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Precarious employment experiences and their health consequences: Towards a theoretical framework

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Abstract. Fundamental shifts in the structure of labour markets, work systems, and employment relations of industrialized countries have outpaced changes in legislative, social and political mechanisms. As a result, a growing number of workers are exposed to precarious employment experiences, which we define as experiences that give rise to instability, lack of protection, insecurity, and social and economic vulnerability. These experiences represent a potentially significant occupational health risk. Our central objective is to develop a detailed framework that outlines the key aspects of work experiences that makes them precarious, and to consider links between these aspects and downstream health effects.

1. Introduction

Structural changes in the economies of industrialized countries have given rise to fundamental changes in firm structures, work systems, employment relations, and hence, labor-market experiences [53]. The forces of globalization, trade competition, and rapid technological innovation have brought with them a number of adaptive changes in the labor-market landscape, such as changes in the demand for labor and hiring strategies [8]. In the search for competitive advantage, many employers have adopted "flexible staffing" practices that allow them to quickly respond to market shifts [114,119]. Contrasting with these changes is the slow and belated evolution of labor-market legislative, social, and political mechanisms [102,131]. This combination of factors has made the labor-market experiences of many individuals increasingly insecure – a development that may have implications for the long-term health and well-being of the labor force [14,16,52].

In the academic literature a wide range of vocabulary has evolved to describe the new and/or more prevalent work forms and arrangements experienced by workers. The diversity of vocabulary signifies, in part, a range of value judgments on the meaning of these experiences. Terms range from the approving "flexibilization" through "atypical", "alternative work" and "non-standard work" to the critical "precarious work" or "peripheral" or "marginal" work [103,132]. Terminology is controversial and politically charged. Even the ostensibly neutral "atypical" and "non-standard" have been criticized as being gender- and race-biased, for so-called standard work has only been "standard" for white men, not for women, or for people of color [28, 99]. Further, the different terms encompass different

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aspects of experiences, though they are often used interchangeably. In our review of the literature, we focus on what we consider the most salient aspects of experiences – particularly those aspects with the potential to impact workers' health – and attempt to trace the evolution of the terminology, while developing an understanding of how precariousness arising from labor-market experiences might affect health.

We use the term "precarious" to describe work experiences that are associated with instability, lack of protection, insecurity across various dimensions of work, and social and economic vulnerability. This broad definition is similar to that employed by Rodgers [103]. However, unlike Rodgers who adopted the term with reference to "atypical" work, we note that our definition of work-related precariousness does not refer exclusively to work forms and arrangements such as temporary work, defined-term contract, casual work, contingent work, and non-standard or atypical work. Polivka and Nardone develop several related constructs for measurement purposes [92,93,95], but focus on non-standard, alternative and contingent work. Indeed, these work forms and arrangements are what often come to mind when the term "precarious" is invoked. However, an exclusive focus on the nature of the labor contract obscures the fact that many labor-market experiences in the new economy – including those that fall under the banner of standard work – exhibit characteristics that could be experienced as insecure, and thus, potentially detrimental to health and well-being. Although the labor contract can represent a key indicator of individual insecurity and precariousness, all told it is but one of a number of work-related factors that can give rise to these experiences. Furthermore, though work-related insecurity is frequently viewed as tantamount to "job insecurity" – i.e., a low degree of certainty of continuing work – in fact, job insecurity represents only one of several aspects of insecurity and precariousness that can arise from labor-market experiences [16,115].

In this paper we review macro-level developments in industrialized countries over the last three decades, with a focus on how these developments are linked with changes in workers' labor-market experiences during this period. At the individual level, we explore what might constitute the "basic elements" of labor-market experiences that give rise to insecurity and precariousness, and consider their implications for the health and well-being of labor-force participants. Much of the literature on the relationship between labor-market experiences and health in the new economy focuses on specific work forms and arrangements [7,104], and fails to consider the underlying aspects of these experiences that make them more or less precarious; moreover, much of this literature does not consider the specific pathways (e.g., stress, material deprivation, exposure to physical hazards) through which these experiences can adversely affect health. Our key contribution to this work is the development of a framework that elaborates the principal dimensions of work experiences that can be precarious, and the pathways by which work-related precariousness might bear on health and wellbeing.

The paper proceeds in five sections. In the first section we review global economic, political, and labor-market developments over the last few decades and consider their implications for labor-market experiences. In the second and third sections, we examine constructs related to insecurity as they have developed in the literature and consider their relationship to health. In the fourth section we lay out the theoretical foundations for our framework of "work-related precarious experiences and health." Lastly, we conclude with a discussion of how our framework might inform future research and policy.

2. Macro economic trends, political developments and labor-market changes

Prior to World War II, work forms and arrangements that today are commonly labelled "non-standard" in North America (or "atypical" in Europe) were more the norm than the exception. However, the legislative, political, and social developments of the post-war period gave rise to a new standard: full-time, full-year permanent employment [13,83,84,109]. Henceforth all other work forms and arrangements were considered "non-standard." A major determinant of the rise of so-called standard employment was the massive expansion in the size and scale of industries after the war, which put pressure on firms to control costs by ensuring a reliable source of labor [84,109]. Simultaneously, trade unionists pressured employers for a system of rules governing employment practices that would reduce management's arbitrary authority [24,57,109]. These two developments gave rise to a new employment standard, which typically entailed full-time, permanent employment with regular hours and schedule, based at the employer's location and providing a range of benefits. Generally, it provided workers with certain rights, income and benefits security, and obliged the

employer to provide some degree of safe employment conditions [24,130].

The economic prosperity of the post-war period, in conjunction with new legislation to protect workers' bargaining rights, gave rise to specific labor-market norms in developed countries, which reflected the fact that a large fraction of the labor force was employed in long-term secure employment relationships. Stable employment relationships meant that workers and their families could plan for their long-term financial needs (e.g., large purchases, such as a home or vehicle, and savings for children's education and own retirement) and to pursue opportunities to enhance their skills and develop their careers within, and supported by, a firm [83,109]. In fact, these "in-house" opportunities or internal labor markets (internal to the firm) became the normal commitment a firm made to its workforce, although it was a relationship enjoyed primarily by middle-class (typically white) men [24,83]. The labor market was, and still is, gender- and race-biased; in particular, a disproportionately larger percentage of women, visible minorities, and recent immigrants labor in non-standard work arrangements. In fact, recent labor market trends are seen by some as a downward convergence or "feminization" of labor market experiences [129].

In the 1970s new forces began to erode labor-market norms that had originated in the post-war period. The high productivity growth rates of the 1950s and 1960s that contributed to improvements in living standards began to decline [108].[1] This macroeconomic slowdown was a major cause of the stagnation of real wage rates over the 1980s and 1990s, and led firms to seek new ways to cut costs and to innovate in order to improve performance and competitiveness [24,82,101].[2] The expansion of international trade, facilitated by deregulation and reduction of trade barriers, in conjunction with technological advancements has broadened market boundaries and intensified international competition [25,48,50]. Firms are now under constant and increasing pressure to innovate or cut costs in order to retain their domestic and international customer base [18, 101]; though Dorman [32] notes that cost-shifting and externalization is more pervasive in small firms, competitive industries and open economies than in large firms, concentrated industries and closed economies.

Globalization has played a key role in reducing the strength of organized labor, an institution that has historically played a critical role in protecting and advancing workers' interests [83,85]. At the firm-level, the combination of pro-market policies and the wane in workers' power has meant more opportunities for employers to experiment with alternative business strategies and structures [83]. Such alternatives are aimed at achieving higher levels of productivity, while at the same time giving workers limited influence over the labor process [15]. In turn, emerging forms of work organization have exacerbated certain types of occupational health risks. For example, reports of work intensification and job stress have increased dramatically in the last decade, posing a significant threat to workers' physical and mental health [16,33].

Firms increasingly hire workers under a range of non-standard contracts, such as temporary and part-time employment contracts as well as self-employed contractors [8]. In some cases, entire functions within organizations are being outsourced. Large-scale organizational restructuring throughout the last two decades has resulted in the elimination of a large proportion of permanent positions and their replacement with "flexible" ones [24]. From the employer's perspective, a system of *ad hoc* employment helps facilitate adjustments to market shifts and, at the same time, avoid the burden of expensive benefits packages and fixed labor costs during periods of reduced demand. Employing non-standard workers may also appeal to employers because such workers are less able to force improvements in their employment arrangements due to their frequent exclusion from many important worker-advocacy mechanisms, such as trade union representation [24]. All of this has meant that the valued features of the standard employment relationship are increasingly less common in the labor market [63,67,70, 128]. In some cases, the increased flexibility of some work forms and arrangements (e.g., part-time and temporary work) may be of benefit to workers, though in many cases the "voluntary" nature of engaging in these forms and arrangements may simply reflect the lack of flexible full-time employment options [73].

Somewhat surprisingly, firm level "flexibility" has resulted in a more stable environment at the aggregate level. This phenomenon is described as "idiosyncratic volatility" – local-level volatility that balances out to macro-level stability [27]. In essence, the peaks and

[1] Average annual productivity growth rates were 2.8% in the US and 3.4% in Canada in the 1960s, but were only 2% in the 1970s and just above 1% in the 1980s for both countries [18,53].

[2] The modest growth of GDP in the US combined with continued decline in employment growth may explain the lack of wage inflation in late 1990s. Greenspan (as cited in [27]) attributes this to the widespread fear of layoffs that pervaded the labour market through much of this time period.

troughs at the macro level have been smoothing out to a trend of slow yet stable output growth as a result of the frenetic and continuous adjustment at the firm level. Recessions in the United States have become shorter in duration and shallower in severity, while periods of modest economic growth have become noticeably longer. However, as implied here, the macro-level stability offered by flexible employment practices often rests on individual level instability, indeed insecurity. And, to date, there remains only limited knowledge or evidence on the impact of these changes on individuals exposed to persistent and increasing labor- market insecurity.

As these changes have unfolded, researchers have focused on investigating the links between key aspects of working conditions and health, such as the individual impact of job demands and control [60], and the balance between efforts and rewards [117]. The demand-control and effort-reward imbalance models are the cornerstone job-related stressor models in epidemiology. They draw on the earlier social stress literature in which stress is described as an arousal arising from an imbalance between demands and the ability to address those demands [58,77,88]. However, these work-health models have been developed within the framework of the standard employment relationship [14,91]. Overall, the research on work and health has failed to adequately conceptualize the way changes in broader labor-market trends, based on new forms of work organization and flexible employment practices, may affect the health status of labor-force participants. In particular, it is not clear which aspects of the changing labor-market experiences are most likely to undermine health and well-being. As a result, there is little understanding of the human and social impacts of the current structural changes taking place in the labor market [14,15].

3. Expanding the concept of insecurity

The construct of "job insecurity" is one of the forms of work-related insecurity first thought by researchers to have a bearing on health. The concept arose out of practitioners' and theorists' interest in studying the impact of the large-scale organizational restructuring occurring as a result of the economic downturn of the mid-70s. Prior to this period, in the context of more stable labor market conditions, job *security* had been the focus, while general inventories of work climate [49], and indices of overall job satisfaction [54] were the measures of interest. As the globalization of markets gave rise to increased competition and employers began reducing their commitments to workers, the focus of research on work and health shifted to job insecurity. The construct was believed to be a key stressor, and research on it expanded considerably [97,123].

Job insecurity has typically been defined as a perceptual phenomenon, specifically, as the perceived threat of job loss [47,51,56]. Although some of the research on job insecurity broadens the definition of the construct to include threats to "valued job features" (such as promotion opportunities, periodic pay increases, or job status), in general studies on job insecurity reflect a basic definition of the construct as an "overall concern about the continued existence of the job in the future" [123]. At its core, job insecurity reflects the discrepancy between the level of security a person experiences, and the level that s/he might prefer [51]. Hence, different individuals may react differently to the same objective level of risk of layoff. In view of the basic definition of job insecurity as arising from anticipation of a "fundamental and involuntary event," it follows that job insecurity is considered a classic work stressor with health consequences consistent with demand-control models of job strain [60,69].

A meta-analytic review of the job insecurity literature by Sverke et al. [123] concluded that the causal associations between job insecurity and mental health are moderate, while those with physical health are small [123]. One explanation of the limited effect sizes is that job insecurity is just one of several forms of insecurity arising from work experiences that bear on health. According to De Witte [30] insecurity extends beyond the narrow concept of threat of job loss to include the threat of loss of other valued effects of labor-market engagement, such as income, social contacts, help with structuring time, and opportunities to develop skills, etc. [5,47]. Sverke et al.'s [122] finding that multiple-item measures perform better (i.e., are more likely to be a significant predictor of adverse health) than single-item measures, alludes to this fact.

More recent investigations from the Whitehall II series also confirm the proposition that the link between insecurity and health may be attributable to a broader set of causes than simply the threat of job loss [72]. In these studies, traditional job insecurity was shown to have limited impact on persistent inequalities in morbidity and cardiovascular risk factors (with the exception of depression), despite steep gradients in perceived job insecurity among employed persons. In contrast, the overall level of individual financial insecurity was a significant variable explaining health inequali-

ties, particularly amongst men [40,72], and depression for women [34]. Additional in-depth interviews revealed that insecurity can be engendered by a number of factors independent of the explicit threat of layoff. In particular, individuals experiencing organizational restructuring in their workplaces described feeling vulnerable because of the loss of valued job features, as well as from having to take on unwanted tasks and responsibilities. Other interviewees cited the insecurity they felt when faced with increasingly limited career development opportunities [72]. Although preliminary, the Whitehall II results indicate a need to take the insecurity-health linkage beyond the realm of the threat of job loss [36,38–40].

Many employment experiences are likely to involve some degree of stress producing insecurity, though several observers suspect that a broad category of experiences typically labelled "non-standard" or "atypical" are inherently more insecure, and thus potentially more harmful to health than standard or typical employment. A small literature has developed that qualitatively and empirically investigates this phenomenon [4,7, 17,97,104]. In Canada, the United Kingdom, and Germany, researchers have focused on four types of non-mutually exclusive forms and arrangements which they label non-standard or atypical: part-time work, multiple job holding, temporary/short-tenure work, and self-employment [35,46,63,79,135]. Unfortunately, much of the empirical and theoretical work in this field fails to explore what specific aspects of these work experiences may bear on health, with some exceptions [14,15]. This absence of a deeper inquiry into the aspects of insecurity appears to rest on the assumption that non-standard work is inherently more insecure. But non-standard employment includes a diverse set of experiences and can include a mix of desirable and undesirable characteristics. For example, the self-employed can range from those forced from stable jobs within companies into self-employment as external contractors, to independent professionals such as doctors and lawyers, and entrepreneurs. Clearly, a deeper exploration and more refined measurement of the insecurity-inducing aspects of employment experiences are warranted.

Polivka and Nardone [95] rejected the broad, catchall notion of non-standard employment and returned to the notion of continuity of employment to develop a construct they label "contingent work" [95]. The focus on continuity of employment, which is akin to job insecurity, is based on the notion that it is the most relevant aspect of non-standard employment that sets it apart from standard employment. Polivka and Nardone define it as insecurity regarding the continuing availability of employment in one's job, though they also include regularity of minimum hours available. They theorize that job insecurity arises when at least one of two conditions are present: first, there is no implicit or explicit understanding that employment will continue; and second, the minimum number of hours available can change in an unpredictable manner (for example, in on-call work). The significant and positive relationship between job insecurity and contingent work has been empirically demonstrated by Sverke et al. [122] who found that contingent workers perceive higher levels of job insecurity than workers in more traditional full-time arrangements. Polivka and Nardone also test various permutations on the specific translation of the above definitions with the *Current Population Survey* to assess their implications for the size of the contingent labor-force [80,81,92–94]. As might be expected, they identify a much smaller sample using their "contingent work" definition than that found by researchers focusing on the broader "non-standard" work construct. However, the construct of contingent work, as the original construct of job insecurity, *is* quite narrow.

Perhaps in recognition of the narrowness of the contingent work construct, Polivka and Nardone also created a construct they term "alternative work arrangements" to capture a broader category of employment experiences. The construct of alternative work builds on the basic theme of unpredictability underlying contingent work, but expands it to include unpredictability in timing, and location of work. It includes employment through an intermediary, as well as employment with unpredictability in the place, time or quantity of work. The construct encompasses independent contractors, on-call workers, and workers paid by "temping" or contracting agencies. Essentially, the construct captures employment negotiated through an intermediate firm, in addition to that captured under the construct of contingent work. Though the construct of alternative work represents a much broader conception of insecurity than do contingent work and job insecurity, it still may not capture the full range of factors that can give rise to insecurity and ultimately poor health.

Rodgers [103] developed a more general framework to describing employment experiences based on the notion of insecurity. He begins with the construct of "atypical work" (which appears to be synonymous with non-standard work), and uses these work forms and arrangements as a basis to theorize about the key dimensions of work experiences that may give rise to instability, insecurity, and vulnerability. He identifies four

dimensions of employment experiences that can give rise to instability, insecurity and vulnerability, and uses the term "precarious work" to describe them. The four dimensions are: 1) the degree of certainty of continuing work; 2) the control over work (i.e., control over working conditions, wages, and the pace of work); 3) protection (i.e., the protection provided by regulation, social norms, and benefits); and 4) income adequacy [103]. This paradigm has been adopted by Cranford et al. [29], who use it to develop a mutually exclusive typology of jobs and to identify and map proxy measures of these dimensions [29].

Rodgers' work represents a more complete theorization of insecurity arising from labor-market experiences than the notion of job insecurity, non-standard work, and contingent work. We use this conceptualization as a platform to develop a framework of precarious employment experiences which explicitly transcends the structure of the labor contract, to consider the health consequences of various basic elements of precariousness. We draw upon several incremental dimensions of employment experiences that could give rise to instability, lack of protection, insecurity across various dimensions of work, and social and economic vulnerability, as well as identify several pathways by which such employment experiences can lead to adverse health outcomes.

4. Pathways from precarious employment experiences to health

Underlying the conceptualization of the links between work-related insecurity or precarious employment experiences and health is the notion that strain arising from undesirable work conditions or arrangements leads to stress, and may ultimately bear on health. Stress is the principal pathway from precarious employment experiences and health. In Fig. 1 we depict a simple model of the stress process drawn from the literature on social stress, which we describe in more detail below.

There are others pathways by which health can be affected, two of which we elaborate upon below. In describing these pathways, we note that our objective is not to expound on all of the avenues whereby specific work aspects might affect health. Instead, we present several key mediating factors in an effort to elucidate the relationship between exposure to work-related precariousness and adverse health outcomes in workers.

It is well known that human biology is not well adapted to high-levels of enduring stress. When confronted with a stressor, the body mobilizes biological resources to deal with the impending threat, and suspends long-term biological activities such as digestion, immune function, tissue repair, and so on, until the stress has passed [110]. Several studies have shown that exposure to chronic stress is responsible for a range of psychological and physical problems generally considered less tractable than those resulting from acute stress, such as increases in cholesterol and changes in the nervous, immune and endocrine systems [22,61,74, 90]. Prolonged exposure to glucocorticoids, a class of hormones released when under stress, can cause muscle and skin atrophy, longer wound healing times, increased risk of infection, hypertension (chronic high blood pressure), mood disturbances, reduced memory and cognition, and many other physiological and psychological ailments [112]. Overexposure to glucocorticoids also causes atrophy of neurons (nerve cells) in the hippocampus, an area of the brain which is vital to memory and learning [111]. In addition to being implicated in such disease processes as coronary heart disease and cancer, chronic stress is associated with mood disorders including anxiety and depression [22, 59,90]. Applied to the subject of labor-market experiences and health, this evidence suggests that, through constant and enduring stress, sustained insecure experiences will likely lead to adverse health consequences.

We propose three avenues by which stress might ultimately lead to adverse psychological and physiological health outcomes (see Avison and Turner [6], Kahn [58], McGrath [77], and Pearlin et al. [88] for conceptual formulations of social stress and its effects, and Ferrie [37] for a review of the evidence on the impact of insecurity on psychological and physiological health). First, stress may directly influence psychological and physiological health contemporaneously or sequentially (i.e., first psychological and then physiological health or *vice versa*) [26,126]. Second, it may influence key mediating variables related to levels of well-being such as life or job satisfaction, which may then have an impact on psychological and physiological health [116]. Lastly, stress may encourage coping behaviours that are detrimental to psychological and physiological health [75].

These avenues are not meant to be exhaustive, nor do they necessarily operate independently. In actuality they may be more complex, intertwined and spiralling. Furthermore, personal attributes (e.g., personality traits) and contextual factors (e.g., coping re-

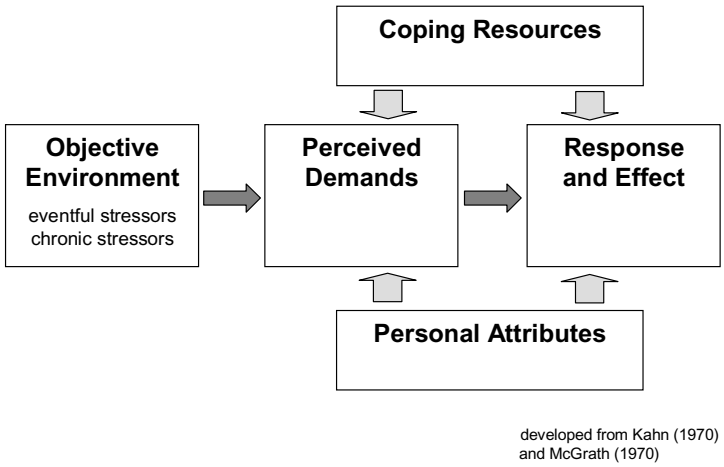

Fig. 1. The Stress Process.

sources) will bear on the avenues that are most salient for an individual, and the impact that stressors have on health. For instance, the need for control that characterizes individuals with Type A Behaviour Pattern is associated with poorer stress coping ability relative to individuals with Type B personalities [45]. Likewise, individuals with an external locus of control tend to cope with stress less effectively than those whose locus of control is more internal [64]. Furthermore, the lack of key coping resources (e.g., inadequate income, low education, or the absence of social support) can increase individuals' vulnerability to stressful circumstances [1, 3]. Where stress is perceived, the three pathways linked to adverse health are as follows.

The first pathway is directly from stress to adverse psychological and physiological health. The stressors that individuals experience today, in the work environment and elsewhere, can persist for lengthy periods of time. At the workplace, trends in work intensification and reduced job security have been identified as key sources of ongoing occupational stress [33,83,119]. Consequently, stress hormones may remain at high levels for prolonged periods or even for the duration of an individual's participation in a particular work form or arrangement. A sustained release of stress hormones can lead to adverse psychological and physiological effects [112]. One study in particular has shown that high job demand and low control at work may be related to increased levels of fibrinogen a protein that, when present in elevated levels, has been shown to lead to myocardial infarction [125]. Moreover, several studies have found that stress and psychiatric conditions such as major depression and anxiety can compromise the immune system making the individual more vulnerable to infection and disease [44,62]. However, other studies, such as Steptoe et al. [121], have found that those who suffer from depressive symptoms and hopelessness are no more likely than controls to have compromised immune function [121]. These contradictory findings attest to the complexity of pathways and the need for further research to better understand them.

A second pathway, wellbeing (life or job satisfaction), may also serve as an avenue by which stress can bear on psychological and physiological health. Studies have demonstrated that job satisfaction decreases with increased strain from work [120], increased fatigue from high work demands [23], and low levels of control or role clarity [66]. Most studies categorize life or job satisfaction as a construct distinct from health [7,41,87], although there is evidence of a direct link between individual job-related well-being, and general (i.e., "context-free") well-being [9,96]. In particular, some researchers have found associations between the characteristics of job insecurity, job dissatisfaction and physiological measures known to be detrimental to physiological health over time.

A third pathway is through unhealthy behaviours for coping with stress. This avenue may overlap with the first and second pathways described above in that compromised psychological health and/or wellbeing may give rise to unhealthy coping behaviours. Research has shown that chronic stress, coupled with feelings of a loss of control and powerlessness, is associated with declines in self-efficacy and the ability to perform instrumental behaviours (such as those required for maintaining/improving health) [75]. Behavioural responses may include decreases in physical activity and increases in smoking, drinking, and unhealthy eating [31,78] or changes in the use of health care [12,55,65].

There are at least two other pathways by which precarious work-related experiences might affect health that are not derivatives of insecurity. Stress may also be involved in these pathways as a secondary pathway, though we do not expound on this complexity here. Material deprivation is known to have a strong, inverse relationship with measures of physical and mental health [19–21]. Specifically, health may be adversely affected through prolonged periods of income inadequacy, which can lead to material deprivation of various forms including poor living conditions, poor nutrition, and inadequate access to health care resources [76]. Impoverished circumstances can also lead to insecure social insertion [103]. In turn, the stress arising from social exclusion can contribute to mental health problems such as anxiety and depression [2,11,71].

A second pathway is through exposure to physical hazards in the work environment. Workers in non-standard employment may be particularly at risk of increased exposure due to the intensification of work arising from the underbidding of contracts by their employers or being called upon to fill in only during peak demands; inadequate occupational health and safety training or unfamiliarity with the hazards of a work sight; coordination/communication gaps arising from disconnected work groups employed by different contractors; selection by an employer into inherently more dangerous jobs; and lack of access and/or ability of marginalized workers to exercise legal rights to a safe workplace. Quinlan et al. [98] classify these factors that bear on increased exposure to occupational health and safety hazards into three categories: economic/reward pressures, disorganization, and regulatory failure [100]. They site evidence from 76 studies that found increased exposure to such hazards associated with non-standard work forms and arrangements. Though again, it is important to emphasize that the issue of increased exposure due to human resource and other practices directed at increasing flexibility and productivity may also affect workers in standard jobs.

5. A framework of the dimensions of work-related precarious experiences

Our framework of the dimensions of work-related precarious experiences and their health consequences, depicted in Fig. 2, is based on Rodgers [103]. As noted, Rodgers recognized, as have other researchers, that atypical or non-standard work forms and arrangements are extremely heterogeneous. Furthermore, there is no reason to believe that non-standard employment has a "monopoly on precariousness," and indeed, experiences under the banner of "standard employment" may also be precarious along some dimensions. This said, on average, non-standard employment *does* tend to be more precarious than standard employment. Based on an analysis of the undesirable characteristics of non-standard employment experiences, Rodgers identified four key dimensions that, in their negative valence, can give rise to insecurity. They are: continuity, control, protection, and income adequacy. We include these four dimensions in our framework and have added four additional ones based on literature on the labor-market experiences in the new economy [14,15,91,100,113]. The following is a short description of each, followed by an explication of the key pathways identified in the framework, and a discussion of the role of exposures and context.

5.1. Dimensions of precariousness

1) *Degree of certainty of continuing work:* This refers to the threat of job loss (job security), as well as, more broadly, to employment security with a current employer, or with current employment arrangements. It may also encompass employability security within the labor market, and predictability in the amount of work from week-to-week or month-to-month. While employment security refers to the ability to maintain an employment arrangement (not necessarily within the framework of the same job), employability security relates to the threat of long-term unemployment or underemployment spells. On this point, Silla, Sora, and Garcia [118] have found that insecurity is most pronounced among non-standard (i.e., contingent) workers with fewer skills, a finding that may indicate that the prospect of job loss is less worrisome to workers with skill sets that are in high demand [118].

2) *Control over work processes:* This pertains to the ability to control or influence the full range of factors that bear on the work experience such as the pace of work, organization of work flow, assignment of tasks that are consistent with an individual's skill set, methods for accomplishing tasks and having access to adequate resources to accomplish them, hours of work including scheduling and the ability to refuse overtime, and the ability to negotiate appropriate wage increases. According to Gallagher [42], compared to workers in standard full-time arrangements, workers in non-standard (specifically, part-time and contingent) employment tend to have less control over several key as-

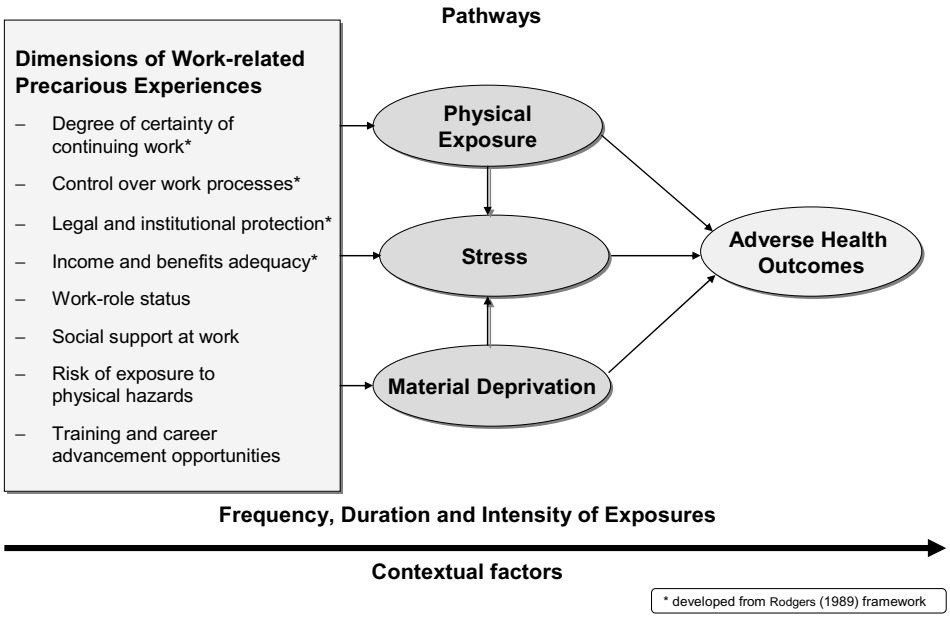

Fig. 2. Framework of the Health Consequences of Work-related Precarious Experiences.

pects of work, with implications for higher work-based strain [42]. For instance, the ad hoc and fixed-term nature of much non-standard employment can give rise to stresses arising from inadequate control over work schedules [42]. Also, part-time and contingent workers are frequently hired to perform jobs that require limited training and involve fairly repetitive tasks, which can lead to boredom and, in turn, distress [42,105,133]. Moreover, non-standard workers tend to be less well integrated into organizational networks, limiting access to key resources required for performing assigned tasks effectively [42]. Lack of control over access to organizational resources may lead to performance-based frustration that, in turn, can negatively impact worker well-being [42,89].

3) *Legal and institutional protection:* This reflects the extent to which an individual is protected against unfair dismissal, and unhealthy working conditions and practices through labor legislation, a collective bargaining agreement, a labor union, or customary practice (institutional norms). This dimension also concerns the accessibility of the judicial system, including the availability of legal information, and the ability to receive and access legal representation. Because the labor laws of industrialized countries were designed around the traditional standard labor contract, many of the new non-standard arrangements are difficult to characterize from a legal standpoint. As a consequence, many non-standard workers may be denied important statutory benefits and protections such as the right to refuse unsafe work, and the right to minimum wage and employment insurance. Moreover, even those workers who do fit the legal definition of an employee may be denied effective legal protection due to their lack of power in the workplace, and the uneven enforcement of labor laws [68].

4) *Income and benefits adequacy:* This refers to the sufficiency of labor-market earnings and benefits for current and future lifestyle or financial needs. A key characteristic of non-standard work (particularly contractually-limited forms) is its susceptibility to unpredictable fluctuations in number of hours worked, and hence, an unpredictability in income [42]. Benefits are another important part of the social wage and include social security benefits such as unemployment insurance, workers' compensation, and public pension plan and other work-related benefits such as private life and disability insurance, private pension plans, dental plans, prescription drug plans, and extended health care plans. Other aspects of the social wage are the ability to take time off (paid or unpaid) and have access to child-care leave and benefits, as well as employee assistance programmes.

5) *Work-role status:* This refers to the prestige associated with an individual's work role in the view of peers within an organization and within the larger community. Work-role status may be based on an individual's position in the occupational hierarchy, co-workers

perception of an individual's standing in the organization, and social position based on race/ethnicity, gender, age, and health status factors that may be stigmatized (e.g., obesity, disability status). In the case of non-standard work, status may be associated particularly with an individual's contractual relationship with an organization. For example, temporary workers may be perceived as having lower status by permanent workers and supervisors [15].

6) *Socio-cultural environment at work:* This refers to the quality and quantity of peer or collegial support available at work. It may be based on firm and industry specific cultural norms, the management style at an organization, and the social disposition of the individuals employed at an organization. The quality and quantity of support provided or available to individuals in an organization may rise or fall in relation to their work-role status. There is research to indicate that the lower status of temporary workers makes this group susceptible to social exclusion by regular full- and part-time workers [43,106]. In turn, social exclusion is known to be related to higher levels of workers' anxiety, depression and loneliness [10].

7) *Risk of exposure to physical hazards:* This pertains to the risk of exposure to physical, biological, chemical, radioactive, or other hazards that may undermine an individual's physiological health. Inevitably, these risks may vary depending on job assignment, which in turn may depend on work-role status. Moreover, occupational health risks (e.g., diseases, accidents) are not equally distributed across social groups, occupations, genders and firms [16,75,127]. The variation in work conditions across these social strata represents a key determinant of inequalities in health [16,21]. One systematic review on the health and safety effects of precarious employment found these jobs to be associated with higher rates of injury, increased risk of disease and exposure to hazards, and poorer worker (and manager) knowledge of occupational health and safety and regulatory responsibilities [100].

8) *Training and career advancement opportunities:* This includes the availability of job-specific training (to carry out regular duties), occupational health and safety training, access to training that helps to develop skills that enhance an individual's employment prospects (at the same level) as well as and the availability of opportunities for moving up the "job ladder" both within the current organization and in the labor market in general. Reports indicate that workers in non-standard (e.g., part-time) employment are less likely to be assigned managerial positions, or to have access to professional development opportunities within organizations [42, 134].

It is important to reiterate that although workers in non-standard employment may be more prone to precariousness, the experience – and its constituent elements – transcends the nature of the labor contract. Indeed, individuals in ostensibly "safe" standard work arrangements are not immune to precarious employment experiences. In fact, an empirical profile of the distribution of work-related insecurity in the Canadian labor market reveals that a substantial proportion of workers in standard employment are exposed to several aspects of precariousness. These include: earnings and benefits inadequacy, a lack of control over work processes in the form of substantial unpaid overtime hours, poor career advancement opportunities (namely, inaccessible job and pay ladders), and a lack of legal and institutional protection due to the absence of union coverage [115]. Other research has shown that job insecurity (i.e., low degree of certainty of continuing work) can also be prevalent among workers whose labor contracts are nominally secure [107]. Hence, by interrogating current notions of insecurity and precariousness, we reveal the commonalities underlying the apparently disparate literatures on: 1) job insecurity; and, 2) insecure employment experiences arising from labor market restructuring. In the process, we show how emerging aspects of employment that are associated with instability, lack of protection, insecurity across various dimensions of work, and social and economic vulnerability have the potential to impact even workers who labor under contracts considered the employment "standard."

5.2. Pathways

Work-related precarious experiences are employment experiences characterized by one or more of the above dimensions in their negative valence. The dimensions represent stimuli that, either singly or through their interactions with each other, affect health. In our framework we identify three key pathways by which negative health outcomes might occur: physical exposure, stress, and material deprivation. More likely than not, there will be interplay among the dimensions, as, for example, the lack of control over work and the inability to influence wages may lead to income inadequacy, which in turn may lead to low work-related status. One dimension will also likely contribute to more than one pathway. For example, the risk of exposure to a physical hazard, may lead to both physical injury

or illness and increased stress, while income inadequacy may cause both material deprivation and increased stress. Clearly, stress is a central means by which labor-market experiences impact on health, hence we have placed it in the centre of the framework with arrows from the other two pathways to reflect the possibility of these secondary pathways. As suggested, there is also the possibility of feedback loops from adverse health outcomes to labor-market experiences that may exacerbate the process and cause further downward spiralling of psychological and physiological health. For example, an impairing physical injury directly leads to a negative health outcome and, in the context of insufficient social security benefits, may also lead to income inadequacy, material deprivation and increased stress, which could further exacerbate the deterioration in health.

5.3. Exposures and context

Critical characteristics that bear on the experience of precariousness are the intensity, duration, and/or the frequency of exposure to undesirable work conditions related to a particular dimension. An increase in the number of dimensions that are precarious will also likely intensify the stress and increase the probability of adverse health outcomes, and may do so in more than an additive manner. Consistent with this notion, the importance of work conditions related to one dimension may depend on the quality of work conditions related to other dimensions. For example, low work-role status may produce more stress if there are low levels of social support at work than if there are higher levels of support. Similarly, low levels of legal and institutional protection may not be an issue if income and benefits are more than adequate, and if training and career advancement opportunities are present.

Most importantly, contextual factors that define the personal situation of an individual may magnify or modify the impact of precarious employment experiences. The key notion here is that that the framework describes a person-in-context phenomenon–stimuli arise from the conditions of work or an employment experience, but the impact those stimuli have on an individual can vary depending on contextual factors. Consequently the same conditions may result in different levels of stress and different probabilities of adverse health outcomes for different individuals. For example, a part-time job in the retail sector may be considered adequate by a young full-time student, though it may be less than adequate for an older individual with dependants. Contextual factors might include sociodemographic characteristics such as age, gender, marital status, number of dependants; economic factors such as spousal labor-market earnings and benefits, other family income sources and amounts; and personal attributes such as psychological, physiological and personal resources available to cope with adversity.

In describing the framework as being based on a person in context, however, it is important to point out that we are not suggesting that the desirability or undesirability of the attributes of a particular job or employment experience are a purely subjective phenomenon. For the most part, the attributes will be clearly desirable or undesirable, healthy or unhealthy, for the preponderance of labor-force participants.

6. Where do we go from here?

Many researchers and policy makers have cited concerns about the transformations taking place in the labor markets of developed countries. Globalization, aided by technological advancements, has significantly intensified competition and provided a strong incentive for firms to "flexibilize" large portions of their workforces. The growing prevalence of non-standard or atypical work forms and arrangements is testament to the magnitude of the changes taking place. At issue is a concern about who benefits from these changes and at what cost.

While it is not uncommon for labor-market experiences and norms to change in response to shifts in market conditions, it is vitally important that societies not revive old vulnerabilities, or create new ones, in the process of adapting to these changes [103]. Many current legislative and policy responses have failed to keep pace with the rapid developments of labor markets. For instance, workers' compensation, occupational health and safety, and labor legislation are designed around traditional (i.e., standard) work norms [98]. Furthermore, many of the regulatory responses to changes in the economy have been fragmented, *ad hoc*, and driven, not by workers' needs, but by those of employers. As a consequence, particular groups of individuals such as young adults, older individuals, women, visible minorities and recent immigrants are more likely to be burdened by the labor-market changes [28]. Polarized wages, divided labor-market opportunities and a general downward harmonization of many jobs are aspects of labor-market dynamics that need to be addressed through *pro*active, rather than reactive, policy initiatives.

There is good reason to believe that these labor-market changes if not adequately addressed, may have long-term health, well-being, and productivity implications for society. Health capital is a vital part of a country's capital resources, particularly given the aging profile of the labor force. It is even more important in the new "knowledge" economy, where mental acuity and the ability to continually acquire new skills are critical if productivity is to continue to grow. Ideally, legislative, economic and social mechanisms need to promote opportunities that allow employers flexibility, with sufficient incentives for them to provide workers with healthy and sustaining labor-market opportunities. Flexibility for employers does not have to translate into precariousness for labor-force participants if appropriate incentives, institutional norms, and regulatory and enforcement mechanisms are in place. Examples of reforms that provide for firm-level flexibility, yet still address issues of security include: requiring portability of benefits and financing of work-related training; developing occupational health and safety regulations and workers' compensation programmes that reflect the nature and level of risk associated with many new work arrangements [86]; and modifying other social safety net programmes such that they accommodate the greater variety in current labor-market experiences (e.g., adjusting eligibility thresholds for unemployment insurance to accommodate workers with multiple spells of temporary employment). These are merely some general and preliminary policy responses; more specific and refined measures will clearly be needed.

Before more detailed policy can be developed, we need a better understanding of the specific aspects of the increasingly prevalent labor-market experiences that present the greatest risks to workers' health. To date, only a small number of studies have attempted to model the health outcomes of exposure to non-standard or precarious work [7,17,31,104]. Moreover, studies on the linkage between precarious employment experiences and health tend to focus on a single aspect of the experience, namely job insecurity. Some observers suggest that the emphasis on job insecurity provides only a "partial picture" of new work contingencies since it neglects other key aspects of work organization that may bear on health. For instance, Benach et al. [16] point to workplace structural determinants such as lack of unionization, and lack of benefits as features of insecure employment that may give rise to poor health outcomes. Moreover, social relations in the workplace must also be considered with respect to the status and treatment of workers in non-standard arrangements [15].

Our conceptual model captures various structural and social aspects of work that can contribute to precariousness, and subsequent downstream adverse health outcomes. The dimensions outlined in our framework provide a meaningful starting point for qualitative and quantitative analyses. Qualitative studies can shed light on the nature of work-related precariousness, and the dimensions that are most salient to individuals in different life circumstances. In addition, grounded research can be used to develop measures for subsequent use in large-scale survey research.

With quantitative observational data, longitudinal modelling techniques offer the greatest potential for teasing apart the relationship between exposures to dimensions of precariousness from their health impacts. Some of this research is already underway. For instance, Tompa et al. [124] have used data from a Canadian panel survey to investigate the health impacts of exposures to several proxy measures of precarious employment [124]. Scott [115] has also used similar measures within a multilevel modelling framework to examine the longer-term health impacts of work-related insecurity experiences among individuals employed in arrangements that are nominally secure (i.e., full-time permanent jobs) [115]. Findings from these empirical investigations provide support for a link between dimensions of work-related precariousness and health. These dimensions include exposures to physical hazards, earnings inadequacy, lack of control over work processes (e.g., work intensification and substantial unpaid overtime hours), and a lack of training and career advancement opportunities (e.g., the absence of regular earnings ladders).

The next steps will be to develop better measures for the dimensions of precariousness; to further explore the nature and magnitude of the relationships between exposure to dimensions of precariousness and their impact on health through multivariate regression analyses (e.g., are the relationships linear and additive, or are they more complex?);[3] to investigate the specific mechanisms or "pathways" by which the different dimensions of precariousness operate; and to identify the individual and contextual factors that magnify or modify the relationships between exposure and outcomes. Such a research mandate requires a multidisciplinary approach, since the systematic integration of the broad

[3] Warr (1999) has identified specific job characteristics that affect well-being in curvilinear fashion. For instance, very high levels of job autonomy can be deleterious to health since they imply uncertainty, difficulty in decision making, and high responsibility on the job.

range of factors identified at the structural, social and individual levels demands a diverse set of perspectives and research tools. Scholars with expertise in sociology, psychology, economics, political science, legal and regulatory frameworks, and occupational health and safety each have a role to play in addressing the complexities of precarious employment and the links to health. Only with a thorough understanding of the dimensions of work-related precariousness and their impacts on health can policy makers develop appropriate legislation, policies, programs and practices to prevent societies from resurrecting on a large-scale the historical vulnerabilities their predecessors have worked so hard to reduce.

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