated that Canadian workers have only a 14.3% chance of exposure to a work environment with little or no stressors (i.e. belonging to the *Low Stress* category), while most would experience at least two or three during their working day. This lends further evidence that prior estimates have overestimated the proportion of workplaces inducing low stress (Williams 2003). Of prime interest, however, is the substantive difference between individual stress experiences, of which five distinct patterns were identified.

The first is a relatively relaxed environment with little to no stressors at all. This environment stands in direct contrast to the least common yet most stressful environment distinguished by multiple stressors – the most prominent of which are repetitive tasks, conflicting demands, and a hectic environment. In addition, low autonomy and social stressors are not characteristic of any work environments except this one. Given the high occurrence of other stressors in this pattern, this reflects the demand-control-support (DCS) or iso-strain model that suggests the co-occurrence of these stressors with a high number of other demands is characteristic of a highly stress inducing environment (Karasek 1979; Karasek and Theorell 1990; de Jonge et al. 2000; Theorell 2003; Griffin and Clarke 2011). To definitively test the DCS model, however, what is needed is an examination of the relative stress induced by this environment compared to all others. Nevertheless,

the current results support the co-occurrence of these major stressors and the important addition of social stressors to the original demand-control model (de Jonge et al. 2000; van der Doef et al. 2000; Griffin and Clarke 2011). The ability of the DCS model to characterize workplaces, however, appears to be limited to the extremely low or high stress patterns, as social stressors and low control are not a defining feature of any other workplaces identified. The 'passive' work environment (low control, low demands) postulated by the model was not identified in our model of stressor patterns. Further, a comparison of overall stress by pattern is again needed to determine whether all other stressor patterns indicate an 'active' (high control, high demands) environment.

In addition to cases characterized by an extremely high or low number of demands, this study found that working Canadians have the greatest chance of being in a third class mainly defined by high physical stress. Monotony appears to be salient, with the next largest class reporting only repetitive tasks as a stressor. Indeed – as is consistent with the literature in this area (Melamed et al. 1995; van der Doef et al. 2000) – monotony appears to be highly characteristic of stressful work, being prominent in three out of the five work environments. Finally, stress experienced by the final group of workers is mainly induced by a chaotic environment.

All but one stressor, job insecurity, appeared as a salient stressor in this study, in contrast to prior research (de Witte 1999; Sverke et al. 2002; Näswall et al. 2005; Steiber and Pichler 2015). In the Canadian context, it appears that job insecurity is *not* "one of the most distressful aspects of the work situation" (de Witte 1999:155). This may point to a high perception of security among Canadian workers, which is surprising given the high rate of change in the post-industrial workplace and the increasing precarity of work (Sverke et al. 2002; Sikora et al. 2004). Are Canadian

workers more secure in their occupations as compared to those in other post-industrial economies? How does this relate to stress experiences in general? This is an interesting point for further research, as even the highest prevalence of job insecurity in our stressor typology gives only a moderate probability, despite its occurrence in the most stressful environment. Overall, the present study highlights the value of studying the interactional nature of work stressors, providing support to multidimensional and holistic work stress theory (Pearlin 1989; Cavanaugh et al. 2000; Sikora et al. 2004). Finite mixture models such as LCA provide a robust method of measuring stress as it is experienced through multiple and simultaneous stressors. Going beyond the immediate workplace environment, it is important to determine how job design aligns with social structure.

This study contributes to sociological stress research by demonstrating how immediate workplace structural characteristics are connected to social and personal characteristics (Pearlin 1989). In accordance with inequality research in this area, it was found that stress is differentially distributed across groups (Pearlin 1989; Burke 2002). Notably, the results support substantial variation in stressor patterns by occupational group, giving insight into their shared structural features. In particular, the results are suggestive of prior research in that pink- and blue-collar workers are more likely than white-collar workers to experience a high stress situation (Sverke et al. 2002; Warren et al. 2004; Gallo et al. 2005), indicating that occupational hierarchy may indeed have a negative relationship with stress. However, stress differences exist even among white collar workers, with those in the business and finance sectors being exposed to more stressors than others. Work defined by physical effort – in addition to monotony and hectic work – proved to be highly definitive of blue- and pink- collar work, particularly for trades and transport workers, which

is in line with prior research that blue-collar workers experience more physical demands (MacDonald et al. 2001; Burke 2002) and monotony (Melamed et al. 1995). However, their probability of experiencing only monotony as a stressor is not overwhelmingly different than that of white-collar workers, suggesting that stress from exposure to 'repetitive work' may differ depending on the levels of physicality. In contrast to prior research on job insecurity (de Witte 1999; Burke 2002; Ibrahim et al. 2009), the results did not indicate that it was a major stressor for blue collar workers, although it may be somewhat more important for them than for white collar workers.

To reiterate, there was substantial variation between the two white-collar occupation groups: those in the business and finance sectors are more likely to experience at least six major stressors at work, while those in the public sector, professions, management and cultural occupations report more physically stressful work. Given that low control is uncharacteristic of all but the most stressful environment, these results support prior research that professionals are unlikely to experience low control over the work process (Chan et al. 2000). The current study found that this is not necessarily the case for business workers, standing in contrast to prior research that extends high control to all white-collar occupational positions (MacDonald et al. 2001). Additionally, professionals were not more likely than other white-collar workers to experience interpersonal conflict and low workplace social support (Chan et al. 2000). In general, the results suggest more nuance in stress experiences than has been previously documented by unidimensional measures (Sverke et al. 2002), showing that stress does differ by qualitative patterns at least as much as by quantitative levels. What remains to be seen is the connection of workplaces patterns to overall stress levels, and the implications of this for various groups. Future work would also do well

to examine these work environments in greater detail with a focused set of stressors to uncover how and why stressor patterns may vary within occupations. Moreover, more detailed measures of stressors may also help determine how common sources of stress – such as monotony or physical stressors – may be differentially experienced across the occupational hierarchy.

With some notable exceptions, lower educated workers have increased chances of experiencing any stressor environment – including exposure to a high number of demands. In terms of overall levels of stress, this is consistent with findings that lower education is associated with higher stress, as found by Christie and Barling (2009). Differences across income groups more or less parallel the above, as confirmed by prior research (Christie and Barling 2009). However, there is one notable exception. Chaotic workplaces do not vary significantly between occupational groups or education, but they do by income: higher earners are significantly more likely to experience disorderly environments than lower earners. Could chaos – and perhaps less predictability – work be a feature of some higher earning firms? For example, Shuey et al. (forthcoming) found that work in some higher earning IT firms is characterized by a chaotic, disorganized environment, unstructured and ambiguous expectations, and work overload. Additionally, other IT workers experience a situation analogous to workers in the *Low Stress* category identified in the present study (Shuey et al. forthcoming). Future, more focused research may be able to account stressor differences within the same occupation, and whether this may be due to earnings.

In terms of other individual characteristics, net of occupational location the most stressed workers – i.e. those with a high chance of experiencing at least six prominent stressors – tend to be female, middle-aged, non-white, Canadian born, and single. In fact, women are more likely than

men to experience all other stress environments, consistent with prior findings that female workers experience greater work stress overall (APA 2009; Steiber and Pichler 2015; HSE 2016). Following this, the current findings provide little support that job insecurity is more characteristic of men's work (de Witte 1999), and moderate support for monotony being characteristic of women's work (Melamed et al. 1995). Interestingly, immigrants are less likely to be exposed to all stressor patterns as Canadian-born workers, consistent with prior literature that found that the Canadian born are more likely to be stressed overall (Crompton 2011). This may be due to the fact that they are also more likely to be higher educated (Galarneau and Morissette 2008), and the higher educated are less stressed. However, they are also more likely to be underemployed (Galarneau and Morissette 2008), and as such these findings merit further investigation. This study also found that single workers are more likely to experience a high stress environment, while other stressor patterns vary substantially by marital status. This is in contrast with Crompton's (2011) findings of higher overall stress among married and common-law workers, suggesting that more nuanced measures are important for discerning stress differences. Like other studies before it, this study confirms that stress is differentially distributed across social groups (Pearlin 1989; Melamed et al. 1995; de Jonge et al. 2000), and adds to the literature by unearthing how different patterns of stressors are contingent on socioeconomic and demographic differences.

CONCLUSION
This study provided a novel approach to conceptualizing and measuring work stress, which has shown to be adequately represented by an underlying structure of stressor patterns. More specifically, latent class analysis was used to identify stress using the multifaceted demands of the

workplace, connect these patterns to the extant organizational and socio-economic structure, and its distribution across social groups. The above findings also provide many points of departure for further investigation. What is now needed is a comparison of the overall stress levels induced by these environments to further examine how stress is differentially distributed and contingent on social and structural factors. Past research has found little support for the impact of stressor interaction on overall stress (de Jonge et al. 2000; van der Doef et al. 2000). However, these studies have been limited in their ability to observe the interactive effects of more than two or three stressors, while a model of higher-order interactions may be preferable. The findings also provide some grounding for more focused future studies – such as on specific occupations or social groups – which will provide even better specification of stressor patterns and experiences. What additional stressor patterns could be unearthed if these are shown to differ between, for example, men and women? Latent class analysis introduced a novel way to measure the occupational structure position using workplace characteristics, approaching holistic, dynamic, multidimensional and non-linear conceptualizations of the stress process (Pearlin 1989; Sikora et al. 2004).

However, the current study was constrained in several ways. First, to better account for the dynamism of modern workplaces, a longitudinal research design would allow for observing pattern stability and change (Christie and Barling 2009). Such studies could prove effecting for intervention targeting (Cavanaugh et al. 2000), and identifying the mechanisms through which stress changes. Second, stressor choice was limited by those provided by the data. This excludes a multitude of contextual features such as management behaviour and workload (Shuey et al. forthcoming), hours worked (Steiber and Pichler 2015), and frequent on-the-job harassment (McDermut, Haaga, and

Kirk 2000). Stressors external to the workplace may also have a bearing on overall work-related stress, such as the nature of family situation, social network, or work-family conflict (Chan et al. 2000; Crompton 2011). The use of only self-report data may also be seen as a limitation (Hobfoll 2001; Gallo et al. 2005; Ibrahim et al. 2009), and may cast doubt on the ability of such measures to identify a model of workplace structure due to their subjective nature (Sverke et al. 2002). For instance, two employees in identical situations may perceive the same stressor differently (Sverke et al. 2002). Nevertheless, the identification of common experiences is valuable in and of itself, as the psychological impact of stressors is what gives them substantive meaning and importance. For example, Klandermans and van Vuuren (1999) found that employee perception of job insecurity had a greater impact on health and well-being than a firm's actual conditions. Similarly, when it comes to stress intervention, perception determines how well intervention efforts are received (Nielsen, Randall, and Albertsten 2007). Moreover, scholars have thrown the objectivity of "objective measures" or "expert ratings" into doubt, especially when such measures contain expert bias and error themselves (Semmer et al. 1996:293).

Finally, the broad categorization of socioeconomic and demographic variables may be limiting, as what is gained in generalizability incurs loss in specificity (Ibrahim et al. 2009). To reiterate, studies on a focused group or set of groups may unearth a greater variety of stressor patterns, better approximating the stress experience. Further, although the binary stressor measures aided interpretation of the latent classes, this likely led to a loss of information as opposed to the original five-point scale (Lanza and Rhoades 2013). It could further be argued that each stressor is multidimensional in its own right, and by using a dichotomous measure we lose complexity

(Greenhalgh and Rosenblatt 1984; Sverke et al. 2002). For instance, job insecurity was only a moderate stressor even for the most stressed subgroup of workers. However, measures capturing more specific manifestations of insecurity – such as high turnover or continuous structural readjustments – may be preferable to vague and ambiguous concepts (Greenhalgh and Rosenblatt 1984). Similarly, monotony may be present in a wide variety of tasks. As such, it's likely that stress induced by monotony varies substantially by type of repetitive task. Despite these limitations, the results provide important — although preliminary — evidence of the differential distribution of stress across the socioeconomic structure. In order to understand the social processes that stratify health outcomes it is worthwhile to consider those processes that stratify the characteristics and conditions of paid employment.

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