

A multidimensional approach to precarious employment:

measurement, association with poor mental health and prevalence in the Spanish workforce

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A mis padres, Eduardo y Pilar.
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ABSTRACT

Objective: To study the psychometric properties and construct validity of a multidimensional instrument to measure employment precariousness; to assess the association between employment precariousness and poor mental health; to estimate the prevalence and distribution of employment precariousness in the Spanish workforce; and to estimate the population attributable fraction of poor mental health due to employment precariousness.

Methods: Cross-sectional study using data from the Psychosocial Work Environment Survey conducted in 2004-2005 in Spain. Representative sample of 6968 temporary and permanent workers with a formal work contract.

Main results: The Employment Precariousness Scale (EPRES) proved to be an acceptable and psychometrically sound measurement instrument. A high score of employment precariousness was associated with more than double the prevalence of poor mental health than a low score, both in women and men and after adjustments for relevant indicators of social position. More than 45% of the sample was exposed to some degree of precariousness, over 6.5% to high precariousness, with a highly unequal distribution across groups of workers. With due caution, it was estimated that if the observed association were causal, between 11% and 23% of poor mental health in the working population in Spain could be attributable to employment precariousness.

Conclusions: Results highlight the relevance of employment precariousness for the mental health of the Spanish workforce. The EPRES is a promising tool for future research.

RESUMEN

Objetivo: Estudiar las propiedades psicométricas y la validez de constructo de un instrumento multidimensional para medir la precariedad laboral; estudiar la asociación entre precariedad laboral y mala salud mental; estimar la prevalencia y distribución de la precariedad laboral en la fuerza de trabajo Española; y calcular la fracción atribuible poblacional de mala salud mental debida a la precariedad laboral.

Métodos: Estudio transversal con datos de la Encuesta de Factores de Riesgo Psicosociales realizada entre 2004 y 2005 en España. Muestra representativa de 6.968 trabajadores temporales y permanentes con contrato formal de trabajo.

Resultados principales: La Escala de Precariedad Laboral (EPRES) demostró tener buenas propiedades psicométricas. Una puntuación alta en la escala se asoció con una prevalencia dos veces más elevada de mala salud mental que una puntuación baja, tanto en mujeres como en hombres y aun después de varios ajustes por indicadores de posición social. Más del 45% de la muestra estaba expuesta a algún grado de precariedad laboral, más del 6,5% a precariedad laboral alta, con una distribución muy desigual entre distintos grupos de trabajadores. Con la debida precaución, se estimó que si la asociación observada es causal, entre el 11% y 23% de la mala salud mental de la población trabajadora española podría ser atribuible a la precariedad laboral.

Conclusiones: Los resultados destacan la importancia que la precariedad laboral puede tener para la salud mental de la población trabajadores Española. La EPRES es un instrumento útil para investigaciones futuras.

PREFACE

This study is embedded in part of a long term research tradition within GREDS-EMCONET and CiSaL, the employment precariousness and health project (PRESAL), in Universitat Pompeu Fabra. The impact that changing employment conditions may have on workers' wellbeing and health has been in the interest of PRESAL researchers for many years now, with influential publications in Europe and abroad.

Parting from more pragmatic approaches that employ readily available data to study the relationship between changing employment conditions and health, PRESAL took a sharp turn towards the conceptual development of the *employment precariousness* construct. This task, which has taken many years of hard work, was explicitly aimed at generating conceptual and measurement alternatives rooted in a deep understanding of employment relationships and the social organization of work.

This dissertation is framed within the PRESAL project and the collaboration with the Union Institute of Work, Environment and Health (ISTAS). The Employment Precariousness Scale (EPRES), developed within the PRESAL project was included in ISTAS's Psychosocial Work Environment Survey, providing with the data which made this study possible.

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1. INTRODUCTION

Work is a key human activity and waged-work the means through which most people in western capitalist societies provide for their daily sustenance. In Europe, 85.3% of those in the occupied labour force work as employees (EUROSTAT). Work is a key determinant of health, both promoting and damaging health through several pathways. Work content, working conditions, and, in the case of paid work, the wage-labour relationship under which work is performed are crucial in determining whether work will be harmful or beneficial for health and well-being (Benach et al. 2010b).

Unemployment has raised considerable interest among epidemiological and public health researchers at different times during the past century, following more or less closely the unemployment rate {{821 Dooley,D. 2003}}. Similarly, noxious exposures derived from the environmental, physical, ergonomic and psychosocial work environment, as well as from occupational health and safety conditions have raised substantial concern among researchers. Models of work stress have been conceptually and operationally developed and empirically tested abundantly for the last decades. Employment relationships and employment conditions, however, are substantially less an object of epidemiological inquiry. There is a paucity of conceptual developments and a shortage in the development of indicators and the generation of data for the study of employment-related health effects (Benach et al. 2010).

Within capitalist economic systems, work is organized in pursue of profits, production is generally performed under the command of employers

and the majority of people working do so for someone else in exchange for a wage or salary (Bowles, Edwards 1990).

Employment is the social form that relations of work have undertaken in capitalist societies (Miguélez 2005). It is the form of relationship between capital and labour, between employers and employees (Solow); between buyers (employers who hire workers who perform labour) and sellers of labour (employees who contribute with labour in return for wages) (Benach et al. 2010, International Labour Office (ILO) 2005-2006).

Employment relationships are highly regulated in Western capitalist societies. This provides them with stability and provides the parts with institutional strength (Miguélez 2004). Employment relationships are mediated by a contract of employment, are regulated by law or by collective agreement and underpinned by the social security net of the welfare state. The aim of this regulatory apparatus is to protect workers from labour market insecurities, allowing them to sustain their living standards during non-work periods (the *decommodification* of labour) and to limit the prerogatives of management (Esping-Andersen 1990, Esping-Andersen 2000a, Mückenberger 1992).

At the macro-social level, employment relations involve collective actors, that is, workers' unions and employer associations, generally with the mediation of the state. Collective bargaining processes and collective agreements settle those terms of the employment contract which are not settled by law. When collectively established, these need not be negotiated individually (Mückenberger 1992).

For this reason, collective labour-capital relations are crucial determinants of the conditions of employment and of the working and living conditions of workers (Muntaner et al. 2010, Benach et al. 2010a). Unions, as collec-

tive actors, improve workers' bargaining power and give workers a voice in national debates over priorities and reforms, particularly in those shaping the labour market and the welfare state (Muntaner et al. 2010, Elliott, Freeman 2003).

At the microsocial level, the terms under which an employment relationship is established are legally framed by the employment contract. These, the conditions of employment or *employment conditions* are one of the most important influences on socioeconomic position (Benach et al. 2010a). Contracts can be collective or individual, although they more and more are being settled at the individual level.

The employment contract is nonetheless an 'incomplete contract', given that some of its terms are unspecified (Rubery, Grimshaw 2003, Standing 1999). Hours of work and wages are determined explicitly, but work effort and intensity are indeterminate. This means that workers and employees do not face a single formal bargain at the moment the contract is established, but that repeated bargains or transactions will take place during the duration of the contract (Standing 1999, Bowles, Edwards 1985).

These bargains will take place within a relationship that is inherently asymmetrical in terms of bargaining power (Bowles, Edwards 1985). Historically, most of the aspects of the employment relationship were left to be thus settled, leading to very poor conditions of employment and work.

During the thirty "golden" post-war years, from 1945 to the mid-1970s, stable, protected and stable employment relationships developed which were synergistic with the predominant Fordist form of production and accumulation (Boyer 1993), underpinned by strong workers' unions, a strong welfare state, and Keynesian economic policies (Benach et al. 2010). The "standard" of full-time, full-year, permanent employment

developed, based on the male breadwinner model and benefitting mainly (white) men in industrial economic activities. The standard employment relationship became the normative model of employment through which much of the non-wage and social security benefits attached to employment were secured.

Regulatory protection of the “standard” employment relationship limited the freedom of management to terminate employment contracts and the managerial prerogative to control labour (Mückenberger 1992). The social security net of the welfare state allowed workers to sustain an acceptable standard of living independently of market participation (Esping-Andersen 1990).

The golden years began to see their decline with the oil shocks of the 1970s and subsequent economic downturns. Faced with a new economic scenario, an acceleration of the globalization process, growing international competition, and the deregulation and expansion of financial markets, the Fordist mode of production and accumulation and accompanying labour relations were forced to change (Boyer 1993).

Flexible production and flexible relations of employment became the alternative; more and more organizations reduce their market risks by reorganizing, restructuring, outsourcing, downsizing, and “rightsizing” (Lewin 2007, Boyer 1993).

To the workforce, this meant becoming adaptable to changes in the production process, to new work schedules, and to the economic cycle. Labour market regulations underwent a process of de-regulation to grant organizations adaptability in the new economic scenario (Miguélez 2005, Standing 1999). In Europe, flexibilisation of labour markets also constituted the neoliberal recipe to counter chronically high levels of unem-

ployment. Flexibilisation has many features: from hiring and firing practices, to collective bargaining, to welfare provisions, all the institutions framing the standard employment relationship have undergone a process of flexibilisation.

If labour market regulation protects workers from market risks, non-work periods, and the prerogative of management to control labour, deregulation implies the opposite. While –in wealthy countries- the most visible consequence of flexibilising the labour market has been the expansion -in numbers and variety- of new and old forms of non-standard employment, the expansion of precarious employment is amongst its more severe consequences (Benach et al. 2010). The groups most severely affected by precarious employment in Europe are women, youth, immigrant workers and manual workers and the long term unemployed (Rodgers 1989).

The health consequences of these changes have been studied in epidemiological research as the impact of perceived or objective job instability: objective job instability derived from working under a temporary contract or from experiencing an imminent threat of job loss when the employing organization is undergoing major restructuring; subjective instability derived from the perception and interpretation of external signals indicating that the current job is not secure. All of these have demonstrated a negative health impact, either as an increased risk of occupational injuries, cardiovascular events, deteriorating general health, and above all, of poor mental health (in a wide array of related outcomes).

The research approaches described above, however, lack the conceptual development that a broader understanding of precarious employment relations requires. Job insecurity and temporariness are but one feature of precariousness, which leave aside key issues such as the reduction in

worker rights, social security benefits, and the shift shifts in the balance of workplace power toward employers (Scott 2004).

To move beyond this narrow vision, several authors in sociological and labour economics have adopted a multidimensional approach to precarious employment as a concept that can be used to assess the attributes of all forms of employment (Burgess, Campbell 1998). Most models draw from Rodger's four dimensions of precarious employment: unsecure jobs (of limited duration or high risk of termination); in which workers lack of control over working conditions, the pace of work and wages (collectively and individually); lack personal protection (against unfair dismissal, discrimination, unacceptable work practices) and social protection (social security benefits); and receive low wages, with the ensuing risk of social exclusion (Rodgers 1989).

Epidemiologists however have not yet adopted this multidimensional perspective. And, in common with researchers in the other fields, statistical indicators and measurement instruments have not been developed. This implies that current knowledge on precarious employment is limited, specially regarding the magnitude of its expansion in the workforce and its health-related impact.

To fill this gap, the *employment precariousness* construct and measurement scale (EPRES) were developed by Amable and colleagues (Amable 2006) to measure a multidimensional construct encompassing contract-related features of the employment relationship (employment instability; individual-level bargaining over employment conditions; low wages; limited workplace rights and social protection) and workplace interpersonal relations, i.e., workplace power relations (defencelessness to workplace

authoritarianism, discrimination, and abusive treatment; powerlessness to exercise workplace rights).

Consistent with quantitative research findings that indicate mental health to be among the most frequent and consistent health outcomes of insecure employment, qualitative research employing has described psychological distress to be at the core of precarious workers' health complains (Amable, Benach & González 2001, Porthé et al. 2010, Clarke et al. 2007).

This is not to exclude other stress-related health outcomes that might be observed in the longer run, or other health-related consequences derived from associated poor working conditions, or economic deprivation. Higher rates of occupational injuries among temporary workers are an example of such other outcomes. But beyond specific associations, on the face of life events and circumstances that have an effect on health in general, mental health is “the most acutely responsive and the most sensitive, and as such, can be considered the most sensitive health indicator” (Marusic, Bhugra 2008).

Mental health in turn, threatens to become a serious public health and labour market problem. Mental illness causes extensive disability and is increasing globally (Marusic, Bhugra 2008, Brundtland 2000). By 2004, depression was the most prevalent cause of moderate and severe disability among persons younger than 60 years of age worldwide, and particularly so in high income countries (World Health Organization 2008).

In Europe, mental health problems affect one in four people at some time in life (World Health Organization, Regional Office for Europe 2010); neuropsychiatric disorders (ICD-10) are the first-ranked cause of years

lived with disability in Europe (WHO Europe 2008); and the leading cause of disability-adjusted life-years lost in Spain (WHO).

The workplace is acknowledged as one of the key environments that affect mental well-being and health (World Health Organization (WHO), International Labour Organisation (ILO) 2000). According to the European agency for safety and health at work, work-related stress is one of the biggest health and safety challenges that Europe faces, with nearly one in four workers affected by stress, and between 50% and 60% of all lost working days possibly related to it. This work-related stress is partly attributed to the changing world of work regarding the need for flexibility and changes in employment relations (European Agency for Safety and Health at Work).

In this context, this study aims to answer the following research questions: 1- Is the EPRES a valid measurement instrument to assess the degree of precariousness of employment? 2- Is there an association between employment precariousness (measured by the EPRES) and poor mental health, and if so, what is its magnitude? and 3- What is the prevalence, distribution and degree of employment precariousness in Spain, and what is its potential impact on the mental health of the Spanish workforce?

The dissertation is guided the conceptualization of employment precariousness developed by Amable and colleagues and by the Employment Conditions Knowledge network's (EMCONET) framework of employment relations and health inequalities (Benach et al. 2010).

The chapters that follow are organized in the following manner. Chapter 2 is a broad introduction into the issues around which the notion of employment precariousness study is constructed. It presents a brief history of employment relations in wealthy countries during the second half of the

past century and their evolution from protected, collective relations to flexible, individualized relations, and the consequent increase in precarious employment. This account is aimed at framing the notion of precarious employment relationships historically and not to be a full account of the complexity of these processes.

It then briefly addresses the evolution of employment relations in Spain. Finally, it makes a brief account of some aspects of working and non-working life affected by precariousness of employment relations.

Chapter 3 addresses the knowledge that can currently be derived from epidemiological research on the relationship between precarious employment and health. The strengths and limitations of such approaches are discussed.

Chapter 4 presents the conceptualization of employment precariousness as a determinant of health developed by Amable and colleagues, framing it within a power relations framework. An overview of labour market inequalities is also offered. Finally, the operationalization of employment precariousness into the Employment Precariousness Scale is presented.

Chapter 5 briefly presents the objectives of this dissertation. Chapter 6 introduces general aspects of materials and methods which are described in further detail in each of the manuscripts of the results section.

Chapter 7 presents the results of the three sub-studies in the form of published or to be unpublished original research articles. Two of them are preceded by some preliminary analyses, whose results are presented in the Appendixes. Chapter 8 discusses the research results, and chapter 9 summarizes the main conclusions.



2. PRECARIOUS EMPLOYMENT IN WEALTHY COUNTRIES.

Brief historical perspective and a focus on the Spanish case.

Employment relations and the reciprocal obligations and entitlements established between employers and employees are historically determined by the economic, social and political context.

Throughout the history of the capitalist organization of work, many of those in waged labour have been in low-waged, insecure jobs. During the 20th century, and specially during the “golden” thirty years following WWII, waged-labour achieved unprecedented levels of employment security in most Western capitalist societies, underpinned by the statutory regulation of the labour market and the extension of the welfare state and its social security net (Miguélez 2005, Buechtemann 1993, Standing 2009).

The model of permanent, full-time employment on which social protection and employment regulation were based is, still today, considered an “ideal type” in many ways.

Today, the historical pillars on which this “standard” employment relationship stood have been deeply transformed. With them, employment protection and rights have eroded, in a broad process that can be understood as a precarisation of employment.

2.1. Standard employment relationships

“It is industrialization that gave birth to wage-labour, and it is the domain of large-scale industry that is the site par excellence of modern salaried relations.” (R. Salais 1930, in Castel 2003, p305)

a) The thirty “golden” years (1945-1975)

Employment relations in wealthy countries during the post-war years were moulded by the Fordist model of industrial production and capital accumulation, the Keynesian model of state economic intervention, the regulation of employment relations, the social security net of the welfare state, and strong worker unions (Benach et al. 2010). In this context of relative economic prosperity, stable, secure employment relations developed.

Fordism was the dominant production paradigm, characterized by oligopolistic competition and intense capital accumulation. The production paradigm is one of mass production of standardized goods under a deep division of labour and tight managerial control, in synergy with mass consumption based on high and stable wages and on high levels of welfare secured by the state (Rubery, Grimshaw 2003, Boyer 1993).

The relative synchronization between (mass) production and (mass) demand accounted for a smoothening of business cycles, reducing cyclical unemployment and promoting overall economic stability (Boyer 1993, Buechtemann 1993). The progressive improvement of wages for labour, Ford’s “five dollar a day”, represented a sizeable increase in wages which boosted mass consumption and increased workers ability to consume the products of industrial society (Castel 2003, p313).

Under this system, and specially for large organisations, there existed functional complementarities between profitability and employment stability: the mode of production, consisting of mechanization and automation, benefited from learning-by-doing, worker commitment and long job tenure (Boyer 1993, Rubery 1994).

In consequence, where possible, internal labour markets developed, which offered the prospect of career advancement, increasing wages, and a transparent form of worker pricing and allocation within the organization (Rubery 1994). Within the context of economic stability and prosperity, labour relations were based on the principles of hard work and acceptance of potentially adverse working conditions or low job satisfaction, in return for productivity gain sharing and trend rises in real wages, and relatively high levels of job security (conditions necessary to support mass consumption markets) (Rubery, Grimshaw 2003, Lowe, Schellenberg & Davidman 1999, Boyer, Saillard 2002).

The role of the state, which adopted a commitment towards stability and equality, contributed to smooth business cycles and further promoted employment stability through public spending, fiscal redistribution, Keynesian countercyclical economic policies and the compromise to full employment (Boyer 1993). Further, the statutory regulation of employment relations evolved to guarantee workers stable employment, employment-related rights and protections, and the right to collective representation.

In addition to the protections and benefits offered in the labour market, the social security net provided by the welfare state expanded and played a major role. West European welfare states were the result of the “social pact” between organised labour, governments (specially Social Democratic parties), and business associations (Benach et al. 2010, Esping-Andersen 1990). Based on the male breadwinner model of society, the

welfare state allowed for the *decommodification* of (male) labour: it provided employees with social insurance to cover temporary interruptions of earning power, including frictional unemployment, ill-health or disability, and retirement (Esping-Andersen 1990). Now, the employment contract went beyond the mere transaction over labour and gave rise to social (security) rights that could ameliorate the harshness of the market (Frade, Darmon 2005).

Decommodification reduced the pressures on persons to eke out a living under disadvantageous circumstances (Standing 1999, Quinlan, Mayhew & Bohle 2001b). The higher the level of decommodification, the more workers are able to maintain their livelihood during non-work periods (Muntaner et al. 2010). This protection also allows workers to refuse hazardous work environments and poor employment conditions (Benach et al. 2010, Cano 2004). In addition, and ensuring families' economic stability and well-being, welfare states provide health care, education and other social services (Muntaner et al. 2010).

A key factor behind the regulation of labour markets and the strengthening of social security was the rising industrial and political influence of organized labour (Benach et al. 2010, Quinlan, Mayhew & Bohle 2001b). Several collective labour rights, such as freedom of association, collective bargaining, and collective action such as strikes, were legally recognized during the XXth century. Trade unions became accepted as the legitimate representatives of organised labour in the negotiation process (both at the level of the firm and the state) (Lane, 1995, in (Rubery, Grimshaw 2003)).

The collective nature of labour relations, based on collective bargaining and mediated by state intervention, replaced the previously prevailing "regime of the free contract", which legally allowed for nearly unlimited "entrepreneurial dominance" (Mückenberger 1992). This had an impact

on the daily experiences of workers, through its influence over workplace power relations, the organization of work, and working conditions, including the exposure to occupational hazards (Muntaner et al. 2010).

Overall, the post-war period is described as a period of social consensus, providing firms with workplace peace and a committed workforce, and in which “the rights of the labouring man were legitimised more than ever” (Standing 1997)p51. Workers were granted unprecedented levels of security, of which Standing has identified seven main forms (Standing 1999): labour market security¹; employment security²; job security³; work security⁴; income security⁵; labour reproductive security⁶ and labour process security⁷. Of these, he posits income and representation security as the most essential for ensuring the other five.

Employment relations in this context were an important redistributive mechanism, through productivity gain sharing, employment-related benefits and the welfare state, contributing to greater social equity in firm-worker relations and in society in general (Muntaner et al. 2010, Buechtemann 1993).

¹ Adequate employment opportunities.

² Protection against arbitrary dismissal, regulations on hiring and firing, etc.

³ Presumes a niche designated as an occupation or career, plus barriers to skill dilution, tolerance of demarcation practices, etc.

⁴ Protection of occupational health and safety.

⁵ Protection of income through minimum wages mechanisms, comprehensive social security, progressive taxation, etc.

⁶ Widespread opportunities to gain and retain skills.

⁷ Protection of collective voice in the market, through independent trade unions and employer associations incorporated economically and politically into the state.

b) The ideal type: “standard” employment relationships

Modern salaried relations are considered to be a product of the large-scale industry of the post-war years (Castel 2003)p305 characterised by a historically unique form of salaried employment arrangement. Referred to as the “standard employment relationship”, it is generally considered as a reference or “ideal type” of employment in wealthy countries.

The standard employment relationship (SER) is best characterized as permanent (continuous), full-time, year-round employment with job-related benefits ⁸(Hadden et al. 2007). The regulatory framework that shaped standard employment relationships responded to the demands of workers (Standing 1999, Vogel 1996). It included statutory constraints on hiring and firing and regulations against arbitrary dismissal, the right to collective representation, minimum wages, non-wage benefits and the social security net of the welfare state.

Within the schema of standard employment, one of the most important factors for distributing job-related benefits and social security was employment continuity. Duration of employment within the organization conditioned the access to, or the relative degree of, such benefits (Mückenberger 1992, Fudge, Vosko 2001).

As a result, the standard employment relationship (SER) was situated within the idea, and favoured the development of a predictable life course, consisting of three clearly distinct periods: pre-work, work, and post-work

⁸ Additional characteristics are that work is performed for a single employer, at the employer’s worksite. (Lowe, Schellenberg & Davidman 1999)

states (Scott 2004). During the working-age period workers could expect a high level of security regarding the continuity of employment and income generation. Such a context allowed workers and their families to plan for their long-term financial needs, e.g., purchases of a home or vehicle, savings for children's education and own retirement (Tompa et al. 2007).

The standard employment relationship then, developed as the normative model of employment and the platform on which social citizenship was built in most of Western European countries (Fudge, Vosko 2001, Fudge 2007).

It is important however, to underscore that as an "ideal type" standard employment was not universal (O'Connor 2009). Substantial numbers of workers continued to be employed outside the "norm", most obviously, self-employed contractors, shiftworkers, and the majority of female employees (Quinlan, Mayhew & Bohle 2001a, Vosko 2006).

In fact, it is held that the normative nature of the SER produced a persisting dualism or discrimination against employment relationships that did not meet the standard (Mückenberger 1992, Fudge, Vosko 2001). The "ideal" norm described a male -predominantly white, middle-class- world, reinforcing the gendered division of labour in which men were family bread-winners with access to the benefits provided for by means of the employment relationship, while women's primary responsibility was to carry out unpaid family and household work and, if anything, would participate as a secondary labour force in non-standard jobs (Lowe, Schellenberg & Davidman 1999).

Despite of this, "standard" employment is the type of employment arrangement that corresponds most closely with the basic principles of regulated employment relations, offering a unique correction to the inherently

weak and unbalanced power position of individual workers relative to employers as regards their rights, employment and financial security and working conditions (Standing 1999)p57. Therefore, even today the “standard” model of full-time, permanent, protected employment constitutes an “ideal” type or reference, against which other forms of employment can be compared and is an historical benchmark against which the evolution of employment relations can be analysed (Lowe, Schellenberg & Davidman 1999).

2.2. Flexible employment relationships

Despite the advances achieved, the situation changed dramatically in the mid 1970s when the economic oil shocks and worldwide recession put an end to prosperity. Since then, nature of work and employment relations have changed profoundly (Boyer 1993, Buechtemann 1993). The determinants of such changes are a constellation of forces, economic, political, and social.

a) Fordist “rigidities” in a changing economic and political context

Various elements are described to have contributed to a decline of Fordism: an inherent social crisis derived from the monotonous character of work in assembly lines; the diverging expectations of younger, more educated, generations; and a decline in productivity resulting from a crisis in the mode of productive organization (Boyer 1993). But it was the severe economic recessions of the 1970s and 1980s, when the expectation of smooth economic cycles and slow and predictable change in the industrial structure was broken, that critical, inherent “rigidities” of the Fordist

model became problematic and called for economic restructuring at various levels (Standing 1999, Boyer 1993).

Both the mode of production -indivisible assembly lines and continuous production processes-, and the high levels of regulatory protection of employment implied that the Fordist production system carried an inherent, “built-in rigidity” regarding variations in both the volume of labour and equipment (Boyer 1993). This *rigidity* hindered management’s possibilities to adapt production and the volume of labour in response to the pressures of exogenous changes in product demands (Solow).

In addition to the economic “oil shocks” of the 1970s, which affected the demand for products quantitatively, the characteristics of demand also changed qualitatively (Miguélez 2005). The market for standardized commodities slowed down, while a new demand developed for product differentiation and quality. This relied to a large extent on the capacity to produce rapidly changing products in small volume (Rubery, Grimshaw 2003). Fordist organizations resulted too “rigid” for this demand, in that it exhibited a large lag between the perception of new demands, conception and production of alternative products, being incapable to meet these requirements, much less at low costs (Miguélez 2005, Boyer 1993).

Furthermore, globalization and the intensification of international economic competition from newly industrialized countries; the deregulation, volatility and pre-eminence of financial markets; the deregulation of products markets; and the shift away from Keynesian economics, progressively broke down the smooth pace of the economy and of Fordist oligopolistic competition, giving way to an epoch of growing economic uncertainties (Boyer 1993, Buechtemann 1993, Standing 2009, Scott 2005, Bradley et al. 2000, Green 2009)

b) Economic and employment restructuring: the pursuit of flexibility

With the aim to overcome Fordist-rigidities and to face growing competition and market uncertainties, capitalism has undergone a continuous process of economic restructuring. Governments have accompanied these developments with major economic reforms driven by the crises and massive unemployment at the end of the 1970s (Burchell, Ladipo & Wilkinson 2002), and by an ideological shift amongst governments and policymakers, who have adopted free market ideology and neoliberal economic recipes. In this context, labour market flexibility progressively gained centrality in the political agenda (Boyer 1993).

In general terms, in the 1980s the aim was to obtain wage flexibility; some years later, the aim was to ease the constraints on hiring and firing practices and the relaxation of employment protection (Solow, Standing 1999, Boyer 1993). By 1994, labour market flexibility was an integral part of the OECD strategy to reduce unemployment in industrialized countries (OECD 1994). Such flexibility meant that workers could more frequently be redeployed, and that those in unemployment should be provided “incentives” to seek jobs, so that the overall worker experience would be of more frequent flows in and out of jobs (Green 2009).

Beyond the influence of international agencies, globalization, with its deeper economic integration across national boundaries, imposes strong constraints upon national compromises and forms of organization, and on the ability of elected governments to develop and implement policies that

are at odds with the central tenets of the dominant economic policies.(Fudge 2007, Boyer 1996)⁹

Governments pursuing flexibility have relaxed labour market regulation (de-regulation or rather re-regulation of employment relations), limited social security benefits (the re-commodification of labour), and modified collective bargaining regulation limiting the bargaining power of unions and favouring the individualization of employment relations (Standing 1999, Vogel 1996, Laparra Navarro 2006, Monastiriotis 2006, Toharia, Malo 2000).

The relaxation of employment protection has followed two general mechanisms: *explicit* deregulation of the employment relationship through the relaxation of employment protection legislation for standard employment contracts (open-ended contracts protected from hiring and firing), and *implicit* deregulation of the employment relationship by allowing for, or promoting, a variety of non-standard employment forms (Standing 1999, Sels, Van Hootegem 2001). The latter is described the preferred strategy by many countries, producing what is termed flexibility “at the margin”, that is, an growth in a non-permanent, secondary labour force while the core work-force remains in relatively protected employment (Organization for Economic Co-operation and Development (OECD) 1997).

At the same time, neoliberal ideas have exerted a critical influence on government revenue, expenditure policies, and unemployment compensation benefits which “discourage” employment (Quinlan, Mayhew & Bohle 2001b). In consequence, reforms pursuing balanced budgets, aimed at

⁹ Critics of this vision signal that globalization is rather the excuse for government inactivity and deregulatory practices (Bradley et al. 2000).

reducing social expenses and limiting redistributive policies which were previously secured by the welfare state have come hand in hand with labour market reforms (Fudge 2007). This retrenchment of welfare regimes reduces the “reservation wage” (Esping-Andersen, Regini 2000), forcing more workers to accept poor employment conditions. In other words, it has weakened workers’ bargaining power over employment conditions (Quinlan, Mayhew & Bohle 2001b, Cano 2004, Laparra Navarro 2006).

As for economic restructuring, organizations underwent and continue to undergo repeated processes of restructuring, frequently accompanied by mass redundancies. Private and public organizations downsize, restructure, outsource parts of the productive process, resort more to temporary workers and dismantle internal labour markets (Burchell, Ladipo & Wilkinson 2002, Quinlan, Bohle 2009, Grimshaw et al. 2001). To grasp the extent of these processes, between the late 1980s and the mid 1990s between one third and one half of medium and large-sized firms in the U.S. are held to have downsized every year (Cole 1995 in (Atwood et al. 1995). In five years in Spain (1989-1994), 50% of Spain’s big firms downsized by 31% on average (Suárez 2000, in (Magán Díaz, Céspedes Lorente 2007)). In addition, public services (frequently the largest single employer) are privatized, exposing them and their workers to market competition and “market regulation” (Standing 1999, Burchell, Ladipo & Wilkinson 2002).

The flexible organization of production means that anything from less profitable activities to specialized non-core activities to entire production processes can be outsourced or subcontracted (Miguélez 2005, Goudswaard, De Nanteuil 2000). Large scale industry is fragmented and dispersed nationally and internationally. This has created a variety of inter-firm relations, many of them characterized by subordination and depend-

ency, where smaller firms, peripheral to the “mother” organization, absorb greater portions of market risks and thus offer worse employment conditions (Cano 2004). In addition, the internationalization of production has allowed organizations to delocalize their productive processes into markets with lower labour costs (Miguélez 2005).

The reshaping of organizational forms has also changed the notion of employer-type responsibilities, with the development of more complex organizational forms which have generated ambiguities in employment relations, such as dependent self-employment, multi-employer worksites, temporary agency workers, subcontracting, outsourcing, etc. (Rubery et al. 2002). These forms of organization tend to dilute the figure of the employer, with the implications of introducing ambiguity regarding who is to take responsibility for worker safety, who can control worker performance, and who is responsible for disciplinary issues, grievance procedures, among others. Also, it makes it difficult to enforce and monitor compliance with protective and health and safety regulations (Rubery et al. 2002, Echeverría Tortello 2009).

In addition, employment in wealthy countries has largely shifted from industry to the services sector. Part of this shift obeys to organisations’ outsourcing strategies, which externalize services to smaller, specialized firms (Rubery 2006). Employment in the services sector generally offers lower quality employment with less union presence, while at the same time allowing for the expansion of female employment (given the provision of family services and the creation of increasing numbers of “women’s jobs”) (Esping-Andersen 2000a, Boyer 1993, Bradley et al. 2000). Together with increased migratory flows from peripheral countries, this has provided with an enlarged secondary workforce that can fill the growing numbers of temporary jobs.

In all, labour market *flexibility* is a euphemism used to refer to multiple processes, many of which tend to erode employment relationships, the associated securities, and the balance of power between labour and capital. Market risks are transferred from employers towards and among workers, while there has been a shift away from productivity gain sharing and job security (Scott 2004, Frade, Darmon 2005).

c) Organizational flexibility strategies

Within the realm of production and productive processes, the flexible use of all company resources, including the flexible use of labour became key strategies to cope with the new scenario of market uncertainty and intense competition, and to reduce organizational economic risks (Scott 2004, Amable 2006).

Consequently, non-permanent forms of employment, which provide flexibility and reversibility, spread in most industrialized countries (Boyer 1993). In addition, the shift of employment from industrial towards service activities, a sector which tends to be characterized by weak unions, smaller firms, and higher worker mobility (Boyer 1993), has shifted important numbers of workers into more non-permanent forms of employment.

However, the new market conditions and the modified regulatory frameworks have lead organizations to adopt a variety of flexibility strategies, not all involving non-permanent employment. Some strategies rely on subcontracting or hiring temporary workers, while others rely on organizing shift work, using part-time contracts, or increasing the polyvalence of the workforce (Goudswaard, De Nanteuil 2000).

The term “flexibility” however, is frequently used in a non-specific manner to refer to these strategies, introducing confusion into the debate on employment flexibility. “Flexibility” may be used to refer to flexible work schedules, which in some cases may help make compatible productive and reproductive work; others may refer to the ease with which workers can be moved from one task to another; and still others refer to the ease with which firms can hire and fire workers to adjust the size of their workforce to variations in demand.

A classification of different strategies of flexibility is presented in the matrix below (Amable 2006): qualitative or quantitative flexibility and internal or external flexibility can be combined into four different types of flexibility (table 1). In general terms, quantitative flexibility implies variation in the quantity of labour (and of wages where it refers financial flexibility), whereas qualitative flexibility implies variations in the functions of labour or the hiring of specialists or subcontracting for specialised tasks (Goudswaard, De Nanteuil 2000).

In turn, internal strategies make a flexible use of the organization’s workforce, while external strategies use resources outside the organization. The goal of external flexibility is to adapt the volume of workers to fluctuations in market demand and to cut costs in order to face market competition (Amable 2006).

External flexibility strategies may comprise support functions such as cleaning or transport or complete parts of the productive process (flexible production), or only labour power, that is, variations in the number of workers working for the company (*numerical flexibility*).

Generally, *functional flexibility* is used to refer to the adaptability of employees to utilise a broad range of skills and / or perform a wide range of

tasks. *Temporal flexibility* involves varying patterns of working hours to reflect variation in demand, and *wage flexibility* involves ‘a shift from uniform and standardised pay structures towards more individualised systems incorporating a greater element of variability’. *Numerical flexibility* denotes management’s ability to vary the amount of labour in response to changes in demand (using short-term contracts or ‘hire and fire’ policies). *Productive flexibility* implies subcontracting other specialized companies or workers through a “contract for services” (Goudswaard, De Nanteuil 2000).¹⁰

In general, organizations view flexibility positively, as the solution to problems raised by the “rigidities” of the preceding regulatory and production model, and tend to implement different strategies on a complementary rather than on an exclusive basis (Goudswaard, De Nanteuil 2000).

¹⁰ Attention is called to the fact that the distinction between forms of flexibility may vary between countries, and that different forms of employment are not always easily put into one single category, but rather intersect with one another. (Goudswaard, De Nanteuil 2000)

Table 1 Matrix with different forms of flexibility.

Forms of flexibility	Quantitative	Qualitative
External	<p>Employment status and duration of work:</p> <ul style="list-style-type: none"> • permanent contracts / fixed-term contracts • temporary agency contracts • seasonal work • work on demand / on call <p><i>numerical flexibility and/or contract flexibility</i></p>	<p>Production system:</p> <ul style="list-style-type: none"> • subcontracting • outsourcing • self employed <p><i>productive and/or geographical flexibility</i></p>
Internal	<p>Working time and wages:</p> <ul style="list-style-type: none"> • reduction of working hours / part-time work • night work / shiftwork / varying work schedule • weekend work • compressed working week • irregular working time • individualised pay systems • variable pay <p><i>temporal & financial flexibility</i></p>	<p>Work organisation:</p> <ul style="list-style-type: none"> • job enrichment/ rotation • teamwork / autonomous work • multitasking / multitasking • project groups • worker responsibility over: planning, budget, innovation, technology <p><i>functional flexibility</i></p>

Source: adapted from Amable, 2006; Vassilis, 2006; Goudswaard and De Nanteuil, 2000.

d) The retrenchment of workers' bargaining power

“These changes tend to strip the ‘labour market’ of rigidities which were the achievements of the labour movement during the preceding decades.” Vogel, 1996. (translation mine)

Stripping off “rigidities” has been possible, at least in part, given the progressive transformation of industrial relations regimes, with a weakening of workers' power and a shift of power towards employers (Scott 2004). Major drivers of this shift have been regulatory reforms aimed at reducing workers' bargaining power, such as the decentralization of collective bargaining (Cano 2004, Vogel 1996, Bradley et al. 2000, Monastiriotis 2006, Toharia, Malo 2000, Ferreiro 2004).

Additionally, the expansion of a variety of employment forms and the progressive individualization of employment contracts has segmented the workforce into multiple groups with diverse needs, making it difficult for labour unions to represent collective interests (Cano 2004). Also, unions face considerable difficulties trying to gain access to non-permanent employees, specially if they perform intermittent work, or to self-employed, subcontractors, homeworkers, etc., limiting their ability to protect growing numbers of workers (Hannif, Lamm 2005). This is compounded by the absence of unions in small organizations, which concentrate non-standard, unprotected employment arrangements.

Globalization has also contributed to reduce the strength of organized labour (Quinlan, Mayhew & Bohle 2001b). Today, capital can relocate operations in various regions throughout the globe, seeking more profitable, low-cost, low-unionized labour around the world (Scott 2005). On the contrary, organized labour faces important difficulties to surpass the

national framework and adapt to the internationalised field of competition (Tompa et al. 2007).

Overall, the transformation of employment relationships has been built not via direct confrontation with worker unions, but rather via a progressive narrowing of the breath of the protective character of unions and collective bargaining (Vogel 1996).

2.3. Precarious employment relationships

These deep transformations in the social organization of work have raised concern over the precarisation of employment relationships. Over the last decades, employment precariousness has gradually become an issue of academic, political and social attention. The interest in precarious employment can be seen as a response to a general decline in employment conditions and in employment security in many countries and the growth of both old and new forms of employment characterised by poor wages and conditions (Burgess, Campbell 1998). Precariousness of employment is in fact not new, but rather the characteristic of many jobs over the history of capitalism and, for several periods, the norm rather than the exception (Quinlan, Mayhew & Bohle 2001b, Cano 2000).

So, the current interest in the concept lays not in its novelty, but in its renewed historical meaning. Today, employment precariousness emerges after, and in contrast with, an era of consolidation of the salaried condition (Standing 1999, Cano 2004). As such, precarious employment implies a deviation from the high levels of security and social protection which had come to be seen as the “norm” of salaried employment and which underpinned the salaried “way of life”.

a) Flexible employment and precarious employment

As seen above, there is more to flexibility than business adaptability to eliminate uncertainties (Miguélez 2005). Flexibility has brought with it an externalisation of the risks associated with economic activity towards the work force. In the process, some of the guarantees surrounding the “standard” employment contract have been undermined. And as described above, together with the de-regulation of employment legislation, the bargaining position of workers -individually and collectively- has declined, and the social security net of the welfare state weakened (Miguélez 2005, Mückenberger 1992, Vogel 1996, Fudge 2007).

Consequently, and particularly in Europe, precarious employment can be conceived as the flip side of employment flexibility.(Recio Andreu) The concept of precariousness of employment focuses on the undesirable outcomes of such flexibility, as recognition of the social costs incurred by part of the working classes on its behalf (Recio Andreu).

Employment flexibility refers to the ease with which labour can be hired and fired (external-numerical flexibility). Internal types of flexibility refer to the work performed and are less related to precarious employment relationships. Functional flexibility, for example, may have positive effects on conditions of work, on worker control over the work process, and on conditions of employment, providing a background for training and career prospects (Miguélez 2005, Goudswaard, De Nanteuil 2000, Recio Andreu 1994).

Despite their high degree of overlap, not even flexible employment arrangements are always precarious. In some countries, they are described as a valuable means of gaining experience to build a “career” or serving

as a bridge to regular employment (Zijl, van den Berg, Gerard J. & Heyma 2004, Booth, Francesconi & Frank 2002, Smithson, Lewis 2000). Indeed, even flexible employment could be convenient or beneficial for individual employees, depending on their personal needs and expectations, and on the control they have over such flexibility. However, collectively, the push for external flexibility has tended to erode employment rather than to make it more adaptable to the needs of the contemporary workforce (Miguélez 2005, Bradley et al. 2000).

One of the reasons why employment (contract) flexibility is most directly related to precariousness of employment is because of the centrality of employment continuity in gaining access to employment-related benefits, whether provided by the employing organization or by the welfare state, in many countries (Mückenberger 1992, Burgess, Campbell 1998, Barbieri 2009). Also, because the socioeconomic consequences of externally flexible arrangements are the most severe (Giesecke 2009); and because of the importance that employment and economic stability have for a broad range of issues related to employee well-being which are discussed throughout.

Employment flexibility could be achieved by reducing the constraints on hiring and firing workers with open-ended contracts, but, in most countries the main strategy has been the promotion of non-permanent employment forms (Barbieri 2009, European Commission, Directorate-General for Employment, Social Affairs and Equal Opportunities 2006). This implies that non-permanent contracts are the main source of flexibility and the main driver of employment precariousness in Europe.¹¹ Also abroad, the

¹¹ In some cases, both forms of flexible employment may combine. In Chile, for example, despite a share of temporary contracts of 30% (in formal, private companies with 5 workers or more), up to 50% of open-ended contracts are termi-

growth in non-standard (flexible) employment arrangements can be seen as the most important path towards increasing employment precariousness (Burgess, Campbell 1998).

This is not to say, however, that open-ended contracts or other types of flexibility are unrelated to precarious employment. The correspondence of external-numerical flexibility with temporary work only holds as long as open-ended contracts, identified as “standard” employment, are protected from dismissal or are established as long-term arrangements. This level of protection varies from country to country and in some cases, the creation of a temporary workforce would be unnecessary (as would be the case of the UK, for example), since open-ended contracts with lower firing and hiring costs also provide with external-numerical flexibility (Rodgers 1989).

Also, the flexible organization of production through strategies such as subcontracting is precarising the workforce (Quinlan, Mayhew & Bohle 2001b, Vogel 1996). Although subcontracting is a heterogeneous phenomenon, and while a subcontracting company may not in itself incur in precarious employment arrangements, down the line of subcontractors, as market uncertainty grows, precariousness of employment is also likely to grow. At the same time, long subcontracting chains contribute to make labour regulations progressively more difficult to enforce. In addition, thresholds in the size of companies to access the right to collective representation are generally not reached by subcontractors (Vogel 1996). In other words, what in terms of the firm is a *productive flexibility* strategy,

nated before 3 years and 20% don't last more than one year (Dirección del Trabajo 2009).

may translate into non-permanent and precarious employment for the workers involved.

Finally, there exist forms of employment outside the realm of legally recognized employment relationships, which also provide flexibility and reduce labour costs. Examples of these are dependent self-employment, and informal work. The former, although legally considered a “contract for services”, is in many cases characterized by its dependency on a single client, being in some cases termed “dependent” self-employment and in others “bogus” self-employment, as situations in which waged-labour is being “hidden” and denied of its rights (Frade, Darmon & Laparra 2004). The latter could be legally recognized as employment if the relationship can be demonstrated, but to the extent that it remains informal, it does not count with any of the legal protections and benefits of legal employment. Informal employment can be understood as an extreme case of precariousness.

In all, like with the standard employment relationship of the post-war years, it is the regulatory framework, including regulation of the labour market (hiring and firing, collective bargaining) and the welfare state, which shapes precarious employment (Muntaner et al. 2010, Burgess, Campbell 1998). The changes of this regulatory framework are both acting through the growing numbers of non-standard workers, as well as through changes to the very essence of standard employment (Burgess, Campbell 1998).

b) Precarious employment: conceptualization

Precarious employment was most explicitly and comprehensively defined after a seminar and debate on vulnerable work-forms celebrated in the

Université Libre de Bruxelles in 1988. In the introductory chapter of the book that collected the various presentations to the seminar, Gerry Rodgers presents the overall conclusions and defines precarious employment as having the following dimensions: 1) (un)certainly of continuing employment, resulting from either short time horizons or high risk of job loss; 2) limited control (collective or individual) over working conditions, wages and pace of work; 3) limited protection, or the extent to which workers are or are not protected by law, through collective organisation, or customary practice, including social security, protection against discrimination, unfair dismissal, or unacceptable working practices; and 4) (a low) income level, whereby low-waged jobs are precarious if they are associated to poverty, not allowing the worker to maintain herself/himself and her/his dependants (Rodgers 1989).

This conceptualization highlights several relevant issues: first, that temporariness of employment is not the only dimension that defines a job as precarious; second, that flexible or “non-standard” employment forms are not necessarily “precarious”; and third, that there are different degrees of precariousness, and so a focus on the degree of precariousness would be more useful than a dichotomist divide between typical and atypical or flexible/standard workers (Rodgers 1989).

Various authors (Burgess, Campbell 1998, Vosko 2006, Hannif, Lamm 2005, Cano 2000, Frade, Darmon & Laparra 2004, Tucker 2002), predominantly situated in the field of labour economics, have taken this definition of precariousness as a starting point for research focused on contemporary precarious employment.

Among them, Cano elaborates a general definition of precarious employment as “a work trajectory that does not allow consolidating a level of income, a profession, and a stability of employment that can permit work-

ers to plan for their future and become fully integrated in social life”. In addition, precarious employment is a situation of “worker vulnerability, uncertainty and dependency both in the face of market risks and of management policies in the employing organization ” (Cano 2004).

This “double” definition hints at the double character of employment relationships, which encompass a “contractual” component, related to the terms and conditions under which the relationship is established, and a “social relationship” component. Precarious terms of employment (low wages, unstable employment, limited rights and non-wage benefits) hamper workers capacity to secure a living within acceptable standards and to plan ahead into their future. The social relationship component implies that precariously employed workers are in a vulnerable position regarding the politics of management within the organization, given their weak bargaining power, which may have serious consequences for their employment experience and working conditions.

2.4. The expansion of flexible employment

In the absence of a routine, integrated indicator of precarious employment, routinely collected data on non-permanent employment can give an approximate picture of its evolution over time in wealthy countries. Several descriptions of the growth of flexible employment can be found in the literature, so this section discusses the rationale for the focus on temporary employment and provides only a brief review of some key points.

The selection of temporary employment as indicator of precarious employment is based on, in the first place, the link between external flexibility and precarious employment discussed above. This, however, is nuanced by the fact that employment flexibility strategies vary across coun-

tries (Sels, Van Hootegeem 2001). Nevertheless, it appears that overall, the main driver of flexibility in European -and other- countries has been the promotion of various non-permanent employment forms (Burgess, Campbell 1998, European Commission, Directorate-General for Employment, Social Affairs and Equal Opportunities 2006). So, the expansion of non-permanent employment is one of the most visible consequences of labour market flexibility, and possibly also the main driver of employment precariousness. In the second place, employment instability or the flexible utilization of open-ended contracts is more complex to assess in routinely collected data and so remains a quite less visible phenomenon (Pochic, Paugam & Selz 2003, Sparrow, Cooper 2003). In consequence, non-permanent employment forms are the most accessible and possibly the best available proxy indicator of employment precariousness to be found in routine data from wealthy countries (Benach et al. 2010, Monastiriotis 2006).

Accounts of the evolution of new employment arrangements tend to use different definitions of cases. Some studies focus on atypical, contingent or non-standard employment. These are broad categories that group all employment arrangements that depart from standard employment in some aspect, some of which may not be precarious. Nevertheless, these forms of work, as a whole, have increased in variety and in numbers in most industrialized countries.

In the 1980s Britain, Rubery (Rubery 1989) identifies temporary or contract jobs, homework, self-employment, underground economy work, and part-time work as atypical employment forms. ILO enterprise-level labour flexibility surveys have identified up to 15 different types of employment contracts (Standing 1993).

In Canada, Cranford et al (Cranford, Vosko & Zukewich Fall 2003) report that non-standard employment reached 63% of the workforce by 2002, with active growth in the relatively more precarious (less protected) forms. In Australia, Louie et al (Louie et al. 2006) report that non-standard employment grew from 28% in 1982 to 40% of the workforce in 1999. In the United States, Cummings describes contingent work to represent about one third of the total workforce since 1995, when national data were first collected, with increases in part-time, temporary agency work and independent contractors (Cummings, Kreiss 2008).

In Europe the expansion of non-standard employment has been most notorious in part-time jobs and in temporary employment (Parent-Thirion et al. 2007). By 2009, part-time work occupied 18.1% of the employed workforce, 31% among women and 7.4% among men.¹² Among women the main reason for part-time is looking after children, while not finding a full-time job is the main reason among men (EUROSTAT). This illustrates the importance of gender-based analysis of trends in non-standard work forms (Vosko, Zukewich & Cranford October 2003).

Temporary employment in Europe grew considerably between the early 1980s and mid-1990s in countries like Australia, France, The Netherlands, and specially, Spain (OECD 1996). Between 1990 and 2000, in seven (out of twenty-nine) OECD countries temporary employment either accounted

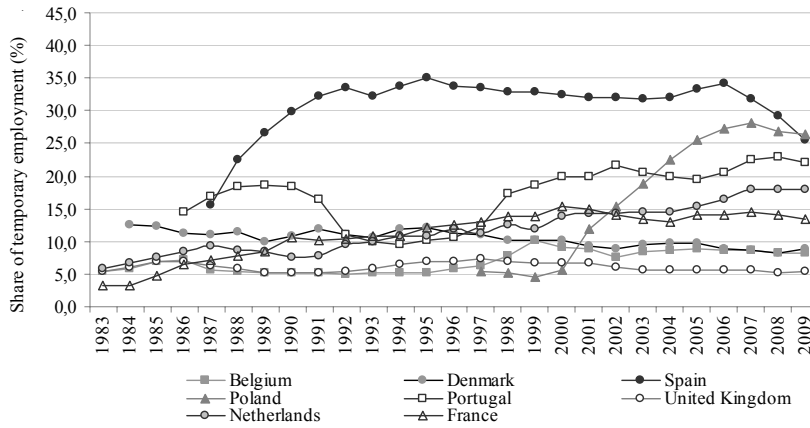
¹² While it is frequently considered a precarious form of employment and much of it is low-waged (Frade, Darmon & Laparra 2004) part-time work has been described to often constitute a form of regular labour (Rubery 1989). In the UK, for example, it has increasingly become long-term (Doogan 2001), and in Germany it has been recently described as having less severe socio-economic consequences than temporary employment (Giesecke 2009). In line with this, there is no consistent evidence that part-time work is harmful for health. A review of 7 studies on part-time showed that 6 of them found no negative association with health (Quinlan, Mayhew & Bohle 2001a). It appears to be involuntary part-time work which may have a negative impact on health.(Joyce et al. 2010)

for over two-thirds of total employment growth, or had grown despite a fall in total employment (OECD 2002).

During the late 1990s and 2000s there were notorious expansions of temporary employment in Portugal and Poland. Spain's share of temporary employment fell towards the end of the decade due to the current economic and unemployment crisis (figure 1). Other countries, like the UK, show a stable, low share of temporary employment over time. The EU yearly average share of temporary employment rose from 9% in 1987, to 15% in 2005.¹³ In 2009 it declined to 13.4% (EU27), dragged by the fall in the share of temporary employment in Spain (figure 2).

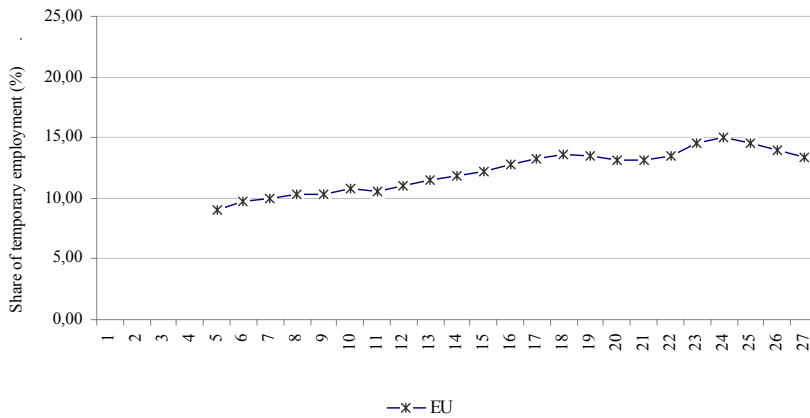
¹³ The EU share of temporary employment increases in part with its expansion towards more "peripheral" countries with higher shares of temporary employment.

Figure 1 Share of temporary employment. Selected countries (1983-2009).



Source: Eurostat. Women and men aged 15 to 64 years.

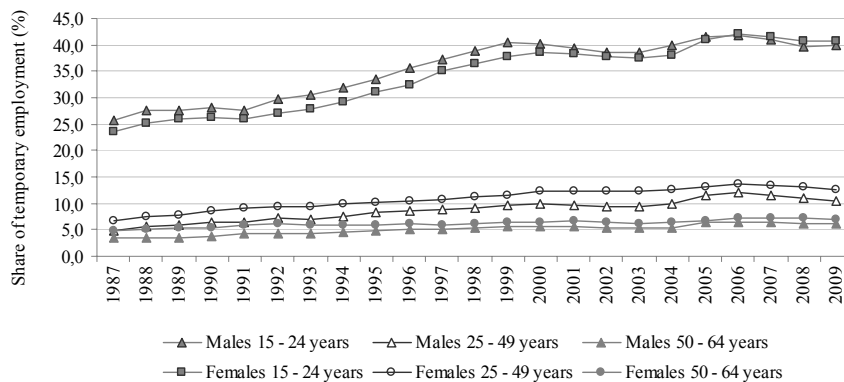
Figure 2 Share of temporary employment. European Union. (1987-2009).



Source: Eurostat. Women and men aged 15 to 64 years. EU (European Union): EC10-1985, EC12-1994, EU15-2004, EU25-2006, EU27.

The proportion of temporary employment is markedly higher among youth, and more prevalent among employed women at all ages (figure 3) (EUROSTAT, OECD 2002). With the exception of a few countries, temporary employment is also more frequent among unskilled workers (OECD 2002).

Figure 3 Share of temporary employment according to sex and age groups. European Union (1987-2009).



Source: Eurostat. EU (European Union): EC10-1985, EC12-1994, EU15-2004, EU25-2006, EU27.

The extent to which temporary employment is voluntary may give some indication of the extent to which it is adapting to workers' needs. Available Eurostat data (1987-2009) on the motivations to be working under a temporary contract shows that the reason reported by the majority of male and female employees is not having found a permanent job.¹⁴ Less than 10% of the men and around 15% of the women reported not wanting a permanent job (figure 4). The exceptions are younger workers: around

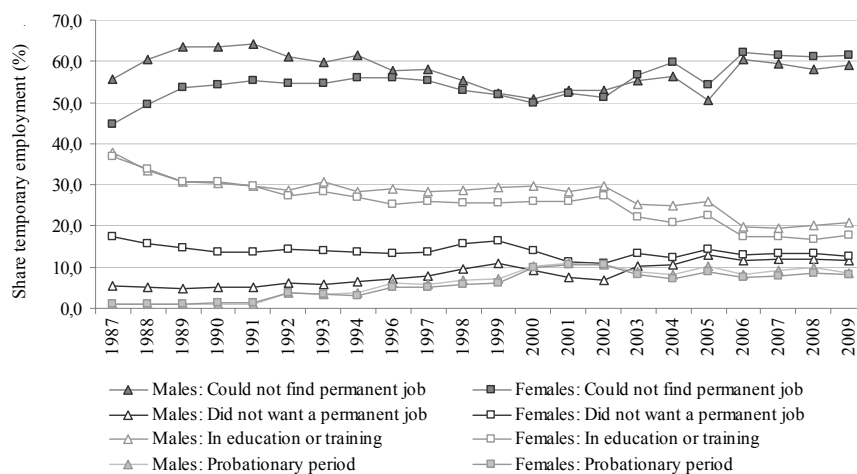
¹⁴ These data are considered to be extremely unreliable by Eurostat.

50% of workers aged 15 to 24 reported having taken temporary employment because they are in education or training (figure 5). In Spain, however, more than 80% of workers of every age group report that they have a temporary job because they did not find a permanent one (yearly data from 1987 to 2009).

In resume, the above data show that there has been an overall tendency for non-standard employment in general, and of temporary employment in particular, to grow. The expansion of temporary employment across countries in Europe has been heterogeneous. Some countries have stable low shares of temporary employment; others exhibit a moderate and gradual increase over-time, and still others made a fast and significant shift towards high shares of temporary employment. Overall, temporary jobs are more frequently occupied by young workers and women. While approximately half of workers aged 15 to 24 take temporary employment because they are studying or in training, the rest of them and over 60% of the women report that they are in temporary employment because they cannot find permanent positions.

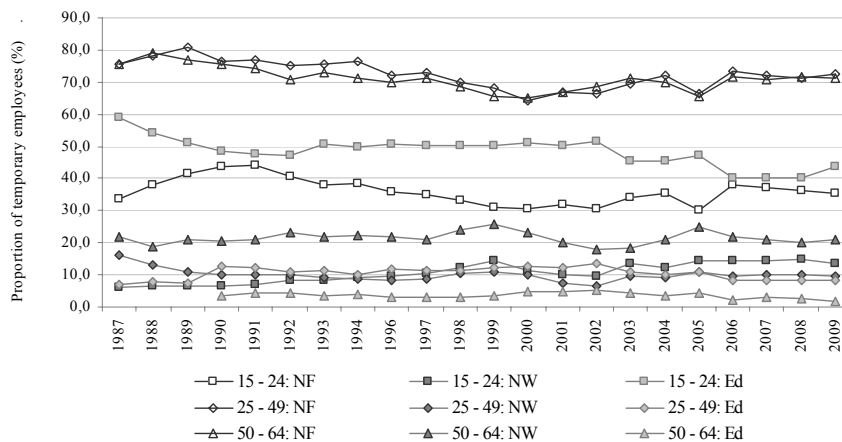
It is important to keep in mind two things. First, that temporary employment does not automatically equal precarious employment, and vice-versa, growing numbers of workers in formally stable jobs may be affected by the overall precarisation of the work-force (Miguélez 2005, Burgess, Campbell 1998, Cano 2004). For example, workers in temporary work agencies, or subcontractors, may be precariously permanently employed. Second, that the choice and combination of strategies to achieve employment flexibility in different countries depends on the complex dynamics of legal, economic and customary issues. This country-by-country will result in different strategies for flexibility and possibly different sources of precariousness in different countries. So, the total numbers described above may constitute an imprecise account of the extension of precarious employment relationships and inter-country comparisons should be made with caution.

Figure 4 Main reason for temporary employment. Women and men. European Union (1987-2009).



Source: Eurostat. EU (European Union): EC10-1985, EC12-1994, EU15-2004, EU25-2006, EU27. Data missing for 1995.

Figure 5 Main reason for temporary employment according to age groups. European Union (1987-2009).



Source: Eurostat. EU (European Union): EC10-1985, EC12-1994, EU15-2004, EU25-2006, EU27. Data missing for 1995. NF: Could not find a permanent job. NW: Did not want a permanent job. Ed: In education or training.

2.5. Flexibility and precarious employment in Spain

After almost four decades of Franco's dictatorship (1939-1975), Spain's transition to democracy brought about political, economic and social changes (Jódar 2010). The development of the welfare state and its social security net, the regulation of the labour market, the incorporation of women into the labour market and the transformation from a rural to a urban society all occurred at a later time than in other European countries (Jódar 2010, Carrasco, Recio 2001, Navarro, Quiroga 2004).

In the 1980s Spain faced a sharp economic crisis, with a profound change in the economy, and the transition from an industrial to a service economy. Spain joined the European Community -now European Union- in 1986. Compared to other EU countries, however, the Spanish welfare state is less developed, with a comparatively small proportion of the GDP going to public spending in social protection (Navarro, Quiroga 2004).

a) Spanish labour market

The Spanish labour market, regulated by the 1980 Workers' Statute, has traditionally been characterized by low participation rates, specially among women, and high unemployment rates (Navarro, Quiroga 2004). A high proportion of employment is provided by sectors such as construction, hostelry and commerce, which are most susceptible to the economic cycle. Also, there are geographical variations in the level of employment, the promotion of quality of employment, and some social security provisions (Laparra Navarro 2006).

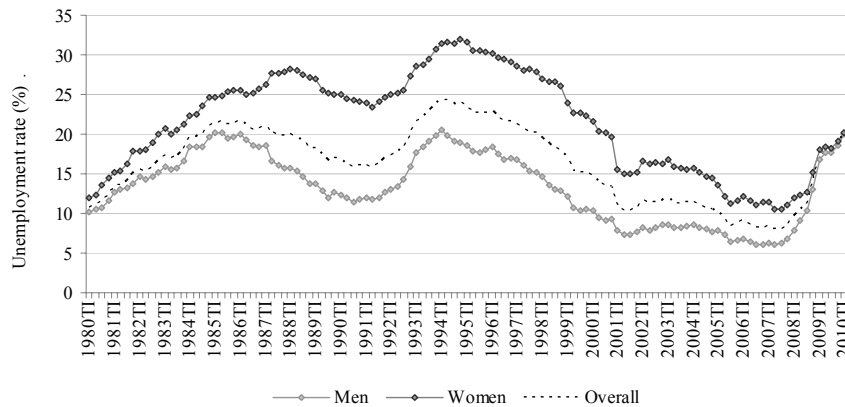
The male breadwinner family model dominated in Spain during the Franco dictatorship (Carrasco, Recio 2001), so that the incorporation of

women into the labour market is a relatively recent phenomenon. Women's activity rate has grown steadily since the late 1980s, rising from 28% in 1980 to 52% in 2010 (INE). Despite this, women's activity rate still remains low compared to men's (52% and 68% respectively in 2010) (INE) and to other European Union countries (Benavides 2007), partly attributable to a limited provision of social services for families (Navarro, Quiroga 2004).

An important feature of the Spanish labour market has been the rapid increase in immigrant labour since the mid-nineties: by 2007 some 4,519,554 foreign migrants lived in Spain, more or less 10% of the total population, the great majority of which were working age adults (Ahonen 2009). The immigrant population as a whole has a higher level of workforce participation compared to natives (76.6% vs. 57.03%) and most of them work as dependent employees (*cuenta ajena*) (73.5% in 2007) (Porthé 2008). Immigrant labour tends to occupy jobs in low productivity sectors, where wages are lower, while native workers moved onto better paying jobs (Ahonen 2009). They have a significantly higher proportion of them working in temporary jobs (88.4% for 2006) (Porthé 2008) as well as a higher unemployment rate (14.65% vs. 8.73%) (data for 2008) (Ahonen 2009).

Unemployment in Spain has exhibited important variations during the last three decades, reaching a maximum of almost 25% in 1994 and a minimum of roughly over 8% between 2006 and 2007. Currently, the unemployment rate has climbed back to 20%. While women always had higher unemployment rates than men, currently women and men have similar unemployment rates (figure 6) (INE).

Figure 6 Unemployment rate. Women and men. Spain (1980-2010).



Source: Economically Active Population Survey (EPA), Instituto Nacional de Estadísticas (INE). Quarterly data.

b) Introducing flexibility: explicit and implicit de-regulation

In line with the predominant vision that deems labour market “rigidities” to be the main culprits of persistently high unemployment rates in Europe, and despite the lack of solid empirical corroboration (Solow, Esping-Andersen 2000b, Nickell 1997), high unemployment in Spain, (together with high levels of irregular employment and the integration into the European Union), triggered a reform to the 1980 statute in 1984 (Laparra Navarro 2006).

The 1984-reform created a new flexible employment contract (Laparra Navarro 2006), allowing for non-casual fixed-term contracts (previously confined to certain groups of disadvantaged workers) with much lower severance pay than open-ended contracts (Cabrales, Hopenhayn 1997, Bover, Gómez 2004). The reform contributed to the creation of employ-

ment observed during the following years, although its specific role is held to have been limited: during the years following the reform, unemployment fell from 20% in 1984 down to 16% in 1991 (Toharia, Malo 2000, Ferreiro 2004). By 1990, the share of temporary employment involved over one third of the salaried workforce (INE). But, with the recession of 1992, unemployment climbed above pre-reform levels (Toharia, Malo 2000, Cabrales, Hopenhayn 1997).

Another extensive reform in 1994 abolished non-casual fixed-term contracts, except for some disadvantaged groups¹⁵ (Cabrales, Hopenhayn 1997), but introduced temporary employment agencies and part time contracts (Laparra Navarro 2006). The reform did not, however, lead to an actual decline in the observed share of temporary contracts (Gil Martín 2002).

The 1997 *Interconfederal Agreement for Job Security* introduced a new permanent contract with low firing costs and reductions in social security costs, with the aim to stimulate indefinite-term employment and reduce temporary employment.¹⁶ Two reforms, in 1998 and 2001, were introduced to favour part-time employment (Gil Martín 2002) but with limited success.

By 2004, there existed 13 legal non-permanent contract forms (Amable 2006) with temporary employment still being the main strategy of numerical flexibility in Spain.

Currently, and given the massive surge in unemployment due to the international economic crisis and the burst of the Spanish real-estate bubble, a

¹⁵ Workers under 30, long term unemployed, and over-45 unemployed.

new labour market reform has been approved in a push for greater labour flexibility. This reform eases hiring and firing of permanent workers, aiming to promote the transfer from temporary to permanent employment and limit the segmentation of the labour market; weakens collective agreements by allowing companies to diverge from collective wage agreements in difficult economic circumstances; and provides temporary employment agencies with more extensive attributions as labour market intermediaries, strengthening their economic role.

c) Introducing flexibility: collective bargaining reformed

The right to collective bargaining in Spain is enshrined in Article 37.1 of the 1978 Constitution, and since then collective bargaining has undergone important transformations.

The 1994 reform also modified collective bargaining against the bargaining power of permanent workers, changing the wage-setting process by giving more importance to the variable component of earnings, and allowing lower-level collective bargaining agreements to pass lower wage growth than upper-level agreements (Toharia, Malo 2000, Ferreiro 2004).

In 1996 and 1997 other reforms limited the role of the State in the regulation of employment relations, increasing the tendency towards individualization of employment arrangements and leaving more decision making to collective bargaining (Laparra Navarro 2006) which had already been affected by the previous reform.

¹⁶ Applying to workers under 30, long term unemployed, and over-45 unemployed.

Today, there is, a wide variety of collective bargaining levels, ranging from the national industry level to company-level agreements (Ferreiro 2004). Regarding the number of collective agreements signed, company-level agreements grew by 117.7% between 1981 and 2000, reaching 73.3% of total collective bargaining agreements by 2000, exhibiting a structural atomization of collective bargaining (Ferreiro 2004). However, according to the proportion of workers covered, there is a predominance of workers covered by agreements at the provincial-industry level, i.e., that affect firms of a specific industry located within a same province, and the number of workers covered by national-industry level agreements (mainly provincial-industry) increased between 1981 and 2000. These apparently contradictory trends are indicating that the increase in company-level agreements is concentrated in small workforces (Ferreiro 2004). In addition to the loss of bargaining power that it brings, another problem with this relative atomization of collective agreements is that workers may be ill-informed about which agreement, if any, establishes the term and conditions of their employment, and if so, what these terms are.

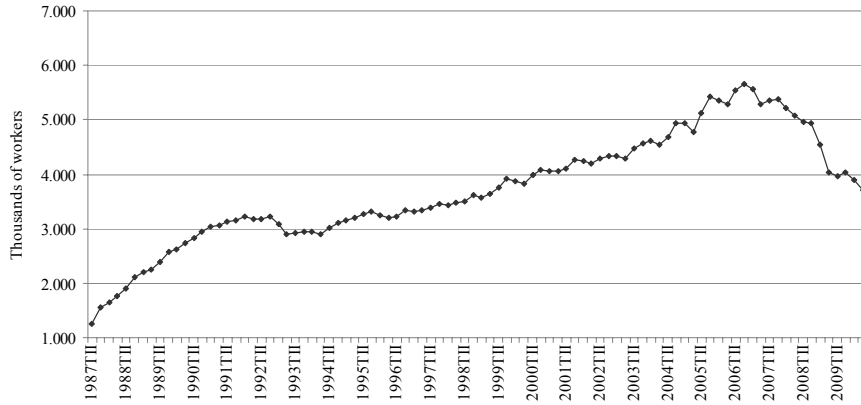
d) Flexible employment in Spain: characteristics and trends

As noted earlier, temporary employment appears as the main strategy of numerical flexibility in Spain, which is held to have had the effect of replacing permanent job posts with temporary jobs (Cano 2004, Laparra Navarro 2006). Labour market policies to increase flexibility are held to be largely responsible for the expansion of temporary employment in Spain, having encouraged its use (Alba-Ramírez 1998), by generating the conditions for its expansion (Laparra Navarro 2006).

In Spain the flexibilisation of employment relations coincided historically with major trends in the supply-side of the labour market, namely the accelerated increase of women's activity rate, increasing migration flows of a predominantly economic nature (Ahonen 2009), and, at an earlier time, a late and rapid de-ruralization coinciding with de-industrialization and the difficulty to place unskilled rural workers into employment (Esping-Andersen 2000a). This offers a growing mass of potentially secondary sector workers, who given their general situation of social disadvantage, are offered –and have few chances to refuse- poorer employment conditions (Rubery 1994). This must be further contextualized in the situation of high unemployment in which the reforms take place, which reduces workers' capacity to refuse poor employment conditions generally.

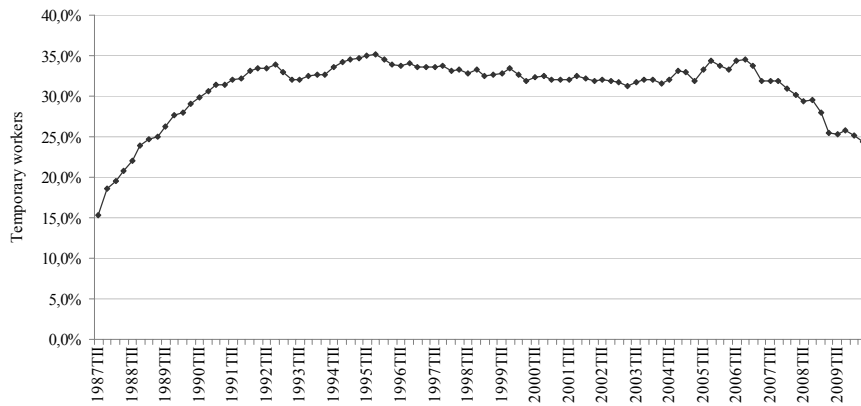
Temporary employment increased rapidly in Spain after the 1984 reform (figure 7). Following the reform, more than 90% of new contracts were temporary (Cabralés, Hopenhayn 1997, Bover, Gómez 2004, Gil Martín 2002). By 1990 temporary contracts reached –and then exceeded- 30% of the employed labour force, the highest among OECD countries and the EU. Only during the third trimester of 2006 did the share of temporary employment fall under the 30% threshold, in the context of Spain's severe economic and unemployment crisis (figura 8).

Figure 7 Number of temporary workers (1000 workers). Spain, 1987–2010.



Source: Economically Active Population Survey (EAPS).(INE) Quarterly data.

Figure 8 Share of temporary employment over all salaried employment. Spain, 1987–2010.



Source: Economically Active Population Survey (EAPS).(INE) Quarterly data.

Spain's high temporary employment rate is generalized to all sectors of economic activity, albeit to different extents, with the highest share of temporary employment in the services sector and agriculture. By far however, the largest absolute number of temporary workers is found in the services sector (on average, around 65% of the temporary workforce was in the service sector during 2008 and 2009) (INE). Temporary employment is generally low-waged: in 1995, a temporary worker earned 44.8% of a permanent one (Ferreiro 2004).

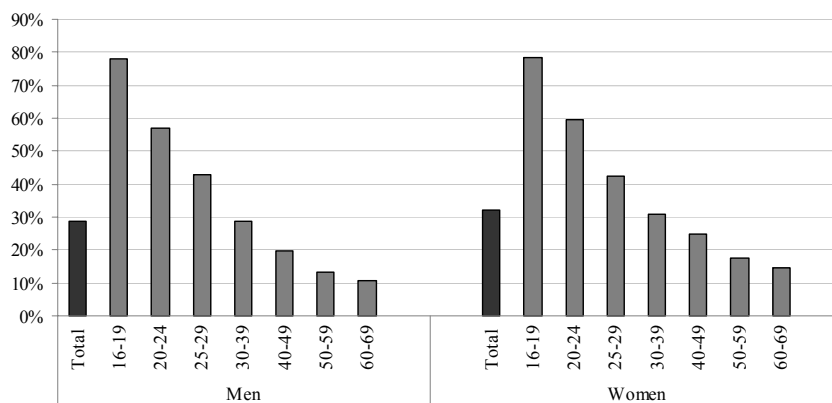
Temporary employment in Spain also appears to constitute a "trap" or "dead-end", given the rather limited possibilities that a temporary employee will transit into permanent positions (Amuedo-Dorantes 2000, Hernanz M. 2003). For example, the proportion of temporary workers who were holding a permanent contract after one year declined from 23% in 1988 to an average of 12% in the period 1993-1996 (Alba-Ramírez 1998). Instead, they exhibit a high degree of job rotation, both between temporary jobs and between temporary work and unemployment, with employment tenure being a key predictor of the transit towards a "permanent" job (Hernanz M. 2003).

The flexibilisation of the labour market starting with the 1984 reform is also held responsible for segmenting the labour force (Toharia, Malo 2000), leaving the most precarious jobs to the most disadvantaged social groups (Gil Martín 2002). Temporary employment is more prevalent among women (34.8%) than men (30.2%) and more so among young (64.8%) and unqualified manual workers (63%), while reaching only 5% in the managerial occupations (Benavides 2007).

Figure 9 shows the 2005-2010 average share of temporary employment for women and men in different age groups. Women, youth, and less-educated men employed in temporary jobs also have a significantly lower

probability of obtaining permanent employment status (Alba-Ramírez 1998).

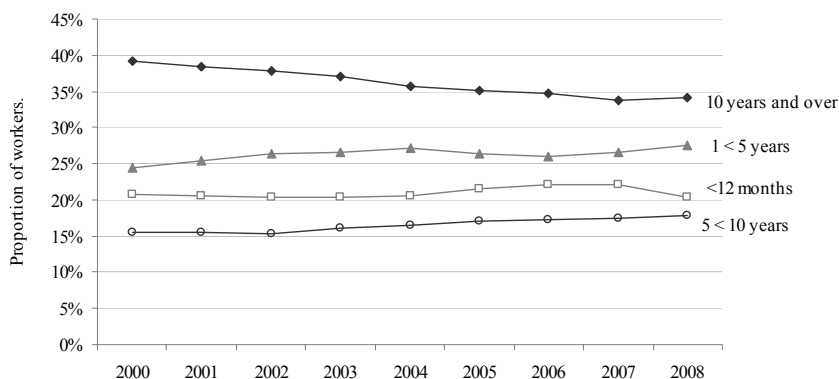
Figure 9 Share of temporary employment out of total employment for women and men of different age groups. Spain, average 2005-2010.



Source: Economically Active Population Survey (EAPS).(INE) Average of quarterly data.

However, precarious employment in Spain is not linked exclusively to temporary employment contracts. Also subcontracting has grown in Spain during the last decades. In 2009, 18,6% of a representative sample of Spanish enterprises with at least one worker registered in the Social Security reported to use subcontracting or externalization of their activity, reaching up to 30% in the construction sector (Zimmermann, Pinilla & Departamento de Investigación e Información. Instituto Nacional de Seguridad e Higiene en el Trabajo (INSHT)).

Figure 10 Employment by job tenure intervals, percentage over all jobs. Spain, 2000-2008.



Source: OECD.Stat (OECD)

In addition, actual “practice” regarding permanent employment is also held to contribute to labour flexibility in Spain. In the early 1980s, 80% of employees with open-ended contracts had tenures of more than 5 years. In 1995 these had fallen to 50% (Prieto 1999). During the 2000s, the share of jobs with tenures of 10 years or more have fallen steadily from 39.2% in 2000 to 34.2% in 2007 (jobs with such long tenures can be assumed to be mostly open-ended contracts). Further, the mean duration of these jobs increased during the same period. This is suggesting that it has been the long-term employees with shorter tenures who have left their jobs at a higher rate (if retirement of older workers explained the fall in long-tenured employment, then mean tenures would have fallen over the period) (Sparrow, Cooper 2003).

Together, these data are indicating that there has been a relative fall in stability of stable employment in Spain since the 1980s. The extent to which this is evidence of an expansion of employment precariousness

unto open-ended contracts remains unknown, but the data are in agreement with authors who have suggested this to be the case (Cano 2004, Prieto 1999). It is possible, then, that measuring employment flexibility as the share of temporary jobs may be underestimating the actual flexibility of the Spanish labour market.

2.6. The impact of precarious employment on living and working conditions

Precarious employment is still poorly understood but its consequences are far reaching (Vosko 2006). The ESOPPE project has said of precarious employment that it is one of the main facets of social and socio-economic insecurity and risks in contemporary European societies (Frade, Darmon & Laparra 2004).

More widespread use of non-standard contracts, downsizings, subcontracting, outsourcing, and the general push for flexibility in employment relations, can affect workers' lives in many ways (Malenfant, LaRue & Vezina 2007).

This chapter presents a brief overview of some of the effects of the precarisation of employment relations in people's work and non-work life. Because the best available indicator of precariousness is temporary employment, most of the aspects discussed refer to evidence available for temporary employees. However, in many of these situations, other aspects of precarious employment relations (limited control, vulnerability, lack of regulatory protection, low wages) may be more explicative of the phenomenon being described than the notion of temporary work.

a) Working life

The changes in industrial organization and employment restructuring have seen an expansion in the number of workers who feel insecure about their employment situation (OECD 1997). Strong competition and greater market uncertainties are also passed onto the workforce as increased work intensity and extended working hours (Burchell et al 2002).

Today, fear of job loss is considered an increasingly important aspect of employment (Hartley 1999) and constitutes a source of both acute and chronic stress (Scott 2004). Perceived job insecurity shows variations over time which appear to follow the unemployment rate (Green 2009, Green 2003), suggesting it may be the most important driver of job insecurity. Perceived job insecurity also shows regional variations (Erlinghagen 2008). The 1997 OECD study found that perceived insecurity was significantly lower in countries with better economic performance, higher unemployment benefit replacement rate, and more centralised and higher level collective bargaining (OECD, 1997).¹⁷

¹⁷ A paradox regarding pervasive perceptions of job insecurity during the 1990s despite the concurrent finding that indicators of job stability had remained relatively stable or improved has repeatedly been pointed to (Organization for Economic Co-operation and Development (OECD) 1997, Doogan 2001, Auer, Cazes 2003). According to these observers, the explanation may lie in methodological limitations in the assessment of job instability (Sparrow, Cooper 2003, Auer, Cazes 2003); in the worsening consequences of unemployment (Organization for Economic Co-operation and Development (OECD) 1997, Sparrow, Cooper 2003, Green 2003, Auer, Cazes 2003); in the increase of *involuntary* job loss and the expansion of temporary jobs (Auer, Cazes 2003); in general anxiety generated by changes in wider social and economic circumstances (rather than by an individual's capacity to keep his or her job) (Doogan 2001); or in a manufactured discourse as a way to discipline the workforce (Bradley et al. 2000, Doogan 2001).

Changes to the organization of work which increase workload intensity, such as lean production, multi-tasking, and downsizing appear to be affecting the workforce as a whole, albeit to different extents: temporary and permanent workers, downsizing survivors, manual workers and professionals (Benach et al. 2004, Letourneux 1998, Benavides et al. 2000).

Beyond generalized changes to the organization of work, work intensification is facilitated by precarious employment relationships, whereby workers have limited capacity to control the rhythm and pace of work, are induced to comply with increased employer demands or must overwork themselves given the uncertainties regarding their employment in the future, and the low wages of temporary work (Quinlan, Mayhew & Bohle 2001a, Lewchuk, Clarke & de Wolff 2008, Lewchuk et al. Fall 2003).

Work intensity and job insecurity appear to affecting the working life of the workforce as a whole. But in a range of other aspects, temporary employment arrangements are generally inferior to permanent employment. For one, they are characterized by inferior employment quality than permanent jobs. They tend to pay less, offer less access to paid vacations, sick leave, pension, unemployment insurance and other fringe benefits; less access to training, skill development, and career advancement; and less access to workplace participation (Booth, Francesconi & Frank 2002, OECD 2002, Benavides et al. 2000, Aronsson 1999, Aronsson, Gustafsson & Dallner 2002). Although generally nominally covered by benefit schemes of some sort, their eligibility for these benefits is substantially limited because of the need to demonstrate minimum contribution periods (Benach et al. 2010, OECD 2002).

Temporary employees must also generally endure worse working conditions than permanent workers. They more often report inflexible work schedules, monotonous work tasks, exposure to strenuous and tiring posi-

tions, intense noise and repetitive movements, less job autonomy and less control over their work schedules (Benach et al. 2010, Letourneux 1998). These hazardous working conditions, poor psychosocial work environments and insufficient health and safety provisions pose a serious threat to their health and wellbeing.

Among the most salient consequence of these poor working conditions are fatal and non-fatal occupational injuries, which are significantly more common among temporary workers. In Spain (the country with the highest rate of occupational injuries in the EU), during the years 2000 and 2001, temporary workers had almost 3 times more non-fatal injuries and 2.5 times more fatal occupational injuries than permanent workers (Benavides et al. 2006).

Poor employment and working conditions may dampen employees' everyday work experience and overall satisfaction with the job, but will also affect their non-work life and probably, that of their families.

b) Non-work life, reproductive sphere

Precarious employment affects the reproductive or non-work sphere of life through social and material deprivation, as well as by the uncertainties regarding the future.

Central to the idea of social deprivation is the conception that social integration has been mediated by stable and adequate income (and stable and protected employment), a work-related identity, and significant work-related social relationships (Laparra Navarro 2006). During the past century waged-labour ceased to be only a source of income; it also "guarantees rights, gives access to benefits outside of work (sickness, accidents, retirement) and allows a wider participation in social life: through con-

sumption, housing, education, and even (...) leisure.”(Castel 2003)p303-304.

Precarious employment can have serious social effects given its impact precisely on these mechanisms of social integration, with possible long-term implications for employees in terms of their well-being and their livelihoods.

Temporary employment relationships are related to serious socio-economic disadvantages, caused by lower wages and higher unemployment, among others (Giesecke 2009). Relative economic deprivation -and social precariousness- is specially serious among individuals “trapped” in precarious employment. Income and asset shortfalls due to job loss or long periods of low-waged work may force individuals into poverty, having to live in substandard or inappropriate housing in bad neighbourhoods, with few financial resources for basic necessities such as food, and other forms of material deprivation (Government of Canada's Policy Research Initiative 2004).

The relationship between employment precariousness and poverty is much stronger in developing countries (Benach et al. 2010). Nevertheless, their numbers are not negligible in some wealthy countries. In Spain, poverty rates among workers with temporary contracts have been described to be nearly 5 times larger than among those with open-ended contracts. More so, it was observed that the shorter the duration of the work contract was, the higher the poverty rate that was observed. Similarly, workers in short-term temporary contracts (less than six months) are described to have the lowest poverty-exit rates and the highest poverty entry rates among employed workers (Amuedo-Dorantes, Serrano-Padial 2005).

The biographical uncertainty due to job instability and the inability to secure financial stability hamper the control workers have over their personal lives (Bernardi, Klarner & von der Lippe 2008). As an example, a study of on-call workers in Sweden revealed that nearly a third of them reported to worry, on a daily basis, about their personal finances (Aronsson et al. 2005). On-call workers in Sweden have been described to see their form of employment as an impediment to –or to have worsened their chances of- obtaining a loan or acquiring a housing contract (Aronsson et al. 2005). Further, that study showed that on-call employees find it difficult to obtain permanent accommodation, such that many not only are in temporary jobs but also have a temporary residence.

This biographical and financial uncertainty of precarious employment also has an important impact on the family. It implies economic costs for families who must support part of the weight of precarious employment and the periods of unemployment through monetary and non-monetary intra-family transfers (Toharia, Malo 2000). It also limits the ability to make key decisions relative to personal life and deters decisions relative to family formation (Clarke et al. 2007, Tompa et al. 2007, Bernardi, Klarner & von der Lippe 2008, Lewchuk et al. May, 2007). Long-term commitments such as marriage and parenthood tend to require some job stability or realistic future career prospects, and some immediate economic security, although this appears not to be the case in all countries (Bernardi, Klarner & von der Lippe 2008).

The Spanish case is consistent with these observations. In Spain the expansion of (precarious) temporary employment is thought to be a cause for delayed emancipation and social integration of young people. There has been a shift from an early and secure occupational transition of youth to a late and insecure one, and incapacity to leave the parental home

(Toharia, Malo 2000, Prieto 1999). The fall in the percentage of married persons aged 30 to 34 from 85% to 70% between 1977 and 1996 has been interpreted as evidence of this (Prieto 1999).¹⁸ In epidemiologic research, workers with temporary contracts in Spain, in particular men, have been shown to delay partnership formation and entry into parenthood (Artazcoz et al. 2005).

Also, and combined with the relative lack of social services provided for families, employment precariousness in women is held to be one of the reasons for the Spanish decline in fertility rates (Toharia, Malo 2000, Navarro, Quiroga 2004, Prieto 1999). In 2008 the fertility rate was 1.46, lower than the OECD average (1.71), and in 2005, Spanish women were among those who entered motherhood the latest (over 29 years for first child, OECD mean 27.8 years) (OECD 2010).

In addition, precarious employment is frequently associated with longer or irregular working hours or multiple jobs, which results in difficulties balancing time between workplaces and the home. (Lewchuk et al. Fall 2003)

c) Social inequalities

As mentioned above, precarious employment forms are unequally distributed in the working population. They are primarily occupied by women, immigrants, unskilled workers, youth and the long-term unemployed (Rodgers 1989). Inequalities in labour market opportunities and employment conditions will run through social position and the axes of inequalities as will be described below (section 4.3). Studies analysing the gen-

¹⁸ According to Toharia, however, effects on young people are probably due just as much to the high unemployment situation that affected them before the 1984 reform. (Toharia, Malo 2000)

dered distribution of flexible employment, for example, have described women to be more frequently in non-permanent employment, and further, to be overrepresented in the worst forms of flexible employment (Aronsson, Gustafsson & Dallner 2002, Artazcoz et al. 2005).

Because *employment conditions* are one of the most important determinants of socioeconomic position, broadening inequalities in employment conditions will bring with them a broadening of socioeconomic inequalities. There is quite a body of evidence in this sense, attributing the widening gap to shrinking redistributive policies, among others. A 2008 OECD report shows that there has been an increase in income inequality that has gone on since at least the mid-1980s and probably since the mid-1970s. The increase is fairly widespread, affecting two-thirds of all OECD countries (OECD 2008).

At another level, de-industrialization (and de-ruralization) in central wealthy countries has been accompanied by an externalization of industrial risks (both for labour and the environment) towards peripheral countries with lower labour and environmental standards. Raising them is posed to undermine their competitiveness. In consequence, many products consumed in wealthy countries are produced by workers in poor or middle income countries whose labour standards are inferior to the labour standards of consumer countries. In this way, the (internationalized) organization of production is linking workers and consumers globally, but sustained on important health inequality gaps (Benach et al. 2010, Vogel 2010).



3. EPIDEMIOLOGICAL RESEARCH: AVAILABLE EVIDENCE ON PRECARIOUS EMPLOYMENT AND HEALTH

Epidemiological research has been interested in employment status for a long time now. A quick search into Medline registers for “employment” or “unemployment” recovers publications on unemployment dating back to the beginning of the century, and acknowledging unemployment to be a matter of public health concern (McCrudden 1915, Bolt 1933). The main focus of research then was unemployment, or the employment-unemployment dichotomy. Since then, the volume of research on unemployment has increased, particularly during times of economic crisis (falling back during good economic times) (Dooley 2003). The predominant finding (with occasional exceptions) is that of a significant adverse health effect of unemployment (Dooley 2003, Dooley, Fielding & Levi 1996).

The economic crises of the 1970s and 1980s were followed by a surge in research interest on the health impact of unemployment (Dooley 2003). But now, the structural transformations that followed, and the “epidemic” of work place closures, restructuring, downsizing and privatization, together with the flexibilisation of labour markets and the expansion of flexible employment widened the focus of epidemiological research towards the employment experience of employees. Over the years, studies on the health effects of employment conditions have mostly focused on the stability of employment, whether objectively assessed or subjectively perceived by employees.

3.1. **Epidemiological research evidence**

The body of research related to the stability of employment is a rich source of information regarding the potential health effects of precarious employment, specifically with regards to the instability dimension of precarious jobs. Epidemiologic research also provides abundant evidence on the health-related effects of low income on health, but this body of research is far from the aims of this dissertation. In what follows, a brief account of the epidemiological evidence that provides preliminary support to the hypothesis that precarious employment may be deleterious to worker health and well-being is presented. It is divided into three research categories: 1) the immediate and lasting effects of the threat of job loss in the context of organizational restructuring (major organizational change); 2) the experience of chronic job insecurity, as a perceptual phenomenon reported by the study subjects; and 3) the experience of non-permanent or temporary employment.

a) Downsizing and major organizational change (MOC)

Definition

Studies grouped into the “major organizational change” category are those in which organizations prepare to undergo a restructuring process such as a merger, privatization, outsourcing a business function, or a workplace closure. These forms of organizational restructuring are among the most important features of capitalist economic restructuring today, generally involving a workforce reduction or “downsizing”. For workers, they involve an imminent threat of job loss, producing feelings of high insecurity

(Quinlan, Bohle 2009, Hartley 1999, Kivimaki et al. 2001, Kivimaki et al. 2003).

The stressful exposure in cases of major organizational change is the anticipation of job loss, also referred to as job insecurity.¹⁹ In these studies participants are usually not inquired about their perception of security (McDonough 2000, Ferrie 2001). Instead, insecurity is attributed by the researchers to those participants exposed to the (objective) imminent threat of job loss (Ferrie 2001).

The threat of job loss subsequently materializes for some – but not all – threatened workers, in the form of unemployment, job transfer, early retirement, etc. (Ferrie 1999).

Context

Studies on organisational change appeared in the literature early in the 1970s (Tompa et al. 2007, Ferrie 1999), in the context of major economic crises and consequent workplace closures, and have continued as the advance of deindustrialization, technological innovation, globalization, privatization and a general commitment to a free market economy have led

¹⁹ It is useful to make a distinction between the feelings of insecurity elicited by the imminent threat of job loss, on one hand, and the feeling of insecurity elicited by a general lack of guarantees concerning continuity of the current job and/or reduced probabilities of finding secure jobs in the labour market, on the other hand (Scott 2004). In this line, Ferrie characterized MOC studies as studies of “attributed insecurity”, given that the imminent threat of job loss allowed researchers to attribute perceptions of insecurity to the study subjects without requiring from them a self-report of perceived insecurity (Ferrie 2001, Ferrie et al. 2008). The imminent threat of job loss distinguishes MOC studies from studies of perceived job insecurity where there is no threat at the organizational level. Notwithstanding this, MOC survivors are understood to be exposed to perceived job insecurity given their previous experience of their organizations undergoing major restructuring and having acknowledged that more restructuring can occur in

more and more companies to restructure in order to meet the needs of a highly competitive economy and reduce labour costs (Ferrie et al. 2008).

Many of these studies have been developed in traditional “Fordist workplaces” undergoing organizational restructuring or privatized public services adapting to their new status as competitors in the markets. Often, data are collected over time, starting during the early stages of rumour about changes to come, and continuing through job loss and post-termination phases (McDonough 2000).

Conceptualization

Most studies on major organizational change are focused on the health effects of anticipating job loss, or the *anticipation phase* of unemployment described by Joelson and Wahlquist (Ferrie 1999, Ferrie et al. 1995, Joelson, Wahlquist 1987).²⁰ The anticipation phase of unemployment has been found to be very burdening for workers due to prolonged uncertainty regarding the outcome of the process and the future of their jobs (Kivimaki et al. 2001, Joelson, Wahlquist 1987). The severity of the job insecurity experience of workers in the context of downsizing has been described as depending on the perceived probability and the perceived severity of losing the job (Hartley 1999).

Downsizing processes have the potential to impact the health and well-being of all who are exposed to the threat of job loss: those who eventually lose their jobs, as well as those who remain in their jobs, known as

the future. This form of “survivor” insecurity is now closer to the general perception of job insecurity in flexible labour markets.

²⁰ Joelson and Wahlquist described unemployment as comprising a process consisting of four phases: an anticipatory phase, a termination phase, a phase of unemployment with insurance coverage, and social welfare phase when unemployment becomes long term (Joelson, Wahlquist 1987).

“survivors” or “stayers”. Once the process is finished, workers who lose their jobs will have to additionally endure the health risks associated with unemployment. For survivors, the organization of work after downsizing appears to imply an intensification of work, increased job strain and effort-reward imbalances, in addition to sustained job insecurity.

Results

A review of the early literature (1968-1995) on the anticipation (uncertainty phase) and termination (culmination) phases of downsizing/restructuring can be found in Ferrie, 1999 (Ferrie 1999). Briefly, she reviews 15 workplace closure studies with longitudinal data, and finds that nearly all of them describe adverse effects on physical health, psychological health and/or physiological indicators. The studies reviewed described considerable excess morbidity, increase in number of reported illnesses and in health service use; variations in blood pressure (increases and depressions), increases in circulatory disease and neuro-hormonal changes with potentially detrimental cardiovascular effects; significant effects in the psychological sphere, with increased personal distress and minor psychiatric morbidity; problems with spouse; and, generally, no differences in health-related behaviour (Ferrie 1999). In her own research on the Whitehall cohort, Ferrie confirmed most of these findings²¹ (Ferrie 1999).

In all, most of the health effects of major organizational change are stress-related, such as decline in self reported health status (Ferrie et al. 1995), increased psychological morbidity (Ferrie et al. 2001), sleep disturbance

²¹ Increase self-reported morbidity, ill-health and symptoms, deteriorated cholesterol levels and BMI, increase in EKG-diagnosed ischaemia, more frequent divorce and separation, increased psychiatric morbidity (women during anticipation phase; men during termination phase), and no effects on health-related behaviour.

(Ferrie et al. 2008, Mattiasson et al. 1990), BMI increase, increases in blood pressure and cholesterol (Mattiasson et al. 1990, Ferrie et al. 1998), and EKG-diagnosed ischaemia (Ferrie et al. 1998, Ferrie et al. 1998). Almost all studies have documented an association with psychological ill health (Ferrie et al. 2008). Presenteeism has also been described during the anticipation phase (Ferrie et al. 2001). Overall, the evidence for physiological measures (blood pressure, cholesterol, coronary function, etc) is still limited as compared to self-reported health measures (Ferrie et al. 2008).

The notion of “perceived severity” of losing the job as mediating the experience of threat of job loss may be illustrated by a workplace closure study in which muscle tension, sleeping problems, anxiety, and depression were all significantly lower in older workers who accepted early retirement than in younger men without such benefit,(Mattiasson et al. 1990) pointing to the relevance of financial security in the context of job loss (Artazcoz et al. 2004).

For those workers who remain in work after workplace restructuring processes, higher rates of disability pension (Vahtera et al. 2005) and higher rates of sickness absence have been described among those (permanent but not temporary employees) exposed to major downsizing as compared to minimally exposed workers (Vahtera et al. 2004, Vahtera, Kivimaki & Pentti 1997) and to themselves prior to downsizing (Vahtera et al. 2004). Also, a higher symptom load among exposed individuals (Dragano, Verde & Siegrist 2005), more musculoskeletal problems (Kivimaki et al. 2003), a higher prescription of psychotropic drugs (antidepressants, anxiolytics and hypnotics) (Kivimaki et al. 2007), a faster decline in self-rated health up to four years after downsizing (Kivimaki et al. 2001), increases in blood pressure and body mass index (Ferrie et al. 1998), and a twofold

greater risk of death from cardiovascular diseases compared to minimally exposed workers, specially during the first three years following downsizing have been described (Vahtera et al. 2004).

The extent of the health impact on survivors seems to depend on the degree of downsizing and varies according to job categories (Kivimaki et al. 2003, Vahtera et al. 2005, Vahtera, Kivimaki & Pentti 1997). The health effects among survivors have been explained in part by the stressful experience of downsizing (Dragano, Verde & Siegrist 2005), in part because of enduring perceptions of heightened job insecurity following the experience of workplace restructuring (Kivimaki et al. 2001, Kivimaki et al. 2000, Ferrie et al. 2005/4), and in part because working conditions tend to become harder (e.g. greater workload and demands, decreased control, longer working hours, presenteeism) (Quinlan, Bohle 2009, Kivimaki et al. 2001, Kivimaki et al. 2003, Kivimaki et al. 2000, Ferrie et al. 2005/4) and by the combination of these factors (Kivimaki et al. 2001, Dragano, Verde & Siegrist 2005).

For a recent, comprehensive review of studies on major organizational change and downsizing the recent work of Quinlan and Bohle, 2009 provides a good reference (Quinlan, Bohle 2009).

b) Perceived job insecurity

Definition

This body of research addresses perceptions of uncertainty regarding the continuity of the current job, or perceived likelihood of job loss, and has most frequently been performed on seemingly unthreatened job situations (McDonough 2000, Sverke, Hellgren 2002). The negative connotations of

job insecurity are held to derive from the lack of control the worker has over his employment situation (Ferrie 1999).

Context

Studies of perceived job insecurity multiplied in the epidemiological literature during the 1990s (Marmot et al. 2001b), when it became apparent that insecurity had become an inherent trait of the contemporary organisation of employment and could not be reduced to major breaks in otherwise stable employment trajectories (Scott 2004, Ferrie et al. 2001). However, in the literature, the term “job insecurity” is often used both to address acute threats of layoff and the perceptual phenomenon described here.

Conceptualization

The job insecurity construct has been defined and operationalized in various ways. Conceptual work on the construct within the organizational psychology field dates back to the late 1950s (Greenhalgh, Rosenblatt 1984).

Job insecurity can be described as the subjectively perceived likelihood of involuntary job loss (Sverke, Hellgren & Naswall 2002). A frequently cited (Hadden et al. 2007, Ferrie et al. 2008, Sverke, Hellgren 2002, Rosenblatt, Ruvio 1996) definition of job insecurity is that it “*reflects a discrepancy between the level of security a person experiences, and the level he or she prefers*” (Hartley 1999).

The experience of job insecurity results from a process of cognitive appraisal of the uncertainty existing about the future employment situation (Hartley 1999). Apart from objective circumstances that may pose a threat to the continuity of one’s job, an individual’s interpretation and evaluation

of these as a threat will vary according to personal and contextual factors (Hartley 1999, Erlinghagen 2008, Greenhalgh, Rosenblatt 1984, Kinnunen, Natti 1994). Relevant macro-level contextual factors are the functioning of the labour market and the unemployment rate, the economic environment, and the scope of social security protection (Green 2003, Erlinghagen 2008).

As for measuring job insecurity, a global perspective has generally been adopted, in which job insecurity is conceived as an overall concern about the continued existence of the job in the future (De Witte 1999). This approach is usually operationalized as a single item in a questionnaire (e.g., How secure do you feel in your present job?).

However, a broad global measure may be capturing feelings of insecurity generated by the threat of losing the job itself, of losing other valued job features, or of being pushed to take on unwanted tasks and responsibilities (Sverke, Hellgren 2002, Greenhalgh, Rosenblatt 1984, Sverke, Hellgren & Naswall 2002, Ferrie et al. 2002). Individuals may use the same response to refer to any of these different aspects of the phenomenon (Greenhalgh, Rosenblatt 1984), rendering these broad measures difficult to interpret.

Multi-item scales to assess employment insecurity in a more reliable way have been introduced in occupational health research. One example is the Copenhagen Psychosocial Questionnaire job insecurity scale, which assesses worries about losing the present job and about future employability (Burr et al. 2003, Kristensen et al. 2005) Another is the job insecurity scale in the Job Content Questionnaire (Karasek et al. 1998) which assesses a combination of perceived security and “empirical” job instability. These multi-item measures have a unitary content domain related to the whole job, i.e., they do not address all sources of insecurity. The ad-

vantage of using multiple items is that it enhances the measurements' content validity and reliability, making them easier to interpret than single items addressing global insecurity (Rosenblatt, Ruvio 1996).

Greenhalgh and Rosenblatt propose a multidimensional theoretical model in which job insecurity is defined as “*perceived powerlessness to maintain desired continuity in a threatened job situation*” where “job situation” refers to the job itself and to valued job features. The dimensions included in their model are the severity of the threat (value of what may be lost and probability of loss occurring) and the powerless to counteract the threat. Their model is equally applicable whether there is or isn't an objective threat to security (Greenhalgh, Rosenblatt 1984).

Multi-dimensional scales have been developed accordingly (Ashford, Lee & Bobko 1989), including valued job features such as loss of income, promotion opportunities, location, colleagues. However, this multi-dimensional approach, developed within the organizational psychology field, is less frequently applied in occupational health research.²²

Results

Job insecurity is understood as a source of employment-related stress. Consequently, it is expected to affect psychological well-being (Sverke, Hellgren 2002) and other stress-related outcomes, such as cardiovascular disease. Results from a Belgian exploratory study suggested that, even in the absence of an objective threat to the continuity of the job, perceived job insecurity may be among the most distressful aspects of the working

²² For a description of various measurement scales with different approaches to insecurity, see Sverke et al, 2002 (Sverke, Hellgren 2002).

situation, possibly as distressing as the experience of short-term unemployment (De Witte 1999).

The body of research on perceived job insecurity reveals effects upon several health outcomes. Regarding mental health, associations have been described with job dissatisfaction, poor mental health (McDonough 2000, De Witte 1999, Virtanen et al. 2002), minor psychiatric morbidity (Ferrie et al. 2002) and depressive symptoms (Burgard, Brand & House 2009). In a review of the literature on perceived job insecurity, Ferrie documents that most research has looked at mental ill health as an outcome, and that all studies consistently documented adverse effects (Ferrie et al. 2008), with some studies finding dose-response relationships, and others reporting longitudinal associations (Ferrie et al. 2002, Burgard, Brand & House 2009, Hellgren, Sverke & Isaksson 1999). Of note, Hellgren and colleagues found that mental health (but not physical health) and work-to-leisure carry-over remained significantly associated with perceived job insecurity (job itself) after adjustment for negative and positive affectivity and for base-line health status (Hellgren, Sverke & Isaksson 1999).

Regarding physical health, less evidence has accumulated, but associations have been described with poor self-rated health (McDonough 2000, Ferrie et al. 2005/4, Burgard, Brand & House 2009, Rugulies et al. 2008) and cardiovascular health (e.g., increased risk of non-fatal myocardial infarction in the short term (2 year follow up)) (Lee et al. 2004) and with biomedical risk factors such as increased blood pressure and changes in body weight (Ferrie et al. 2008). Other health effects that have been described are sleep disturbance, chronic insomnia, fatigue, migraine, colds and flu-like symptoms, longstanding illness, and musculoskeletal disorders (Ferrie et al. 2008). Both dose-response (Domenighetti, D'Avanzo & Bisig 2000) and longitudinal (Ferrie et al. 2002, Burgard, Brand & House

2009, Mohren et al. 2003, Heaney, Israel & House 1994) relationships have been documented for physical health too.

The health impact of perceived job insecurity appears to be greater when workers are exposed to extended periods of job insecurity (chronic exposure) both for mental health (Ferrie et al. 2002, Burgard, Brand & House 2009, Heaney, Israel & House 1994) and for general physical health (Burgard, Brand & House 2009, Heaney, Israel & House 1994). Taken together, the evidence suggests that, as with other risk factors, the health impact of job insecurity depends on the magnitude and duration of exposure.

Several reviews on the health-related impact of perceived job insecurity have been performed (Ferrie et al. 2008, Sverke, Hellgren & Naswall 2002, De Witte 1999). Sverke et al (Sverke, Hellgren & Naswall 2002) performed a meta-analysis and found that job insecurity is more strongly related to mental health than to physical health: they found a small effect size for physical health, and a medium effect size for mental health.

c) Temporary employment

Definition

“Temporary employment” refers to non-permanent employment arrangements, which do not guarantee long-term stability. Generally the term is considered to include fixed-term, project- or task-specific jobs, supply or on-call work, subcontracted jobs, and jobs obtained through temporary-help agencies (Ferrie et al. 2008). “Non-standard employment” is a broader concept which includes a greater variety of employment forms which differ from the “standard” –that is, either better or worse than the standard–. For the purpose of reviewing literature that may provide infor-

mation on the health impact of precarious employment, the focus will be put on non-permanent employment forms.

Conceptualization

Temporary employment is an “objective” approach to the inherent instability of flexible employment relationships. This approach addresses instability by identifying legally-defined forms of non-permanent work. As discussed in section 2.4 above, temporary employment is probably the best indicator of precarious employment currently available in routinely collected data, and the most employed in epidemiological research.

The key dimension of “temporary jobs” is their contingent and insecure status, specifically, the lack of any expectation of continuing to be employed with the same employer (McDonough 2000).

Context

Most research on temporary employment has been performed in industrialized countries in Europe, North America, and Australia which have undergone the process of flexibilisation of employment relationships. Very few studies have been performed in middle and low income countries (Benach et al. 2010), with the exception of some research performed in South Korea (Kim et al. 2008, Kim et al. 2008, Kim et al. 2006).

Results

The most frequently studied outcomes for temporary employment are self-rated general health, different measures of mental health, sick leave, musculoskeletal disorders and occupational injuries. The most frequent employed analytical strategy is to compare the health status of temporary employees with that of permanent employees. Working conditions of

temporary employees are also frequently compared to those of permanent employees.

Although there is considerable heterogeneity within flexible employment forms, studies generally find that temporary workers have worse working conditions than permanent employees (Letourneux 1998, Goudswaard, Andries 2002). Further, working conditions are described to be worse the more “non-standard” or “peripheral” the employment situation is (jobs that are more unstable and irregular, require lower levels of skills, and have poorer job content) (Hannif, Lamm 2005, Aronsson 1999, Aronsson, Gustafsson & Dallner 2002).

Regarding occupational health and safety (OHS) measures, temporary workers often have less information about their work environment and receive less training in order to do their job; they are seldom represented in health and safety committees, and in some cases, have less access to OHS equipment (Quinlan, Bohle 2009, Goudswaard, De Nanteuil 2000, Benach, Muntaner 2007). Related to the above, rates of occupational injuries are higher among temporary workers (Benavides et al. 2006, Guadalupe 2003). This higher risk has been attributed to shorter job tenures and inexperience on the job (Benavides et al. 2006, Guadalupe 2003, Quinlan 1999), less training for the job (Aronsson 1999) and lack of health and safety training (Clarke et al. 2007, Quinlan, Mayhew & Bohle 2001a). In Spain, working conditions also appear to make a significant contribution to the higher injury rates of temporary employees (Benavides et al. 2006, Amuedo-Dorantes 2002).

Fatigue is also more frequently reported by temporary workers (Benavides et al. 2000, Aronsson, Gustafsson & Dallner 2002, Benavides, Benach 1999), although they report work stress less frequently (Benach et al.

2004, Letourneux 1998, Benavides et al. 2000, Benavides, Benach 1999, European Agency for Safety and Health at Work 2009).

Relative to the psychosocial work environment (PSWE), temporary employees have been described to have less influence on decisions regarding work arrangements and to receive less support from superiors and fellow workers than permanent employees (Aronsson, Gustafsson & Dallner 2002). However, there also are contradictory findings: a study on Finnish municipal employees found that fixed-term workers had fewer problems with their PSWE than their permanent fellow-workers, both in terms of high demands, low control and poor social support (Saloniemi, Virtanen & Vahtera 2004). Another study, on fixed-term workers in Finland and Canada, found no differences in psychosocial working conditions, but did find increased levels of job insecurity among fixed-term workers (Saloniemi, Zeytinoglu 2007).

In general, temporary workers report higher job insecurity than permanent workers (Virtanen et al. 2003), although some studies have found this association to be small (De Witte, Naswall 2003). Perceived insecurity is hypothesized to act as a mediator in the observed association between temporary employment and low job satisfaction (De Witte, Naswall 2003) and between temporary employment and mental ill health (Virtanen et al. 2002). But the effects of perceived insecurity appear to vary according to contract type and may be more problematic for job satisfaction and psychological wellbeing among permanent employees (Virtanen et al. 2002, De Witte, Naswall 2003).

The low and/or unstable income of many temporary workers is another potential source of stress and health complaints. Research on the financial stress of on-call workers in Sweden described that those individuals who were both worried about their personal finances and objectively poor had

lower psychological well-being and more musculoskeletal complaints, stomach complaints, headaches, and tiredness (Aronsson et al. 2005). Whereas a quantitative study on temporary workers in Canada did not support this finding (Lewchuk, Clarke & de Wolff 2008), the same study revealed, through in-depth interviews, that the lack of financial buffers by partner, parent or other family members were associated with perceptions of un-sustainability of the employment situation, stressful work and deteriorating health (Clarke et al. 2007).

Findings for psychological ill health and depression have been mixed (Ferrie et al. 2008): compared to permanent employees temporary workers' mental health has been described to be better (Liukkonen et al. 2004), equal (Virtanen et al. 2001, Bardasi, Francesconi 2004) or worse (Virtanen et al. 2002, Kim et al. 2008, Kim et al. 2006, Virtanen et al. 2003, Quesnel-Vallée, DeHaney & Ciampi). A stronger association between temporary employment and poor mental health has been observed among female temporary workers than male temporary workers in Korea (Kim et al. 2008, Kim et al. 2006), and in non-manual temporary women than non-manual temporary men in Spain (Artazcoz et al. 2005), but few studies have looked into gender differences. Not many studies make distinctions between different temporary contract types either, but there presently exists evidence suggesting that the mental health effects of temporary employment are related to the degree of employment instability (Artazcoz et al. 2005, Virtanen et al. 2003, Virtanen et al. 2008).

Interestingly, worse mental-health has been observed in studies where general health was found to be better among temporary employees (Virtanen et al. 2002), indicating that associations with physical health and mental health may differ. Some studies have found temporary workers to report worse self-rated health (Kim et al. 2008, Kim et al. 2008,

Rodriguez 2002) while others have found them to report better self-rated health than permanent employees (Virtanen et al. 2002, Liukkonen et al. 2004, Virtanen et al. 2001), particularly in the case of fixed-term employees (Liukkonen et al. 2004). Musculoskeletal pains are reported to be more frequent among temporary workers as well (Benavides et al. 2000, Aronsson, Gustafsson & Dallner 2002), although in later surveys this excess risk appears to have decreased (Benach et al. 2004).

Lower sickness absence has been repeatedly described among temporary workers (Benavides et al. 2000, Virtanen et al. 2003, Virtanen et al. 2001, Virtanen et al. 2004, Virtanen et al. 2006). This can be interpreted as reflecting a better health status or a higher threshold for taking sick leave while being ill (Virtanen et al. 2001, Vahtera, Pentti & Kivimaki 2004). The threshold hypothesis has supported by a longitudinal study which showed that despite initially low rates of sickness absence, fixed-term employees who were transferred to permanent positions in the following two years equalled the higher rates of sickness absence of their permanent colleagues (Virtanen et al. 2003). The higher threshold hypothesis implies temporary workers have a tendency to work while ill. This sickness “presenteesim” is possibly caused by fear of job loss (Virtanen et al. 2005), and lack of pay during sick leave (Lewchuk et al. May, 2007).

One study has looked at the relationship between temporary employment and premature mortality and found that overall mortality was higher among temporary employees, and most strongly associated with deaths from alcohol-related and tobacco-related causes (Kivimaki et al. 2003).

Virtanen and colleagues conducted a meta-analysis of studies on temporary employment for different health outcomes. They found that the literature was most suggestive of a relationship between temporary employment and increased psychological morbidity (combined OR=1.25; 95% CI

1.14–1.38), sickness absence (OR= 0.77; 95% CI 0.65–0.91) and occupational injuries (combined risk estimate not computed) (Virtanen et al. 2005). The combined risk estimate was positive but insignificant for poor physical health and for musculoskeletal disorders. The meta-analysis also confirmed that the association with health was stronger as instability of temporary employment increased. However, they found a high degree of heterogeneity between the studies, thus defining their analysis as an *explorative inspection* of existing research (Virtanen et al. 2005).

A specially difficult feature of studying the association between temporary employment lies in health selection and the “healthy worker effect”. The healthy worker effect is a relevant issue in occupational health research (Carpenter 1987). However, it is likely to operate differently among temporary and permanent employees (Virtanen et al. 2002). Evidence shows that temporary workers are frequently healthier than their permanent colleagues, suggesting that they are initially selected for their good health (Ferrie et al. 2008). There also seems to be a health selection process, which includes mental health status, underlying the transfer of workers from temporary to permanent positions (Virtanen et al. 2005). Workers with poor health may more frequently suffer bouts of unemployment or finally leave the labour market (Virtanen et al. 2006), whereas workers with better health are more likely to be promoted into permanent employment (Virtanen et al. 2002, Virtanen et al. 2005). These issues pose serious difficulties to the interpretation of research findings that compare the temporary and permanent workforces.

In summary, temporary employment is most consistently associated with lower job satisfaction, worse mental health, greater sickness presenteeism, and more workplace injuries. Temporary employees are frequently described as lacking training and support in the workplace and being ex-

posed to hazardous working conditions. All of the above are a potential source of stress, dissatisfaction and injuries. Finally, if the observed association with increased mortality were real, it would be indicating that there may be longer-term health effects which may be mediated by behavioural risks acting that act as coping strategies in the face of anxiety, stress or psychological distress. The evidence also suggests that the working conditions and health risks of temporary employees may be stratified according to the level of stability provided by their jobs (Virtanen et al. 2005).

3.2. Strengths and limitations

The bulk of the evidence presented above suggests that unstable employment relationships pose a threat to health and well-being. Major organizational change studies have shown that downsizing poses a threat to employee's health during the anticipation phase, and also for survivors once the process has been completed; because many of these studies have collected health-related information before and after exposure, they have provided valuable evidence in favour of a causal association between stressful employment situations and health. Job insecurity has consistently demonstrated a negative health impact, specially for mental health. Finally, temporary employment, despite its heterogeneity, is consistently associated to worse mental health, lower job satisfaction, sickness presenteeism, and more workplace injuries.

However, while the bodies of research previously described are fruitful sources of information regarding the potential impact of precarious employment on health, relevant conceptual limitations must be discussed.

One first general issue to bear in mind is that these approaches are largely one-dimensional: they address issues of employment security or instability

(threat of job loss, perceived job insecurity, non-permanent employment), but do not explicitly address the other dimensions that make an employment situation precarious. In particular, these approaches to employment relations (like much occupational health research) have largely ignored the relevance of power relations in the workplace as a determinant of health (Benach et al. 2010, Brooker, Eakin 2001) .

Specifically regarding downsizing research, a major issue is that while precarious employment represents a situation of chronic job instability and sustained uncertainty, MOC research usually describe the situation of workers socialized into stable employment, now faced with an acute threat of job loss (Scott 2005). However, regarding downsizing “survivors” or “stayers”, the determinants of their higher work intensity, elevated psychological demands, lower control and increased perceptions of job insecurity may be related to a precarisation of employment relations in these organizations.

Regarding job insecurity, most research has used global measures, and its association with ill health is quite consistent across studies. But perceptions of insecurity may be informed by a variety of signs and events arising from the organization’s internal and external environment (Green 2003, Erlinghagen 2008, Greenhalgh, Rosenblatt 1984). In consequence, unspecific, global measures of job insecurity may be difficult to interpret. This difficulty has been acknowledged by researchers (Ferrie 2001), who have pointed at the need for further theoretical and empirical work to clarify its content and develop psychometrically sound measures (Sverke, Hellgren 2002).

Additionally, as Hartley describes it, job insecurity is a largely “private” experience, an “internal event” which may have an objective basis but may vary considerably between individuals due to personal attributes

(Hartley 1999). The perception of insecurity depends on the individual's interpretation and evaluation of external signs (Hartley 1999, Erlinghagen 2008, Greenhalgh, Rosenblatt 1984, Kinnunen, Natti 1994). In fact, job insecurity research does not generally attempt to assess the employment relationship itself. This predominant view is said to have produced a body of research focused on individual psychology (McDonough 2000), an approach likely to generate findings more closely linked to the individual than to the employment relationship (Aronsson, Gustafsson & Dallner 2002). These approaches cannot allow clarifying the social (and modifiable) causes of insecurity.

As a third research approach, temporary employment "objectively" addresses the issue of current employment security: temporary employment does not guarantee employment continuity, and can be measured without mediation by perceptual processes. Also, it has grown substantially in some countries during the last decades. However, conceptual and practical issues limit the usefulness of contract type as a proxy for precarious employment. However, conceptual and practical issues limit the usefulness of non-permanent contract types as a proxy for precarious employment, one of the most problematic being the large heterogeneity between temporary employment forms (Rodgers 1989, Tompa et al. 2007).

For one, categories defined exclusively according to contract type cannot address actual "empirical" instability: they cannot distinguish long-lasting temporary jobs from short-term temporary jobs (or insecure from secure temporary jobs (Virtanen et al. 2003)), nor if open-ended contracts tend to last a limited period of time, introducing error in the measurement of both the "exposure" category (temporary employment) and the "reference" category (permanent employment). Indeed, permanent jobs may also be precarious along several dimensions (Tompa et al. 2007). A consequence

of this is that the health impact of precarious employment experiences may be underestimated.

Also, while some aspects of precarious employment such as low income and insufficient benefits have been suggested to link temporary employment with poor health (Ferrie et al. 2008). these aspects also present important variability within legal employment forms. For example, people on “project-related” contracts in Sweden have reported considerably more job training, higher decision making and better opportunities for personal development than “on-call” workers, while they are both considered temporary contracts (Aronsson, Gustafsson & Dallner 2002). But this variability generally remains unmeasured when a single measure is used to account for a multidimensional phenomenon like precarious employment.

As noted, the contradictory findings in temporary employment research described above may stem from this unmeasured heterogeneity between employment forms (De Cuyper et al. 2008). Heterogeneity may exist within countries, possibly resulting in a misclassification of study subjects. Heterogeneity may also exist between countries regarding the levels of protection and rights legally granted to different forms of employment and regarding consuetudinary employer-practices, making studies difficult to compare and possibly resulting in contradictory research findings (Benavides et al. 2000, Rodriguez 2002, Virtanen et al. 2005, De Cuyper et al. 2008, Bielenski 1999).

Overall, limitations of precarious employment research are derived from the absence of an official definition and lack of routinely collected data on official statistical sources, and the lack of appropriate concepts, measurement instruments and data for epidemiologic studies. In consequence, researchers that adopt a multi-dimensional perspective do not count with a composite indicator of precarious employment or appropriate indicators

for the different dimensions in existing databases. Furthermore, it is unclear how such indicators would have to be combined into an integrated measure (Laparra Navarro 2006, Frade, Darmon & Laparra 2004). These limitations hamper epidemiological research and imply that the health-related impact of precarious employment remains controversial.

In addition, the actual prevalence of precarious employment remains unknown, as well as trend changes associated with labour market and related policies and with the economic cycle. This second problem can be well illustrated with the Spanish case, where amidst a severe labour market crisis (more than 1.5 million employment jobs lost between the first trimesters of 2008 and 2010 (INE)), temporary jobs are at their lowest level in twenty years. This descent reflects that temporary jobs were the first to be destroyed during the crisis. If aiming to assess the impact of the crisis on the expansion of precarious employment, the share of temporary employment is surely providing a very misleading picture. High unemployment is expected to produce the effect of precarising all jobs, increasing -rather than decreasing- the prevalence of precarious employment (Rodgers 1989).

Finally, the lack of an appropriate indicator limits cross-national comparisons of both prevalence and health impact of precarious employment, given that determined forms of labour contracts will be more or less precarious depending on the legal context in which they are established (Benavides et al. 2000, Bielski 1999).



4. TOWARDS A MULTIDIMENSIONAL APPROACH TO STUDY PRECARIOUS EMPLOYMENT IN EPIDEMIOLOGICAL RESEARCH

4.1. The need for a multidimensional approach to precarious employment

As described in section 2.3 above, outside the public health field precarious employment has been conceptualized as a multidimensional construct for some time now. But a multidimensional conceptualization of precarious employment for epidemiological and public health research is wanting. The need for a multidimensional approach is guided by conceptual considerations, whereby employment instability is but one of the dimensions of employment precariousness, thus not a sufficient nor necessary condition. It is also necessary in order to overcome the limitations described above for currently available one-dimensional measures, which cannot capture the complexity of the concept (e.g., contradictory findings, poor assessment of employment conditions). Finally, the complex way in which employment relationships are shaped at the individual level makes it necessary to address precariousness in a more comprehensive way, as will be discussed below.

At the aggregate level, flexibility is achieved through different strategies across countries, regions within countries, specific sectors of economic activity and within organizations. These strategies may be linked to the mode of organization of production; to the nature of employment protection legislation, where some countries favour non-permanent employment forms whereas other favour ease of firing and hiring of employment in

general (Sels, Van Hootehem 2001); to social protection provisions, where certain countries combine high flexibility with high levels of protection for unemployed workers and a strong social security net; and to the enforcement and effective application of legislations and consuetudinary practice, which will ultimately determine actual employment practices and the resulting degrees of precarious employment (Laparra 2006). As a result, it is indeed possible that some strategies may combine flexibility with low precariousness while others will combine flexibility with high precariousness.

This heterogeneity in flexibility strategies is expressed at the individual level. At the individual level the heterogeneity in legal employment forms will combine with “practice” within sector, company, or workplace, and with social provisions that are applicable on a case by case basis depending on the achievement of certain “thresholds” (months of social security payment, cumulative number of hours worked, age, etc.). In non-permanent employment, “practice” plays a still more relevant role than for the “standard” permanent employment relationship, with the distribution of risks (e.g., job loss) and benefits (e.g., career opportunities, job stability) being particularly open to the employer’s discretion, product of –and reproducing– the individualization of employment relationships.

Hence, for each individual, the combination of employment contract, access to social security, and practice based on informal criteria will determine a unique level of “precariousness”. Thus, a typically one-dimensional approach to precarious employment, focused on employment instability, is limited in its ability to both identify precarious employment relations and to assess their impact on health and well-being. On the contrary, a multidimensional conceptualization and measurement of precarious employment –if conceptually sound and psychometrically valid- will

capture the heterogeneity between and within legal employment forms, and offers greater explanatory power for an analysis of the health impact of precarious employment. Furthermore, an internationally applicable, general definition of precarious employment would facilitate cross-national comparative studies, overcoming the problem of the legal specificities of employment forms across countries (Aronsson, Gustafsson & Dallner 2002).

4.2. Multidimensional measurement proposals

The need of a multidimensional approach to precarious employment has been acknowledged by various authors, and some proposals have been forwarded. Most of these proposals come from disciplines outside epidemiology, occupational health or public health.

For New Zealand, Tucker developed a set of indicators of employment precariousness based on a literature review and focused on non-permanent employment at the lower end of the employment continuum (Tucker 2002). Based on Rodger's dimensions (Rodgers 1989) and on Burgess's employment of Standing's seven forms of labour security as indicators of employment precariousness (Burgess, Campbell 1998), Tucker proposes a set of ten indicators (to be added up into a simple summated measure) grouped into five dimensions: certainty of ongoing employment, degree of employee control (over employment and working conditions), level of income (and possible deprivation), level of benefits, and degree of regulatory and union protection.

The proposal contains elements such as awareness about rights, mobility between precarious employment and unemployment, and the ability of the employer to change job features at will, which is a reflection of the lack of

control a worker may have over his working conditions and the imbalance of workplace power relations. In line with Rodgers, for Tucker precariousness is best thought of as a continuum, where it is “the combination of a number of elements that causes precariousness, rather than any one aspect”. That I am aware of, Tucker’s model has not been employed in quantitative research.

Tompa and colleagues (Tompa et al. 2007) in Canada proposed a multi-dimensional approach to employment precariousness based on Rodgers dimensions, to which they added work-role status, social support at work, risk of exposure to physical hazards and training and career advancement opportunities. In their model, precarious employment leads to adverse health outcomes through poor working conditions, material deprivation and stress. Measurement alternatives don’t appear to have been developed.

Also in Canada, the employment strain model was developed focusing on temporary employees, but highlighting the need for a broader assessment of employment relationships, beyond contract type, to understand the links between precarious employment and health. The *employment strain* model (Lewchuk et al. Fall 2003) is an expansion of the job strain model (demand – control – social support) (Karasek et al. 1998, Karasek 1979). The notion of employment relationship strain recognizes the relevance of issues related with getting, keeping, and negotiating the terms of employment (Clarke et al. 2007, Lewchuk et al. Fall 2003).

Employment strain results from the combination of high uncertainty regarding future employment and employment conditions (control dimension), and high effort expended in ensuring future employment (demand dimension). Ensuring future employment implies workers will have to overexert themselves in the effort of finding, securing and keeping em-

ployment²³ (Lewchuk, Clarke & de Wolff 2008). Besides, there is also employment relationship support (the support dimension), including support at work from formal organizations such as unions and co-workers, and outside work, from friends and family.

Employment strain has been found to be associated with health-related measures quantitatively (Lewchuk, Clarke & de Wolff 2008) and qualitatively (Clarke et al. 2007). The health-related indicators that showed the strongest association with employment strain dimensions include frustration at work, tension and stress at work, work-related sleeping problems and headaches. Additionally, they described how temporary employment may be sustainable if there is economic (or other) support from the family or spouse, and unsustainable if there wasn't (Clarke et al. 2007).

Another approach undertaken by several researchers employing Rodgers's dimensional and gradational concept of precarious employment, address it through a classification of employment forms. One such strategy has been applied by Vosko and colleagues (Vosko 2006, Cranford, Vosko & Zukewich Fall 2003, Vosko, Zukewich & Cranford October 2003), who proposed creating a typology of employment forms based on the dimensions of precarious employment. Their typology identifies mutually exclusive employment forms, such as permanent full-time, permanent part-time, temporary full-time, temporary part-time, etc. By creating such a typology, they move beyond the standard / non-standard or temporary/permanent dichotomies, to create a more refined classification, which

²³ Examples of this additional effort are: having to look for work in their spare time, engage in unpaid training, or perform tasks for employers beyond those narrowly defined in a labour contract, with the goal of increasing the probability of securing future employment on favourable terms (Lewchuk, Clarke & de Wolff 2008).

they relate to different degrees of precariousness given the legal provisions, wage levels and other characteristics ascribed to them. They then relate their typologies to individuals' characteristics, such as gender, age, and race, providing a picture of the extent to which precariousness is, for example, gendered. Such a typology also allows following in a more detailed manner the temporal trends in the growth and expansion, or retrench, of precarious employment.

This strategy was also taken up by Louie and colleagues who validated the typology for Australia by showing how, along the continuum, employment forms differed significantly and coherently in socio-demographics, job characteristics, and self-reported job insecurity (Louie et al. 2006).

In Barcelona, Spain, researchers at Universitat Pompeu Fabra designed and conducted a research project with the objective of defining precarious employment as a *health determinant*, and determining the impact of precarious employment on workers' mental health. Following an extensive multi-methods study, they defined *employment precariousness* and its dimensions and developed the Employment Precariousness scale (EPRES) for use as a survey instrument (Amable 2006). They explicitly addressed both the contractual and social-relationship aspects of employment as an unequal power relationship.

The EPRES was specifically devised for epidemiologic research, so that the Employment Precariousness Scale (EPRES) provides with a picture of interrelated dimensions which can affect the health and well-being of workers. This does not necessarily limit its usefulness in other kinds of research, but it does make it the most suitable available approach for epidemiologic research and public health, and will be the focus if this dissertation.

4.3. The employment precariousness construct

Amable defined employment precariousness following the conceptualizations developed by Rodgers and Cano, as they apply at the individual level, in order to study it as a health determinant. The study that led to this conceptualization and to the identification of the dimensions of precariousness is briefly described below.

The resulting *employment precariousness* construct encompasses 6 dimensions, based on those defined by Rodgers and Cano (employment stability, lack of collective control over work, lack of protection through workplace and social security rights, low wages) (Cano 2004, Cano 2000, Cano 1998), and enriched with dimensions related to employee-employer workplace power relations (workers vulnerability or defencelessness and powerlessness to exercise workplace rights).

Understanding of the embeddedness of the construct in power relations is fundamental to grasping the nature of employment precariousness beyond national or historical specificities or the specific way in which it is proposed to be measured.

a) Conceptualising precarious employment within a power relations framework

“We understand by ‘power’ the chance of a man or of a number of men to realize their own will in a communal action even against the resistance of others who are participating in the action.” Max Weber, 1946.

Employment relationships are social relationships between an employer and an employee, characteristic of the way in which work and the production of goods and services are organized in capitalist societies. They are economic relationships in which labour is exchanged for wages (Bowles, Edwards 1985). Employment relationships are situated between the market (where labour power is sold and bought) and the organization, in which the employee performs work under the command and control of the employer (van Ruysseveldt, Huiskamp & van Hoof 1995).

Employment relationships also are a class relationship between employers who organize the labour process for profits, and employees who provide labour for wages. Thus *employment precariousness* has a “collective” meaning in terms of class relations (Cano 2004). It also has a particular historical meaning, in that it reflects on an “ideal standard” of wage-employment that developed during the post war years, the standard employment relationship.

The standard employment relationship protected workers from the risks of the market and from the economic uncertainties of non-work periods (and hence from social exclusion and poverty). On the other hand, it limited managerial prerogative to control labour or the “nearly unlimited entrepreneurial dominance”(Mückenberger 1992) that may arise when a private

employment “bargain” is made between people in unequal power relations, and that characterized early stages of capitalism (Standing 1999).

Major economic restructuring and globalization, employment deregulation and the winding back of welfare regimes, and the decline in union strength have eroded the standard employment relationship, transferring market risks back to workers and increasing the relative power of management in the workplace.

While the notions of class interests and power are complex ones, they will be dealt here in a simplified manner for the purpose of illustrating how employment precariousness can be conceptualized and better understood within a power relations framework. The EMCONET network’s model for employment conditions and social inequalities will be employed (Muntaner et al. 2010, Benach et al. 2010d, Sarkar et al. 2009).

Unequal power relations

Employment relationships are also power relationships. For the large majority of the working population, nearly all income is obtained as earnings from jobs paid by an employer in exchange for work. Given the high dependency of workers on employment as their main and -frequently only- source of income (workers do not generally own any means of production), they tend to be in a weak bargaining position relative to employers. Also, workers are many while employers are few, so the latter have extensive power in deciding who they employ, whereas for workers the perspectives of non-employment are harsh (Ironside and Seifert, 2003 in (Hoel, Beale 2006). So, power inequality is inherent to waged-labour and employer-employee relations (Miguélez 2005, Bowles, Edwards 1985).

Unbalanced power relationships imply that the terms under which such relationships are established (when the employment contract is issued and agreed on) may be settled unilaterally, safeguarding the interests of the part that bears the largest portion of power, i.e., the interests of the employer, which is basically profit making (and minimizing risks).²⁴

Contrasting interests

To an important extent, workers have a common set of interests within an employment relationship. Workers will generally benefit from minimizing the risks of employment instability and increasing the level of benefits received in exchange for the labour that is performed. In addition, because workers are directly involved in the production process, they are exposed to additional sources of risk related to the production process itself, including work intensity, safety, environmental, ergonomic, and organizational/psychosocial conditions. The reduction of these risks is also in the general advantage of workers.

And to an important degree, worker interests are in contrast to the interests of employers (Bowles, Edwards 1990, Miguélez 2004). These conflicting interests are generally illustrated as a conflict over wages and work intensity (Bowles, Edwards 1985), but also include other aspects of the waged labour relationship as mentioned above. It is widely recognized that the wages and employment security desired by workers imply costs for employers, the latter being specially relevant in times of economic

²⁴ Notions of differential power also apply along subcontracting chains, where the central organization uses its greater economic power and unilateral control over the production process to shift risks to subcontractors. These, in turn, contract workers under more precarious employment conditions (Cano 2004, Munson, Rosenblatt & Rosenblatt 1999).

uncertainty when guarantees of employment security imply that employers take a greater portion of the market risks to their account (Solow). And minimizing health damaging exposures associated to the production process may, for one, imply a slower pace of work, and for other, investments which in the short term imply higher (direct) costs for the employer (despite long-term benefits, occupational health and safety provisions generally have to be enforced by law) (Quinlan, Mayhew & Bohle 2001b).

The conflict over work pace and intensity is also a conflict about control over the labour process, the organization of work, the way risks are dealt with, etc.(Edwards 1983a). The right of the employer to direct and control labour forms part of the employment contract and is legitimated by law and by collective bargaining, but within certain (explicit or implicit) limits (Rubery, Grimshaw 2003). While some degree of control or “the right to manage” is recognized of management, the balance of control over the labour process is key to the level of satisfaction workers can obtain from work and the extent to which work can result in beneficial or harmful consequences to health.²⁵

Power relations, labour market regulation and employment conditions

The bargaining process –formal or informal- through which the terms of exchange (mediated through the contract of employment) and conflicting interests are settled involve 1) the amount of wages and non-wage benefits (which allow for financial security across diverse contingencies such as unemployment, sickness, maternity, old age); 2) the level of employment security and career prospects; 3) the amount of work (generally it is the number of hours that are explicitly settled, including daily, weekly and

yearly rest periods, but the intensity of work is generally left to a more continuous, informal, and maybe tacit, bargaining process (Bowles, Edwards 1990, Standing 1999)); and 4) the conditions under which work may be performed, which, as with work intensity, are not settled in an explicit form in the contract.

The way in which these issues are settled has varied with time (Benach et al. 2010, Standing 1999, Quinlan, Mayhew & Bohle 2001b). During the 19th century, employment and working conditions in industrialized countries were mainly settled unilaterally by the employer. During the XXth century the collective strength of workers led unions to be recognized as representatives of organized labour, gave them political power to influence state policies and bargaining power to deploy during collective bargaining.²⁶

Employment relations came to be regulated either by the state or by collective agreement, reducing the scope of issues to be settled by the employer (Mückenberger 1992). Given the inherent power imbalance between the parties, most employment regulation and policies that developed during the century tended to protect workers both from market risks and from “unfair” treatment by employers.

Into the XXIst century, bargaining over the terms of employment and working conditions can occur at the collective or, and increasingly so, at the individual level (Miguélez 2004, Mückenberger 1992). Collective bargaining takes place between collective actors, i.e., workers’ unions and

²⁵ Employees will always retain some control over the work process, technical or social (collective action), and ultimately, over their work effort (Edwards 1983a, Sørensen, Kalleberg 1976).

business associations, and is frequently mediated by the state. The balance in political (and economic) power between collective actors is fundamental in determining labour market policies and regulation, and social security provided by the welfare state (Benach et al. 2010, Muntaner et al. 2010). Individual level bargaining takes place between the employer and the employee, leaving many issues to be settled between management and the individual worker.

While collective bargaining and state regulation tend to favour workers with better employment conditions and stronger social protection, the opposite is true about individual level bargaining with limited state regulation: by leaving a number of issues to be settled at the individual-contract level, it increases the prerogative of management to settle the terms of employment and conditions of work, favouring a reduction in employment standards (Mückenberger 1992).

Workplace power relations

Collective power relations and the resulting regulations and policies will affect the way in which power relations are subsequently acted out in the workplace, i.e., control and authority relations. Unfavourable employment conditions undermine employee workplace bargaining power (different types of contracts in one workplace will also result in varying degrees of bargaining power amongst co-workers). Extent of employment security, level of wages, access to rights and benefits, worker protection and degree

²⁶ The experience of war and the settlement of communist regimes in the East also gave governments in Western Europe, made social peace more desirable and the quieting of labour conflict ever more important (Standing 1999).

of decommodification²⁷, all modify workers' vulnerability and capacity to bargain over their work experience.

The resulting balance of workplace power is crucial in the settling of those issues that are not arranged explicitly in the work contract or by law (and to enforce those which are). As mentioned before, these are, fundamentally, day-to-day work effort or intensity and working conditions (including safety issues), although wages are re-negotiated periodically too (Bowles, Edwards 1985). These issues, which are fundamental in shaping workers' everyday experience, are increasingly left to be solved at the individual level when collective bargaining and statutory regulations decline. So, paradoxically, under such circumstances the workplace bargaining power of individual workers becomes even more important (Miguélez 2005, Mückenberger 1992, van Ruysseveldt, Huiskamp & van Hoof 1995).²⁸

In sum, working conditions and the daily experience of work and employment are determined by macro-level structures and processes (Benach et al. 2010, Dragano, Siegrist & Wahrendorf 2010): macro-level power relations (between collective actors) shape employment relations and workplace power. During the post-war era, the combination of state regulation, collective bargaining, and welfare guarantees achieved two major and interrelated goals for workers: protection from economic risks (market risks and non-work periods) and from the prerogative of management

²⁷ While some authors do not share this interpretation of de-commodification (Standing 2009), it will be used here to mean what Esping-Andersen has made it to mean, i.e., the extent to which workers are able to maintain their livelihood when they find themselves unemployed or in non-work situations, and the significance it has for precariousness in that it protects workers from market risks and improves their bargaining power.

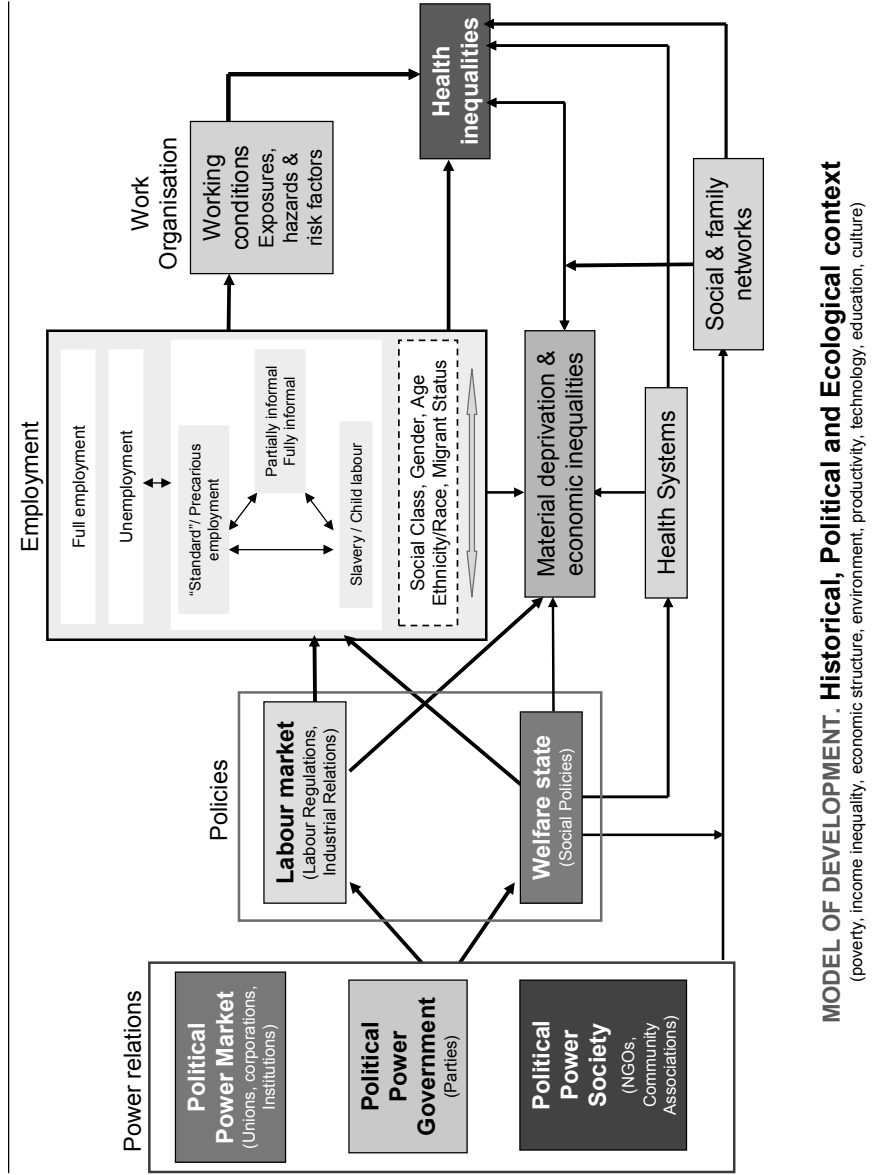
²⁸ Worker bargaining power may be increased in cases of specific skills requirements which are scarce and difficult to obtain in the labour market.

to freely manage labour (to the detriment of workers, that is) (Mückenberger 1992, Amable 2006). It is precisely the expansion of these risks and power imbalances which gives rise to *employment precariousness*.

Theoretical framework of employment relations and health (EMCONET)

This embeddedness of precarious employment in power-relations is depicted in Figure 11, the Employment Conditions (EMCONET) Knowledge network's macro-level model of employment relations and health inequalities.

On the left side are the macro-social power relations between collective economic actors which will determine the policies that shape the labour market and the welfare state (Muntaner et al. 2010). At the centre are the employment conditions that result from macro-social power relations and ensuing policies, including the extent to which employment relations are or not precarious. To the right are the pathways that link employment conditions to health (Benach et al. 2010d). An important pathway runs through working conditions; another pathway runs through material deprivation and its toxic effects on health (Tompa et al. 2007). In addition, there are direct, stress-related, pathways emanating from employment precariousness. All these pathways are likely to affect health via psychosocial factors, lifestyle behaviours and physiopathological changes (Tompa et al. 2007, Benach et al. 2010d).



MODEL OF DEVELOPMENT. Historical, Political and Ecological context

(poverty, income inequality, economic structure, environment, productivity, technology, education, culture)

Figure 11 Theoretical framework of employment relations and health inequalities: a macro-level model. (NGO : nongovernmental organizations).
Source: EMCONET WHO {842 Benach, J 2010}.

b) Labour market stratification, social inequalities and employment precariousness.

Labour market structure and inequalities

Labour markets exhibit important differences in wages, employment stability and general job quality. These differences can be observed both by characteristics of the jobs, or by the characteristics of the individuals that occupy those jobs. There are systematic and pervasive differences in the way better jobs and worse jobs are allocated in society, giving rise to marked labour market inequalities.

There are different theories attempting to explain both why “good” and “bad” jobs are created, and how “good” and “bad” jobs are socially distributed. Some theories focus on worker characteristics and qualitative and quantitative differences in their investment on “human capital” (Becker 1983). Other theories focus on organizations (firms) to explain the creation of separate “segments” in the labour market. These are theorized to respond to technological and productive process requisites, segmenting markets according to the required levels of skill (Piore 1983); or to the deployment of different managerial strategies in the control of the workforce (Edwards 1983b).

When “bad jobs” result from these organizational requirements, they will tend to be allocated to individuals in disadvantaged social positions. Hence, women, immigrants, racial minorities, manual workers and youth will be most probably allocated to the “bad” jobs of the secondary labour market. In consequence, broader social and economic disadvantage is

replicated as labour market disadvantage (Rubery 1994). Labour market disadvantage is manifest in limited opportunities to access “good” jobs and higher rates of unemployment.

Rubery suggests that this relationship also runs in the other direction: “bad jobs” can be created for those groups whose bargaining power and labour market opportunities are limited (Rubery 1994, Rubery 2006). For example, “women jobs”, such as caring for others, can be created as secondary labour market jobs given women’s relatively weak labour market position (Rubery 1994). These employment policies create themselves a shortage of labour market opportunities for disadvantaged groups, thus actively reproducing the inequalities rooted in the long term economic and social disadvantage of certain groups (Rubery 1994).²⁹

The “bad” jobs constituting the secondary labour markets can be characterized as precarious jobs in that they are unstable, low-waged, lacking

²⁹ Rubery and colleagues developed an integrated and dynamic approach to labour market segmentation. Their point of departure is that all employer organizations prefer to have a stable and committed workforce. The observed differences between jobs may lie instead in the constraints that may hinder their chances of securing worker commitment. These constraints are rooted in the characteristics of the organization (e.g., small versus large organizations), characteristics of product market and inter-firm competition (p.e. demand, price, and non-price product market pressures (Wilkinson, White 1994)), power relations in the workplace (presence of unions), and labour market characteristics and regulations. At the same time, changes in external conditions such as the flexibilisation of labour markets (labour market policy), decline in union power, and the increasing incorporation of women and immigrants into labour markets open opportunities for organizations to employ new strategies to reduce labour costs and ensure labour commitment. So, organizations which face structural (size) and economic constraints to providing internal labour markets may achieve worker commitment by employing people in a disadvantageous position who will see their lack of external opportunities as a constraint to leaving the job and as a push to performing well. At the same time, certain jobs, such as “women’s jobs” can be more flexible and paid less given women’s weak position in the labour market allows organizations to reduce labour costs even in some of their core functions (Rubery 1994, Grimshaw, Rubery 1998).

promotion perspectives, and probably exposed to more authoritative and abusive forms of control.(Edwards 1983b) In consequence, the expansion of precarious employment has been equated to an expansion of the secondary labour market.(Recio 1997)p184 However, the concepts of secondary labour markets and precarious employment are interrelated, yet different.(Amable 2006) The fundamental difference lies in the fact that labour market segmentation supposes the existence of segments with “good” and others with “bad” jobs, whereas the precarisation of employment describes an overall transformation of employment relations which will affect all jobs, albeit to different extents (Burgess, Campbell 1998, Amable 2006). Nevertheless, an understanding of labour market structure and the underlying processes described above allow understanding inequalities in the distribution of employment precariousness.

Labour market inequalities and social health inequalities

The notion of labour market structuring as a process which not only replicates but also reproduces patterns of inequality in social position can be fitted into Graham’s schema of social inequalities in health. In it, health inequalities are rooted in broader structural inequalities that are maintained over time and across generations (Graham 2004). According to Graham, structural inequalities (in this case, in the labour market) “work through” inequalities in social position (social class, gender, race, etc.) to determine their unequal access to societal resources and unequal exposure to societal hazards (the social determinants of health). As noted by Graham, social determinants include both “people’s everyday environments and the societal structures and policies that shape them”(Graham 2010).

So, structural inequalities in the labour market are key determinants of the unequal distribution across social positions of societal resources such as

good jobs and of societal hazards such as bad jobs.³⁰ Figure 12 is an adaptation of Graham's schema, showing the relationship between the labour market, social position, employment conditions, and health. The double arrow from labour market structure to social position is illustrating how social position informs organization's employment policies (bad jobs are allocated to people in disadvantaged social positions) while at the same time these policies hinder the labour market opportunities of these groups, thus generating or reproducing inequalities in social position.

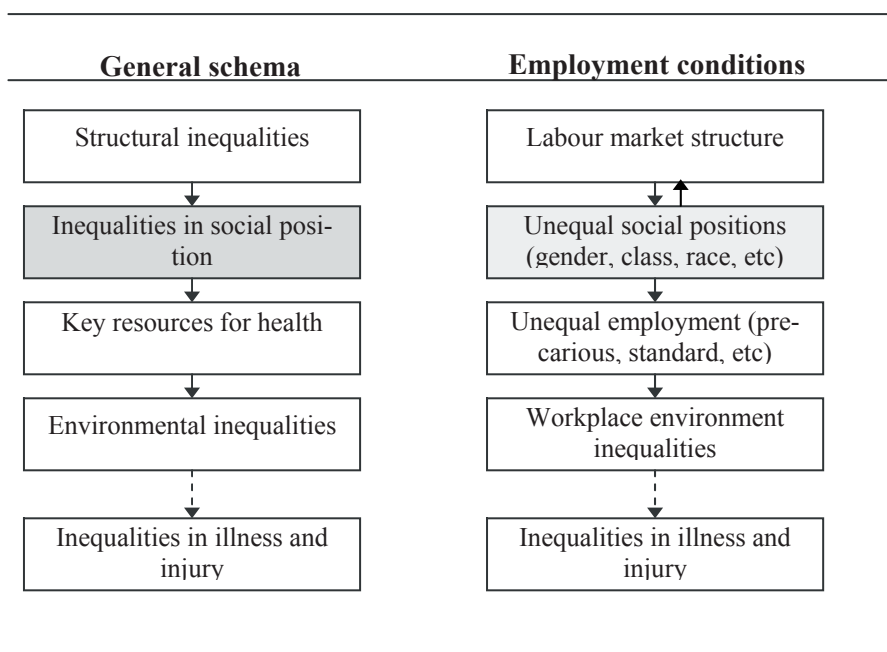


Figure 12 Labour market structure as a determinant of health inequalities. Based on Graham, 2004.

³⁰ In the labour market, youth are clearly in a position of disadvantage, which is partly being generated within the labour market (Rubery 1994).

Inequalities in the workplace

At the workplace level, and drawing on the previously posited negative relationship between employment precariousness and workplace power, the unequal distribution of employment precariousness (bad jobs) across the axes of gender, age, race, class, etc., means that there will be an unequal distribution of workplace power across these same axes. It follows that, because low workplace power is a determinant of worse working conditions (above and beyond the specificities of the tasks for which “precarious” workers may be hired), people in unequal social positions will face unequal working conditions, i.e., unequal access and exposure to the social and material environment of work (above and beyond the specificities of the tasks for which certain groups of workers may be most frequently hired) (Graham 2004).

The distribution of workplace power across the social axes of inequalities is consistent with Krieger’s description of workplaces as social spaces in which “each worker is necessarily embedded in her or his societal context, and thus simultaneously embodies and brings to the work her or his social position in relation to key societal divisions involving property and power” and “work is a locus not only of economic production but also of social reproduction of social relationships of the society at large” (Krieger et al. 2006).

Also, the literature on unequal workplace power across the axes of gender, race and class, organizational power (location in the organizational hierarchy) described organizational resources and workplace hazards to be unequally distributed across these axes (Brooker, Eakin 2001, Rospenda, Richman & Nawyn 1998). However, to what extent these workplace inequalities are rooted in general “socio-cultural power” and to what extent in employment conditions is largely unknown. One study in Australia has

documented that non-permanent employees were subject to unwanted sexual advances at work in a much higher proportion than permanent employees, and that this association was stronger in women (LaMontagne et al. 2009). This finding suggests that both sources of unequal power are in action at the workplace.

So, inequalities in the social patterning (distribution) of precarious employment may be understood as the reproduction of broader social inequalities in the context of a general decline in employment conditions. As a result, employment precariousness will be more prevalent among certain groups, and also the degree of precariousness will be expectedly higher among these groups (Rodgers 1989). From a public health perspective, this means that certain social groups will exhibit both an increased prevalence and severity of exposure to employment precariousness.

c) Employment precariousness and its dimensions

Employment precariousness was defined by Amable at two levels, macro-social and microsocial. It is the product of the new economic and political framing of employment relations, the “flexibility regime” (macro), which is manifest in the relative distribution of power in the workplace (micro) (Amable 2006). In other words, it addresses how labour market outcomes extend into the workplace experience of individual workers. So, employment precariousness is a fragile employment relationship (poor employment conditions) that sets few limits to the prerogative of management and provides workers with few resources to restore those limits (workplace power imbalance).

As a determinant of health, Amable posits that employment precariousness acts as “a psychosocial dimension” arising from the daily experience

of workers exposed to the management style imposed on flexible wage-labour. The notion of “daily experience” is highlighting the extent to which employment relationships configure a persistent “exposure”, whether it be favourable or adverse to health. The notion of “psychosocial dimension” highlights the importance that workplace power relations have in conceptualization of precarious employment as a determinant of health.

As a health determinant thus defined, employment precariousness lies in a continuum with the ideal type of standard employment relationships at one extreme and the most precarious jobs at the other (Benach, Muntaner 2007). Thus, employment relationships may be affected by precariousness to greater or lesser extent (Rodgers 1989, Burgess, Campbell 1998, Amable 2006, Benach, Muntaner 2007).

Dimensions of the construct

The employment precariousness construct encompasses six dimensions: employment instability, dis-empowerment, vulnerability, wages, rights, and capacity to exercise rights (Benach et al. 2010, Amable, Benach & González 2001).

Employment instability or *Temporariness* refers to the type and duration of the employment contract, indicating that unprotected (lacking employment protection) or short term contracts contribute to greater employment precariousness.

For one, many employment benefits are more or less strictly linked to length and continuity of employment. In addition, long-term employment implies workers are secured from labour market risks (security increases with tenure), can plan ahead, establish significant relationships at work, and do not need to be in constant exertion to find more work or secure

current employment (Lewchuk et al. Fall 2003). Third, unsecure employment serves as a form of coercion, which may be used explicitly or implicitly as a means to discipline the workforce (Miguélez 2005, Bowles, Edwards 1985, Sørensen, Kalleberg 1976), constituting a pervasive source of workplace stress. Hence, stability and security of employment are central to the notion of employment precariousness.

Both temporary and open-ended contracts may be unstable over time. Instability depends both on the terms of the labour contract and on actual employment practice and enforceability of regulations.

Disempowerment: the way the worker's employment conditions are negotiated, whether individually or collectively.

Employees who are collectively represented arguably have greater power to influence decisions concerning employment and working conditions. On the contrary, individual employment relations are generally disadvantageous for workers, leaving them in a position of vulnerability to the effects of unilateral decisions from which they have little recourse.

Due to (mandatory) extension and enlargement provisions regarding collective agreements, in many countries collective agreement coverage is substantially higher than the national union density rates (Tijdens, Van Klaveren 2007). However, when there is an atomization of collective bargaining, although being covered by collective agreements workers may be ill-informed about the precise terms and conditions of their contract. This lack of information is indicating that the worker has a low level of control over his employment conditions and probably is unaware of the protective role unions can play (generally, and for particular matters that may arise as well) (Hannif, Lamm 2005).

Vulnerability: refers to the set of explicit or implicit social power relations in the workplace, where workers are in a situation in which they lack the necessary resources to offset authoritarianism and discrimination, or the discipline that the wage relation imposes (examples of which are threats of being fired, intimidation, and discrimination).

Vulnerability results both from managerial prerogative to determine the continuity of employment (as in temporary employment) (Cano 2004, Sørensen, Kalleberg 1976) and from the absence of collective support and the protective role of worker organizations (unions or others at the local level) (Amable 2006, Cano 2004).

Vulnerability is expressed, for example, in an incapacity of contingent workers to control their work life, having to accept extra work any time out of fear of not been called in (for work) again (Amable, Benach & González 2001). Another example is the experience of workers who feel fearful to complain about unsafe working conditions given the risk of being fired or not being offered more work (Clarke et al. 2007).

The position of greater vulnerability of precarious workers implies that permanent co-workers may also be in a position to exercise power over them. Amable's interviews reported that on occasions, permanent co-workers tended to leave the most undesirable tasks and the extra work to temporary workers, who were not in a position to complain.

Wages: actual monthly wages and the sufficiency of these to cover regular and unexpected living expenses, indicating worker's economic dependence on employment and risk of material deprivation.

Employment is fundamentally an exchange of labour for wages, and within precarious employment relations, employees are particularly reliant

on the income provided by the job (Government of Canada's Policy Research Initiative 2004). When income from wages does not cover regular or unexpected expenses, it is indicating that current employment may be contributing to impoverishing the worker, and if maintaining dependents, the well-being of the latter will be affected too.

Insufficient income can lead to material and social deprivation (exclusion), where households or individuals are no longer able to enjoy the level of consumption or leisure which members of society legitimately expect. In addition, low wages may have implications for social protection and future pensions.

Workers' rights: a set of rights or non-wage benefits which regulate the utilization of the workforce or which may help mitigate the effects of other aspects of precariousness.

The decline in rights and protection for workers is central to the idea of employment precariousness. Access to non-wage employment benefits provided by these rights (holidays, sick leave, retirement) may be limited or denied to some workers on behalf of their limited number of working hours, length of employment, type of employment relation, etc (Mückenberger 1992, Burgess, Campbell 1998).

Social protection provisions, such as severance pay, unemployment compensation and sick leave, protect workers from market variations and commodification. Other worker rights set limits to the utilization of labour, guaranteeing the right to rest, recuperation and leisure (weekend rest, paid vacations) (Aronsson, Gustafsson 2005).

Cuts in welfare and unemployment benefits increase the threat that non-work periods represent to economic stability (Ferrie 1999), and weaken

workers bargaining position. Cuts in the right to recuperation and rest have implications for health, which are even more severe in the cases of workers exposed to high work intensity (Aronsson, Gustafsson 2005).

As with disempowerment, access to information is also relevant regarding rights. In practice, being knowledgeable about rights is a pre-requisite to exercise them. Being uninformed regarding rights implies that management has not provided with the information. It may also indicate a fracturing of formal and informal information flows among workers (Quinlan, Bohle 2009).

Capacity to exercise rights: the degree to which workers may exercise their legal rights. This dimension is considered as a complementary to the preceding dimension.

The incapacity to exercise rights may be reflecting the inadequacy of existing mechanisms to enforce these rights in the real life situations of many workers (Vogel 1996). Worker powerlessness to exercise rights may be the product of implicit or explicit threats of job loss, wage cuts, or others, or may be reflecting that workers refrain themselves from exercising rights for these same reasons.

Porthé, for example, describes how precarious immigrant workers do not make use of their right to sick leave due to explicit employer threats regarding employment continuity (Porthé et al. 2010). Zeenobiyah and colleagues provide additional examples where the legal rights of workers in vulnerable positions are breached (Hannif, Lamm 2005).

General characteristics of the construct

The expression ‘employment precariousness’ tends to be used interchangeably with precarious employment in the literature. The construct developed by Amable and colleagues, however, is not that of a “precarious job” in opposition to stable jobs, but rather an overall change in employment relations that affects the salaried workforce.

The employment precariousness construct is not narrowly conceptualized not as a workplace risk factor, although its main “playing field” is the workplace, but as a social determinant of health, which will have an impact on multiple spheres of workers’ lives (economic, social, political). These may have direct effects on health, as well as numerous indirect effects through determining the living and working conditions of workers.

The construct makes a clear distinction between the *conditions of work* and *conditions of employment*, which although interrelated, are different concepts (Benach et al. 2010). Employment conditions are the conditions or circumstances in which a person is engaged in a job or occupation (Benach et al. 2010c); or the rules and status under which people are employed, trained and paid (Goudswaard, De Nanteuil 2000). Working conditions define people’s experience of work (Benach et al. 2010c); they describe the practical conditions under which people work and cope with a specific technical and organisational environment (Goudswaard, De Nanteuil 2000).

The *employment precariousness* construct is limited to the description of the employment relationship, leaving aspects of work organization and working conditions out. This distinction provides with conceptual clarity, and avoids overlapping with well-established models of occupational stress originating from the organization of work (the demand-control-

social support model (Karasek et al. 1998) and the effort-reward imbalance model (Siegrist 1996). It also has significant analytical advantages, since it is only possible to analyse the associations between employment conditions and other work characteristics (and their overall impact on health) by separating them conceptually (Laparra et al. 2004).

The construct is conceptualized as objective conditions and work experiences: employment precariousness is not primarily understood as a perceptual process. In consequence, items in EPRES were worded with the aims of gathering "objective" data and questions were posed as reports and not as evaluations or perceptions regarding their experience. This should limit the subjective individual component when measuring the construct, acknowledging however, that self-reports are not void of subjectivity (Karasek et al. 1998).

4.4. Employment precariousness and mental health

“Life events and circumstances are known to have considerable effect on our health in general with mental health being the most acutely responsive and the most sensitive.” (Marusic, Bhugra 2008)

Mental health is an important indicator of the health status of a population (Hoeymans et al. 2004). According to the fourth European survey for the living and working conditions, work-related stress is the second most frequently reported work-related health problem, affecting 22% of workers from EU 27 in 2005 (Parent-Thirion et al. 2007). The expansion of employment precariousness may explain an important part of the high prevalence of work-related stress in wealthy countries.

Conditions of employment may influence mental health positively or negatively, directly or indirectly, with the pathways leading from em-

ployment conditions to health being found both at work and in non-work life(Muntaner et al. 2010).

The beneficial effects associated with being in employment (as contrasted to being unemployed, but not meaning that an unemployed person does not *work*) are derived from its role as a source of income, from the opportunities for self satisfaction in the work performed, from its role in adult socialization, in engaging in meaningful social relations, in the development of identity and self-esteem and in providing a time structure to one's day (Bradley et al. 2000, Jahoda 1982).³¹ And indeed, wages can give a person control over his or her life, and access to living standards that are a fundamental lever for improving health (Graham 2004) and for participating as a member of the society to which they belong.

Thus, the exclusion from work, or the limited inclusion provided by precarious employment may hamper the health promoting functions of employment. Among the most notorious is how temporary employment may hamper the development of meaningful social relationships: temporary employment is consistently found to be associated workplace discrimination and lower social support from co-workers and superiors (Amable, Benach & González 2001, Letourneux 1998, Lewchuk, Clarke & de Wolff 2008, De Cuyper et al. 2008, Paoli, Merllié 2001). Also, intermittent employment has the potential to hamper the development of a signifi-

³¹ Evidence on the latent functions of unemployment come from the Marienthal study from the Great Depression era (Jahoda 1992). While Marienthal's study subjects were predominantly male industrial workers, these "latent" roles of employment also applied to Marienthal's working women. Consistent with this, a study that examined gender differences in the impact of unemployment showed that observed differences were dependent on role configurations rather than on intrinsic differences between women and men.(Ensminger, Celentano 1990)

cant relationship to work, and of obtaining satisfaction from the work performed.

In fact, there is strong evidence that precariously employed workers are less satisfied with their work than permanently employed co-workers (Booth, Francesconi & Frank 2002, Benavides et al. 2000, Virtanen et al. 2003, Bardasi, Francesconi 2004, Virtanen et al. 2002), although the opposite has also been described (De Witte, Naswall 2003). Job satisfaction is a relevant indicator of the quality of working life and an important predictor of well-being. A seven year follow-up of school-leavers showed that men who were employed and women who were satisfactorily employed had improved their psychological well-being over time (Winefield, Tiggemann & Winefield 1991). In contrast, mental health had declined for unemployed men and dissatisfied employed women (Winefield, Tiggemann & Winefield 1991). And a meta-analysis of 485 studies found that job dissatisfaction was strongly associated with mental health problems (Faragher, Cass & Cooper 2005). So, probably mediated by low job satisfaction, the lack of the latent functions of employment is an impediment for the achievement of health.

Regarding the noxious potential of employment precariousness on health, various pathways described above relating precarious employment to poor working conditions and material deprivation also act as a source of stress and psychological distress (Tompa et al. 2007, Krieger et al. 2008). In addition, several other sources of psychological distress and job dissatisfaction are rooted in employment precariousness itself, related to its various dimensions.

Insecure or intermittent jobs hamper the possibility of planning for the future, limiting the possibilities of controlling one's own life. Rather, frequent job changes demand repetitive processes of adaptation to new work-

ing environments, new tasks, and new social relations. Losing control over one's life situation can play a significant role in the deterioration of health. Additionally, Amable (Amable 2006) found that lacking control over their own lives had a negative impact on the self-esteem of precarious workers.

Low or uncertain wages –specially in the absence of social security transfers- have an important toll on mental health (Tompa et al. 2007, Dooley 2003, Dragano, Siegrist & Wahrendorf 2010, Marmot et al. 2001a). Precarious employment intensifies the unpredictability and lack of control associated with relying exclusively on salaries or wages for income (Muntaner et al. 2003). For some workers, this means undergoing the persistent stress of struggling with material disadvantage (Porthé et al. 2010), which may result in social exclusion if it limits the capability to sustain the standard of living required for community (Gallie 2002) and may further translate into the life chances and health of dependent children (Lynch, Kaplan & Salonen 1997).

For many, including relatively “stable” temporary employees, unsecure work creates a necessity to work constantly to ensure future employment and income (Porthé et al. 2010, Clarke et al. 2007, Porthé et al. 2009a). This combination of uncertainty and increased effort to stay employed has been termed “employment strain” and posed as a risk factor for poor mental health (Lewchuk et al. Fall 2003). Furthermore, lack of economic resources can deter the beneficial effects of leisure time and time off work, since these generally imply additional costs (Aronsson, Gustafsson 2005).

Lack or limited access to workplace rights is another potential source of distress. As mentioned above, limited access to social security rights implies greater financial uncertainty and stress (Dooley 2003, Muntaner et al. 2003). Limitations to worker protection rights (legal dispositions that

regulate the employment relationship itself) increase workplace vulnerability and the risk of exposure to workplace social hazards (see below).

Lack of rights -or the impediment to exercise them- may also hamper taking time off work to attend family responsibilities, to adequately recuperate from work effort, or to take sick leave to recover from illness. The latter, known as sickness “presenteeism,” appears to respond to fears that a worker who is ill or absent from work may not be offered more work once the current contract is terminated (Amable 2006, Clarke et al. 2007, Porthé 2008, Virtanen et al. 2005). This lack of necessary rest may hinder recuperation, accumulate stress, and workers may see their current illness complicated by increased disease severity and disability (Bergstrom et al. 2009).

Finally, workplace power is a centre-piece of employment relationships. Workplace power relationships are posited as determinants of the distribution of organizational resources and hazards (material and social), of the quality of management-labour relations, and also of relations among co-workers (Brooker, Eakin 2001, Rospenda, Richman & Nawyn 1998). Increased power imbalances in the workplace allow for more coercive methods of managerial control and explicit or implicit threats to job stability, for abusive treatment, workplace bullying, harassment (including sexual harassment), and discriminatory workplace practices, among others (Amable, Benach & González 2001, Hoel, Beale 2006, Edwards 1983a, Krieger et al. 2006, Rospenda, Richman & Nawyn 1998, Richman et al. 1999).

The fragmentation of the workforce into groups with varied statuses (casual, temporary, apprenticeship, etc), low collective workplace power, and fear of reprisals among insecure workers may be further influencing the extent to which workplace power abuse can go uncontested, with the risk

of isolating precariously employed workers and deepening the toll on their mental health (Hoel, Beale 2006).

There is some evidence linking employment relationships, workplace power and the behaviours described above. In a more superficial account, the second European survey of working conditions found that temporary agency workers reported workplace discrimination more frequently than other employees (Letourneux 1998).

In a more detailed account of working experiences, Amable's qualitative study described how temporary employees performing the same jobs than permanent co-workers were discriminated into performing their jobs under worse working and safety conditions. That is, employment precariousness had an effect on working conditions over and beyond the kind of work they were hired to perform (Amable, Benach & González 2001).

A recent study on sexual harassment across workers with different employment arrangements lends further proof to the notion of workplace power derived from employment conditions. Sexual harassment is frequently conceptualized as a matter of power relations (Krieger et al. 2006, Rospenda, Richman & Nawyn 1998, Richman et al. 1999), and the aforementioned study found that workers with casual or fixed-term contracts reported 7 times more events of workplace harassment than workers in permanent positions (LaMontagne et al. 2009).

Generalized workplace abuse, harassment and discrimination have been described to be associated to poor mental health outcomes (Krieger et al. 2006, Richman et al. 1999). Some of these experiences, being derived from broader social disadvantage (see above), will probably interact or accumulate with similar experiences outside the workplace (Krieger et al. 2006).

Qualitative research undertaken in Canada (Lewchuk et al. May, 2007), New Zealand,(Hannif, Lamm 2005), and in Spain among Spanish (Amable, Benach & González 2001) and immigrant (Porthé et al. 2010) workers has helped further understand how precarious employment may affect worker's well-being and psychological health. In general, precarious temporary workers refer that their employment situation causes them nervousness, feelings of anxiety, depression, fear, suffering, and hampers processes of socialization and the development stable relationships (Amable, Benach & González 2001, Porthé et al. 2010, Clarke et al. 2007). Further, a review of quantitative studies on contingent work described a possible connection between precarious employment and abnormally high suicide rates (Quinlan, Mayhew & Bohle 2001b).

4.5. The Employment Precariousness Scale

The Employment Precariousness Scale is a composite measurement scale devised to measure employment precariousness as the combination of the six dimensions that make up the construct. Each of the six dimensions of employment precariousness is measured by two or more items so as to increase its ability to capture the concepts being assessed. The development process to identify the dimensions and obtain the initial pool of items described bellow has been more thoroughly described elsewhere (Amable 2006).

a) Development

Following an extensive literature review and interviews with 12 key informants (experts in sociology, labour economics, and public health, among others), the departure point chosen by Amable and colleagues was

the macroeconomic proposals of Rodgers in the EU context (Rodgers 1989) and Cano (Cano 2004) in Spain.

The study then involved six focus group discussions with temporary workers, permanent workers, and trade union representatives (four to eight participants per group) (Amable 2006). During focus group analysis the four dimensions drawn from the aforementioned framework (temporariness, disempowerment, wages and rights) were confirmed. Two new, inter-personal dimensions of precarious employment, highly relevant for workers' well-being, emerged (vulnerability and capability to exercise rights). Hence, Amable concludes that employment precariousness is made up of four main dimensions, two of which encompass two sub-dimensions.

One of them is the 'vulnerability' dimension, which was made up of an "institutional-level" sub-dimension (being employed through a collective contract backed up by collective bargaining and agreements) and an "interpersonal-level" sub-dimension which expresses the defencelessness of working under individual contracts. Finally, as described below, they respectively take the names of 'disempowerment' (which includes those aspects of collective regulation whose object is to protect workers by posing constraints on the utilization of the workforce) and 'vulnerability' (which includes features related to the weakening or absence of such protection).

Similarly, the 'rights' dimension was made up of an "institutional" sub-dimension (the entitlement to rights by law) and an "interpersonal" sub-dimension, the actual capability to exercise the rights one is entitled to. They respectively take the names of 'rights' and 'exercise rights'.

Focus groups analyses also provided for the items that make up the questionnaire. After content analysis of an initial pool of items, the scale developers selected 36 items which they pretested through cognitive debriefing to assess understanding of the questions and appropriateness of the wording. Further, content validity was assessed by expert consensus.

Amable and colleagues performed pilot testing and preliminary psychometrics on a sample of 100 temporary workers selected by snowball procedure. As a result, the number of items was reduced to 26. Also, Amable concluded that the sub-dimensions in ‘vulnerability’ and ‘rights’ were in fact independent subscales and forwarded an instrument with six subscales and 26 items.

An initial essay to examine the association with mental health was also performed on this convenience sample, which confirmed the hypothesized negative association between mental health and precarious employment.

In this initial phase, Amable proposed to use the EPRES as a unitary scale, adding up all items into a single summary score, where the different number of items in each subscale would provide with different weights. ‘Vulnerability’ and ‘exercise rights’ would then be the subscales with the highest weights, whereas ‘temporariness’ would have the lowest weight, reflecting the relevance for health that each dimension revealed in focus-group analysis.

The EPRES scale is specifically devised for employed workers with a contract. Particularly because of its focus on certain contractual aspects such as duration of contract, EPRES in its current form is limited in its applicability to other working populations, such as informal workers (workers without a formal contract) and dependent-autonomous workers. Ideally, qualitative research should be performed within these groups in

order to identify relevant aspects of their employment relationship that are not considered in the EPRES, and to acquire more insights on how to better interpret their understanding of the current EPRES questions..

b) Dimensions

The scale comprises six subscales corresponding to the six dimensions of employment precariousness that are outlined above: ‘temporariness’ or employment stability (type and duration of contract) (2 items); ‘disempowerment’ (level of negotiation of employment conditions) (3 items); ‘vulnerability’ (indicators of workplace power relations) (6 items); ‘wages’ (low or insufficient; possible material deprivation) (3 items); ‘rights’ (entitlement to workplace rights and social security benefits) (7 items); and ‘exercise rights’ (powerlessness, in practice, to exercise workplace rights) (5 items) (See appendix 1).

The types of response scales vary across the subscales. In some, 5-point frequency scales are used (‘vulnerability’ and ‘exercise rights’), in others, 5-point ordinal scales are used (‘wages’ and ‘temporariness’), and still others are answered with 3-point ordinal scales (‘disempowerment’, ‘exercise rights’). In all items, the highest score implies the highest level of precariousness.

5. RESEARCH QUESTIONS AND OBJECTIVES

Population-level data of employment precariousness measured with the EPRES were collected for the first time in the Psychosocial Work Environment Survey. The purpose was to perform occupational, epidemiologic, and public health research.

At this stage of development, the Employment Precariousness Scale needed validation. Then, some of the basic questions that bear on this broad social epidemiological research field can be addressed. It is not feasible, on this first study, to address the numerous questions that this complex issue raises. In consequence, this study is restricted to testing two central hypotheses driving the broader research program, that is, the role of precarious employment as a (social) determinant of mental health and its population prevalence and distribution as a determinant of health inequalities. Other important research matters, such as the specific -or general- pathways leading from precarious employment to poor health, or specific group effects will not be addressed here.

So, this study aims to answer the following research questions:

1- Is the EPRES a valid measurement instrument to assess the degree of precariousness of employment?

Whereas Amable performed an initial psychometric study of the questionnaire on a convenience sample of 100 temporary workers, a validation study on a heterogeneous and representative sample of the Spanish workforce has not been performed. In addition, the validity of the scale was not

tested on permanent workers, few construct validity hypothesis were tested, and acceptability and item-level statistics were not examined.

2- Is there an association between employment precariousness (measured by the EPRES) and poor mental health, and if so, what is its magnitude?

Research on temporary work and job insecurity most consistently find a negative mental health impact, seemingly worse amongst most unstable and peripheral jobs. Similarly, qualitative research has described poor mental health to be an early consequence of employment precariousness. Amable's preliminary analyses on data from his convenience sample of temporary workers described a negative crude association between the EPRES and mental health status. The aim of this study is to examine this relationship while overcoming the limitations on generalizability of his results. Also, the shape and magnitude of the association must be described, and confounding of the association by relevant variables must be ruled out.

3- What is the prevalence, distribution and degree of employment precariousness in Spain, and what is the potential impact on the mental health of the Spanish workforce?

Studies on precarious employment relying on counts of temporary workers do not provide a full picture of the prevalence of precariousness. The EPRES offers an opportunity to overcome these limitations. In addition, the distribution and degree of precariousness across different workforce strata, and its differential potential impact on mental health within these groups at the population level will allow examining the role of employment precariousness as a social determinant of health inequalities.

The corresponding objectives of this study then are:

- 1- To test the psychometric properties (acceptability, reliability) and construct validity of the EPRES.
- 2- To assess the magnitude of the association between employment precariousness and poor mental health after controlling for significant confounding variables, and assess whether it describes a graded relationship.
- 3- To quantify the prevalence of employment precariousness in the Spanish salaried workforce and across intersecting axes of social inequalities, and the proportion of poor mental health possibly attributable to employment precariousness.



6. METHODS

This is a cross-sectional study. The data come from the Psychosocial Work Environment Survey (PWES) conducted by the Union Institute of Work, Environment and Health (ISTAS) in 2004-2005. The PWES was carried out to assess the psychosocial work environment, employment precariousness, and work-life conflict of the Spanish working population, and its association with health-related quality of life.

The three questions and objectives posed above will be addressed separately, in the form of three separate research articles. Common methodological aspects are described in this section.

6.1. Study sample

The sample was designed and recruited to be a self-weighted, representative sample of the wage-earning population aged 16 to 65 years living in Spain.(Moncada Lluís et al. 2008) Recruitment was carried out between October 2004 and July 2005 at three different times of the year: autumn, winter and spring (Table 2). The timing of the survey in relation to labour market conditions as measured by the (falling) unemployment rate is shown below (Figure 13).

Subjects were eligible to participate if they had been in paid employment for at least one hour during the week preceding the survey (including subjects temporarily absent from their job).

Sample selection followed a multistage, stratified, random-route sampling procedure, as generally recommended for population-based working conditions surveys in Spain (Campos et al. 2009). Stratification was achieved

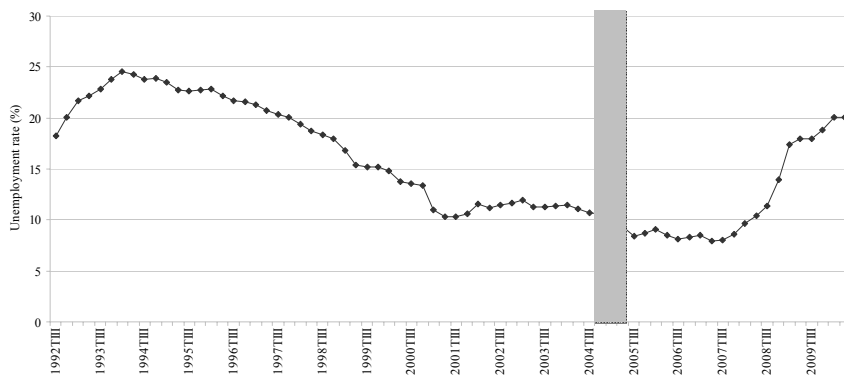
by combining municipalities (divided into 5 strata according to population size) with autonomous region (17 strata), creating 85 strata. Within these 85 strata, sample selection was performed in three stages: first, census tracts were selected; second, households were selected by random walk procedure; and finally, within each household, one eligible subject was randomly selected to participate. Within strata, the number of census tracts (randomly) selected was proportional to the population size of each stratum, producing a self-weighted sample. Non-respondents were substituted on the field, following the same sampling procedure and inclusion criteria. In all, thirty interviews were performed within each census tract, ten in each recruitment period.

Interviews were performed in the participant's household, immediately after having been selected to participate. They were conducted face-to-face by trained interviewers, using structured questionnaires. In all, 7650 workers were interviewed, with a response rate of 60% (Table 2).

Table 2. Psychosocial Work Environment Survey (PWES) field work: dates and number of interviews performed.

Recruitment period	Dates field work		Interviews	
	Onset	End	n	%
1	04/10/2004	04/11/2004	2560	33,5
2	08/02/2005	08/03/2005	2540	33,2
3	03/06/2005	07/07/2005	2550	33,3
Total	04/10/2004	07/07/2005	7650	100

Figure 13 Unemployment rate and EPWS fieldwork period (shaded). Spain, 1992-2010.



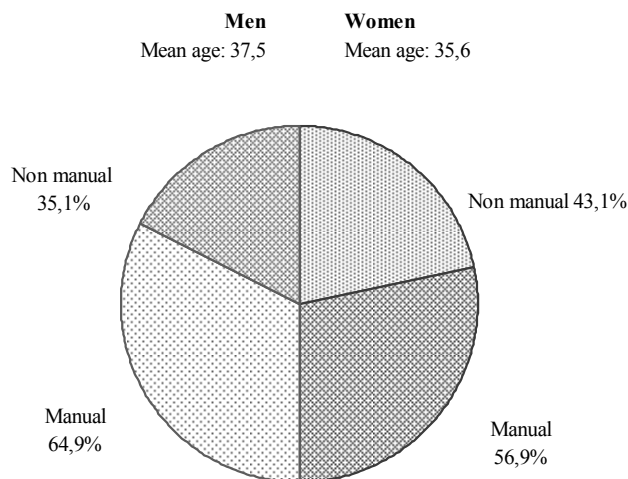
Source: EPA (Active population survey).

Because the EPRES is specifically devised for employed workers with a contract, the sample for this study was restricted to those workers in waged or salaried employment with an employment contract. That means that respondents who were of non-eligible ages ($n=19$), self-reported self-employed workers ($n=296$), workers without a contract ($n=348$), graduate students ($n=12$), and those who had an unknown employment status ($n=7$) were excluded. This sample of 6968 respondents was further restricted by excluding respondents who were classified into the self-employed category (SC IIIb) according to the Spanish social class classification of social class ($n=20$).³² The final sample size was 6948. This sample is generally referred to as the “study sample” throughout the text, except in sub-studies 2 and 3 where further sample restrictions were applied and which are described in the methods section of the corresponding manuscripts.

³² These were not excluded from sub-study 1, which in consequence has a slightly larger sample size ($n=6968$).

The study sample and socio-demographic variables are described in the manuscripts below. Figure 12 is a snapshot of the distribution of the study sample across sex and occupational class.

Figure 14 Distribution of the study sample according sex and manual / non-manual occupational class.



6.2. Ethical approval

Prior to its initiation, the PWES protocol was reviewed for ethical and methodological considerations by ISTAS institutional review board (IRB). The survey represented no more than minimal risk for participants. Participation was voluntary and confidential, and the data set was completely anonymized by removing all personally identifiable information.

6.3. Management of the EPRES scale

a) Scoring

It was a core objective in the development phase of the questionnaire to provide with a single, integrated indicator of employment precariousness, so that the developers' proposal was that the EPRES should be summed up into a single summary score. This study is in line with this general perspective, but the computation strategy previously employed by Amable was modified for this study.

The scale developers and experts in scale development shared the view that a conservative approach was preferable to subscale weighting, making the assumption that each dimension contributes equally to total employment precariousness. Therefore each subscale must contribute equally to the total score, regardless of its number of items.

In order to obtain an equal weight scale, each subscale score must be computed independently, standardized, and then integrated into a global summary score. Consequently, the items in each subscale were added together, and this overall score was transformed into a 0 to 4 score. These were then averaged into a global EPRES score, which ranges from 0 (not precarious) to 4 (most precarious).

The assumptions behind this computation strategy are that all dimensions weight the same within the global score, and that all items weight the same within each subscale. These assumptions may eventually be modified, but are preferred until a study on subscale weights is performed.

The computation of the global score is illustrated in figure II.1 of the appendices.

b) Item non-response

As will be described in substudy 1 below, the only item with considerable non-response was the “monthly wage” item in the ‘wages’ dimension (9.4%). This is entirely expected in survey research and in fact does not represent a very high proportion of income non-reporting relative to international experience (Turrell 2000, Groves, Couper 1998).

In order to minimize the loss of data due to non-response to “monthly wage”, it is proposed that the calculation of the global score allows for non-response to this item, and is in fact the computation strategy used for substudies 2 and 3.

Two ensure that allowing for non-response to “monthly wage” does not distort the scores and locations of subjects in the continuum of employment precariousness, the mean scores for ‘wages’ and the global EPRES scores, and the location of subjects into quintiles of employment precariousness with and without “monthly wages” were compared. Also, Spearman correlations were calculated for both versions of each score. Only full responders were included in these analyses.

Results are presented in Appendix II. There are only minor changes in the ‘wages’ mean score and in the global EPRES score when the “monthly wage” item is excluded (table II.1). Spearman correlation between both ‘wages’ scores is 0.87 and 0.97 between both global scores. Also, the location of subjects into the quintiles of employment precariousness is highly similar (table II.2). This suggests that the remaining two questions capture enough information so as to satisfactorily locate respondents into their relative levels of precariousness. The alpha coefficient for the ‘wages’ subscale with two items is 0.76.

Given that non-response to income questions in surveys does not occur at random (Groves 2004), including non-respondents to the monthly wages item contributes to reduce non-response bias associated to the socioeconomic position of participants.

c) Cut-off scores

To study the association of health with employment precariousness, an approach that could preserve its continuous nature was preferred. For methodological reasons, the employment of lineal regressions was excluded, given that neither the exposure nor the outcome under study were normally distributed. In consequence, employment precariousness was divided into quintiles, so as to best preserve the continuous character of the score.

For the prevalence study simple cut-offs were chosen based on the scale's response structure: most items, all subscales, and the global score range from 0 to 4. In consequence, we established the following cut-offs: $0 < 1$; $1 < 2$; $2 < 3$; 3-4. However, there were insufficient respondents in the 3-4 category, so it was collapsed with the $2 < 3$ category. Resulting categories were $1 < 2$; $2 < 3$; 3-4. Because there are no respondents with a 0 score, the group in the lowest category is defined as non-precarious, including all subjects with a global score lower than 1. These cut-off scores are illustrated in figure II.1 in the appendices.

The selection of a cut-off score ≥ 1 requires that at least two dimensions (sub-scales) are combined in order to classify a subject into employment precariousness. A single subscale with the maximum score (score=4) is not enough to surpass this threshold ($4/6=0.67$). It also requires that for a respondent with scores not exceeding 1 on each subscale, he or she must

have endorsed all subscales (obtained an average score of 1 on all of them).

The results of substudy 2 show that a score of around 1 has a significant association with health among both women and men. Mental health scores across the three levels of precariousness so defined are showed in figure II.2 in the appendices.

d) General distribution of employment precariousness in the study sample

The distribution of employment precariousness in the overall sample and separately for women and men are described in table 3. The mean scores of employment precariousness across sex and age are shown. An histogram was also used to further illustrate the data.

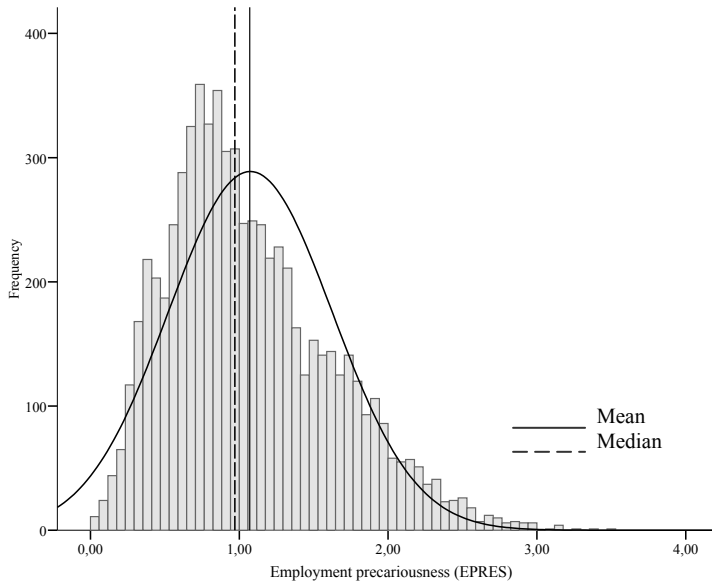
Table 3 Descriptive statistics for the distribution of EPRES in the study sample.

	Missing	Mean (SD)	Observed range	Median	p 25	p 75
Overall (n=6797)	171	1.07 (0.55)	0-3.48	0.97	0.68	1.41
Women (n=3283)	94	1.14 (0.56)	0-3.48	1.05	0.72	1.50
Men (n=3497)	76	1.01 (0.53)	0-3.25	0.91	0.64	1.33

p 25 and p 75: 25th and 75th percentiles, respectively.

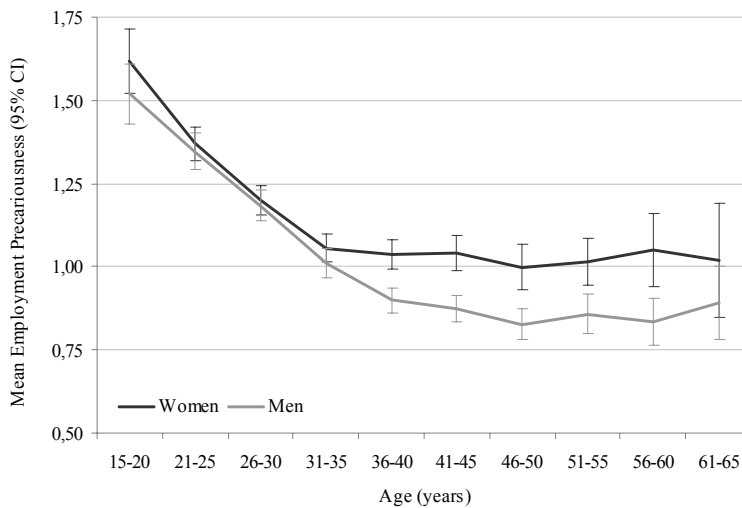
Results show that employment precariousness has a positively skewed distribution, with few subjects in the higher end of the scale (figure 15). Kolmogorov-Smirnov Z test ($p < 0.001$) indicates that EPRES scores are not normally distributed. Despite this, the mean and the median are fairly similar (table 3 and figure 15).

Figure 15 Distribution of employment precariousness in the sample. PWES survey, Spain, 2004-2005.



PWES: Psychosocial Work Environment Survey

Figure 16 Mean employment precariousness (EPRES) score according to age and sex. Spain 2004-2005.



6.4. Measure of mental health

a) The mental health scale

Mental health was measured with the SF-36 5-item mental health (MH) scale, version 1, which was included in the Copenhagen Psychosocial Questionnaire to assess the health status of workers (Kristensen et al. 2005). The SF-36 is a six factor scale developed in the early nineties, in the United States, for the Medical Outcomes Study (MOS). It provides a generic health status profile and applies to both patients and the general population. It is helpful in evaluating health related quality of life (HRQOL), comparing the burden of several diseases, identifying the health benefits of a range of different treatments, and to assess the health status of individual patients (Vilagut et al. 2005).

The MH scale has the advantage of its brevity and extensive use. Its interpretation is claimed to be unambiguous: if differences are observed on the scale, they can be interpreted as attributable to mental health with a high degree of confidence (McHorney, Ware & Raczek 1993). It has been shown to have high validity in discriminating patients with major depression, severe affective disorders, and anxiety disorders, performing as well or better than longer, widely used mental health measures (Berwick et al. 1991). It has also shown to be valid in discriminating psychiatric patients from those with other medical conditions.

The SF-36 MH scale consists of 5 questions (items) that value both positive and negative states of health. All items are scored so a higher value indicates a better health state, constituting “a gliding scale from perfect mental health to poor mental health”(Hoeymans et al. 2004).

As is recommended by the IQALA project for combining the SF-36 with other measures, the SF-36 scales were put first in the survey questionnaire. In this manner, its use is consistent with the standard followed when normative SF-36 data are gathered.

The MH score was computed following the standard procedure described in the scoring manual, as a simple algebraic sum of responses for all items in the scale (Medical Outcomes Trust 1996). For ease of interpretation it is then transformed to a 0-100 scale using a transformation formula which converts the lowest and highest possible scores to zero and 100 respectively. According to the standard procedure, non-response for up to two items was accepted, in which cases missing values were replaced by imputing the mean of the remaining items (Medical Outcomes Trust 1996). Item non-response in the study sample mounted to less than 1% for each of the five items in the MH scale, similar for women and men (table 4).

Cronbach's α for the MH scale was 0.80, identical to that obtained for the Spanish normative sample (Alonso et al. 1998). Floor effects (worse possible score) were insignificant (0.06% in women and 0.03% in men); ceiling effects (best possible score) were 8.8% in women and 9.4% in men. Mean mental health scores for every age group in the study sample were also comparable to the Spanish reference norm, somewhat higher than the normative sample for older working women and somewhat lower for working men (table 5).

Table 4 Item non-response to the SF-36 mental health scale items. Waged and salaried workers, Spain 2004-2005.

		Proportion of responders with missing answers to the				
		Item 1	Item 2	Item 3	Item 4	Item 5
Men	(n= 3 555)	0,0%	0,3%	0,1%	0,9%	0,1%
Women	(n= 3 375)	0,0%	0,2%	0,1%	0,9%	0,1%

Table 5 Mean mental health scores for the study sample. Comparison to the normative sample according to age groups. Waged and salaried women and men, Spain 2004-2005.

	Age groups (years)				
	16-24	25-34	35-44	45-54	55-65
Women					
Study sample (n=3555)	74.3	74.3	72.6	69.7	69.6
Normative sample [†]	73.2	74.4	72.8	70.1	65.1
Men					
Study sample (n= 3375)	77.6	76.0	75.5	74.2	72.7
Normative sample	78.6	77.9	77.7	77.9	75.4

[†] Normative sample in Alonso, 1998.

b) Classification into poor mental health

Mental health scores were dichotomised and respondents were classified into one of two groups: poor mental health and good mental health. Dichotomisation was based on Spanish normative values. These are population-based reference values (norms) for the Spanish version of the SF-36, which were obtained in 1996 from a representative sample of non-institutionalized individuals aged 18 years or more living in Spain, through personal home interviews (Alonso et al. 1998).

Normative data

We used normative data to determine a threshold for poor mental health because no formal cut-off point on the MH scale has been established to distinguish those with probable mental health problems from those without (Hoeymans et al. 2004). In such cases, normative data can facilitate score interpretation by comparing it to the distribution of scores for individuals in the norming sample (Gandek, Ware 1998).

Norm-based comparisons require that norms are considered valid for a well-defined and representative sample of the population of interest (Gandek, Ware 1998, Ware et al. 1993). The Spanish norm complies with these requirements, and norm developers have recommended their utilization for the Spanish population (Alonso et al. 1998).

In addition, norm-based comparisons are meaningful only to the extent that the individual or group whose score is being interpreted belongs to the normative population, i.e. the comparability of the normative to the analytic sample (McHorney 1999). This holds generally for the study sample, given that both the normative and study samples are taken from the Spanish general population. The working population is considered to be a healthier subset of the general population, given “healthy worker” selection bias. Nevertheless, some deviation from the normative sample in relevant features such as socioeconomic status can be expected because the normative sample includes “owners”, autonomous self-employed workers, and informal workers, but could not be ruled out.³³ However, as showed above, the study sample’s mean scores by sex and age groups were very similar to the normative sample’s scores (table 5).

Cut-off scores

Considering the samples to be comparable within acceptable limits, the cut-off for poor mental health was defined as follows: each respondent was classified as belonging to the poor mental health group if his or her MH score was below the 25th percentile of the normative sample. Specific scores for the respondent’s sex and age were used (table 6).

³³ The magnitude of these differences could be examined because occupational data were provided for the entire normative sample, which includes subjects older than working age (20% of the sample) which are not included in the PWES.

The resulting mean MH scores for the “poor mental health” group was 53.7 [95% CI: 53.1 – 54.2] in men and 47.7 [95% CI: 47.0 – 48.4] in women. For the “good mental health” group these were 84.2 [95% CI: 83.9 – 84.6] and 80.0 [95% CI: 79.5 – 80.5] respectively.

Table 6 Cut-off scores for poor mental health according to the 25th percentile in the Spanish normative sample. Waged and salaried women and men, Spain 2004-2005.

	Age Group (years)*				
	16-24*	25-34	35-44	45-54	55-65*
Women					
Cut-off score	<60	<63.2	<60	<56	<52
Study sample distribution [†]					
Men					
Cut-off score	<68	<68	<68	<68	<64
Study sample distribution [†]					

[†] Normative sample in Alonso, 1998. *Respondents aged 16 or 17 (n=23) were classified into the 18-24 age group; respondents aged 65 (n=10) were classified into the 55-64 age group.

Clinical significance

The straightforward interpretation of the selected cut-off scores is that respondents classified into the poor mental health group are at the lower end of their source population’s mental health status distribution. However, they may have clinical significance too. Several studies performed abroad have reported norms and cut-offs for patients with medical conditions, based on different analytical techniques. Reported cut-off scores vary as a function of the population being investigated, severity of the study outcome, outcome prevalence and gold standard employed. (Kelly et al. 2008)

A study on a Dutch population of general practice attendants found that a cut-off of ≤ 72 resulted in a study prevalence of mental problems most

comparable to the GHQ-12 cut-off point (≥ 2) and that these subjects consulted mental health care five to seven times more than those with a higher score.(Hoeymans et al. 2004). A study performed on wave 9 of the British Household Panel Survey (2000) using three or more points on the GHQ-12 as gold standard, found that the best cutpoint to define a case of common mental disorder using the MHI-5 was 76. Another study, performed in the US showed that a score of 52.75 corresponded to subjects with psychiatric conditions (McHorney, Ware & Raczek 1993). In addition, the observed differences between the groups with and without poor mental health were 30.5 for men and 32.3 for women, which can be considered large differences (27 points have been found to reflect the impact of serious depressive symptoms when comparing subjects with and without a serious psychiatric condition) (McHorney, Ware & Raczek 1993).

Based on these studies, it is possible to assume that although we have defined the mental health status of approximately 25% of the sample as “poor”, most of these cases should correspond to respondents experiencing some level of psychological distress (low scores on the SF-36 MH scale measure psychological distress). In the Dutch sample, a caseness defined as ≤ 72 gave a prevalence of health problems of 21% (and a 23% caseness with a GHQ-12 score of ≥ 2). In sum, 25% prevalence of poor mental health as defined for this study is reasonable within the standards of other studies.

Interpretation of prevalence of poor mental health estimates

The interpretation of our estimates of poor mental health differs from that of studies in which sample quartiles of the mental health score distribution are compared, or in which a unique threshold level, irrespective of sex or age, is used.

In being able to compare the mental health status of our sample to that of the normative population allows for a finer interpretation of MH scores in terms of their social and, eventually, clinical relevance. In this case, we should expect that if the mental health of the sample is identical to that of the normative population, 25% of responders in every subgroup should be classified into the poor mental health group. A proportion lower than 25% suggests that the mental health status of the study sample is better than that of the normative population, and a proportion higher than 25% implies the mental health status of the sample is worse than that of the normative population.

To make sure the criteria for classifying responders into the poor mental category is not influencing the results of our study, analyses were performed using traditional criteria, that is, the sample distribution of mental health. This is further discussed in the manuscript presenting the results to substudy 2 and the corresponding table and figure are presented in appendix IV.

6.5. Analyses

Methods of data analyses and further sample restrictions used in the three substudies are described in the corresponding manuscripts. Any additional analyses are described in the introductory sections of the substudies.

7. RESULTS

The study results are presented in the form of three original research articles, one for each research question. The research articles are complemented, when appropriate, with additional analyses. These are briefly presented and discussed in the introductory section preceding each of the manuscripts. The corresponding tables and figures are shown in the Appendixes. Also, tables and figures of additional analyses described but not shown in the manuscripts are shown in the Appendixes.



7.1. Sub study I

Preliminary psychometric analyses: Item level statistics

Summated scales have the advantage of simplicity, but are based on a number of assumptions that must be tested (Ware, Gandek 1998). Item-level and scale-level statistics must be performed to test these assumptions. Item-level statistics must precede scale-level statistics. In this section, item-level analyses are shown: item-level descriptive statistics, inter-item correlations, and item-scale correlations in a multitrait item-scale correlation matrix. Scale-level analyses are shown in manuscript 1.

These analyses were performed on the complete study sample (n=6968), and following recommendations by Ware and colleagues (Ware, Gandek 1998). Item level descriptive statistics include the proportion of missing data for each item, item means and standard deviations, and frequency distributions for each item. Frequency distributions are examined to determine if all of the response categories are used.

Inter-item correlations are the correlations between every item in the scale and all other items in that same scale. They allow testing for internal consistency, which is desirable, and item redundancy, which should be avoided. Item inter-correlations lower than 0.3 are cited as indicating that the parts of the questionnaire are measuring something different (low internal consistency), whereas a correlation higher than 0.7 suggests that the test is too narrow and too specific, which may provide with high internal consistency but low validity (redundancy) (Boyle 1991). Inter-item correlations were examined using Spearman's correlation coefficients.

In the multitrait/multi-item correlation matrix the relationship of each item to its hypothesized scale and to other scales was examined using Spearman's correlation coefficients. Correlations are corrected for overlap, i.e., the relevant item was removed from its scale for correlation. With this matrix the assumptions that 1) items are substantially linearly correlated to the total scale score, i.e., to the underlying concept being measured (test of "item internal consistency"); and 2) that items are stronger measures of their hypothesized constructs than of other constructs, or the extent to which each item measures other concepts that it is not supposed to measure (test of "item discriminant validity") (Ware, Gandek 1998).

Item internal consistency was tested by examining the correlation between each item and its subscale score computed from all *other* items in the subscale (item-scale correlation after correction for overlap). A value of 0.40 is considered substantial and satisfactory. Item discriminant validity is examined by comparing the correlation of an item with its hypothesized scale to the correlation of the same item with all other scales in the matrix (Ware, Gandek 1998).

In addition, the extent to which item-scale correlations are roughly equal across items in the same scale was examined. If they do, this "equality of item-scale correlations" means that items in a scale contribute roughly equal proportions of information to the total scale score. This standard can also be considered satisfied when all items contribute substantially to the total score (e.g., from 0.40 to 0.70), even if item-scale correlations vary (Ware, Gandek 1998).

Results are shown in appendix III. Table III.1 shows item-level descriptive statistics. The results showed that percentages of missing data are extraordinarily low, except for the "monthly wage" item, as discussed above.

Frequency distributions of individual items showed that despite some items having highly skewed response distributions, all response choices were used in all items. Item responses were not normally distributed, except roughly for items in the ‘wages’ subscale. This is not a surprising finding, because items tap rather uncommon –and undesirable- situations. Within each subscale, however, some items had a wider distribution across the response range than others, increasing content validity of the scale by contributing to better measure the full range of the concept (Ware, Gandek 1998).

Item means and standard deviations should be roughly equivalent within a scale to fulfil traditional Likert criteria (Ware, Gandek 1998). EPRES is not a Likert-type scale except for two dimensions, ‘vulnerability’ and ‘exercise rights’. Nevertheless, item means within each subscale were similar within a reasonable range. Item means reflect the frequency with which certain situations occur. More extreme situations (e.g., being treated in a violent manner) should be less frequent and expectedly have a lower mean than other items (e.g., being afraid to demand better working conditions).

The item “cover basic needs” in the ‘wages’ subscale has a lower item mean than the other two items in the scale. This responds to the fact that it measures a more extreme situation and to the fact that it has less response categories. It is recommended that the latter be corrected in future versions of the EPRES. Standard deviations are not all similar within each subscale, but also within a reasonable range, and around 1 for 5-choice response scales, as is recommended.(Ware, Gandek 1998)

Table III.2 shows inter-item correlations. High inter-item correlations (> 0.7) in ‘disempowerment’ and between “go to the doctor” and “sick leave” are indicating some item redundancy. Low inter-item correlations

(< 0.3) among items in the ‘rights’ subscale are indicating that “day off” (two correlations are lower than 0.3), and, to a lesser extent, “weekly holydays” are lower in internal consistency.

Table III.3 shows the multitrait/multi-item correlation matrix. Results show that all items correlated substantially with their subscales (item-internal consistency), the lowest being “monthly wage” in the ‘wages’ subscale (0.37). However, it is very close to the proposed threshold (0.4). This finding was expectable since “monthly wage” measures a related but slightly different concept than the other items in the scale, but may be also due to the way response categories were grouped. Finally, results also showed that all items correlate better with their own subscales than with other subscales, indicating that items are not measuring concepts that they are not supposed to measure (item discriminant validity).

Ordering of response categories

A most challenging aspect in the design of EPRES was the ordering of the response scales for items in ‘temporariness’, ‘disempowerment’ and ‘rights’. The final ordering was conceptually grounded, regarding what situations are expectedly more and less precarious. To verify the developers’ decisions, the mean of employment precariousness was calculated across response categories for each item in the questionnaire. To do this, the mean of employment precariousness was calculated excluding the subscale to which the item of interest belonged (corrected for overlap).

Table III.4 shows the results of these analyses and demonstrates that, with the exception of item 2 in the ‘temporariness’ subscale, response categories are ordered as expected, i.e., the mean of employment precariousness tended to increase with the response score of each item.

Of special concern was the ordering of items in ‘disempowerment’ and ‘rights’. Results on table III.4 consistently supported the notion that being unaware about worker rights and about level of bargaining over employment conditions is the most precarious response category for items in both subscales. Unaware implies that the respondent has not been informed about these issues either by his employer or by fellow workers, whether organized or not, adding to the overall precariousness of declining worker rights and individual-level bargaining.

Preliminary conclusions

The results of the analyses described above indicate that assumptions underlying the construction of the scale have been met, and that scale-level statistics could proceed as shown in the manuscript.

The results will also contribute to the preparation of a revised version of EPRES. In addition, they will be helpful in the process of deciding which items to exclude and include in a short version of the questionnaire. For item selection, items should be loaded maximally by the factor representing their scale, but exhibit moderate to low item inter-correlations in order to maximise the breadth of measurement of the given factor (Boyle 1991). However, caution is warranted, because, as the original EPRES scale cannot be considered a gold standard (a conceptual construct does not, in fact, have a gold-standard measure), an expert-based approach to a scale-shortening process is preferable to a statistical approach (Coste et al. 1997).



MANUSCRIPT 1

The Employment Precariousness Scale (EPRES): psychometric properties of a new tool for epidemiological studies among waged and salaried workers

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7.2. Sub study II

Substudy 2 aims to answer the second research question and fulfil the second objective. That is, to assess the association between employment precariousness, as measured by EPRES, and poor mental health. The strategy to do so was to compare the prevalence of poor mental health across different levels of employment precariousness, after controlling for significant confounding variables. Separate analyses were performed for employed women and men, given their differential role configurations: the gendered division of labour and gendered segmentation of labour markets.

Before the analyses shown in the manuscript were performed, some preliminary analyses were undertaken on the complete study sample (n=6948). The average mental health score and the prevalence of poor mental health across ten levels of precariousness were examined, separately for women and men, in order to explore the associations. Then, mental health scores (continuous) were regressed on each one of the dimensions of EPRES separately (age adjusted linear regression analyses). The purpose was to confirm previous findings (substudy 1) that all dimensions of employment precariousness have a significant and negative association with mental health.

Results are shown in appendix IV. Figure IV.1 shows there is a negative association between employment precariousness and mental health for both women and men, and that the decline in average mental health is stronger for those at the high end of the distribution of employment precariousness. Figure IV.2 is consistent with the former, showing that there is an increase in the prevalence of poor mental health as employment precariousness increases.

Table IV.1 shows the age-adjusted association between mental health and each of the subscales of employment precariousness. Results show that all six dimensions of the scale are significantly and negatively associated to mental health. The stronger associations were observed for ‘vulnerability’, followed by ‘exercise rights’ and ‘wages’ (consistent with the multitrait-multimethods matrix of manuscript 1).

The rest of the analyses shown in appendix IV were performed on the same subsample as substudy 2. Table IV.2 shows the data corresponding to Figure 2 in the manuscript. Also additional analyses are discussed in substudy 2, whose data were not shown. These deal with questions regarding the validity of the results we obtained: is the selected measure of poor mental health responsible for the observed associations? Is income (from wages) responsible for these results? Table IV.3 and figure IV.3 show log binomial regressions using sample-based, gender-specific quintiles of employment precariousness. Table IV.4 and figure IV.4 show the analyses that controlled for income from wages.

Finally, table IV.5 and figure IV.5 reproduce the main analysis of substudy 2 using poor general health instead of poor mental health as the outcome, to examine whether the same patterns are observed. Table IV.6 reproduces table IV.1 separately for women and men. In the ‘wages’ and ‘rights’ subscales the association with mental health was much stronger for women (non-significant in men), contributing in a very preliminary fashion to the discussion in the manuscript (see manuscript below). Table IV.7 and figure IV.7 reproduce the main analyses in the manuscript, but using a linear regression, with mental health as a continuous outcome, to ensure that the same patterns are observed as when performing the log binomial regressions. Analyses IV.5, IV.6 and IV.7 are exploratory and are not commented on in the manuscript.

MANUSCRIPT 2

Employment precariousness and poor mental health: evidence from the Spanish labour market

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ABSTRACT

Precarious employment relationships have expanded over the last three decades, with economic, social and health consequences. However, to date, research on its impact on workers' wellbeing and mental health is hampered by the lack of adequate measures of precarious employment. This study describes the association between precarious employment and poor mental health by means of a conceptually-grounded and valid multi-dimensional questionnaire, the Employment Precariousness Scale. Data come from the Psychosocial Work Environment Survey, a cross-sectional sample of Spanish salaried workers who were administered a structured questionnaire in their homes in 2004-2005 (n=5679). Prevalence proportion ratios (PPRs) of poor mental health across quintiles of employment precariousness (reference: 1st quintile) were estimated with log-binomial regressions, separately for women and men. Poor mental health was defined according to the responder's sex and age as a SF-36 mental health score below the 25th percentile of the Spanish norm. Results showed a gradient association between employment precariousness and poor mental health which was slightly stronger in women than in men. Fully adjusted PPRs among respondents in the 5th quintile were as high as 2.54 (95% CI: 1.95–3.31) in women and 2.23 (95% CI: 1.86–2.68) in men. Results were robust to adjustments for age, immigrant status, socioeconomic position, and previous unemployment. These results highlight the role of employment precariousness as a determinant of workers' mental health. Future research is warranted to further our understanding of the association between precarious employment and mental health.

INTRODUCTION

In their pursuit of flexibility, labour markets of most industrialized countries have undergone profound changes during the past three decades. These have resulted in a transformation of employment relationships and, in several countries, an expansion of precarious employment.[1-3] Precarious employment results from the erosion of the “standard” of full-time, permanent jobs with benefits which became the normative model in Western European countries during the decades following WWII.[1] While it is generally understood as an employment relationship of limited duration, there are in fact several dimensions to precarious employment: employment instability, limited social protection and worker rights, limited worker control over employment and working conditions, and low wages.[3]

Precarious employment is not a new phenomenon, but during part of the XXth century was confined to developing countries or certain worker subpopulations in wealthy countries, most notably women.[4] Today, it has expanded to wider sectors of labour markets as employers resort to flexible employment forms, subcontracting, outsourcing, among other productive and labour management strategies, to lower labour costs and respond to fluctuating demand and international economic competition.[1-3]

Precarious employment is considered a key social determinant of health and health inequalities.[1,5] In general, those at greater disadvantage in the labour market, such as women,[3,4] young workers,[3,4] less qualified workers,[3] racial minorities,[4] immigrant workers,[3,4,6] and the long-term unemployed,[3] are who bare the largest share of precarious employment.

In turn, precarious employment is hypothesized to negatively affect workers' health through several pathways. Some pathways are related to poor working conditions and an increased risk of injury and disease.[1,2] Other pathways involve material deprivation[7] and the experience of intermittent unemployment.[7] Insecure employment also increases the demands workers face to ensure future employment, which combined with employment uncertainty result in employment strain.[8] Precarious employment is also associated to sickness presenteeism, hampering recovery from illness.[9,10] Precarious employment may also have direct effects on mental health, by acting as a workplace stressor due to unbalanced workplace power relations where precarious workers are more prone to receive abusive, discriminatory or exploitative treatment.[1]

However, and despite the significant increase of precarious employment forms over the past three decades,[11,12] epidemiologic research on precarious employment is hampered by the lack of a measurement instrument.[7] Currently, most evidence on the health impact of employment in the flexible labour market is provided by research on employment instability, measured as either perceived job insecurity[9,13] (concern about the continuity of the current job),[14] or as non-permanent employment forms.[2,10] Both have been found to be associated with poor physical and mental health, among other health-related outcomes, but, overall, they appear most consistently and significantly associated with mental ill health.[9,13] Yet, although job instability is central to the concept of precarious employment, these research approaches have some conceptual and methodological limitations.[7,15]

First, by focusing on job instability they constitute a one-dimensional approach to a multidimensional exposure.[7] Second, perceptions of job insecurity may be elicited by contextual factors within or without the or-

ganization,[16] even in non-precarious job situations.[17] Third, despite a high degree of overlap between precarious and non-permanent employment, the latter cannot be unequivocally characterized as precarious. In fact, the heterogeneity within non-permanent employment arrangements may partly account for previous conflicting research findings.[10,18] And, because permanent employment is usually identified as the ideal reference, the spread of precariousness unto permanent employment arrangements remains unaccounted for.[17]

The *employment precariousness* construct and scale[1,15] constitute a multidimensional approach to precarious employment, which addresses its main dimensions,[3,4] including “social hazards”[19] derived from imbalanced workplace power relations. Furthermore, employment precariousness is located on a continuum, so that the presence and degree of precariousness can be assessed among all employed workers, whether in temporary or permanent employment.[17]

Consistent with research on job insecurity and temporary employment,[9,13] qualitative research on the *employment precariousness* construct conducted in Spain among Spanish[15] and immigrant workers[6] described mental ill health to be at the core of interviewees’ complaints. In an unpublished study, the Employment precariousness scale (EPRES) was administered to a convenience sample of 100 Spanish temporary workers, among whom those in the third tertile of employment precariousness had a twofold probability of reporting poor mental health (crude odds ratio = 2.73).[20]

Therefore, the purpose of this study is to quantitatively assess the association between *employment precariousness*, measured by the EPRES, and poor mental health on a population-based, representative sample of the Spanish workforce.

METHODS

Survey Design and Study Population

Data come from the Union Institute of Work, Environment and Health (ISTAS) Psychosocial Work Environment Survey (PWES), a cross-sectional population-based survey carried out between October 2004 and July 2005 on a representative sample of the wage-earning population living in Spain (n=7650).[21] While the survey was conducted, non-permanent employment in Spain accounted for 33% of waged-work, a stable proportion since 1990 and the highest in the EU, and unemployment rates fell from 10.6% to 8.4%, reaching their lowest level in two decades.[22]

Sample selection followed a multistage, stratified, random-route sampling procedure. Questionnaires were administered at home by trained interviewers. Subjects were eligible if they were aged 16 to 65 and had worked in a paid employment job for at least one hour during the week preceding the survey (including employed subjects absent from their job). Non-respondents were substituted on the field, following the same sampling procedures and inclusion criteria. Fieldwork was conducted during autumn, winter and spring. The response rate was 60%.

Prior to its initiation, the PWES protocol was approved by the ISTAS institutional review board (IRB). The survey was voluntary and confidential, and the dataset was completely deidentified before analysis.

Given that EPRES was validated for waged-workers with a contract,[17] we restricted our analyses to respondents with those characteristics. Accordingly, we excluded self-employed workers, workers without contract,

graduate students, and workers with unknown employment status (n=684). Respondents of non-eligible ages were also excluded (n=19).

To provide for an induction period, the sample was further restricted to workers with tenures of six months or longer, excluding subjects with shorter (n=845) or unknown (n=37) tenure. Finally, all subjects with non-response to any of the study variables were excluded (n=388). Differences in the distribution of study variables between respondents with complete data and those with missing data were not statistically significant. The final sample size was 5679.

Study variables

Employment precariousness

The EPRES is a structured questionnaire, validated for use among waged-workers with either a temporary or permanent contract.[17] It comprises 26 items grouped into six subscales: ‘temporariness’ (employment instability), ‘disempowerment’ (individual-level bargaining/contract), ‘wages’ (monthly pay, possible economic deprivation), ‘rights’ (entitlement to workplace rights and social security), ‘vulnerability’ (defencelessness towards abusive, discriminatory or exploitative treatment), and ‘exercise rights’ (powerlessness to exercise workplace rights). Subscale scores were computed for the sample of waged-workers as simple averages and transformed into a 0-4 scale. They were then averaged into a global score, also ranging from 0 to 4.[17] The global score was divided into quintiles and treated as a categorical variable to assess whether, as hypothesized, employment precariousness has a gradient association with health.

Mental health

To measure respondents' general mental health[23] the Spanish version of the 5-item Mental Health scale (MH) of the Short Form-36 Health Survey (SF-36) was used, which taps feelings of nervousness, anxiety, depression and psychological wellbeing during the preceding four weeks.[24] The MH score is calculated as the sum of the 5 items and transformed into a 0–100 score. Low scores indicate psychological distress, while high scores indicate psychological well-being.

General population-based reference norms have been the interpretation strategy most recommended for the SF-36 questionnaires. Applying Spanish reference norms obtained in 1996 from a representative sample of the general population[24] we defined poor mental health status as a score below the 25th percentile of the Spanish norm for the individual's sex and age.

Sociodemographic variables

Demographic variables used were sex, age (for descriptive purposes, age was grouped into five categories corresponding to the SF-36 reference groups), immigrant status (yes/no, according to the responder's reported country of origin), unemployment during the year preceding the survey (yes/no), and socioeconomic position.

The socioeconomic position (SEP) indicators used were level of educational attainment and occupational class. We grouped the highest completed level of education into four strata. Occupational class was obtained following the Spanish Epidemiological Society proposal for a social class measure,[25] and grouped into three strata (table 1).

Analyses

Study variables were described as sample counts and percentages. Mean mental health scores were described for men and women in each age group and tested for trends with weighted Anova tests. Crude associations between the study variables and poor mental health were described and tested for significance using Pearson X^2 tests.

We used multivariate log-binomial regressions to estimate adjusted prevalence proportion ratios (PPR) and their 95% confidence intervals. Prevalence proportion ratios[26] were chosen because we have a high-prevalence outcome. The models compare the prevalence of poor mental health across strata of increasing employment precariousness, after controlling for relevant potential confounders. The model output is the PPR of poor mental health in quintiles 2, 3, 4 and 5 of employment precariousness as compared to quintile 1, the lowest precariousness level (reference group).

Adjustments were aimed at controlling for the potential impact of social position on health through pathways unrelated to employment precariousness, and for potential confounding by previous unemployment,[10] which is associated with poor mental health[1] and predictive of precarious re-employment.[3] Education and occupational class were included simultaneously in the models to capture life-course information on SEP.[27]

Three models are presented: model 1, adjusted for age (continuous); model 2, adjusted for age, immigrant status, educational attainment and occupational class; and model 3, further adjusted for previous unemployment. In additional analyses we tested for PPR trends with the Wald sta-

tistic by introducing a continuous variable representing the ordinal categories (quintiles) of precariousness into the models.

All analyses were stratified by sex, given different role configurations[28] of men and women, and given that employment precariousness has been hypothesised[29] to have a greater impact on women's health.

Analyses were performed using the SPSS 15.0 programme.

RESULTS

The study sample included 2709 women and 2970 men. Most participants were between 25 and 44 years old; Spanish; had achieved secondary education or higher; were manual workers; and had not been unemployed during the previous year (table 1).

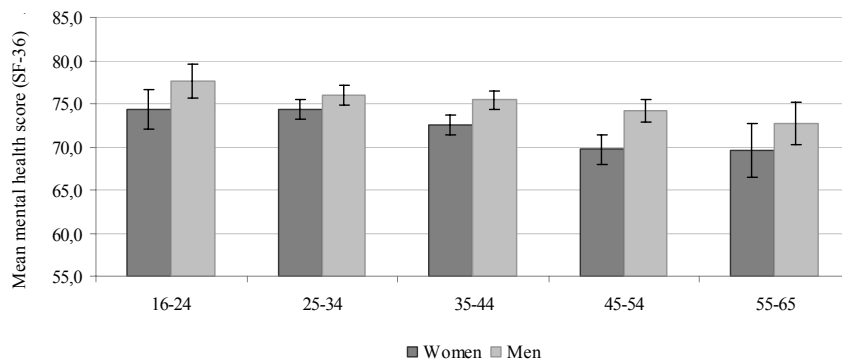
Compared to men, women were younger, more frequently university graduates, less frequently in manual occupations, reported previous unemployment more frequently and reported higher levels of employment precariousness. Mean mental health scores were higher (better) among men than women and decreased with age for both (p for trends < 0.001) (figure 1).

Table 1 Sample characteristics. Waged and salaried women and men, Spain 2004-2005.

	Women	Men
Total	2709 (47.7%)	2970 (52.3%)
Age group		
16 - 24 years	273 (10.1%)	253 (8.5%)
25 - 34 years	963 (35.5%)	848 (28.6%)
35 - 44 years	875 (32.3%)	973 (32.8%)
45 - 54 years	463 (17.1%)	667 (22.5%)
55 - 65 years	135 (5.0%)	229 (7.7%)
Immigrant status		
Spanish	2555 (94.3%)	2762 (93.0%)
Immigrant	154 (5.7%)	208 (7.0%)
Educational attainment		
Primary or less	776 (28.6%)	1109 (37.3%)
Secondary	780 (28.8%)	850 (28.6%)
Trade school	433 (16.0%)	452 (15.2%)
University	720 (26.6%)	559 (18.8%)
Occupational class		
SC I+II	493 (18.2%)	487 (16.4%)
SC III	722 (26.7%)	581 (19.6%)
SC IV+V	1494 (55.1%)	1902 (64.0%)
Unemployment preceding year		
No	2468 (91.1%)	2793 (94.0%)
Yes	241 (8.9%)	177 (6.0%)
Quintiles EPRES		
0.00 - 0.61 (low)	524 (19.3%)	745 (25.1%)
0.62 - 0.85	551 (20.3%)	686 (23.1%)
0.86 - 1.12	568 (21.0%)	635 (21.4%)
1.13 - 1.55	578 (21.3%)	523 (17.6%)
1.56 - 4.0 (high)	488 (18.0%)	381 (12.8%)

* SC I+II: higher and lower managerial and professional; SC III: administrative personnel and supervisors; SC IV+V: skilled, semi-skilled and unskilled manual. EPRES: Employment precariousness scale

Figure 1 Mean mental health scores (95% CI) according to age groups. Waged and salaried women and men, Spain 2004-05.



* p trends women < 0.001 ; p trends men < 0.001

Table 2 shows that 29.4% of men and 22.5% of women reported poor mental health, percentages which showed a tendency to increase with age among men and to decrease with age among women. The prevalence of poor mental health was significantly higher among women immigrant workers; workers with lower educational attainment; manual workers (SC IV+V); and those who had been previously unemployed. The prevalence of poor mental health increased as employment precariousness increased, being twice as high in the 5th as in the 1st quintile among men, and 2.8 times as high among women.

Table 2 Prevalence (%) of poor mental health* (95% CI) according to age, immigrant status, educational attainment, occupational social class, unemployment the preceding year, and quintiles of employment precariousness. Waged and salaried women and men, Spain 2004-05.

		Women		Men	
		%	(95% CI)	%	(95% CI)
All		22.5	(20.9 - 24.1)	29.4	(27.8 - 31.0)
	<i>p value</i>				0.000
Age group					
	16 - 24 years	19.8	(15.0 - 24.5)	26.1	(20.6 - 31.5)
	25 - 34 years	26.8	(24.0 - 29.6)	27.2	(24.2 - 30.2)
	35 - 44 years	21.1	(18.4 - 23.9)	29.8	(26.9 - 32.7)
	45 - 54 years	19.9	(16.2 - 23.5)	32.5	(29.0 - 36.1)
	55 - 65 years	15.6	(9.4 - 21.7)	30.1	(24.1 - 36.1)
	<i>p value</i>		0.010		0.026
Immigrant status					
	Spanish	21.9	(21.9 - 41.4)	29.1	(27.4 - 30.8)
	Immigrant	33.1	(33.1 - 47.2)	32.7	(26.3 - 39.1)
	<i>p value</i>		0.001		0.279
Educational attainment					
	Primary or less	25.1	(22.1 - 28.2)	32.7	(30.0 - 35.5)
	Secondary	22.6	(19.6 - 25.5)	30.1	(27.0 - 33.2)
	Trade school	18.7	(15.0 - 22.4)	21.7	(17.9 - 25.5)
	University	21.9	(18.9 - 25.0)	27.9	(24.2 - 31.6)
	<i>p value</i>		0.079		0.000
Occupational social class					
	SC I+II	20.1	(16.5 - 23.6)	27.7	(23.7 - 31.7)
	SC III	19.7	(16.8 - 22.6)	25.1	(21.6 - 28.7)
	SC IV+V	24.7	(22.5 - 26.9)	31.1	(29.0 - 33.2)
	<i>p value</i>		0.010		0.014
Unemployment preceding year					
	No	20.8	(19.2 - 22.4)	28.3	(26.6 - 30.0)
	Yes	39.8	(33.6 - 46.1)	46.3	(38.9 - 53.7)
	<i>p value</i>		0.000		0.000
Quintiles EPRES					
	0.00 - 0.61	14.3	(11.3 - 17.3)	23.9	(20.8 - 27.0)
	0.62 - 0.85	14.3	(11.4 - 17.3)	23.3	(20.2 - 26.5)
	0.86 - 1.12	19.7	(16.4 - 23.0)	29.0	(25.4 - 32.5)
	1.13 - 1.55	26.1	(22.5 - 29.7)	30.0	(26.1 - 34.0)
	1.56 - 4.0	39.5	(35.2 - 43.9)	50.9	(45.9 - 56.0)
	<i>p value</i>		0.000		0.000

* Poor mental health was defined according to the Spanish reference norm as a score below the 25th percentile for the individual's sex and age (18-24; 25-34; 35-44; 45-54; and 55-64 years). Cut-off scores for women were: 60; 63.2; 60; 56; and 52, respectively. Cut-off scores for men were: 68; 68; 68; 68; and 64, respectively.[24] Subjects aged 16 or 17 (n=23) were assigned the reference value of the 18-24 age group; respondents aged 65 (n=10) were assigned the reference value of the 55-64 age group. CI: confidence interval.

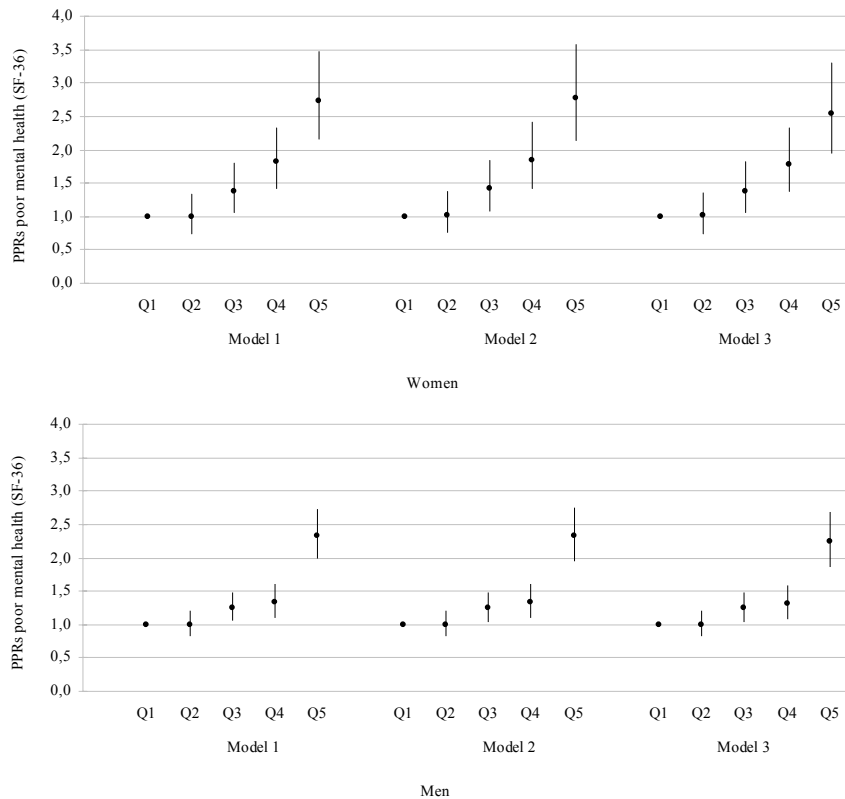
Crude associations remained generally unchanged after all adjustments were performed (figure 2). Fully-adjusted PPRs (model 3) in women were: 1.01 (95% CI: 0.75–1.36) for the 2nd quintile; 1.39 (95% CI: 1.05–1.82) for the 3rd quintile; 1.78 (95% CI: 1.37–2.32) for the 4th quintile; and 2.54 (95% CI: 1.95–3.31) for the 5th quintile. In men these were: 1.00 (95% CI: 0.83–1.21) for the 2nd quintile; 1.24 (95% CI: 1.03–1.49) for the 3rd quintile; 1.31 (95% CI: 1.08–1.59) for the 4th quintile; and 2.23 (95% CI: 1.86–2.68) for the 5th quintile. Tests for trends were significant for women and for men in the three models ($p < 0.001$).

To ensure that our findings were not dependent on the cut-off scores we used to identify subjects with poor mental health (based on Spanish reference values),[24] we repeated our analyses using the sample-based gender-specific 25th percentile of mental health as cut-off score. The gradient and magnitude of associations between employment precariousness and poor mental health were highly similar to our study results (data not shown). The largest change in the fully adjusted model was observed for the 5th quintile in women (PPR: 2.38; 95% CI: 1.91–2.96) and in men (PPR: 2.40; 95% CI: 1.96–2.93).

Monthly wages, included in the Wages dimension,[17] makes up an important proportion of workers' income, which is another frequently used indicator of socioeconomic position. To ensure our findings were not explained by income alone, we repeated the multivariate analyses using a modified version of the EPRES (excluding Wages) and including 'monthly wages' (11 income brackets) as a covariate (data not shown). In comparison to our original results, observed associations exhibited only minor changes: fully adjusted PPRs for the 5th quintile were 2.23 (95% CI: 1.77–2.81) in women and 2.18 (95% CI: 1.83–2.59) in men. The larg-

est change occurred in women: PPRs for the 5th quintile changed by -0.27 in women and by -0.04 in men.

Figure 2 Prevalence proportion ratios (95% CI) of poor mental health according to quintiles of employment precariousness. Waged and salaried women and men, Spain 2004-05.



Model 1: adjusted for age (continuous). Model 2: adjusted for age, immigrant status (yes / no), educational attainment (primary or less; secondary; trade school; university), and occupational social class (SC I + II; SC III; SC IV + V). Model 3: model 2 + unemployment the previous year (yes / no).

DISCUSSION

This is the first large-scale study to explore the association between poor mental health and *employment precariousness* as measured by means of the Employment Precariousness Scale. Our main findings were that employment precariousness was associated with poor mental health, even after controlling for potential confounders; that the association increased along a gradient of employment precariousness; and that the association was somewhat stronger in women than in men.

The general hypothesis that employment precariousness is associated with poor mental health was supported by our results: among workers in the 5th quintile of employment precariousness, the prevalence of poor mental health more than doubled that of workers in the 1st quintile. These results reinforce pre-existing qualitative research findings describing the detrimental health effects of *employment precariousness* on workers' mental health.[6,15] Also, the magnitude of the associations observed are similar to those observed in Amable's study of temporary workers described above.[20]

Workplace power relations are a distinctive feature of the employment precariousness construct ('vulnerability' and 'exercise rights' dimensions) and have been described to be highly significant for worker well-being and mental health.[15,17] Both the relaxation of protective regulations and the individualisation of employment relationships contribute to the exacerbation of power imbalances between workers and management.[7,23] Power asymmetries may have non-material links to poor mental health, acting as a workplace stressor[30] and leading to discriminatory workplace practices,[15] as well as material links, through the unequal distribution of material resources and hazardous exposures.[1]

The hypothesis that there should be a gradient association between the degree of precariousness and poor mental health was also confirmed by the data. For both women and men there was no association at quintile 2 of employment precariousness, and an increasing association thereafter, suggesting there may be a threshold level for the mental health effects of employment precariousness at a score between 0.86 and 1.21 (3rd quintile).

The finding of a gradient association is consistent with previous studies which have found an elevated risk of mental ill health among those forms of flexible employment which are more unstable and more likely to be associated with poor employment conditions.[31,32] It is also consistent with conceptual considerations that describe precariousness as located on a continuum, with the ideal of standard employment at one end and a high degree of precariousness at the other. This continuum is not captured by frequently employed research categories such as standard/non-standard employment.[3,4,7] In fact, “standard” employment is an ideal type against which to compare real-life employment relations, but within flexible labour markets not even permanent employment conforms to this ideal. By considering permanent employment as the reference category, current epidemiological research has largely neglected the precarisation of permanent employment relations and its effects on permanent workers’ health.

Finally, the association of employment precariousness with poor mental health was somewhat stronger in women than in men: the slope of the gradient was steeper and overall effects were slightly larger in women. However, when we defined poor mental health according to sample quartiles of mental health, this gender difference disappeared. Similarly, some studies on non-permanent employment have shown a stronger impact on

women's mental health,[33,34] but others have reported no gender differences.[35] However, despite their limitations, the norm-based, age and sex specific threshold is more likely to identify subjects in poor mental health.

An interaction between employment precariousness and gender-related power asymmetries within and without the workplace may explain a stronger association among women.[29] Within the workplace, gender may structure the access to organizational power and informal sources of power.[36] Evidence that unwanted sexual advances at work are strongly associated with precarious employment arrangements, and more so among women, is suggesting that such interactions do occur.[37] However, it is unclear to what extent the EPRES may be already capturing workplace gendered power asymmetries. Outside the workplace, employment precariousness may be interacting with gendered-role configurations and the gendered distribution of the domestic workload.[28] This is a plausible explanation in Spain, where working women, and especially manual working class women, continue to perform most domestic chores.[38] Working women in precarious employment probably have fewer resources to face the conflicting demands of paid and unpaid work, resulting in a greater work overload and stress.[39,40] Indeed, further research is needed to clarify the relationship between gender, precarious employment and mental health.[29]

In addition to our main study results, the sample distribution of poor mental health deserves some commentary. While mental health scores were higher (better) in men than women and decreased with age in both, when compared to the Spanish reference norm[24] male respondents had a higher prevalence of poor mental health than female respondents. A French study using national thresholds on a mental health scale obtained similar results.[33] In addition, in our study sample women's prevalence

of poor mental health, but not men's, tended to decrease with age. These results may be partially accounted for by socioeconomic differences between ours and the normative sample. They are also suggesting a stronger healthy worker effect among women than among men, especially at older ages, which is consistent with a previous multi-national study which suggested that the healthy-worker survivor effect is stronger in women,[41] and descriptions of a stronger healthy worker effect at older ages.[42] These findings warrant further research into the differential health-related selection of men and women into/out of the workforce.

Our study has the strength of being performed on a large population-based, representative sample of the Spanish workforce, of employing a well-validated measure of mental health, and of including pertinent variables measuring social position and previous unemployment to control for potential confounding. However, it has the limitations of cross-sectional data for drawing causal inferences: observed associations could be explained by reverse causation due to health selection.

Previous qualitative research has supported the causal link between precarious employment and poor mental health,[6,8,15] while prospective quantitative research on temporary employment and health has provided evidence both in favour of causation[43,44] and of selection,[45,46] although effects are typically stronger for the former.[47] Regarding employment precariousness, it is indeed possible that poor health may weaken the bargaining power of a worker, leaving him in a position of greater vulnerability and powerlessness, thus seemingly inflating the observed associations. Additionally, to the extent that there is an overlap between non-permanent and precarious employment, health-related selection into permanent employment may be also leading to an overestimation of the association between employment precariousness and health (a bet-

ter health status favours selection into permanent employment). However, the “healthy worker survivor effect” (the out-selection of less healthy workers will operate more strongly among temporary and precarious employees), and “wearing off of selection” (more pronounced among permanent employees) may be leading to its underestimation.[10,48]

Another limitation of our study is the potential for self-report bias[23] given that both exposure and outcome were measured with self-reports. However, weak correlations observed between employment precariousness and self-reports of psychosocial work conditions suggest that a tendency to negative reporting might not be affecting the assessment of employment precariousness.[17]

This study contributes to previous research on employment conditions and health by expanding the focus beyond employment instability to make use of a comprehensive measure of precarious employment. Its results highlight the relevance of precarious employment as a social determinant of workers’ mental health. Further research is indeed necessary to address the causality concerns this study cannot rule out; explore the effect of employment precariousness on the mental health of workers in different social positions, and the relationship between housework and precarious employment[38]; to explore the pathways linking employment precariousness and poor mental health; and to explore other, possibly longer-term, health outcomes. Also, research should be conducted to explore the impact of precarious employment on health in other national contexts, and in the context of the current economic crisis.

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7.3. **Sub study III**



MANUSCRIPT 3

Employment precariousness in Spain: prevalence, social distribution and population attributable risk percent for poor mental health.

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At time of printing, this manuscript is under review; the version presented here includes some reviewer-suggested changes, the rest of which are under way.

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ABSTRACT

As a consequence of labour market flexibilisation, non-standard employment has expanded and “standard” employment has declined. In many cases, these transformations may be best described as an evolution towards precarious employment, which is considered a major determinant of health and health inequalities. By means of the Employment Precariousness Scale (EPRES), this study aims to determine the prevalence of precarious employment in the waged and salaried workforce in Spain, describe its distribution across social groups defined according to occupational class, gender, age, and immigrant status, and estimate the proportion of cases of poor mental health attributable to employment precariousness. Findings indicate a high prevalence of employment precariousness, affecting nearly 6.5 million workers, with almost 900,000 of them exposed to high precariousness. These estimates are higher than the proportion of fixed-term employment reported in regular statistical sources, but may today be an underestimation given the current economic crisis. Additionally, a significant proportion of cases of poor mental health were attributable to employment precariousness. The proportion of cases of poor mental health attributable to, and the prevalence of, employment precariousness were highly unequally distributed across the study sample, indicating that it may be a significant contributor to social inequalities in mental health.



INTRODUCTION

In wealthy countries, waged employment is the most frequent form of paid work - in Europe, 85.3% of the occupied labour force is employed (EU-15).(1) Despite the high proportion of the adult population involved in employment and the impact of employment conditions in determining living and working conditions, and consequently, the well-being and health status of employees,(2) employment relations are seldom studied as a public health issue.

Employment relations are the relations between employers who hire workers to perform labour in return for payment, usually in the form of wages.(2) Employment conditions are the terms under which a person is engaged in a job, i.e., under which these relations are established.(3) These include the wage and other benefits that are received in exchange for the work performed and the rights and social protection workers are provided with when engaged in employment. These conditions may be settled by the individual contract, via collective agreement or by law.

Employment conditions and related levels of protection and benefits are to an important extent dependent on macrosocial-level power relations between employers and employees.(2) At the workplace level, the balance of power between management and employees will further determine the nature of the relations of authority and control at the workplace, as well as material and psychosocial working conditions. In that regard, prevailing normative regulation of employment tends to correct for the quasi natural asymmetrical bargaining power of employers over employees and limits the prerogative of management to direct and control their workers, while offering workers protection from the uncertainties of the labour market.(4)

During the last three decades, labour markets in many industrial countries have undergone a process of “de-regulation” in order to make employment relations more flexible and adaptable to organizational requirements in the face increased economic pressures emerging from unstable economic environments and globalized competition. A mayor consequence has been the expansion of “non-standard” types of employment and the decline of “standard employment relationships” (permanent full-time employment with benefits).

Non-standard types of employment generally exhibit poorer employment conditions and lower standards of protection than standard employment. At the same time, employment flexibility has eroded the protections and benefits provided to standard employment.

In many cases, these transformations may be best described as an evolution towards precarious employment.(5-10) Precarious employment encompasses several dimensions: employment instability, low wages, limited rights and benefits and lack of worker control over the labour process.(6,11) It is some combination of these dimensions that determines the level of precariousness of any given job.(6)

Precarious employment is considered a major determinant of health and health inequalities.(2) It may impact workers’ health and well-being through multiple pathways both within the productive and reproductive spheres of life.(2,10) To date, precarious forms of employment has been associated with poor working conditions, workplace injuries, poor general health and, particularly, poor mental health.(12-15)

To estimate the prevalence of precarious employment in any given country, the most frequent approach has been to estimate the prevalence of legal forms of employment presumed to be precarious, generally classify-

ing these into dichotomies such as temporary/permanent or non-standard/standard employment. Accordingly, statistical sources indicate that overall, during the past ten years, temporary contracts in Europe (EU) have accounted for around 14% of the employed workforce, with notorious exceptions like Spain, where the share of temporary contracts reaches well over 30% of total employment since 1990.(1) Within countries, these forms of employment are unequally distributed, with women, youth, immigrants, manual workers and those re-entering into employment after long term unemployment bearing the largest share.(6,16-18)

However, the aforementioned “legal approach” has important limitations: employment (contract) forms are heterogeneous regarding the degree to which the various dimensions of precariousness are present, and consequently, the degree to which they are precarious. Further, given the growing individualization of employment relations, large heterogeneity may exist even within employment forms. And while not all non-permanent employment forms are precarious, due to spill-over effects and deregulation of the standard employment relationship, considerable numbers of indefinitely employed workers may exhibit characteristics of precariousness.(19) One key implication of these limitations is that the actual proportion of jobs that are precarious remains unknown.

A multidimensional approach to precarious employment can overcome these limitations and provide a more accurate assessment of changing contemporary employment relations. The Employment Precariousness Scale (EPRES) is a new, multidimensional measurement instrument for the study of precarious employment as a social determinant of health.(20,21) The scale is a six-dimensional construct encompassing employment instability, low wages, limited workplace rights and individual contracts (as opposed to collective contracts resulting from collective

bargaining), worker vulnerability (exposure to managerial power abuse), and worker powerlessness to exercise workplace rights.(2,10,20) The latter two dimensions reflect the shift in the balance of workplace power towards management which accompanies the erosion of employment relationships.(22,23)

The EPRES has been validated for use among temporary and permanent workers in Spain.(21) In an earlier study using the EPRES, a strong positive gradient association between the degree of employment precariousness and the prevalence of poor mental health has been demonstrated, highlighting its role as a social determinant of mental health.(24)

The purpose of this study is to estimate the prevalence of *employment precariousness* in the waged and salaried workforce in Spain, describe its social patterning or differential distribution across social groups, and estimate the population impact of employment precariousness on mental health.

MATERIALS AND METHODS

Subjects and Study Design

Data was derived from the Psychosocial Work Environment Survey (PWES) conducted by the Union Institute of Work, Environment and Health (ISTAS). The PWES is a cross-sectional study carried out between October 2004 and July 2005 amongst a representative sample of the wage-earning population aged 16 to 65 living in Spain (n=7650).(25) Subjects were eligible to participate if they had been in paid employment for at least one hour during the week preceding the survey (including subjects temporarily absent from their job).

Respondents were selected following a multistage, stratified, random-route sampling procedure. Stratification was achieved by combining municipalities of different population sizes (5 strata) with autonomous regions (17), creating 85 strata. Within these strata, sample selection was performed in three stages: first, census tracts were selected; second, households were selected by random walk procedure; and finally, eligible individuals within each household were randomly selected. Within strata, the number of census tracts (randomly) selected was proportional to the population size of each stratum, producing a self-weighted sample. Selection of households within census tracts was performed following a random-route procedure, and within each household, one eligible subject was randomly selected to participate. In all, thirty interviews were performed within each census tract, ten in each of three seasons: autumn, winter and spring. The response rate was 60%. Non-respondents were substituted on the field, following the same sampling procedure and inclusion criteria.

Face-to-face interviews using structured questionnaires were conducted by trained interviewers at the home of the respondents. The survey was voluntary and confidential, and all personally identifiable information was removed before analysis. Prior to its initiation, the PWES protocol was reviewed and approved by ISTAS's institutional review board (IRB).

For this study, we restricted the sample to workers in waged or salaried employment with an employment contract. We excluded 703 respondents who were self-employed, without a contract, graduate students, had an unknown employment status, or were of non-eligible ages. Additionally, 171 subjects without an EPRES score due to item non-response were excluded from analysis. The final sample size was 6777.

Measure of employment precariousness

The Employment Precariousness Scale comprises 26 items in six subscales: temporariness (duration of contract; 2 items), disempowerment (individual or collective contract and bargaining; 3 items), vulnerability (defencelessness towards authoritarianism and the discipline imposed by the employment relation: intimidation, threats of being fired, and discrimination; 6 items), wages (low and/or possible economic deprivation; 3 items), rights (entitlement to workplace rights and social security; 7 items), and capacity to exercise rights (powerlessness, in practice, to exercise workplace rights; 5 items).(21)

Subscale scores are computed as simple averages and transformed into a 0-4 scale, with high values representing high levels of precariousness. The global EPRES score is computed as the arithmetic mean of the six subscale scores. It ranges from 0 (not precarious) to 4 (most precarious).

The global score was transformed into a three-category scale to estimate the prevalence of employment precariousness: $0 < 1$ (no precariousness); $1 < 2$ (low-moderate precariousness); ≥ 2 (high precariousness). Cut-off scores were chosen based on the structure of the scale score and on the number of response categories for most items (four response categories). Consequently, four groups were initially created, but because scale scores were generally skewed to the left and few respondents had a score above 3, all subjects with a score above 2 were collapsed into a single category (high precariousness).

Socio-demographic and occupational variables

Variables included in the analyses were sex, age, immigrant status (Spanish or immigrant, mostly from Latin America), educational attainment,

and occupational social class. Occupational social class was obtained following the Spanish Society of Epidemiology's proposed social class measure.(26) Also, type of contract (temporary/permanent), experience of unemployment the preceding year (yes/no), and economic activity in which the interviewee worked were described.

Poor mental health

Poor mental health was operationalised according to Spanish population-based reference values for the 25th percentile of each respondent's sex and age. These ranged from 64 to 68 in men, and from 52 to 63.2 in women for the age groups under study.(27) Several studies have reported cut-off scores for mental health problems on the SF-36 mental-health scale, which range from 52 to 76 (depending on the severity of the psychiatric conditions analyzed).(28) The cut-off scores employed for this study are below 76, a score considered appropriate to identify cases of common mental disorders.(28)

Analyses

Frequencies and percentages were employed to describe the study sample. Prevalence proportions (%) of low-moderate and high employment precariousness were calculated for the overall sample and according to sex, age group, immigrant status and occupational class. Prevalence proportions were compared with the Pearson Chi-square statistic for categorical variables and with a test for linear trends in the case of ordinal variables (age, occupational social class).

Prevalence proportions (%) of low-moderate, high, and total (score ≥ 1) employment precariousness were estimated for sixteen social strata created by combining sex (women/men), occupational social class (man-

ual/non-manual), immigrant status (yes/no), and age (≤ 30 years; > 30 years).

Population attributable risks percent (PAR%), or the fraction of poor mental health in the working population attributable to employment precariousness were estimated. According to an earlier study, there was a significant increase in the prevalence of poor mental health among workers at or above the third quintile of employment precariousness, that is, with an EPRES score between 0.83 and 1.12.(24) Drawing on that study we calculated, separately for women and men, the prevalence proportion ratio (PPR) of poor mental health in exposed (EPRES score ≥ 1) versus unexposed (EPRES score < 1) participants, adjusted by age, education, occupational social class, immigrant status and previous unemployment.

Then, we calculated attributable risks for each individual, based on the adjusted risks obtained from the multivariable model described above. Finally, we calculated PAR% as the mean attributable risk of all individuals in each strata, divided by the mean risk of all individuals in the strata, where the risks were based on the multivariable model. We estimated PAR% for the overall sample, for women and men separately, and for each of the 16 strata described above.

Given that reverse causality may explain part of the observed associations between employment precariousness and poor mental health, the fraction of the disease that would not occur if the exposure were absent is probably smaller than we have estimated. We thus performed an additional estimation of PAR%, assuming that reverse causality accounts for up to 50% of the observed risks.

Analyses were performed using the SPSS 15.0 programme. PAR% calculations were performed on R software, version 2.11.0.

RESULTS

Compared to respondents with complete data, respondents with missing EPRES data were slightly older, were more likely to be temporary employees, manual workers, and employed through temporary employment agencies (table 1). The final study sample comprised 3479 men and 3281 women.

Table 2 shows the characteristics of the study sample. Compared to men, women were younger, reported a higher educational attainment, were more frequently Spaniards, had a temporary contract or had been unemployed the previous year more frequently, and had a different profile in terms of economic sector. Also, they had a lower prevalence of poor mental health.

Table 1 Characteristics of full responders (n=6777) and item-non responders (n=171) to the EPRES. Waged and salaried workers. Spain, 2004-2005.

	Responders % (n)	Non- % (n)	<i>p value</i>
Sex			
Women	48.5 (3281)	55.3 (94)	
Men	51.5 (3479)	44.7 (76)	0.082
Age group			
16-25	15.6 (1060)	12.9 (22)	
26-35	33.7 (2282)	31.6 (54)	
36-45	29.9 (2024)	29.2 (50)	
46-55	16.0 (1083)	16.4 (28)	
55-65	4.8 (328)	9.9 (17)	0.044
Educational attainment			
Primary or less	33.4 (2239)	40.1 (67)	
Secondary	28.9 (1934)	27.5 (46)	
Trade school	15.2 (1020)	10.2 (17)	
University	22.4 (1501)	22.2 (37)	0.170
Immigrant status			
Spaniard	91.8 (6221)	90.6 (155)	
Immigrant	8.2 (556)	9.4 (16)	0.588
Type of contract			
Permanent	74.1 (5023)	62.0 (106)	
Temporary	25.9 (1754)	38.0 (65)	0.000
Unemployment previous year			
No	87.3 (5866)	82.3 (130)	
Yes	12.7 (855)	17.7 (28)	0.063

Table 1 cont...

Occupational social class			
SCI: higher manage. & prof.	9.1 (607)	3.1 (5)	
SCII: lower manage. & prof.	7.6 (510)	8.6 (14)	
SCIII: adm. personnel & superv.	22.2 (1483)	23.3 (38)	
SCIV: skilled/semi-skilled manual	47.7 (3187)	40.5 (66)	
SCV: unskilled manual	13.3 (891)	24.5 (40)	0.000
Economic activity			
(A) Agriculture, hunting and forestry	0.0 (1)	0.0 (0)	
(C) Mining and quarrying	2.5 (164)	3.0 (5)	
(D) Manufacturing	14.5 (971)	11.9 (20)	
(E) Electricity, gas and water supply	0.6 (42)	1.2 (2)	
(F) Construction	8.2 (549)	8.9 (15)	
(G) Wholesale, repair of motor vehicles, etc.	22.2 (1486)	17.9 (30)	
(H) Hotels and restaurants	9.6 (641)	5.4 (9)	
(I) Transport, storage and communication	5.6 (373)	4.8 (8)	
(J) Financial intermediation	2.6 (174)	1.8 (3)	
(K) Real estate, renting and business activities	9.3 (620)	11.3 (19)	
(L) Public administration, defence; social security	4.9 (328)	4.2 (7)	
(M) Education	5.8 (387)	7.1 (12)	
(N) Health and social work	5.1 (342)	7.1 (12)	
(O) Other community, social and personal services	4.6 (306)	4.2 (7)	
(P) Activities of households	0.0 (1)	0.0 (0)	
*Temporary agency workers	4.6 (305)	11.3 (19)	0.042
Mental health			
Good mental health	73.1 (4939)	78.8 (134)	
Poor mental health	26.9 (1820)	21.2 (36)	0.094

*Temporary agency workers: no information available on economic sector of current job.

Table 2 Sample characteristics. Percentages and numbers.
Waged and salaried women and men. Spain, 2004-2005.

	Women % (n)	Men % (n)	<i>p value</i>
Total	3281	3479	
Age group			
16-25	13.1 (431)	11.6 (402)	
26-35	36.6 (1200)	30.0 (1042)	
36-45	30.1 (989)	31.0 (1077)	
46-55	15.5 (509)	20.4 (710)	
55-65	4.6 (152)	7.1 (248)	0,000
Educational attainment			
Primary or less	29.0 (938)	37.6 (1294)	
Secondary	29.1 (944)	28.5 (981)	
Trade school	15.7 (508)	14.9 (512)	
University	26.2 (849)	18.9 (651)	0,000
Immigrant status			
Spaniard	92.8 (3044)	90.9 (3162)	
Immigrant	7.2 (237)	9.1 (317)	0,005
Type of contract			
Permanent	70.4 (2310)	77.6 (2701)	
Temporary	29.6 (971)	22.4 (778)	0,000
Unemployment previous year			
No	85.1 (2766)	89.3 (3086)	
Yes	14.9 (484)	10.7 (368)	0,000

Table 2 cont...

Occupational social class					
SCI: higher manage. & prof.	9.4	(305)	8.8	(302)	
SCII: lower manage. & prof.	8.0	(258)	7.3	(251)	
SCIII: adm. personnel & superv.	25.8	(837)	18.8	(642)	
SCIV: skilled/semi-skilled manual	42.7	(1384)	52.5	(1796)	
SCV: unskilled manual	14.1	(458)	12.5	(429)	0,000
Economic activity					
(A) Agriculture, hunting and forestry	0.0	(1)	0.0	(0)	
(C) Mining and quarrying	1.9	(60)	3.0	(103)	
(D) Manufacturing	11.2	(360)	17.7	(609)	
(E) Electricity, gas and water supply	0.3	(9)	1.0	(33)	
(F) Construction	2.5	(81)	13.5	(464)	
(G) Wholesale, repair of motor vehicles, etc.	26.2	(846)	18.5	(637)	
(H) Hotels and restaurants	10.5	(339)	8.7	(301)	
(I) Transport, storage and communication	3.6	(117)	7.4	(255)	
(J) Financial intermediation	2.9	(92)	2.3	(81)	
(K) Real estate, renting and business activities	11.2	(362)	7.5	(258)	
(L) Public administration, defence; social security	4.6	(148)	5.2	(179)	
(M) Education	8.0	(259)	3.7	(127)	
(N) Health and social work	7.6	(245)	2.8	(96)	
(O) Other community, social and personal services	4.8	(154)	4.4	(152)	
(P) Activities of households	0.0	(1)	0.0	(0)	
*Temporary agency workers	4.7	(150)	4.5	(154)	0,000
Mental health					
Good mental health	76.1	(2497)	70.2	(2442)	
Poor mental health	23.9	(783)	29.8	(1037)	0,000

*Temporary agency workers: no information available on economic sector of current job.

Prevalence of employment precariousness

Overall prevalence proportions of employment precariousness are shown in table 3. The prevalence of low-moderate precariousness was 41.2% and of high employment precariousness was 6.7%. In all, 47.9% of the sample reported some degree of precariousness. Total precariousness (low-moderate + high) was higher among women than men ($p < 0.001$), younger than older workers (linear trend $p < 0.001$), immigrant workers ($p < 0.001$), and manual workers (linear trend $p < 0.001$). A trend was visible and significant across occupational class, with the lowest prevalence in respondents of occupational class I, and the highest among respondents of occupational class V. Class III occupations appear to have the same (or lower) level of precariousness as class II occupations (table 3).

Figure 1 shows the prevalence of employment precariousness across the 16 strata created by combining gender, occupation, immigrant status and age. Total precariousness was consistently higher among younger (≤ 30), immigrant, manual and female workers. Young male and female non-manual immigrant workers were an exception, although here, confidence intervals are wide.

The prevalence of total employment precariousness is lowest among older, Spanish, non-manual men (19.4%), and highest among young, immigrant, manual women (88.6%). Among younger workers (≤ 30), the prevalence of total precariousness exceeds 50% in all groups, the only exception being male Spaniard non-manual workers. Among older workers (> 30), the prevalence of total precariousness exceeds 50% in four groups: immigrant non-manual women, Spaniard manual women, and immigrant manual women and men who are nearly as precarious as young immigrant workers. Only young immigrants exceed 80% of total precari-

ousness, although older immigrant manual women and younger Spaniard manual women follow close behind.

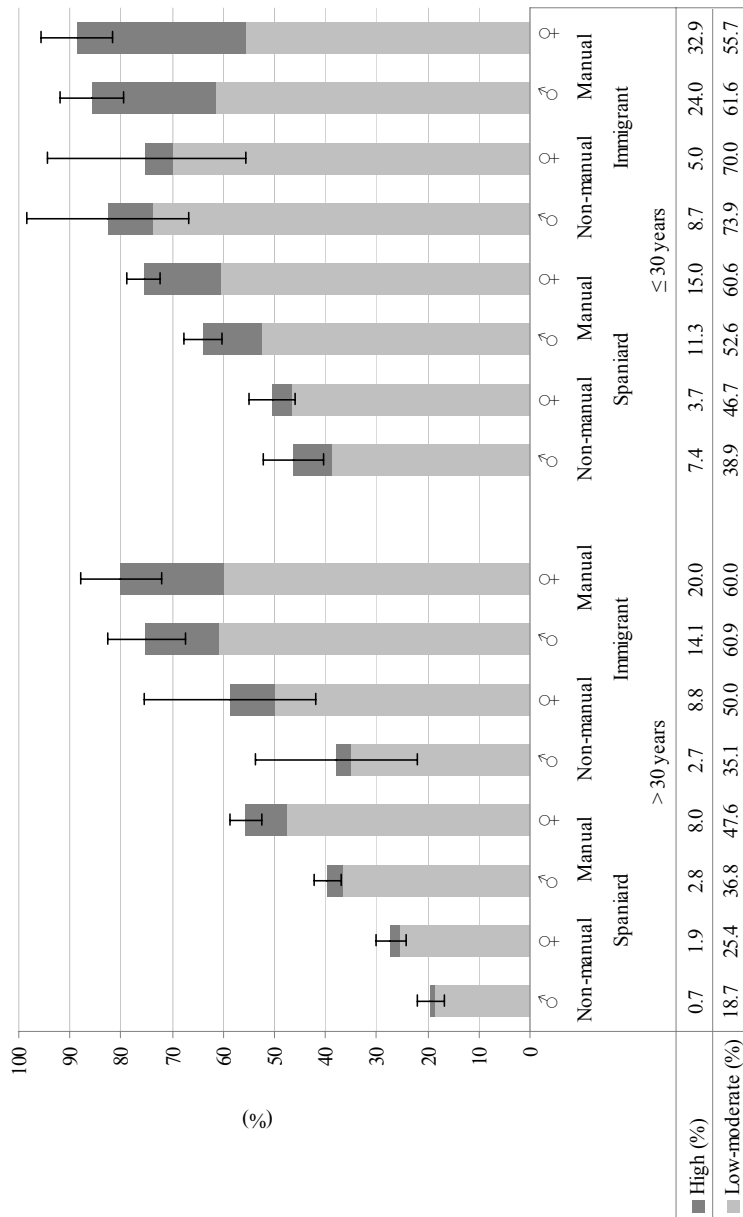
The composition of precariousness among these groups also varies, with those with the lowest prevalence also showing a proportionately lower prevalence of high precariousness, whereas those with high precariousness also have a relatively higher prevalence of high precariousness. For example, among older, Spaniard non-manual men, high precariousness accounts for less than 4% of their total precariousness. Among older immigrant manual workers, instead, high precariousness accounts for more than 20% of total precariousness, and for 37% of total precariousness among young, immigrant manual women.

Table 3 Prevalence (95% CI) of low-moderate and high employment precariousness. Comparison across groups (Chi=quare). Waged and salaried workers. Spain, 2004-05.

	Low-mod. precariousness			High precariousness		
	n	%	(95% CI)	n	%	(95% CI)
Total	2789	41.2	(40.0 - 42.3)	452	6.7	(6.1 - 7.3)
Sex						
Women	1473	44.9	(43.2 - 46.6)	262	8.0	(7.1 - 8.9)
Men	1307	37.6	(36.0 - 39.2)	189	5.4	(4.7 - 6.2)
<i>p value</i>			0.000			0.000
Age groups (years)						
16-25	645	60.8	(57.9 - 63.8)	150	14.2	(12.0 -
26-35	992	43.5	(41.4 - 45.5)	168	7.4	(6.3 - 8.4)
36-45	706	34.9	(32.8 - 37.0)	89	4.4	(3.5 - 5.3)
46-55	336	31.0	(28.3 - 33.8)	37	3.4	(2.3 - 4.5)
55-65	110	33.5	(28.4 - 38.7)	8	2.4	(0.8 - 4.1)
<i>p value</i>			0.000			0.000
Immigrant status						
Spanish	2462	39.6	(38.4 - 40.8)	350	5.6	(5.1 - 6.2)
Immigrant	327	58.8	(54.7 - 62.9)	102	18.3	(15.1 -
<i>p value</i>			0.000			0.000
Occupational S.C.*						
SCI	150	24.7	(21.3 - 28.2)	13	2.1	(1.0 - 3.3)
SCII	138	27.1	(23.2 - 30.9)	17	3.3	(1.8 - 4.9)
SCIII	487	32.8	(30.4 - 35.2)	37	2.5	(1.7 - 3.3)
SCIV	1514	47.5	(45.8 - 49.2)	257	8.1	(7.1 - 9.0)
SCV	449	50.4	(47.1 - 53.7)	123	13.8	(11.5 -
<i>p value</i>			0.000			0.000

* SCI: higher managerial and professional; SCII: lower managerial and professional; SCIII: administrative personnel and supervisors; SCIV: skilled and semi-skilled manual; SCV: unskilled manual.

Figure 1 Prevalence of total employment precariousness (low-moderate and high) across 16 strata of waged and salaried workers. Spain, 2004-05.



Note: Bars represent 95% CI's for total employment precariousness. Manual = SC I + II + III; Non-manual = SC IV + V.

Population attributable risks percent (PAR%)

Adjusted prevalence rate ratios of poor mental health were 1.88 and 1.42 for women and men, respectively. Table 4 shows the population attributable risks percent (PAR%), which were 23% for the overall sample, 16% for men and 33% for women. Observed PAR% across social strata ranged between 7.7% and 44.3%, exceeding 20% in all but 4 strata. Population attributable risks percent followed a distribution similar to that of overall prevalence of precariousness: values were systematically higher among young workers, immigrant workers, manual workers, and female workers. In the scenario in which reverse causality explains 50% of the estimated risk, over 11% of total poor mental health in the Spanish workforce would not have occurred if employment precariousness were absent, ranging from 3.7% to 25% across strata.

Table 4 Adjusted population attributable risk percent and 95% confidence intervals of poor mental health to total employment precariousness across 16 strata. Estimations performed for two different scenarios: 1) that 100% of the risk estimate is causal, and 2) that only 50% is causal. Waged and salaried workers, Spain 2004 – 2005.

Age (years)	Immigrant status	Occupational social class	Fraction of the risk estimate assumed to be causal				
			100% causal	50% causal	50% causal		
> 30	Spaniard	Non-manual	Men	7.70 (6.73 - 8.68)	3.66 (3.18 - 4.15)	3.66 (3.18 - 4.15)	
			Women	20.04 (18.26 - 21.74)	9.56 (8.62 - 10.51)	9.56 (8.62 - 10.51)	
		Manual	Men	14.66 (13.79 - 15.49)	7.26 (6.81 - 7.71)	7.26 (6.81 - 7.71)	
			Women	33.76 (32.55 - 34.91)	17.70 (16.92 - 18.44)	17.70 (16.92 - 18.44)	
	Immigrant	Non-manual	Men	13.78 (8.47 - 18.63)	6.79 (4.02 - 9.50)	6.79 (4.02 - 9.50)	
			Women	34.34 (27.11 - 39.97)	18.08 (13.56 - 21.93)	18.08 (13.56 - 21.93)	
		Manual	Men	23.78 (21.72 - 25.62)	12.45 (11.25 - 13.55)	12.45 (11.25 - 13.55)	
			Women	42.04 (39.61 - 44.01)	23.43 (21.67 - 24.90)	23.43 (21.67 - 24.90)	
	≤30	Spaniard	Non-manual	Men	17.28 (15.45 - 19.04)	8.70 (7.71 - 9.69)	8.70 (7.71 - 9.69)
				Women	31.43 (29.52 - 33.24)	16.21 (15.03 - 17.35)	16.21 (15.03 - 17.35)
			Manual	Men	21.92 (20.94 - 22.85)	11.35 (10.77 - 11.91)	11.35 (10.77 - 11.91)
				Women	40.63 (39.62 - 41.58)	22.41 (21.69 - 23.10)	22.41 (21.69 - 23.10)
Immigrant		Non-manual	Men	25.90 (21.72 - 28.84)	13.75 (11.26 - 15.59)	13.75 (11.26 - 15.59)	
			Women	39.58 (32.21 - 44.48)	21.66 (16.76 - 25.28)	21.66 (16.76 - 25.28)	
		Manual	Men	27.13 (25.82 - 28.28)	14.52 (13.68 - 15.23)	14.52 (13.68 - 15.23)	
			Women	44.30 (42.39 - 45.87)	25.13 (23.69 - 26.34)	25.13 (23.69 - 26.34)	
Total			Men	23.05 (22.57 - 23.53)	11.53 (11.26 - 11.81)	11.53 (11.26 - 11.81)	
			Women	32.92 (32.22 - 33.60)	17.15 (16.71 - 17.61)	17.15 (16.71 - 17.61)	

DISCUSSION

In this paper the prevalence and social distribution of employment precariousness is described. This is a first estimation of the population prevalence as measured by means of the Employment Precariousness Scale. The main results of the study include: overall total precariousness in the Spanish workforce is high (almost 48%) with a predominance of low-moderate precariousness (41%) and 6.5% with high precariousness; prevalence of precariousness is systematically higher among women, young (≤ 30) workers, immigrants and manual workers; the more characteristics of labour market disadvantage subjects accumulate, the higher their prevalence of employment precariousness is, reaching over 80% in the most precarious groups; and with few exceptions, more than 20% of cases of poor mental health across subgroups of workers may be attributable to employment precariousness.

Overall prevalence of employment precariousness

The high overall prevalence of employment precariousness measured in this study implies that almost half of the Spanish workforce is exposed to some degree of employment precariousness. Workers registered in the social security system in Spain are the most likely to have a formal employment contract, thus being comparable to the study sample. According to that registry,(29) there were, on average, 13,372,974 waged-workers during the months the survey data was collected. Crude estimates based on this data indicate that in the years 2004 and 2005 in Spain, more than 6.4 million waged workers were exposed to employment precariousness and almost 900,000 of them to high employment precariousness.

Several labour market features may help explain these high levels of precariousness. First, in Spain temporary employment is used intensively (over 30% of the labour force since 1990) as a mechanism to attain numerical flexibility in organizations. Second, some of the most rapidly growing economic sectors in the Spanish economy during the decades before the current crisis are sectors with important seasonal variations (linked to tourism and construction) and which employ low-qualified labour. Finally, the Spanish labour market is characterized by high levels of unemployment.

A previous estimate of the extent of precarious employment in Spain⁽²³⁾ using a multidimensional approach based on the definition of ‘low quality jobs’ proposed by the European Commission (defined as job security, access to training and career development, and hourly wages),⁽³⁰⁾ estimated that the share of precarious employment in Spain amounted to about 40% by the end of the 1990s. In both this and our estimate, the overall prevalence of precarious employment is not expected to be equivalent to that of legal employment forms that are deemed precarious. According to Spanish labour force data, the average rate of temporary employment during the months in which the survey was being conducted was 33%.⁽³¹⁾ This is lower than both multidimensional estimates, indicating that permanent workers also add to the total prevalence of employment precariousness. Significant dissimilarities between prevalence estimates based on temporary employment versus multidimensional measures have also been reported abroad.⁽³²⁾

Both the prevalence of employment precariousness and the magnitude of the departure from the prevalence of legal employment forms are expected to be country specific. They will depend on existing protective employment regulation and on the actual way this regulation is applied, leading

each country to apply a different combination of employment forms in order to achieve employment flexibility.(33) In addition, variations in the use of legal employment forms may change with time: while in the early 1980s 80% of Spanish employees with open-ended contracts had tenures of more than 5 years, this had fallen to 50% by 1995,(34) implying a gradual ‘precarisation’ of permanent”employment.

The magnitude of employment precariousness is also expected to vary with the economic cycle and levels of national unemployment, which places constraints on the labour management practices employers may use, as well as on the bargaining position of workers: high general unemployment tends to weaken the position of job seekers and makes it possible for employers to offer less attractive employment.(6,34) It should be noted that the PWES survey was conducted during a period of economic growth, when both temporary and permanent employment were growing steadily, and during which unemployment rates fell from 10.6% to 8.4%, the lowest since 1979 (data available since 1976).(31) Given the relationship between broader labour market conditions and precariousness of employment, it is probable that our prevalence estimates are conservative ones with regards to the Spanish labour market today, hit by a severe crisis of employment with unemployment reaching 20% of the workforce in 2010.(31) Of note, during the crisis temporary employment has been massively destroyed, and the share of temporary employment has fallen to its lowest level in 20 years. This implies that if temporary employment is used as an indicator of precariousness, resulting prevalence estimates might be very misleading.

Social patterning of employment precariousness

As expected, the Spanish workforce is not homogeneous in its level of precariousness, with a significant patterning according to gender, occupa-

tional social class, immigrant status and age, all of which constitute key social mechanisms of inequalities. The highest prevalence of low-moderate and high employment precariousness was observed in workers under 25 years of age, immigrant, and manual workers (SC V). Our results are consistent with general descriptions of the precarious workforce(6) and with findings of other studies performed in wealthy countries which show precariousness to be higher among women, immigrants, manual workers or workers with low qualifications, and young workers. (6,16-18)

It is also noteworthy that this pattern of social inequality becomes more marked the higher the degree of precariousness of employment.(6) Prevalence ratios can be estimated from table 3, and show that while low-moderate employment precariousness was 1.2 times higher in women than in men, high employment precariousness was 1.5 times higher. Corresponding figures were 1.7 and 3.4 when comparing younger with older workers; 1.5 and 3.3 when comparing immigrants to Spaniards; and 2.0 and 6.6 when comparing unskilled manual with higher managerial and professional workers.

However, differences in the prevalence of employment precariousness across employee subgroups were most striking when the interaction of social mechanisms of inequalities was considered. The prevalence of precariousness ranged from 19% (older Spanish male non-manual employees) to almost 89% (young immigrant female manual employees). It may seem surprising that the level of precariousness is so high among workers with legal employment contracts. One possibility may be that the employment situation of female, immigrant manual workers without a contract (or a residency permit)(35) influences the overall level of precariousness among female immigrant workers with a contract, in the same

way that general unemployment rates are expected to influence the degree of precariousness of the employed workforce.(6)

This analysis across strata emphasizes the necessity to acknowledge and describe the interaction between employment conditions and social mechanisms of inequality (social position).(2,12,36) Most of all, they reveal the highly unequal social distribution of employment precariousness. These results reinforce the idea that socio-demographic characteristics sort people into precarious employment, acting in such a way that individuals tend to accumulate labour market disadvantage given their age, gender, immigrant status, and social class.

Population attributable risk percent (PAR%)

Population attributable risks percent allowed assessing the impact of employment precariousness on poor mental health at the population level, providing an approximation to its public health impact. According to the PAR% calculations, 23% of poor mental health cases in the Spanish waged-working population would have not occurred if the effect associated with employment precariousness was absent.(37)

PAR% can also be interpreted as the proportion of disease cases that would be prevented following elimination of the exposure, assuming the exposures are causal and their effect completely reversible.(38,39) However, we cannot assume that the observed association between employment precariousness and poor mental health is entirely causal. Consequently, we conducted a second set of conservative estimations assuming a 50% causal component in the observed association. Even in this case, up to 11.5 % of poor mental health cases would be prevented, 17.2% in women and 7.8% in men, following the elimination of the exposure.

The risk of poor mental health attributable to employment precariousness differs widely across social groups, being lowest among older Spaniard non-manual men and highest among young, immigrant, manual women workers. These findings indicate that the public health impact of precarious employment on mental health may be substantially larger for groups in a position of social disadvantage.(2)

It appears that in Spain, precarious employment is socially acceptable for workers under the age of 25 and for female workers general.(16) However, from our result it is apparent that this social acceptance does not prevent these workers from suffering the health consequences of precariousness. Further, our results suggest that a significant and relevant proportion of their poor mental health may be attributable to employment precariousness.

Limitations

This study is not without limitations and results must be interpreted accordingly. Our prevalence estimates may be affected by survey and item non-response. Regarding selection of the sample, the absence of household service workers and employed agricultural workers, who represent 1.3% and 4.5% of social security affiliates (employed workers with a contract), respectively, is of note.(29) These are presumably among the most precarious workers in Spain, especially if they are immigrants,(35,40) which may contribute to an underestimation of the prevalence of precariousness overall and among immigrant manual workers in particular. Likewise, according to labour force data for the 2nd trimester of 2005, the share of temporary employment in Spain among dependent employees was 31%,(31) 5.2 percentage points higher than in the study sample. In addition, item non-responders belonged more frequently to worker categories

with high employment precariousness, which potentially contributes to an underestimation of prevalence estimates.

Further, the restriction of the sample to employed workers with a contract, with the exclusion of dependent self-employed workers (autonomous workers who are economically dependent on a single employer)(23) (3.9% of the PWES sample) and workers without a contract (4.6% of the PWES sample; 4.1% in the 2007 Spanish working conditions survey(41)) also implies that these results underestimate the actual prevalence of precariousness in the Spanish workforce. The extent of precariousness among these groups should be studied in the future.

Regarding the estimation of the population attributable risk percent across the 16 social strata, we used a single risk estimate for all women and a single risk estimate for all men. Given the size of some groups, it was not possible to estimate risks for each group independently. This implies that PAR% estimations may be overestimates for some strata and underestimates for others. A second limitation on the risk estimation is that it is based on a cross-sectional study, so at least part of the observed association may be non-causal or due to reverse causality.(24) Accordingly, we provide a conservative estimation of PAR(%) which takes into consideration that up to 50% of the observed association may be non-causal. Despite these precautions, population attributable risks in this study should be considered exploratory and interpreted with caution.

CONCLUSIONS

As revealed in this study, it can be estimated that nearly 6.5 million workers in Spain were exposed to some degree of employment precariousness in the period 2004-2005, which may be detrimental for their mental

health, with almost 900,000 of them being exposed to high employment precariousness. The high prevalence and high proportion of cases of poor mental health attributable to employment precariousness, as well as its highly unequal social distribution, highlight the social and public health relevance of employment precariousness and suggest it plays an important role as a determinant of social inequalities in mental health. Further research on employment precariousness, poor mental health, and health inequalities should be fruitful in informing policies aimed at reducing the burden of poor mental health and health inequalities.

The study results also underscore the need for finer estimations of the prevalence of precarious employment than those obtained from regularly collected data. Monitoring temporary employment as an indicator of precariousness can be highly misleading: the share of temporary employment in the Spanish labour market is at its lowest in twenty years, despite the deep deterioration in labour market conditions which are expected to increase rather than decrease the prevalence of precarious employment.⁽⁶⁾ In fact, the study results also highlight the necessity of evaluating current labour market reforms in terms of the precariousness of employment and its effects on workers' health.

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8. DISCUSSION

This dissertation aimed to advance our understanding of the relationship between employment precariousness and mental health by answering, three main research questions. The first piece of this work was to test the validity of the Employment Precariousness Scale (EPRES) on a large heterogeneous sample of the Spanish workforce. The second objective was to quantitatively assess the association between employment precariousness and mental health. The third aim was to describe the prevalence and distribution of employment precariousness in the population, above and beyond the share of temporary employment registered by labour force survey data.

8.1. General research findings

a) Psychometric properties of the scale and construct validity:

One of the fundamental impediments of epidemiological research in the study of changing employment relations was the lack of a conceptual framework, of a measurement instrument, and of appropriate data. The employment precariousness construct is a conceptually-driven measurement instrument, devised for epidemiological and public health research. It is clearly framed within an understanding of employment relations as regulated social and power relations whose erosion may lead to a deterioration of workers' working and living conditions, their well-being and ultimately their health.

The first sub-study examined the psychometric properties and construct validity of the EPRES. This was a fundamental first step before the epidemiologic and public health agenda could be taken any further.

The results of this study provided evidence in favour of the scale's psychometric properties and construct validity. As a first relevant issue, the high acceptability of the scale, despite being placed towards the end of a long questionnaire, suggests that it was not too burdensome on responders.

Second, inter-item correlations, item-scale correlations and factor analysis confirmed that items were correctly placed in their subscales, that they measured a same and unique concept and did not measure concepts corresponding to other subscales. On their part, inter-scale correlations demonstrated that the six subscales measure distinct concepts and are not redundant.

Finally, the comparison of the scale across subgroups and with other constructs demonstrated all the expected relations, suggesting that the EPRES is a valid measure of the underlying construct. In relation to the constructs that were examined, the EPRES also proved to be measuring a distinct construct, not conflated with concepts of work stress derived from the organization of work. And it proved to correlate in the expected direction with health variables, specially with mental health.

While this study analyzed correlations between employment precariousness and components of the demand-control-social support model, future validation studies should consider using the effort-rewards model (Siegrist 1996). The latter "builds on the notion of contractual reciprocity that lies at the core of the work contract" (Siegrist, Rodel 2006) and its rewards

component taps aspects of employment conditions, and thus, is in closer proximity to the employment precariousness construct than the former.

This study has highlighted several features in which the scale can be improved. The most important limitation that was encountered was the scale's limited ability to tap "empirical" instability among permanent employees. This is an important issue to address in future studies because security of permanent employment is declining or is markedly reduced in some countries, but it is indeed very difficult to capture. One alternative is to employ a measure of past instability, which is assumed to predict future instability (Pochic, Paugam & Selz 2003). Two such measures are past unemployment and tenure, and are promising alternatives to complement the 'temporariness' dimension, which should be renamed 'instability' if these items are included.

A second aspect that requires improvement is the ability of items in the vulnerability scale to detect differences among subjects with low or mild vulnerability. The actual reasons lying behind low endorsement of these items remain unknown: there is likely to be underreporting due to the use of double-barrelled questions and the sensitivity of some of the issues being tapped (discrimination, violent treatment) (Krieger et al. 2008), or there may be low awareness towards these topics (Krieger et al. 2006). Also, it is recommendable that some items be rephrased in order to reduce their subjective component, to keep the measure closer to the employment relationship than to individual psychology (Aronsson, Gustafsson & Dallner 2002).

Regarding disempowerment, new items could be included in the scale to reduce item redundancy and increase content validity. Issues such as information about, and access to, legal representation (Tompa et al. 2007), protection against unacceptable working practices (Tucker 2002), griev-

ance procedures (Cook 1998), and issues concerning other forms of collective participation that can provide workers with “collective protection from undue exploitation” (Green 2003) should be considered and discussed.

Validation as a continuous process works through successive validation studies (using EPRES in different populations or sub-populations, for example) and through the successive applications of the measurement instrument for research purposes. These will lead to cumulative and in-depth understanding of both the construct and the EPRES measurement scale (Streiner, Norman 1989, 1995).

b) Employment precariousness and mental health

The implications of precarious employment for health can be far reaching: from poor mental health, to workplace injuries and premature mortality ((Benavides et al. 2006, Virtanen et al. 2008, Kivimaki et al. 2003)), many pathways leading to different outcomes may be involved.

Despite this vastness, the choice of mental health for this study is justified in the interpersonal nature of the workplace hazards associated to employment precariousness (implying greater mental and emotional demands); in the elevated prevalence of stress and psychological distress in the workforce, which needs to be better understood and addressed; and in the fact that mental health is an important indicator of overall health status (Hoeymans et al. 2004).

There also are practical reasons that favour mental health as the outcome of interest. First, evidence from unemployment research suggests that poor physical health is a cause and poor mental health a consequence of

unemployment, and that mental ill health associated with unemployment is unlikely to be due to reverse causality (Dooley 2003, Virtanen et al. 2003). Similarly here, it is more likely that subjects be health selected into poor employment due to their physical health situation than to their mental health situation. Second, psychological well-being and distress are more acutely responsive to external factors affecting health than physical or general health (Marusic, Bhugra 2008, Michie 2002): its etiological period can be quite short, making it more likely that mental health rather than general health problems will appear as a consequence of the current job situation. In all, and given its shorter induction period, mental health problems associated to poor mental health are less likely to be due to reverse causation than general health problems.

This is the first epidemiological study to assess the health impact of precarious employment by means of the EPRES. Although reverse causation and health selection cannot be ruled out, the results supported the study hypotheses, and described a strong association between employment precariousness and poor mental health. Belonging to the highest quintile of employment precariousness implied a 128% increase in the prevalence of poor mental health in men and a 150% increase in women. These findings were robust to statistical adjustments and are consistent with quantitative and qualitative research findings linking temporary employment and insecure employment to poor mental health. The study also demonstrated a gradient association between employment precariousness and mental health, consistent with studies describing that the more unstable or peripheral jobs are, the greater their toll on mental health.

One important contribution of this study is to have extended research on employment conditions and health to permanent employees. The study sample is made up mostly by permanent employees (74%), implying that

the observed results are largely applicable to them. To date, most, if not all, epidemiologic research on flexible employment and health has assigned permanent employees to the “reference” group. Studies that have acknowledged the heterogeneity between temporary employment types, by sub-dividing the exposed population into categories according to their degree of employment instability and protection, have not overcome this limitation. This means that precariousness within permanent employment has gone largely unattended, and that study results may be underestimates of the underlying associations.

Some indications of possible pathways linking employment precariousness to poor mental health can be derived from this study. Workplace power relations may be among the most important factors determining the mental health status of precarious employees. The role of power relations is an all-too often neglected aspect of working life in epidemiological research aiming to explain the health effects of flexible employment (Brooker, Eakin 2001). This is another important contribution of this research, which requires more and deeper study to be better understood.

Another important pathway relating employment precariousness and poor mental health may be job dissatisfaction. Job satisfaction has been consistently found to be lower among temporary employees (Benavides, Benach 1999, Virtanen et al. 2003), and exhibited the highest correlation with employment precariousness in our validation study.

In addition, employment precariousness may be related to poor mental health through its effects on social support at work, and to a lesser extent, the components of control at work. These well known risk factors for poor mental health (Karasek 1979, Stansfeld, Candy 2006) showed correlations greater than 0.2 with employment precariousness. These findings lend preliminary support to the hypothesis that precarious employment may

affect mental health through working conditions and the psychosocial work environment. Given the centrality of workplace (interpersonal) power relations in the employment precariousness construct, social support should be one of the major pathways leading to poor mental health. Somewhat surprisingly, perceived job insecurity appeared significantly less correlated to employment precariousness, suggesting that its role as a mediator may be less significant. However, all these hypotheses must be thoroughly examined in future research.

Doubtlessly, the study results linking employment precariousness to poor mental health need to be replicated with new data, different study designs, on different populations, and ideally, on a longitudinal basis. However, besides demonstrating a plausible and robust association between employment precariousness and health, these results also provide with further evidence of the validity and usefulness of the employment precariousness scale and construct.

c) Prevalence and population level impact on mental health

The first part of substudy 3 estimated the overall prevalence of employment precariousness in the workforce, its prevalence across unequal social positions, and across groups created by the intersection of the axes of inequalities. As discussed in the manuscript, the population prevalence is high, affecting nearly 48% of the population. This estimation is similar to one reported by Laparra (Laparra Navarro 2006), who also employed a multidimensional approach to precarious employment. The estimation is also higher than the share of temporary employment in the sample and in the workforce at the time the survey was conducted.

The analyses shown in this study take into account inequalities in social position and their intersection. Four major axes of employment-related inequality, gender, age, immigrant status and social class (approximated as occupational social class), were combined to construct 16 strata. The distribution of employment precariousness across workers in different social positions confirmed both the unequal distribution of the exposure and the unequal intensity of exposure. Results indicate that certain groups, specially those who accumulate several characteristics of labour market disadvantage, have both a higher prevalence of overall employment precariousness and a higher relative prevalence of high employment precariousness: 37% of overall employment precariousness among young immigrant manual women is high precariousness, while it accounts for only 7% among older Spaniard non-manual men.

In the second part of this substudy, the potential for social impact derived from precariousness of employment is examined. Measures of association (such as PPRs) that approximate the relative risk provide a measure of the force of the association between the exposure and the outcome, but not of its public health relevance (Schoenbach, Rosamond 2000). In fact, small risks can have a devastating public health effect if the exposure is widely distributed (Rose 1992).

The percent population attributable risk represents a useful approach to assess the consequences of an association between an exposure and an outcome at the population level (Benichou 2001). It is a measure of impact that reflects both the strength of association and the prevalence of the exposure in the population (Schoenbach, Rosamond 2000). Strictly, the percent population attributable risk quantifies the proportion of disease cases in the population that would be prevented, or would not have occurred, following elimination of the exposure or if the exposure had not

occurred (Rockhill, Newman & Weinberg 1998, Bruzzi et al. 1985, Basu, Landis 1995).

Estimating population attributable risks is subject to a series of assumptions, two important ones being that the association of interest is causal and that the effect estimates being used in the calculations are not distorted by any bias (Rockhill, Newman & Weinberg 1998, Walter 1998). When the causality assumption is not met, the term *population attributable fraction* has been recommended (Schoenbach, Rosamond 2000). Another assumption is that the elimination of the exposure is feasible, so that the measure can actually indicate the proportion of disease cases that would be prevented following elimination of the exposure (Rockhill, Newman & Weinberg 1998).

First, given the extension and prevalence of employment precariousness, and the fact that it is rooted in the economic structure, it is not possible to suggest that any one intervention will reduce its prevalence. All-encompassing changes to the social structure of work would be necessary. And many causes, and hence cases, of poor mental health would still remain. The objective here is only to give a more comprehensive measure of the public health importance of employment precariousness, and results must be interpreted in this spirit.

Second, the causality assumption cannot be held to hold, given the cross-sectional nature of our study (and thus limitations on causality attribution) and the fact that this is the first study to address the association between EPRES measures and poor mental health. In consequence, we estimated attributable *fractions* using the effect estimates obtained in substudy 2, but then repeated the calculations assuming that only 50% of the observed association was causal. In both cases, there is a relevant portion of poor

mental health attributable to employment precariousness, specially amongst the most disadvantaged groups (immigrant women, for example).

The PAR% analyses performed cannot account for any differential strengths in association that may exist across these groups, except for gender (gender-specific measures of association were employed). Instead, it mainly accounts for the unequal prevalence of employment precariousness across these groups. Despite the assumption, preliminary and indeed unlikely, of an equal association between employment precariousness and the mental health of all men and all women, the study results showed a notorious difference in the proportion of poor mental health attributable to employment precariousness across subgroups. These results better illustrate the importance of labour market inequalities as determinants of health inequalities.

Overall, the study results suggest that precarious employment is a significant determinant of the working population's health and well-being. This is of interest to public health professionals, generally quite afar from issues such as labour market policy-making and the evaluation of employment policy. Indeed, more research must be performed to overcome the limitations of this study, but for now, the results are disturbing and warrant further investigation.

8.2. Study limitations and strengths

This study is focused on Spain, a wealthy country with high relative and absolute levels of employment precariousness. The Spanish labour market is, notwithstanding, regulated to meet minimum standards of similar countries. This study has not looked into labour relations in middle or low-income countries, where labour standards are lower. This may be consid-

ered a limited view, to the extent that transformations in labour relations have a global dimension, and labour policies in one country are intimately linked to labour policies and standards in other countries (Quinlan, Mayhew & Bohle 2001b). However, an account of global employment conditions and inequalities were beyond the scope of this dissertation.

a) Threats to external validity

On the one hand, sampling followed a random-route sampling procedure. Although the sample is judged to be representative by the survey designers, its representativeness is not entirely demonstrable given the lack of a known sampling frame. In addition, because this sampling procedure had not been employed before to recruit a sample of the working population at the national level, there is no gold-standard distribution with which to compare it. The closest comparisons can be made with available data in the social security registers and with labour force survey (LFS) data, both of which are commented on in manuscript 3. In this respect, the PWES sets a first standard with which to compare future samples recruited in the same way.

In addition, there is the potential for selection bias due to unit non-response (selected subjects who, for different reasons, did not participate in the survey). The response rate of 60% is within reasonable limits relative to international experience on survey research. The Spanish response rate to the 4th European working conditions survey performed in 2005 was 66%.³⁴ However non-response bias cannot be ruled out on the basis of the response rate.

³⁴ Fieldwork for the EWCS was carried out between September 17th and November 30th, 2005 (European Foundation for the Improvement of Living and Working Conditions 2007).

Another potential source of bias may be derived from the decision to interview subjects temporarily away from their jobs, which may facilitate contact with, for example, sick individuals. However, only 0.3% of interviewees (n=23) were or had been on sick leave during the week the interview was performed, thus ruling out any significant bias on this behalf.

Selection bias may have implications for our prevalence estimations, as discussed in manuscript 3. It is most likely that the several selection biases predicted on the sample tend to rule each other out, resulting in an acceptable estimation of the population prevalence (Vives, Ferreccio & Marshall 2009). To examine for the presence of such bias, post-stratification weights based on LFS data for the second quarter of 2005 were used to compare prevalence estimates before and after weighting.³⁵ The sample on which these weights were applied differs from the study sample in that in order to make it comparable to the LFS, workers without a contract had to be included in the calculations. Weighted estimations turned out to be almost identical to the crude estimations (table V.2 in the appendix 5). These results suggest that sample non-response is not biasing the prevalence estimates shown above (although they cannot be ruled out for small subgroups).

No important implications derived from selection bias are predicted for the generalization of the observed association between employment precariousness and poor mental health to the general Spanish working population. However, the social, historical and economic heterogeneity between and within countries must be taken into account before results are generalized to working populations abroad, or to very specific geographical areas or economic sectors in Spain.

³⁵ Post-stratification weights were computed based on sex, five 10-year age groups, and 18 occupational groups.

b) Threats to internal validity

Selection bias is also not predicted to hinder internal validity of the observed measures of association. Instead, the most important threats to internal validity in this study are reverse causality due to health selection or the healthy worker effect, and subjectivity bias, both of which have been commented on in the discussion section of manuscript 2. Overall, although they cannot be ruled out, it is unlikely that these sources of bias will explain away all the observed associations.

Regarding reverse causation due to health selection, it is most likely that the different health selection processes at play (selection into employment, selection from temporary to permanent employment, selection out of employment, and the wearing off of selection) rule each other out and result in a small overall bias. In addition, qualitative research is suggestive of a causal relationship, in which individuals refer to their jobs as a source of persistent distress and suffering (Amable, Benach & González 2001, Clarke et al. 2007, Porthé et al. 2009b). These limitations to drawing causal inference also apply to our estimations of population attributable fractions, as discussed in the third manuscript of the results section.

Subjectivity or common method bias also poses a serious threat to internal validity, given that both exposure and outcome measures are based on self reports and, to a greater or lesser extent, are dependent on individual subjectivity (Muntaner, O'Campo 1993, Kawachi 2006). However, other subjective measures, such as perceived job insecurity, exhibited very low correlations with employment precariousness and its dimensions. This suggests that the strength of subjectivity bias is, at best, mild. The measure of mental health (SF-36) was introduced at the beginning of the survey, and the measure of precariousness (EPRES) towards the end, which also re-

duces their potential for co-variation. Nevertheless, subjectivity bias cannot be ruled out.

Finally, there is a potential for residual confounding in the health association study (sub-study 2), where social mechanisms such as previous unemployment, socio-economic position and household income and composition were insufficiently or not at all controlled for. Information on previous unemployment, for example, was collected only for the year preceding the survey. Likewise, information on sources of income other than wages was not collected, and neither was household income. However, the main source of variation in income for the majority of the working population comes from wages, which were controlled for and resulted in a limited attenuation of the study results.

This research did not aim to further examine effect modifiers and interactions. The objectives of this study were focused on an early phase of epidemiological research into the health effects of employment precariousness. The interest on effect modification can only follow the finding of robust evidence of the existence of an association whatsoever, and this latter was one of the main objectives of this study. Also, limitations on sample size and distribution of some individual characteristics across the different levels of precariousness limit the usefulness of this sample to examine some of these potential effect modifiers. In consequence, and only as a starting point, the assumption has been made that, with the exception of gender, overall effects of employment precariousness are homogeneous across the working population.

c) Study strengths

This study also has significant strengths. In addition to its large sample size (n=6968), the survey had an acceptable response rate (60%), thus generally reducing the likelihood of selection bias and increasing the internal validity of the study. Another strength of this study is the employment of a population-based random sample, which means that results may be generalized to the total workforce (Virtanen et al. 2005). Most studies reported in the literature are industry-specific, which limits their generalizability (Virtanen et al. 2005). Also, valid Spanish versions of extensively used measures of self-reported health (SF-36) and of the work environment (COPSOQ) were available in the data.

Additionally, sources of bias which are may be problematic in working conditions surveys were controlled for by performing household rather than work-site sample recruitment and interviews. First, this allows recruiting workers from all types of organizations, being these big or small, formal or informal. This is very difficult to achieve when recruitment is performed in the workplace. Also, when studies are conducted in the worksite, selection of study participants is more likely to be biased, participants may be weary of endorsing certain issues due to direct or indirect pressures, and they may be less assured that confidentiality will be protected. This may induce item non-response, refusals to participate, or increase measurement error.

Another important strength of this study is derived from the nature of the measurement of the exposure, and the classification of participants into the unexposed and exposed categories based on their degree of employment precariousness. This overcomes a fundamental limitation of studies where permanent workers are systematically considered unexposed and all

temporary workers are considered exposed. Because they cannot account for the existing heterogeneity within employment forms, such studies may misclassify study participants.

8.3. **Future steps**

The main lines that can be drawn for future research lie in the scale development and validation sphere, and in the epidemiological research sphere. As mentioned before, scale validation is an ongoing process. Subsequent applications of the scale and all analyses that are performed on it provide with new information that can increase our understanding of the construct and of the scale, of its strengths and limitations, and needs for further improvements. This study has provided with several insights and, accordingly, suggestions are made for improvements to the scale in the near future and in the longer term.

Also, some of the basic questions regarding the role of employment precariousness as a determinant of health and as a social determinant of health inequalities have been answered, but much more questions remain unanswered. Some of the most salient issues that have been encountered during the research process are described bellow.

a) **Scale development**

Construct content

Multidimensional proposals for the assessment or understanding of employment precariousness developed by other authors include work features that are not included in Amable's model of employment precariousness. The main ones are related to working time, training and career ad-

vancement opportunities, and occupational health risks and safety provisions (Porthé et al. 2010, Tompa et al. 2007, Tucker 2002).

Health and safety issues are relevant in terms of discriminatory practices against precarious employees and have an important health impact, as demonstrated by research on temporary employment and workplace injuries (Benavides et al. 2006). However, these are better situated in the realm of working conditions than that of employment conditions. In fact, Quinlan (Quinlan, Mayhew & Bohle 2001b), who has extensively studied precarious employment and their relationship to occupational health and safety issues, conceptualizes these as *consequences* of precarious employment.

Uncertain hours of work that can be changed at will by the employer are considered an indicator of precariousness by Tucker (Tucker 2002). This vision is shared by Porthé, who analyzed the fit of the employment precariousness model among immigrant workers in Spain (Porthé et al. 2010). Qualitative research has shown, for example, that casual workers are more likely to work highly irregular hours over which they have little control, with their daily and weekly working hours ranging from very long to very short according to organisational requirements. (Bohle et al. 2004) The renegotiation of working time is posed as a critical factor shaping the future employment relationship (Rubery et al. 2000). Finally, working time has an important gender component regarding work-life balance (Scott 2004, Leschke, Watt 2008).

From the employment precariousness perspective, this lack of control over working hours may be understood as a feature of vulnerability and disempowerment (whether located in the collective or individual level), rather than a new dimension of employment precariousness. In fact, an item regarding the negotiation over working time is included in the 'disem-

powerment' subscale, and the capacity to take time off for family or personal reasons is included in the 'rights' and 'exercise rights' subscales.

Career-advancement or promotion opportunities are, for several authors, a key dimension of precarious employment relations or "dead-end" trajectories (Scott 2004, Cano 2004, Laparra Navarro 2006, Tucker 2002, Hernanz M. 2003, Ashford, Lee & Bobko 1989). Opportunities for career advancement and/or skill enhancement through training opportunities (formal or informal) are regarded as fundamental in order for workers to participate in higher skilled, less precarious segments of the labour market (Brosnan 1995, in (Hannif, Lamm 2005)).

It can be argued that opportunities for developing a career-job need not be included into an employment relations construct because they are already being tapped by measures of "skill discretion" within the demand-control model. While this perspective does not take into account the mutual influence of employment relations and career prospects, the placement of the career job concept within the organization of work is shared by other authors (Miguélez 2005). It may also be argued that the temporary nature of most precarious employment is a measure of the extent to which it excludes workers from participating in the internal labour market. This however, does not take into account the importance of future prospects in the external labour market.

Doubtlessly, there needs to be further conceptual developments discussing to what extent these features belong or not into the construct, and in what way.

Adaptations of the EPRES

Various potential uses of EPRES will require the development of adapted, modified, or shorter versions of the questionnaire. For one, there is a pressing need to work out instruments that are applicable across countries and make comparative studies possible (Aronsson, Gustafsson & Dallner 2002). For its utilization outside Spain, the scale needs to be adapted to the particularities of national labour markets and employment legislation. Conceptually, the construct is internationally valid, because the issues that are tapped are not nation specific. However, the ways these are addressed in measurement have national specificity, specially regarding workplace rights and income levels. This is specially important if EPRES is to be employed in countries with less developed labour regulation or welfare state provisions.

It is also necessary to have a short form of the questionnaire for its application in large-scale surveys where space constraints are a major problem. Most important, this would eventually allow for utilization as a surveillance tool. The development of a short-form based on the EPRES needs to be performed through an expert-based approach. Shortening requires that a host of issues be considered, and that the short version be tested on an independent sample to test its psychometric properties, construct validity and general performance (Coste et al. 1997).

A complementary approach to the creation of a short-form EPRES is the identification of proxy indicators that can be found in existing data bases. Malmusi and colleagues (Malmusi, Borrell & Benach 2010) have adopted such an approach using six items from the Catalanian Living Conditions Survey. Their results were consistent with expectations in terms of the social distribution of employment precariousness. In fact, they observed that the prevalence of employment precariousness was 83% among poor

immigrant women, comparable to our findings of where the prevalence among manual immigrant women ranged between 80% and 90%.

The employment of existing data bases can serve to perform international studies, cross-national comparisons, and comparisons across time (time-series). This research approach is fundamental if labour market structures, policies and reforms are to be analysed in relation to the degree of precarious employment that results from them.

In another vein, the scale needs to be examined and adapted to assess employment precariousness in different groups of workers and in special populations. Two relevant groups of workers that will need adaptations of the questionnaire, probably extending the construct of employment precariousness to encompass specific dimensions of their precariousness, are informal workers and dependent safe employed workers. These workers, while performing dependent employment, do not fit into the category of formal, waged-work on which the scale's development was based.

Second, immigrant workers are a highly vulnerable and growing population group, whose unique characteristics pose challenges to measuring and studying employment precariousness. First, an important number of immigrants are undocumented workers, who face threats as severe as deportation (Ahonen 2009). Porthé described them as a workforce with extreme vulnerability, absolute powerlessness, complete absence of rights and extremely long working hours (Porthé et al. 2010). Quantitative research has shown that some items in EPRES do not apply to these workers (Armada et al. 2010).

For documented workers, keeping a formal job is indispensable to keep that documentation status (Ahonen 2009), making them a very vulnerable group. Other characteristics of immigrant workers in general are the high

involvement of women in household service work, without contracts, and hard to reach in survey research (Ahonen et al. 2009); the pressuring need to send money back home; frequent unemployment spells (Porthé et al. 2010); and workplace discrimination (Agudelo-Suárez et al. 2009). For the moment, the scale has been applied to a large sample of documented immigrant workers, and preliminary results suggest that the scale is performing well (Armada et al. 2010), but it is possible that sensitive aspects of their employment situation are being overlooked.

b) Future research

Many questions have been posed that should be addressed in future studies. These concern gender related issues, the healthy worker effect and related health selection processes in the context of precarious employment, the relationship between perceived job insecurity and employment precariousness, the exploration of pathways, the study of different health outcomes, the comparison of the impact of employment precariousness on the health status of different social groups, and the changes in prevalence and health impact that may follow from the current economic and employment crises. A few of these will be further discussed below.

Employment trajectories

A key issue on the research agenda concerns the importance of incorporating a dynamic perspective into the study of precarious employment relations. This includes the necessity to explore other, possibly longer term health outcomes, to determine whether the toxic effects of precariousness are cumulative over time, if they are persistent or transitory, and whether the effect is modified over the life course or with changing contextual (social, economic, political) conditions. Also, it should consider the health

impact of different employment trajectories, and take into account the relationship between precarious employment and unemployment.

Understanding the link between unemployment, precarious employment and health may help answer the key question of whether precarious employment is a better option for worker well-being than unemployment, and if so, under what circumstances. Simply put, is any job better (or healthier) than no job? This issue is of special relevance for groups disproportionately affected by unemployment, such as youth, who are generally thought to benefit from certain flexibilisation strategies so as to escape unemployment (Esping-Andersen 2000b). A related issue is the extent to which the answer to this question is dependent on the level of financial protection unemployed workers are provided with, as has been suggested in previous studies (Artazcoz et al. 2004).

The interplay between precarious employment and unemployment may be generating vicious cycles animated by causation and health-selection: both may be cause and consequence of poor health, and are causally linked to each other. This complex relationship is difficult to unravel and requires an understanding of employment trajectories. Few studies have been performed on employment trajectories and health, possibly due to the methodological difficulties associated with describing these trajectories. There is some indication that frequent job changes may be related to increased tobacco and alcohol consumption (Metcalfe et al. 2003), and to worse self-rated health (Virtanen et al. 2005), while stable trajectories are associated to less psychological distress (Virtanen et al. 2005).

Precarious employment is frequently linked to a “precarious employment trajectory” which combines precarious employment and unemployment. Precarious employment relationships that form part of, and reproduce a

precarious trajectory are probably of the greatest social and personal significance (Tucker 2002).

Precarious employment may also be a ‘stepping stone’ towards better quality employment. If this is so, however, does it imply that workers “on-a-path” are immune to employment precariousness given their expectations concerning the future? Does this ‘tolerance’ have a limit? It is likely that non-precarious ‘stepping stone’ jobs are well tolerated, but that precarious ‘stepping stone’ jobs come at a cost to health. It is also likely that ‘stepping stone’ jobs are better tolerated by those that have a supporting family which can cover needs that are unmet by the job (Clarke et al. 2007).

A longitudinal study is the ideal research design to address these issues. One approach is to use proxy indicators of employment precariousness available in existing databases, such as social security registers, as has been proposed in Spain for a study of disability and employment conditions (Benavides et al. 2010). At the medium-term, research should ideally be performed using an improved version of EPRES, previously tested for its usefulness in longitudinal research (evaluating its test-retest stability and sensitivity to change (Scientific Advisory Committee of the Medical Outcomes Trust 2002)). On the whole, adopting a dynamic approach to employment precariousness and health means requires clear concepts and measures, as have been advanced by the PRESAL project, but also the development of appropriate research methods.

Impact across social groups

Among the research questions that remain to be answered in the future is whether employment precariousness is differently associated with health across groups in different social positions and why would that be. Are

differences rooted in the cumulative vulnerability of some groups? Do they lie in different expectations regarding their labour market trajectories? Do differences lie in the way we measure employment precariousness?

Such studies will help further our understanding of the construct (and the scale). Employment precariousness may express itself differently in different groups, and these differences may or may not be captured with the current formulation of the scale. For example, some rights may be more relevant to certain groups than others: women may attribute more importance to control over their working time than men. In Spain, where women still assume most of the domestic workload, they may be more sensitive to the possibility of adapting their working time to respond to domestic demands such as child care. Thinking into the differences that may be found will also bring light into the pathways linking employment conditions and health, and to the mediating effects of contextual variables (is it the same (for health) to be precariously employed in manufacturing than in the services sector?).

The study across social groups is also necessary to document and understand the role of precarious employment as a social determinant of health inequalities. Does its role as a determinant of inequalities in health lie solely in its prevalence? Or does it lie both in its prevalence and differential effect sizes?

While more than 80% of the labour force in developed capitalist countries works in dependent employment, there are important differences within the employed workforce in the conditions under which, for example, managers, supervisors, and workers are employed. The class location of individuals within the employee population may interact with individual precariousness to produce differential health effects. Further, precarious em-

ployment may determine an expansion in the health gap between workers and managers and owners.

The same is true about gender, immigrant status, and race. In the case of gender, for example, it is still unclear to what extent the somewhat stronger association observed between employment precariousness and women's mental health may be interacting or confounded by a gendered distribution of authority within organizations. Likewise, it is of interest to understand to what extent the effects of precariousness on health may be interacting with specific features of ethnicity, immigration, age, etc.

Finally, the impact of precarious employment on the rest of family members should be explored (Benach, Muntaner 2007).

Pathways

The pathways through which precarious employment harms health have been to date mostly theoretically formulated, but remain to be studied empirically (Benach et al. 2010, Tompa et al. 2007, Quinlan, Mayhew & Bohle 2001a). Understanding pathways is important to identify the most salient aspects of precariousness for health (do they lie in material working condition? In workplace social hazards? In material deprivation?) This will allow further understanding the construct; clarifying the link between employment and working conditions, concerning safety, ergonomics, environmental and organizational conditions of work; and identifying entry points for policy. As Aronsson posed it, "*Does form of employment play an independent role, or is the higher health complaint level just a consequence of the fact that temporary employment is accompanied by poorer work conditions (physical, psychological, and/or social) and sometimes poverty?*" (Aronsson, Gustafsson & Dallner 2002)

To date evidence relating employment precariousness to working conditions to health is largely fragmented, and has addressed either one or the other part of the equation (precarious employment to working conditions, and working conditions to health), but the interplay of employment and working conditions on health is seldom studied as such.

This dissertation has not addressed issues relative to pathways, except the suggestion provided by sub-study 2, that socioeconomic position and income from work do not explain the observed association with mental health. Results may differ for other health outcomes or longer time frames, however. Future studies aiming to answer these questions have additional interest given the policy implications provided by an understanding of the influence employment conditions may have on the conditions and organization of work within a workplace, both collectively and individually. The same applies to further understanding the influence of precarious employment on living conditions and socioeconomic circumstances.

Health outcomes

While mental health is hypothesized –and previous epidemiologic evidence lends support to this hypothesis- to primarily and mainly affect workers’ mental health, this does not mean that other outcomes are not be affected by employment precariousness.

This is of interest because different outcomes, even within the mental health sphere, may signal to different vulnerable populations. For example, although women generally have a worse mental health status than men, suicide is more frequent among men. They have been described to have double the risk of suicide than women at every level of mental health (Bramness et al. 2010). The same applies for other subgroups, since the

health risks associated with employment conditions may differ according to age, being an immigrant worker, social class, etc.

Furthermore, employment precariousness sustained over time may act as a chronic stressor affecting mental health more severely, as well as metabolic, cardiovascular, or immunological functioning (Siegrist, Rodel 2006, Michie 2002, Nyberg et al. 2009).

Another health-related aspect that needs to be studied is the relationship between employment precariousness and sickness presenteeism. As was described above, temporary employment has been consistently found to be associated with lower sickness absence, which is increasingly interpreted as a sign of sickness presenteeism. Virtanen and colleagues for example found that initially lower sickness absence rates among fixed-term employees increased to the levels of their permanent co-workers when they were transferred to permanent positions (Virtanen et al. 2002). Sickness presenteeism may be a cause of slow recuperation, deterioration of health status and long term disability (Bergstrom et al. 2009).

Macro-economic context and the economic crisis

Different labour market contexts are likely to modify the extension and degree of employment precariousness in the workforce. It is yet unclear, however, whether variations in the unemployment rate, or the share of temporary employment for example, will only affect the *prevalence* of employment precariousness, or may modify its health effects as well. Today, it is both timely and necessary to study these relationships.

In Spain, the current economic crisis is shifting many precarious workers into unemployment, with a steep increase in unemployment, currently at 20%, and a steep fall in the share of temporary employment. This how-

ever, is unlikely to be reflecting an actual reduction in employment precariousness. Instead, high unemployment limits workers bargaining power collectively and individually: amidst a crisis, unions are incapable to counter, or are pushed by high unemployment rates to accept labour market reforms which tend to increase precariousness of employment (Rodgers 1989, Prieto 1999).

At the individual level, many “survivors” will feel insecure about their jobs, and as is known, will accept a decline in employment and working conditions in order to keep them. This may increase their sense of vulnerability, hinder their capacity to exercise workplace rights, to take sick leave when ill, and, together with a likely reduction in workforce size, will probably result in an overall increase in work intensity (Fenwick, Tausig 1994).

Such a study should not only focus on employment precariousness, but should consider the interplay between employment precariousness and unemployment as discussed above.

8.4. Policy implications

Research into the health effects of employment conditions is scarce if one considers their centrality for the well-being of society and its members, and their strong link to, and dependence on, politics, political forces, and policy-making (Rubery, Grimshaw 2003). As labour markets become more flexible, the employment conditions of workers depend more and more on their individual bargaining power, leaving those with fewer bargaining resources to take the most precarious jobs. The market itself cannot be expected to regulate employment in a manner that is fair nor ap-

appropriate for health, so which policies are made and how they are defined is a crucial issue.(Benach et al. 2010b)

This study, as part of the longer-term research programme on precarious employment and health, aims to take our understanding of precarious employment and its health consequences one step further, and to shed some more light on why employment conditions are a matter of public health concern.

From a public health policy perspective, at least three major lines of action can be pointed at. First, and framed in a “health in all policies” approach, awareness should be raised among policy makers and the general public about the costs for people’s health that may be stemming from their labour market experience. This is very relevant today in Spain, where unemployment levels reaching beyond 20% of the workforce can only lead to assume that employment precariousness is also growing. Additional studies, with similar and different research designs, would lend stronger support to the notion that precarious employment is indeed noxious for health.

A second relevant course of action deals with the need to *“evaluate and register the adverse effects of interventions implemented, such as those implemented on the labour market”* (Borrell, Artazcoz 2008). Public health professionals should aim to provide with a way to monitor and evaluate the impact of employment policies and programmes on the health status of the working population in general, and on different sub-groups in particular (Puig 2009). Here, the PRESAL research program can make important contributions in expertise, research evidence, and an instrument that could be adapted for evaluative research or surveillance purposes.

A third focus for policy refers to social health inequalities stemming from employment conditions. *“To reduce health inequalities between different groups, the aim is to increase the health of the underprivileged and not to reduce inequality by lowering the level of health of the more privileged groups”* (Borrell, Artazcoz 2008). The graded, and seemingly exponential, relationship between employment precariousness and poor mental health described in this study suggests that in fact a dual strategy of “prevention” may be undertaken (Rose 1992): one to reduce precariousness generally, another to protect subjects at high risk,

On the one hand, groups with high levels of precariousness and high proportions of their poor mental health being –potentially- attributable to it, need policies that can counter the precariousness of the jobs that they can access through the labour market. For the most precarious workers, unemployment insurance benefits for example are held to be a very sensitive issue (together possibly with active labour market policies) (Green 2009).

On the other hand, an overall reduction in the population levels of precariousness can contribute to a general improvement in employment conditions and wellbeing. And big efforts should be invested in preventing a deeper penetration of precariousness into employment relations. A shift of the population distribution towards higher degrees precariousness would see many more people falling into the “high precariousness” range, probably at a high cost for mental health (Rose 1992). This is specially true given the “contagious” nature of employment relations: the more employment precariousness is allowed to grow, the more it spreads to all sectors of the labour force, in a sort of “snow-ball” effect (Rubery 2006), to the extent that inequalities could be reduced by “lowering the standards of the more privileged groups”. Reducing and stopping the expansion of employment precariousness could be worded as a sanitary goal.

Many policy alternatives could be discussed in order to fulfil this “low risk strategy”, and which are beyond the focus of this study. Among them, employment protection legislation is said to be in the interest of workers in stable employment (Green 2009). But a more universal approach lays with the welfare state, which can guarantee income stability to all. At the far end of distal determinants are macroeconomic policies pursued by the state and the political power of social actors. All of these are far beyond the scope of public health action, but again, the role should be to raise awareness.

Finally, the gendered-segregation of labour, with women filling more precarious “women’s” jobs, will require pro-gender equity regulation plus a strong welfare estate with active public policies that offer care services on an equalitarian basis (public and not expensive private services). This can allow many women to overcome problems of work-life conflict, work overload, and involuntary part-time or temporary jobs (Artazcoz, Escribaga & Cortes 2004). Organization’s employment policies would expectedly be modified too, as a response to such external changes (Rubery 2006).



9. CONCLUSION

“...any emancipatory social science faces three basic tasks: elaborating a systematic diagnosis and critique of the world as it exists; envisioning viable alternatives; and understanding the obstacles, possibilities, and dilemmas of transformation. In different times and places one or another of these may be more pressing than others, but all are necessary for a comprehensive emancipatory theory.”
E.O. Wright, 2010

Several conclusions emerge from the study reported in this dissertation. First, the Employment Precariousness Scale demonstrated good metric properties and suitability for use both among permanent and temporary workers, and showed that a multidimensional approach to precarious employment is feasible in survey research. This improves our opportunities to advance epidemiological and public health research on precarious employment and health.

Second, employment precariousness appeared significantly associated with poor mental health: the prevalence of poor mental health in subjects in the highest quintile of employment precariousness was more than double the prevalence of poor mental health in subjects in the lowest quintile, even after controlling for social position, or social location, on axes of marked labour market inequality. The extent to which this association is causal remains to be studied in the future.

Third, employment precariousness showed a graded, or dose-response, association with poor mental health. Besides lending some support to there being a causal component in the observed associations, this implies that if precarising processes deepen and the distribution of employment

precariousness in the population shifts towards higher values, the public's mental health may be seriously affected. We do not have enough knowledge about employment precariousness yet so as to make firm predictions, but the study results do call for our attention.

Fourth, employment precariousness proved to be highly prevalent in the Spanish workforce, affecting both temporary and permanent employees. Roughly 48% of the study sample reported some level of precariousness, and almost 7% reported high employment precariousness. This exceeds the proportion of temporary workers in the workforce, normally taken as an indicator of the extension of precarious employment.

Fifth, the distribution of employment precariousness is highly unequal, with groups in positions of social and labour market disadvantage being affected the most. Young immigrant women in manual occupations exhibited a prevalence of nearly 90%, in stark contrast with adult Spanish men in non-manual occupations, whose prevalence was roughly 8%. The most precarious groups not only had a higher prevalence of employment precariousness, but also had a higher relative prevalence of high employment precariousness.

Sixth, given the high prevalence of employment precariousness and its strong association with poor mental health, the proportion of cases of poor mental health in the Spanish workforce that could be attributable to employment precariousness is also high. These results must be taken with caution because a causal relationship cannot be assumed. However, even in the event that only 50% of the observed association was found to be causal, the results raise concern: almost 12% of poor mental health overall, and up to 25% in the most precarious groups, could be attributable to precarious employment.

A final -and unsurprising- conclusion is that the implementation of pre-carising employment policies has a significant potential to affect health. The public health community should strive to place the public's health on the debate about policies that may damage it or hamper labour market opportunities. Also, public health might try to use labour market polices to improve the health of the public.



APPENDIXES

Appendix I

EMPLOYMENT PRECARIOUSNESS SCALE (EPRES)

Subscale / Items	Response scales
TEMPORARINESS	
1- The duration of your contract is	(0) Permanent contract (1) 1 year or more (2) Temporary, non-fixed term (3) Between 6 and less than 12 months (4) Less than 6 months
2- During the last twelve months, how long did you work under temporary contracts?	(0) Did not work under temporary contracts (1) For less than 2 months (2) Between 2 and 3 months (3) Between 3 and 6 months (4) Between 6 and 12 months
DISEMPOWERMENT	
How did you settle the following employment conditions?	
3- Workplace schedule	(0) By collective agreement
4- Weekly working hours	(1) By the employer
5- Wages or salary	(2) Doesn't know
VULNERABILITY	
In relation to the way you are treated at work, can you tell me whether...	
6- You feel afraid to demand better working conditions	(4) Always
7- You feel defenceless towards unfair treatment by your superiors	(3) Many times
8- You feel afraid of being fired for not doing what your are asked to do	(2) Sometimes
9- You are treated in a discriminatory and unjust manner	(1) Only one time
10- You are treated in a authoritarian and violent manner	(0) Never
11- You are made to feel you can be easily replaced	
WAGES	
12- Does your current salary allow you to cover your basic needs?	(3) Not at all (2) A little (1) A good amount (0) Very much
13- Does your current salary allow you to cover unexpected expenses?	(4) Never (3) Maybe once (2) Sometimes (1) Many times (0) Always
14- How much is your take home (net) monthly wage or salary?	(4) 451 € or less (3) 452 € to 751€ (2) 752 € to 1503 € (1) 1504 € to 2405 € (0) More than 2406 €
RIGHTS	
Of the following benefits, which do you have a right to...	
15- Paid vacations	(0) Yes
16- Pension	(1) No
17- Severance pay	(2) Doesn't know
18- Maternity / paternity leave	
19- Day off for family or personal reasons	
20- Weekly holidays	
21- Unemployment benefit / compensation	
EXERCISE RIGHTS	
Indicate how often you can exercise the following rights without obstacles...	
22- Weekly holidays	(4) Never
23- Take sick leave	(3) Only one time
24- Go to the doctor	(2) Sometimes
25- Take vacations	(1) Many times
26- Request a day off for family or personal reasons when needed	(0) Always

Subscale scores are computed as simple averages and transformed into a 0-4 scale. The overall EPRES score is the arithmetic mean of the six subscale scores.

Appendix II

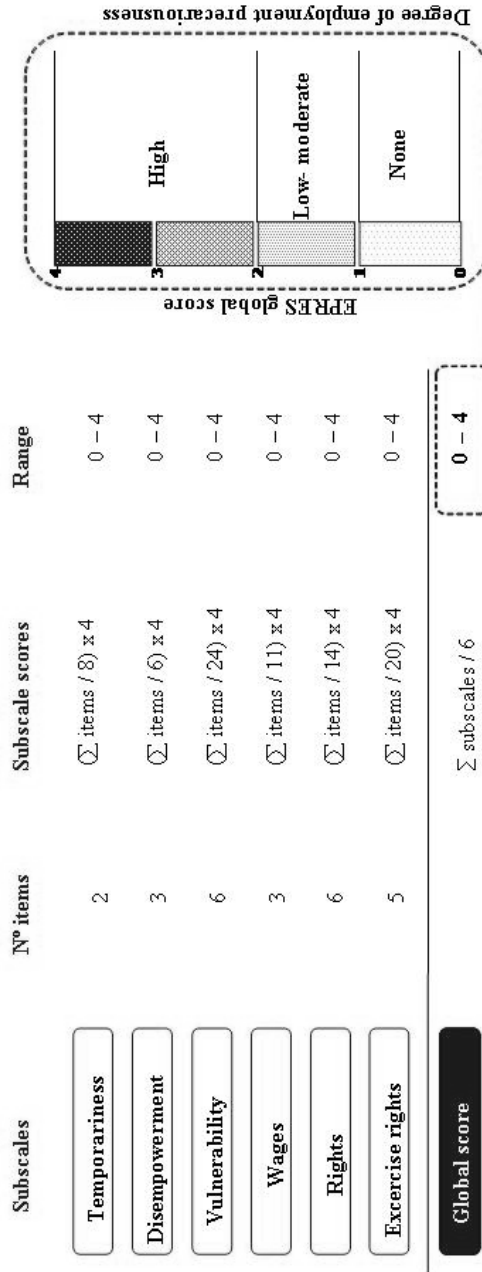


Figure II.1 Computation of the EPRES global score and cut-off scores.

Table II.1 Mean, standard deviation (SD), and observed range of scores for Wages and the global EPRES score: comparison of scores when Wages is constructed with all three items or with two items after removing ‘monthly wage’.[†]

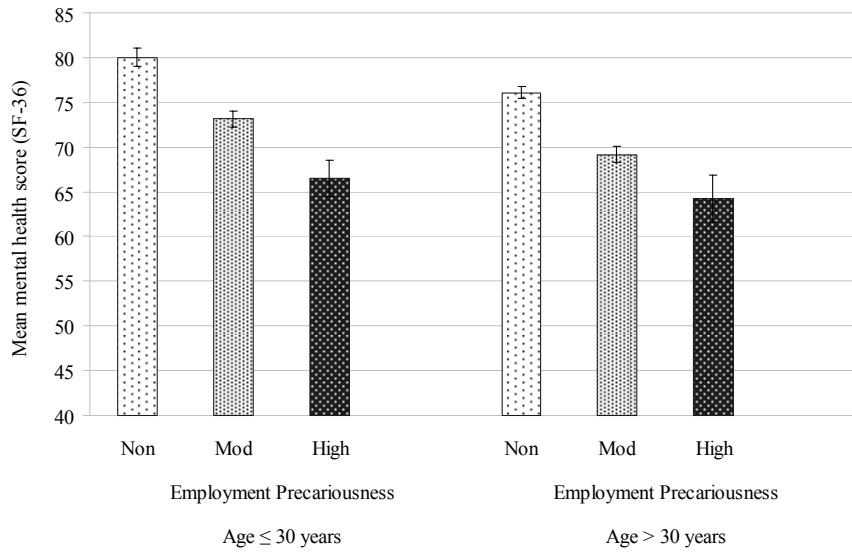
	N	Mean	SD	Range		Spearman correlations
				Min.	Max.	
Wages						0.87
3 items	6281	2.16	0.72	0	4.00	
2 items	6281	2.15	0.93	0	4.00	
Global EPRES						0.97
26 items	6136	1.09	0.55	0	3.48	
25 items	6136	1.09	0.56	0	3.48	

[†] Only subjects who responded to the “monthly wage” item are included, so that the same subjects are compared with both calculations.

Table II.2 Comparison of the distribution of study subjects across quintiles of the global EPRES score: comparison when computed with Wages constructed with three or two items (removing monthly wage).

		Wages (2 items)					Total
		≤0.60	0.61-0.85	0.86-1.14	1.15-1.55	≥ 1.56	
Wages (3 items)	≤ 0.63	1113	115	0	0	0	1228
	0.64-0.86	59	1011	156	0	0	1226
	0.87-1.14	0	81	1017	129	0	1227
	1.15-1.57	0	0	62	1087	78	1227
	≥ 1.58	0	0	0	29	1199	1228
Total		1172	1207	1235	1245	1277	6136

Figure II.2 Mean SF-36 mental health scores across levels of employment precariousness and age group.



Appendix III

Table III.1 Item descriptive statistics

Item	Missing (%)	Mean	SD	Response value frequency					Total
				0	1	2	3	4	
Scale: Temporariness									
Duration of current contract	0.1	0.64	1.18	5147	313	655	567	276	6958
Months under temporary contracts	0.4	0.85	1.53	5138	173	187	388	1052	6938
Scale: Disempowerment									
Settle workplace schedule	0.1	0.76	0.57	2184	4288	491			6963
Settle weekly working hours	0.1	0.76	0.58	2240	4178	545			6963
Settle wages or salary	0.1	0.75	0.58	2245	4221	496			6962
Scale: Vulnerability									
Afraid to demand better working conditions	0.1	0.64	1.02	4546	1000	913	357	144	6960
Defenceless towards unfair treatment	0.1	0.49	0.94	5060	894	594	299	113	6960
Afraid of being fired for not doing...	0.2	0.57	1.00	4809	928	742	330	147	6956
Treated in a discriminatory and unjust manner	0.1	0.31	0.74	5652	669	426	180	32	6959
Treated in a authoritarian and violent manner	0.2	0.26	0.69	5887	546	345	136	38	6952
Made to feel easily replaceable	0.1	0.48	0.93	5123	896	548	245	147	6968

Table III.1 cont. ...

Scale: Wages										
Cover basic needs?	0.1	1.45	0.71	546	3094	2956	365	6961		
Allow for unexpected expenses?	0.1	2.30	1.07	449	1093	2336	2265	816	6959	
Monthly take home (net) wage or salary	9.4	2.17	0.68	68	566	4143	1288	245	6310	
Scale: Rights										
Paid holiday	0	0.16	0.49	6064	676	228		6968		
Pension	0.04	0.44	0.71	4785	1301	879		6965		
Severance pay	0.01	0.29	0.61	5520	873	574		6967		
Maternity / paternity leave	0.1	0.43	0.73	4934	1041	988		6963		
Day off for family or personal reasons	0.04	0.54	0.75	4303	1585	1077		6965		
Weekly holidays	0.1	0.26	0.57	5639	858	464		6961		
Unemployment benefit / compensation	0.1	0.20	0.52	5979	598	386		6963		
Scale: Exercise rights										
Weekly holidays	0.5	1,16	1.43	3601	874	1000	670	790	6935	
Sick leave	0.4	0.74	1.15	4423	899	849	527	244	6942	
Go to the doctor	0.4	0.71	1.10	4428	958	891	468	197	6942	
Holiday	0.5	1.15	1.33	3389	896	1376	741	528	6930	
Day off for family or personal reasons	0.4	1.00	1.25	3668	996	1179	770	324	6937	

Source: Picosocial Work Environment Survey. Spain, 2004-2005.

Table III. 2 Inter-item Spearman correlation coefficients within each subscale.

Scale: Temporariness						
1	Duration of current contract	1	0.809*			
2	Months under temporary contracts	0.809*	1			
Scale: Disempowerment						
1	Settle workplace schedule	1	0.868*	0.846*		
2	Settle weekly working hours	0.868*	1	0.856*		
3	Settle wages or salary	0.846*	0.856*	1		
Scale: Vulnerability						
1	Afraid to demand better...	1	0.644*	0.700*	0.511*	0.470*
2	Defenceless towards unfair ...	0.644*	1	0.634*	0.657*	0.600*
3	Afraid of being fired for not...	0.700*	0.634*	1	0.541*	0.486*
4	Treated in discriminat. & unjust...	0.511*	0.657*	0.541*	1	0.737*
5	Treated in authorit. & violent...	0.470*	0.600*	0.486*	0.737*	1
6	Made to feel easily replaceable	0.562*	0.632*	0.591*	0.627*	0.613*
Scale: Wages						
1	Wages cover basic expenses	1	0.642*	0.333*		
2	Cover unexpected expenses	0.642*	1	0.341*		
3	Monthly take home (net) wage....	0.333*	0.341*	1		

Table III.2 cont...

Scale: Rights	1	2	3	4	5	6	7
1 Paid holiday	1	0.362*	0.472*	0.385*	0.292*	0.363*	0.412*
2 Pension	0.362*	1	0.432*	0.414*	0.239*	0.244*	0.423*
3 Severance pay	0.472*	0.432*	1	0.483*	0.388*	0.298*	0.567*
4 Maternity / paternity leave	0.385*	0.414*	0.483*	1	0.491*	0.319*	0.389*
5 Day off for family or personal...	0.292*	0.239*	0.388*	0.491*	1	0.376*	0.315*
6 Weekly holidays	0.363*	0.244*	0.298*	0.319*	0.376*	1	0.339*
7 Unemployment benefit....	0.412*	0.423*	0.567*	0.389*	0.315*	0.339*	1

Scale: Exercise rights	1	2	3	4	5
1 Weekly holidays	1	0.503*	0.466*	0.557*	0.531*
2 Sick leave	0.503*	1	0.841*	0.563*	0.673*
3 Go to the doctor	0.466*	0.841*	1	0.566*	0.727*
4 Holiday	0.557*	0.563*	0.566*	1	0.683*
5 Day off for family or personal...	0.531*	0.673*	0.727*	0.683*	1

Source: Psicosocial Work Environment Survey, Spain, 2004-2005. * Correlation significant at the 0.01 level (bilateral).

Table III.3 Multitrat/multi-item matrix.

Item	Spearman item-scale correlations*					
	T	D	V	W	R	E
Scale: Temporariness (T)						
Duration of current contract	0.81	0.07	0.16	0.21	0.24	0.14
Months under temp. contracts	0.81	0.08	0.19	0.20	0.27	0.19
Scale: Disempowerment (D)						
Settle workplace schedule	0.08	0.89	0.12	0.16	0.21	0.14
Settle weekly working hours	0.09	0.90	0.09	0.14	0.2	0.13
Settle wages or salary	0.08	0.88	0.1	0.13	0.19	0.13
Scale: Vulnerability (V)						
Afraid to demand better...	0.16	0.10	0.71	0.16	0.15	0.33
Defenceless towards unfair ...	0.13	0.10	0.79	0.13	0.14	0.33
Afraid of being fired for not...	0.18	0.10	0.72	0.17	0.16	0.31
Treated in discrim. & unjust...	0.11	0.11	0.76	0.11	0.12	0.3
Treated in authorit. & violent...	0.09	0.11	0.71	0.09	0.12	0.31
Made to feel easily replaceable	0.20	0.11	0.72	0.18	0.17	0.33
Scale: Wages (W)						
Wages cover basic expenses	0.15	0.11	0.15	0.65	0.16	0.16
Cover unexpected expenses	0.18	0.11	0.15	0.62	0.18	0.12
Monthly take home (net) wage..	0.25	0.19	0.18	0.37	0.27	0.16
Scale: Rights (R)						
Paid holiday	0.21	0.18	0.18	0.21	0.55	0.25
Pension	0.23	0.09	0.1	0.16	0.49	0.14
Severance pay	0.23	0.15	0.15	0.17	0.62	0.25
Maternity / paternity leave	0.22	0.15	0.15	0.16	0.6	0.27
Day off for family or personal..	0.22	0.2	0.11	0.2	0.52	0.33
Weekly holidays	0.12	0.18	0.14	0.14	0.46	0.35
Unemployment benefit....	0.11	0.14	0.12	0.15	0.57	0.24
Scale: Exercise rights (E)						
Weekly holidays	0.10	0.10	0.23	0.09	0.23	0.56
Sick leave	0.14	0.11	0.34	0.14	0.27	0.75
Go to the doctor	0.15	0.10	0.33	0.11	0.25	0.76
Holiday	0.20	0.13	0.33	0.18	0.32	0.68
Day off for family or personal...	0.16	0.12	0.31	0.13	0.30	0.76

* All correlations significant at the 0.01 level (bilateral). Boxed correlations are corrected for overlap, ie., the relevant item was removed from its scale for correlation. Boxed correlations are hypothesized to be the highest in each row.

Table III.4 Mean global EPRES score (corrected for overlap)* across item response categories. Spain, 2004-2005.

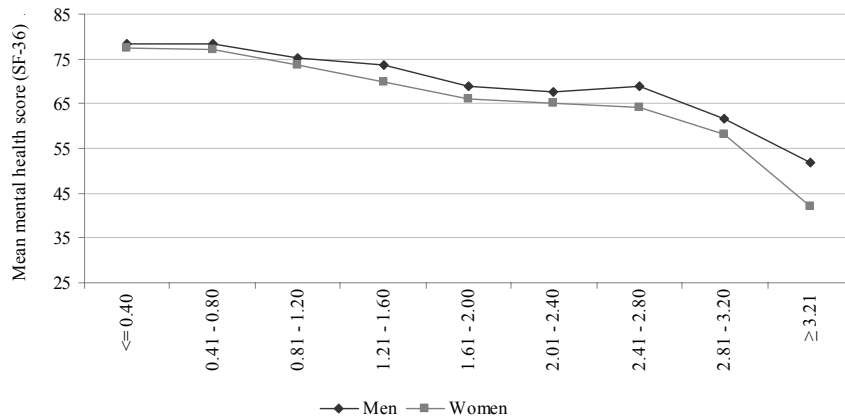
Item	Mean employment precariousness					p value‡
	0	1	2	3	4	
Scale: Temporary contract						
Duration of current contract	1.04	1.31	1.39	1.50	1.51	<0.001
Months under temp. contracts	1.03	1.55	1.46	1.51	1.42	<0.001
Scale: Disempowerment						
Settle workplace schedule	0.83	1.04	1.27			<0.001
Settle weekly working hours	0.84	1.04	1.22			<0.001
Settle wages or salary	0.85	1.03	1.27			<0.001
Scale: Vulnerability						
Afraid to demand better...	1.08	1.34	1.46	1.51	1.69	<0.001
Defenceless towards unfair ...	1.10	1.35	1.52	1.57	1.70	<0.001
Afraid of being fired for not...	1.08	1.36	1.46	1.59	1.64	<0.001
Treated in discrim. & unjust...	1.13	1.39	1.60	1.63	1.76	<0.001
Treated in authorit. & violent...	1.14	1.43	1.60	1.63	1.89	<0.001
Made to feel easily replaceable	1.08	1.39	1.62	1.66	1.66	<0.001
Scale: Wages						
Wages cover basic expenses	0.67	0.75	0.99	1.11		<0.001
Cover unexpected expenses	0.62	0.69	0.82	0.94	1.15	<0.001
Monthly take home (net) wage..	0.56	0.64	0.80	0.89	1.20	<0.001
Scale: Rights						
Paid holiday	1.08	1.67	1.86			<0.001
Pension	1.07	1.33	1.39			<0.001
Severance pay	1.06	1.47	1.63			<0.001
Maternity / paternity leave	1.04	1.42	1.48			<0.001
Day off for family or personal..	1.00	1.37	1.51			<0.001
Weekly holidays	1.07	1.53	1.55			<0.001
Unemployment benefit....	1.10	1.39	1.69			<0.001
Scale: Exercise rights						
Weekly holidays	0.99	1.10	1.25	1.25	1.30	<0.001
Sick leave	0.98	1.45	1.35	1.45	1.52	<0.001
Go to the doctor	0.98	1.13	1.38	1.47	1.46	<0.001
Holiday	0.96	1.06	1.25	1.38	1.52	<0.001
Day off for family or personal...	0.95	1.11	1.31	1.34	1.51	<0.001

Source: Psicosocial Work Environment Survey. * Corresponding subscale was removed from global EPRES for mean estimation. ‡ ANOVA test for linear trends.



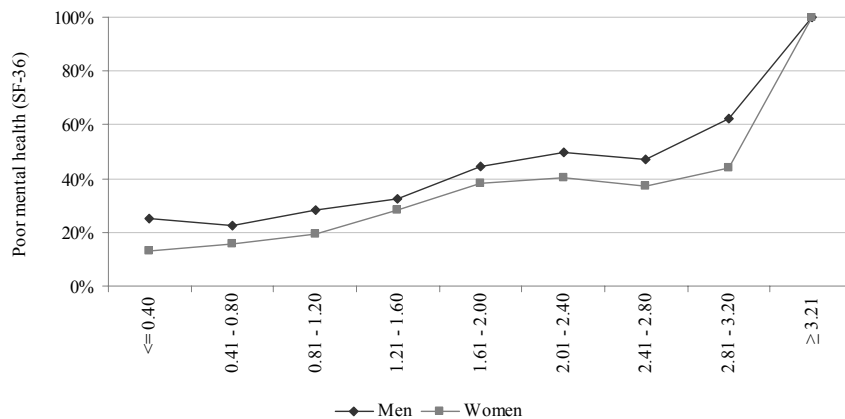
Appendix IV:

Figure IV.1 Mean mental health score (SF-36) according to level of employment precariousness (EPRES).[†] Waged and salaried women and men. Spain, 2004-2005.



Anova: weighted test for linear term: women $p < 0.001$; men $p < 0.001$. Weighted test for quadratic term: women $p = 0.839$; men $p = 0.249$.

Figure IV.2 Prevalence of poor mental health (SF-36) according to level of employment precariousness (EPRES).[†] Waged and salaried women and men. Spain, 2004-2005.



Anova: weighted test for linear term: women $p < 0.001$; men $p < 0.001$. Weighted test for quadratic term: women $p = 0.759$; men $p = 0.009$.

Table IV.1 Age adjusted linear regression of SF-36 mental health score (continuous) on EPRES sub-scale scores (continuous). Waged and salaried workers (n=6948). Spain, 2004-2005.

	Unstandardized coefficients		Standardized coefficients	t	Sig.	95% confidence interval for B	
	B	Std. Error				Beta	Lower bound
Temporariness	(Constant)	80.746	0.859	94.039	<0.000	79.063	82.429
		-1.510	0.178	-8.484	<0.000	-1.858	-1.161
Disempowerment	(Constant)	79.832	0.848	94.139	<0.000	78.170	81.495
		-1.247	0.194	-6.442	<0.000	-1.626	-0.867
Vulnerability	(Constant)	83.351	0.744	111.974	<0.000	81.892	84.810
		-8.711	0.273	-31.866	<0.000	-9.247	-8.175
Wages	(Constant)	83.897	1.050	79.940	<0.000	81.839	85.954
		-2.547	0.286	-8.906	<0.000	-3.108	-1.986
Rights	(Constant)	79.230	0.826	95.894	<0.000	77.611	80.850
		-1.469	0.254	-5.787	<0.000	-1.967	-0.971
Excercise rights	(Constant)	82.217	0.814	101.061	<0.000	80.622	83.812
		-3.355	0.207	-16.200	<0.000	-3.761	-2.949

Dependent Variable: Mental health score (SF-36)

Table IV.2 Prevalence proportion ratios (95% CI) of poor mental health according to quintiles of employment precariousness. Waged and salaried women (n=2709) and men (n=2970). Spain 2004-2005. [Data correspond to Figure 2 in the manuscript “Employment precariousness and poor mental health: evidence from the Spanish labour market”.]

	Quintiles of employment precariousness				
	2	3	4	5	
Men					
Model 1	0.99 (0.83 - 1.20)	1.25 (1.05 - 1.49)	1.33 (1.11 - 1.60)	2.33 (1.98 - 2.74)	
Model 2	1.00 (0.83 - 1.21)	1.24 (1.04 - 1.49)	1.32 (1.09 - 1.60)	2.32 (1.95 - 2.76)	
Model 3	1.00 (0.83 - 1.21)	1.24 (1.03 - 1.49)	1.31 (1.08 - 1.59)	2.23 (1.86 - 2.68)	
Women					
Model 1	1.00 (0.75 - 1.34)	1.37 (1.05 - 1.79)	1.81 (1.41 - 2.33)	2.74 (2.16 - 3.48)	
Model 2	1.02 (0.76 - 1.37)	1.41 (1.07 - 1.85)	1.85 (1.42 - 2.41)	2.76 (2.14 - 3.57)	
Model 3	1.01 (0.75 - 1.36)	1.39 (1.05 - 1.82)	1.78 (1.37 - 2.32)	2.54 (1.95 - 3.31)	

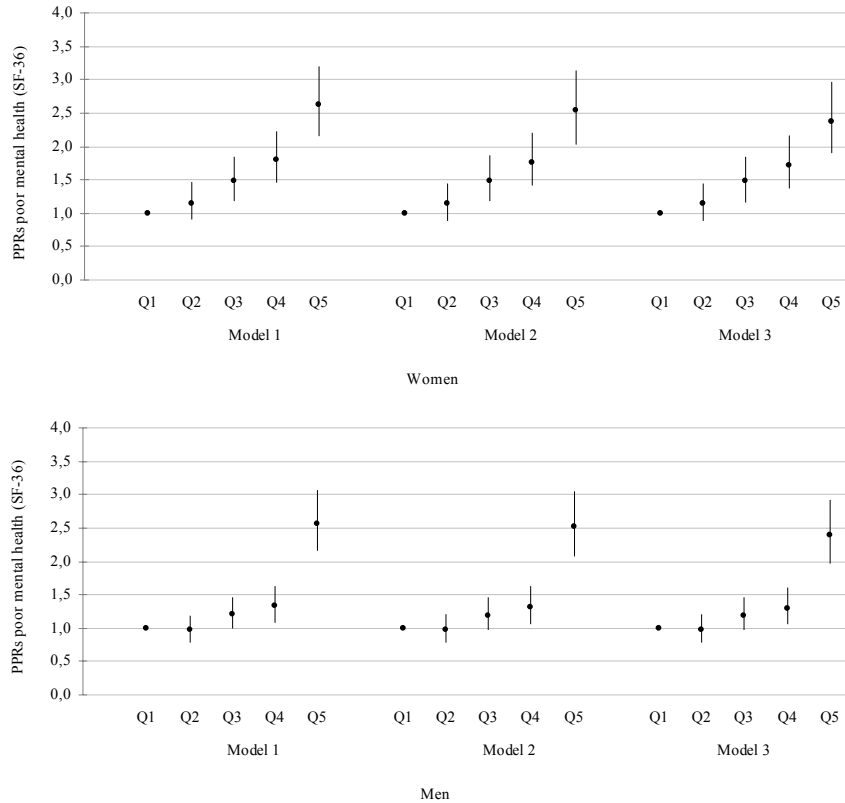
Quintile 1 = reference (not shown). Model 1: adjusted for age (continuous). Model 2: adjusted for age, immigrant status (yes / no), educational attainment (primary or less; secondary; trade school; university), and occupational social class (SC I + II; SC III; SC IV + V). Model 3: model 2 + unemployment the previous year (yes / no).

Table IV.3 Prevalence proportion ratios (95% CI) of poor mental health (defined as the gender-specific lowest quartile of the sample distribution of mental health), according to quintiles of employment precariousness. Waged and salaried women (n=2709) and men (n=2970). Spain 2004-2005.

	Quintiles of employment precariousness				
	2	3	4	5	
Men					
Model 1	0,97 (0,79 - 1,19)	1,21 (0,99 - 1,47)	1,33 (1,08 - 1,63)	2,57 (2,16 - 3,07)	
Model 2	0,97 (0,78 - 1,20)	1,19 (0,97 - 1,46)	1,31 (1,06 - 1,63)	2,51 (2,07 - 3,04)	
Model 3	0,97 (0,78 - 1,20)	1,19 (0,97 - 1,46)	1,30 (1,05 - 1,61)	2,40 (1,96 - 2,93)	
Women					
Model 1	1,14 (0,90 - 1,45)	1,48 (1,19 - 1,85)	1,80 (1,46 - 2,22)	2,62 (2,15 - 3,20)	
Model 2	1,14 (0,89 - 1,44)	1,48 (1,18 - 1,86)	1,77 (1,42 - 2,20)	2,53 (2,04 - 3,13)	
Model 3	1,13 (0,89 - 1,44)	1,47 (1,17 - 1,85)	1,72 (1,38 - 2,15)	2,38 (1,91 - 2,96)	

Quintile 1 = reference (not shown). Model 1: adjusted for age (continuous). Model 2: adjusted for age, immigrant status (yes / no), educational attainment (primary or less; secondary; trade school; university), and occupational social class (SC I + II; SC III; SC IV + V). Model 3: model 2 + unemployment the previous year (yes / no).

Figure IV.3 Prevalence proportion ratios (95% CI) of poor mental health (defined as the gender-specific lowest quartile of the sample distribution of mental health), according to quintiles of employment precariousness. Waged and salaried women and men, Spain 2004-2005.



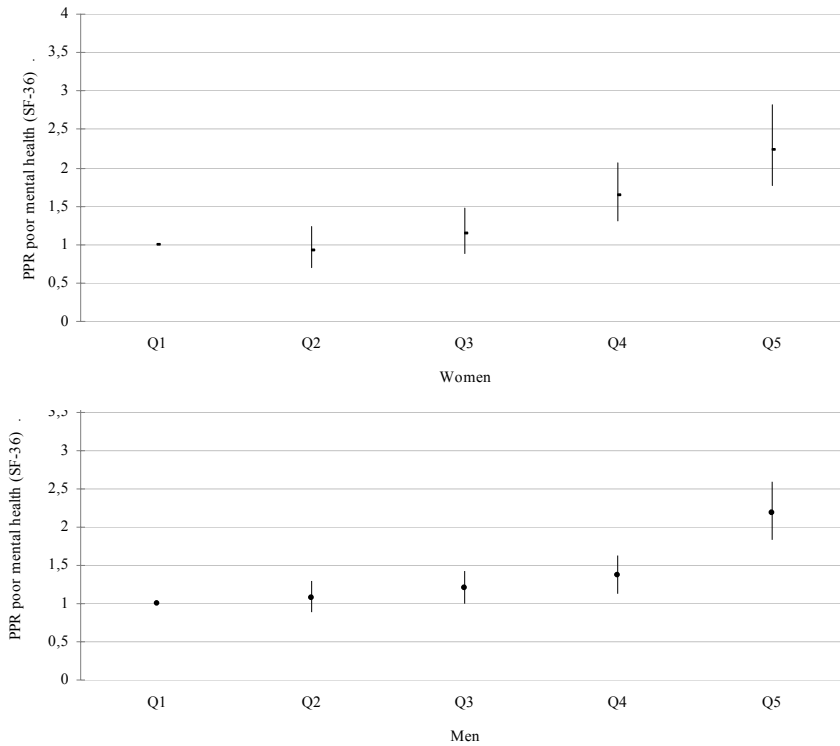
§ Model 1: adjusted for age (continuous). Model 2: adjusted for age, immigrant status (yes / no), educational attainment (primary or less; secondary; trade school; university), and occupational social class (SC I + II; SC III; SC IV + V). Model 3: model 2 + unemployment the previous year (yes / no).

Table IV.4 Fully adjusted[§] prevalence proportion ratios (95% CI) of poor mental health according to quintiles of employment precariousness. Employment precariousness calculated without the ‘wages’ subscale and model adjusted for monthly income. Waged and salaried women (n=2709) and men (n=2970). Spain 2004-05.

	Quintiles of employment precariousness				
	2	3	4	5	5
Men	1,07 (0,89 - 1,3)	1,20 (1 - 1,43)	1,36 (1,14 - 1,63)	2,18 (1,83 - 2,59)	
Women	0,92 (0,7 - 1,23)	1,14 (0,88 - 1,48)	1,65 (1,31 - 2,07)	2,23 (1,77 - 2,81)	

Quintile 1= reference (not shown). [§] Adjusted for age (continuous), immigrant status (yes / no), educational attainment (primary or less; secondary; trade school; university), occupational social class (SC I + II; SC III; SC IV + V) and unemployment the previous year (yes / no).

Figure IV.4 Fully adjusted[§] prevalence proportion ratios (95% CI) of poor mental health according to quintiles of employment precariousness. Employment precariousness calculated without the ‘wages’ subscale and model adjusted for monthly income. Waged and salaried women (n=2709) and men (n=2970). Spain 2004-2005.



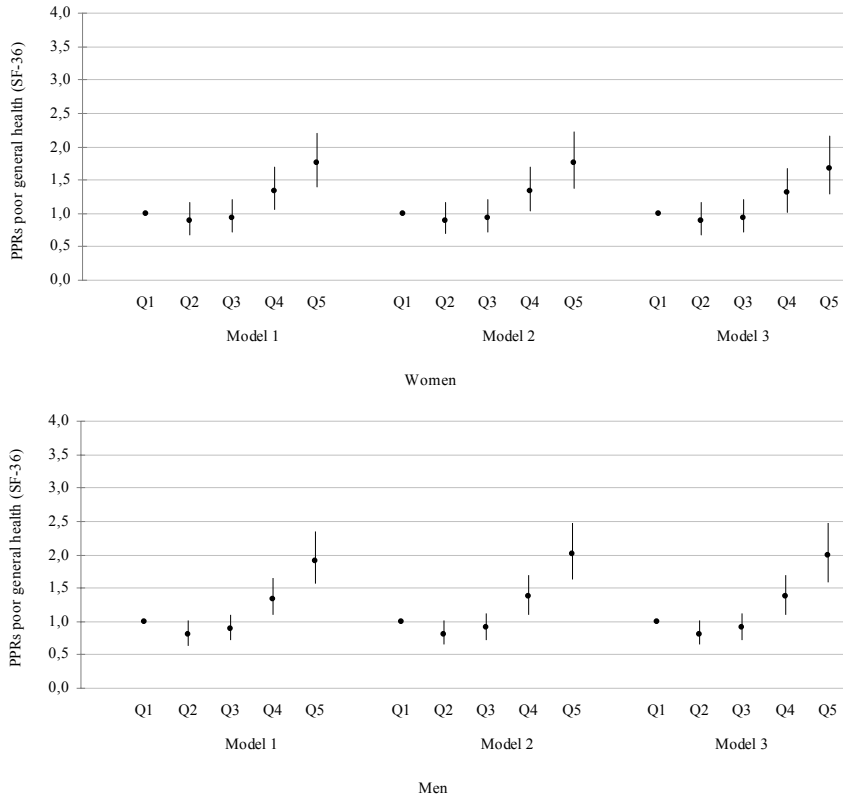
[§] Adjusted for age (continuous), immigrant status (yes / no), educational attainment (primary or less; secondary; trade school; university), occupational social class (SC I + II; SC III; SC IV + V) and unemployment the previous year (yes / no).

Table IV.5 Prevalence proportion ratios (95% CI) of poor general health[†] according to quintiles of employment precariousness. Waged and salaried women (n=2709) and men (n=2970). Spain 2004-2005.

	Quintiles of employment precariousness				
	2	3	4	5	5
Men					
Model 1	0.81 (0.64 - 1.01)	0.89 (0.71 - 1.11)	1.34 (1.09 - 1.65)	1.91 (1.56 - 2.34)	
Model 2	0.81 (0.65 - 1.02)	0.90 (0.72 - 1.13)	1.37 (1.1 - 1.7)	2.00 (1.62 - 2.48)	
Model 3	0.81 (0.65 - 1.02)	0.90 (0.72 - 1.13)	1.37 (1.1 - 1.69)	1.98 (1.59 - 2.47)	
Women					
Model 1	0.89 (0.68 - 1.16)	0.93 (0.72 - 1.20)	1.33 (1.05 - 1.69)	1.76 (1.4 - 2.21)	
Model 2	0.90 (0.69 - 1.17)	0.93 (0.71 - 1.21)	1.32 (1.04 - 1.69)	1.75 (1.37 - 2.23)	
Model 3	0.89 (0.68 - 1.17)	0.92 (0.71 - 1.21)	1.30 (1.02 - 1.67)	1.67 (1.3 - 2.16)	

[†] Poor general health defined as a score below the 25th percentile of the Spanish norm for the individual's sex and age. Quintile 1 = reference (not shown). Model 1: adjusted for age (continuous). Model 2: adjusted for age, immigrant status (yes / no), educational attainment (primary or less; secondary; trade school; university), and occupational social class (SC I + II; SC III; SC IV + V). Model 3: model 2 + unemployment the previous year (yes / no).

Figure IV.5 Prevalence proportion ratios (95% CI) of poor general health[†] according to quintiles of employment precariousness. Waged and salaried women (n=2709) and men (n=2970). Spain 2004-2005.



[†] Poor general health defined as a score below the 25th percentile of the Spanish norm for the individual's sex and age. Model 1: adjusted for age (continuous). Model 2: adjusted for age, immigrant status (yes / no), educational attainment (primary or less; secondary; trade school; university), and occupational social class (SC I + II; SC III; SC IV + V). Model 3: model 2 + unemployment the previous year (yes / no).

Table IV.6 Age-adjusted linear regression of SF-36 mental health score (continuous) on EPRES sub-scale scores (continuous), separately for women (n=2709) and men (n=2970). Waged and salaried workers. Spain, 2004-2005.

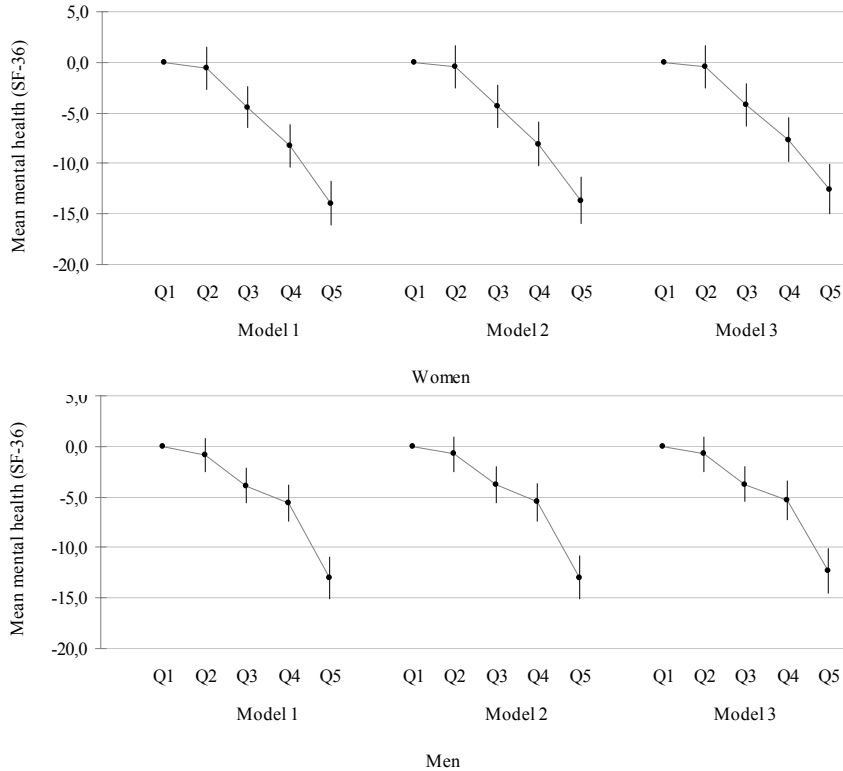
		Unstandardized coefficients		Std. Error	Standardized coefficients		t	Sig.	95% confidence interval for B	
		B			Beta				Lower bound	Upper bound
Temporariness	Women	-1.63	0.30		-0.11		-5.48	<0.001	-2.21	-1.05
	Men	-1.42	0.31		-0.09		-4.59	<0.001	-2.03	-0.81
Disempowerment	Women	-1.28	0.32		-0.08		-4.05	<0.001	-1.90	-0.66
	Men	-1.66	0.29		-0.10		-5.66	<0.001	-2.23	-1.08
Vulnerability	Women	-9.11	0.45		-0.36		-20.42	<0.001	-9.98	-8.23
	Men	-9.06	0.42		-0.37		-21.36	<0.001	-9.90	-8.23
Wages	Women	-3.30	0.47		-0.13		-7.10	<0.001	-4.22	-2.39
	Men	-0.78	0.44		-0.03		-1.80	0.072	-1.64	0.07
Rights	Women	-2.98	0.45		-0.13		-6.68	<0.001	-3.85	-2.10
	Men	-0.48	0.43		-0.02		-1.14	0.256	-1.32	0.35
Excercise rights	Women	-3.51	0.34		-0.19		-10.31	<0.001	-4.17	-2.84
	Men	-3.30	0.31		-0.19		-10.53	<0.001	-3.92	-2.69

Dependent Variable: Mental health score (SF-36).

Table IV.7 Multivariable linear regression of SF-36 mental health score (continuous) on quintiles of employment precariousness (reference=quintile 1). Waged and salaried women (n=2709) and men (n=2970). Spain, 2004-2005.

	B	Unstandardized S. E	Standardized Beta	t	Sig.	95% C. I. for B
Men						
(Constant)	85.03	2.36		36.05	0.000	(80.41 - 89.66)
Quintile 2	-0.79	0.88	-0.02	-0.90	0.369	(-2.52 - 0.94)
Quintile 3	-3.73	0.92	-0.09	-4.08	0.000	(-5.53 - -1.94)
Quintile 4	-5.35	0.99	-0.12	-5.42	0.000	(-7.28 - -3.41)
Quintile 5	-12.29	1.15	-0.24	-10.67	0.000	(-14.55 - -10.03)
Age	-0.21	0.03	-0.13	-6.88	0.000	(-0.27 - -0.15)
Education	0.47	0.34	0.03	1.38	0.169	(-0.20 - 1.14)
Immigrant status	0.97	1.21	0.01	0.80	0.425	(-1.41 - 3.35)
Occupational S.C.	0.36	0.51	0.02	0.72	0.473	(-0.63 - 1.36)
Previously unemployed	-3.06	1.36	-0.04	-2.26	0.024	(-5.73 - -0.40)
Women						
(Constant)	84.22	2.66		31.62	0.000	(79.00 - 89.44)
Quintile 2	-0.42	1.07	-0.01	-0.39	0.696	(-2.52 - 1.69)
Quintile 3	-4.20	1.09	-0.09	-3.87	0.000	(-6.33 - -2.07)
Quintile 4	-7.68	1.11	-0.17	-6.91	0.000	(-9.87 - -5.50)
Quintile 5	-12.53	1.23	-0.27	-10.19	0.000	(-14.94 - -10.12)
Age	-0.25	0.04	-0.13	-7.02	0.000	(-0.32 - -0.18)
Education	0.63	0.37	0.04	1.69	0.092	(-0.10 - 1.36)
Immigrant status	-1.03	1.47	-0.01	-0.70	0.483	(-3.91 - 1.85)
Occupational S.C.	0.57	0.56	0.02	1.01	0.311	(-0.53 - 1.68)
Previously unemployed	-4.10	1.26	-0.06	-3.26	0.001	(-6.56 - -1.63)

Figure IV.6 Linear regressions of SF-36 mental health score (continuous) on quintiles of employment precariousness (reference=quintile 1). Waged and salaried women (n=2709) and men (n=2970). Spain, 2004-2005.



Model 1: adjusted for age (continuous). Model 2: adjusted for age, immigrant status (yes / no), educational attainment (primary or less; secondary; trade school; university), and occupational social class (SC I + II; SC III; SC IV + V). Model 3: model 2 + unemployment the previous year (yes / no).

Appendix V: Methodological annex

Table V.1a Sample distribution. Labour Force Survey (LFS) (2nd quarter 2005) and Psychosocial work environment Survey (PWES) (2004-2005). Spain.

		PWES	LFS
		%	%
Sex	Men	49,5	58,0
	Women	50,5	42,0
Age	16 -25 years	15,6	12,5
	26 - 35 years	33,3	30,2
	36 a 45 years	29,5	27,8
	46 - 55 years	16,3	20,2
	55 - 65 years	5,3	9,4
Type of contract	Open-ended	76,3	69,0
	Temporary	23,7	31,0
Economic sector	Economic activity	0	4,9
	(A) Agriculture, hunting and forestry	0	0,3
	(C) Mining and quarrying	2,8	0,3
	(D) Manufacturing	15,3	16,9
	(E) Electricity, gas, water supply	0,7	0,6
	(F) Construction	8,6	12,7
	(G) Wholesale, repair of motor	23,0	15,3
	(H) Hotels and restaurants	10,3	6,9
	(I) Transport, storage and	6,0	6,0
	(J) Financial intermediation	2,8	2,6
	(K) Real estate, renting and business	9,8	8,7
	(L) Public administration, defence;	4,8	6,0
	(M) Education	5,9	5,8
	(N) Health and social work	5,1	6,0
(O) Other community, social and	4,9	4,1	
(P) Activities of households	0	2,9	

Table V.1b. Sample distribution. Labour force Surrey (LFS) (2nd quarter 2005) and Psychosocial work environment Surrey (PWES) (2004-2005). Spain.

Occupation	PWES %	EPA %
A. Dirección administraciones públicas y empresas 10 o +asalariados	1,2	2,3
B. Gerencia de empresas con menos de 10 asalariados	0,6	2,7
D. Profesiones asociadas a titulaciones de 2y3 ciclo universitario	7,7	8,0
E. Profesiones asociadas a una titulación de 1ciclo universitario	3,9	5,1
F. Técnicos y profesionales de apoyo	17,2	11,7
G. Empleados de tipo administrativo	6,8	9,4
H. Trabajadores de los servicios de restauración y serv. pers.	12,9	8,1
J. Trabajadores de los servicios de protección y seguridad	1,6	1,7
K. Dependientes de comercio y asimilados	10,5	5,2
L. Trabajadores cualificados en la agricultura y la pesca	1,7	3,1
M. Trabajadores cualificados de la construcción	7,8	9,2
N. Trabajadores cualificados de las industrias extractivas.	3,9	5,2
P. Trabajadores cualificados de las industrias de las artes gr.	2,8	3,0
Q. Operadores de instalaciones industriales, de maquinaria fija	3,2	4,5
R. Conductores y operadores de maquinaria móvil	3,6	5,0
S. Trabajadores no cualificados en servicios (excepto transporte)	8,7	7,1
T. Peones de la agricultura, pesca, construcción, industrias.	5,6	6,5
Total	100	100

Table V.2 Prevalence of employment precariousness. Crude and post-stratified according to Labour Force Survey (2nd quarter of 2005). Spain.

	Degree of precariousness	EPRES score	Crude estimates		Weighted estimates	
			n	%	n	%
Overall	None	(0<1)	3704	49.9	7669516	51.7
	Low-Moderate	(1<2)	3189	42.9	6106323	41.2
	High	(2y+)	534	7.2	1046616	7.1
	Total		7427	100	14822455	100
	Missing		204		416195	
Women	Total		7631		15238650	
	None	(0<1)	1609	44.5	2793567	45.2
	Low-Moderate	(1<2)	1690	46.7	2816179	45.5
	High	(2y+)	316	8.7	576232	9.3
	Total		3615	100.0	6185978	100.0
Men	Missing		114		210485	
	Total		3729		6396463	
	None	(0<1)	2088	55.0	4875949	56.5
	Low-Moderate	(1<2)	1489	39.3	3290144	38.1
	High	(2y+)	216	5.7	470384	5.4
Total	Total		3793	100.0	8636477	100.0
	Missing		89		205710	
	Total		3882		8842187	

Appendix VI: Other products of this work

Other co-authored manuscripts

In: Benach J, Muntaner C, eds. Empleo, trabajo y desigualdades en salud: Una perspectiva global [Employment, work, and health inequalities: A global perspective]. Barcelona: Icaria editorial. 2010.

Vives A, Amable M, Ferrer M, Moncada S, Gimeno X, Llorens C, G.Benavides F, Muntaner C, Benach C. Case study 51: Employment precariousness and self-perceived health, and

Vives A, Amable M, Moncada S, Gimeno X, Llorens C, Benavides FG, Muntaner C, Benach J. Case study 21: The prevalence of precarious employment using a new multidimensional scale: the case of Spain.

Porthé, V; Ahonen, E; Vázquez, ML; **Vives, A**; Benavides, FG.; Benach, J. Les característiques de la precarietat laboral i la relació que té amb la salut de les persones immigrades. 2009. En: Secretaria per a la immigració, Generalitat de Catalunya: Recerca i immigració II.

Conferences and invited presentations

Vanroelen, C.; **Vives, A.**; Levecque, K.; Benach, J.; Louckx, F. “A conceptual model for measuring the health associations of precarious employment in Post-Fordist labour markets. A discussion paper.” BSA Work, Employment & Society Conference 2010, University of Brighton, UK.

Vives A, Ferrer M, Amable M, Llorens C, Moncada S, Muntaner C, Benavides FG, Benach J. “Precarious employment and mental health in salaried workers in Spain: A new scale of employment precariousness.” APHA 137th Annual Meeting, November 2009, Pennsylvania, USA.

Vives, A. “Employment precariousness and health in salaried workers in Spain. Using a new Employment Precariousness Scale.” Guest lecturer for the 2008-2009 EOHS Research Seminar Series at The University of Texas School of Public Health. Houston, Texas, USA. March 20th, 2009.

Vives A, Amable M, Ferrer M, Moncada S, Gimeno X, Llorens C, Muntaner C, Benavides FG, Benach J. “Estudio de validación de la escala de precariedad laboral (EPRES), cuestionario multidimensional para investigación epidemiológica.” XXVI Reunión de la Sociedad Española de Epidemiología. Girona, España 2008.

Vives A. “Precariedad laboral y salud percibida.” Proyecto de tesis doctoral. Encuentro Excelencia de la Investigación en Salud Pública. Centro de Investigación Biomédica en Red de Epidemiología y Salud Pública (CIBERESP). Septiembre 2008, Escuela de Verano de Salud Pública, Lazareto de Maó, Menorca, España.

Vives A, Amable M, Gimeno X, Moncada S, Llorens C, Muntaner C, G. Benavides F, Benach J. “A new scale of employment precariousness: preliminary findings of the prevalence of precariousness in Spain and its association with self-perceived health.” EPICOH 2008, Costa Rica.

Vives A, Amable M, Ferrer M, Moncada S, Gimeno S, Benavides FG, Benach J. “Prevalencia de exposición a precariedad laboral y salud percibida en trabajadores en España.” V Foro ISTAS de Salud Laboral: Organización del trabajo y riesgos psicosociales. Barcelona, 24 a 26 de Octubre de 2007.

Vives A, Amable M, Ferrer M, Gimeno X, Moncada S, Benavides FG, Benach J. “Precariedad laboral y salud autopercebida en trabajadores asalariados de España.” XXV Reunión de la Sociedad Española de Epidemiología. Córdoba, España 2007.

Vives A. “Employment precariousness in Spanish workers.” 2ª Conferencia Alban, 2007. Grenoble, Francia.



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