A multilevel analysis of the relationship between national economic conditions, an individual's job insecurity and well-being in Western Europe.

E. Carr[1], M Elliot[1], M. Tranmer[1]

Abstract

Are individuals more strongly affected by job insecurity when economic conditions are worse? Combining data from the European Social Survey and Eurostat, this paper considers whether national economic conditions moderate the association between job insecurity and subjective well-being. The negative association between perceived job insecurity and individual well-being is widely reported (e.g. Burchell et al., 1999; De Witte, 1999; Hartley, 1991). There is also evidence to suggest that local unemployment rates are negatively associated with individual well-being (e.g. Clark et al., 2010). Much less is known about the interaction of these variables. Job insecurity may be associated with depression (Ferrie et al., 2002) or life dissatisfaction (Lim, 1996), but how does the strength of these associations vary in the face of contrasting economic conditions? A multilevel modelling approach is used to test a single hypothesis: that the negative effect of job insecurity on subjective well-being is amplified when regional and national economic conditions are worse.

Keywords: job insecurity, life satisfaction, economic context, multilevel modelling

Introduction

Job insecurity has been shown to be detrimental for various psychological and health-related outcomes (e.g. De Witte, 1999) and family functioning (Larson et al., 1994). Given that it is widely acknowledged that the past four decades have witnessed a general increase in levels of job insecurity in Western Europe (Borg and Elizur, 1992; Burchell et al., 1999; Burke and Nelson, 1998; Hellgren et al., 1999) understanding its consequences and how they might be moderated is of social and political import. This paper focuses on the association between job insecurity and subjective well-being. In particular, to determine whether this association is moderated by national economic conditions across Western Europe. Where unemployment is higher, or where economic growth is lower, is the association between well-being and the fear of job loss stronger? The consequences of perceived insecurity will differ from one employee to the next, and there exist many variables that may moderate (alter the strength or direction of) the relationship. It has been shown, for example, that social support can act as a buffer against the negative consequences of perceived job insecurity (LaRocco et al., 1980; Lim, 1996; Näswall et al., 2005; Seers et al., 1983), as can job control and autonomy Büssing (1999). Elsewhere, Fugate et al. (2004) have shown that individuals who perceive themselves as more skilled or adaptable consequently evaluate the prospect of job loss as less harmful, or even, as an opportunity for advancement.

There are, in short, numerous factors that are likely to moderate the consequences of perceived job insecurity. From a policy perspective, unpicking these 'moderation effects' should be a priority. Understanding why some individuals are more resilient to the consequences of insecure employment than others would be instructive for policy-making. This study considers the impact of a single moderating factor: the national economic climate. As discussed below, much of the stress and anxiety

[1] Social Statistics, School of Social Sciences, University of Manchester

associated with insecure work is in part attributable to the anticipated difficulties of finding alternative employment. Highly qualified individuals or those with 'in-demand' skills (who are highly mobile in the labour market) are thought to be less affected by job insecurity, since finding a new job will be comparatively easy, compared to individuals with few qualifications or out-dated skills. Of course, the anticipated difficulties of finding a job are not solely a function of individual characteristics, and the economic context will also play a role. Where unemployment is high and jobs are scarce, finding new employment will be harder than when unemployment is lower. In this way, the perception of local economic or labour market conditions are hypothesised to moderate the consequences of job insecurity.

Hypothesis 1: The negative association between perceived job insecurity and life satisfaction will be moderated by the national economic context, such that when economic conditions are less favourable (higher unemployment, lower GDP growth) the association will be stronger.

The paper approaches this hypothesis using a multilevel framework to consider whether national differences in GDP and unemployment moderate the association between job insecurity and life satisfaction. The remainder of the paper is in four parts. First, it reviews the existing literature on 'economic climate'. It then describes the data, methods and our analytical approach. The third section presents the findings. A final section provides a summary and conclusion.

Economic climate as a moderator

The association between job insecurity and individual well-being is well established in the literature (for a review, see Ashford, 1989; Cheng and Chan, 2008; Hellgren et al., 1999; Cuyper and Witte, 2005; De Witte, 1999; Greenhalgh and Rosenblatt, 1984). Numerous studies have found job insecurity to be positively associated with mental health complaints (Chirumbolo and Hellgren, 2003; Hellgren et al., 1999) and impaired psychological well-being (Burchell, 1994; De Witte, 1999; Friesen and Sarros, 1989; Kuhnert et al., 1989; Wilson et al., 1993) including distress, anxiety and depression (Orpen, 1993; Roskies et al., 1993). Other studies have found a significant association between job insecurity and physical health (Ashford, 1989; Axelrod and Gavin, 1980; Heaney et al., 1994; Isaksson et al., 2000; Mattiasson et al., 1990). By contrast, there has been surprisingly little research into how this association is contingent on the wider economic context (Reynolds, 1997). Most studies of job insecurity focus on the individual as the main unit of analysis: contextual factors are ignored, or measured at the individual level only. As Sora et al. (2008) put it, despite a growing body of literature on job insecurity, "no research to date has empirically tested job insecurity from a contextual perspective" (p. 130). Further research in this area is therefore much needed. This section reviews the concept of economic 'context' or 'climate', and the extent to which these is associated with subjective well-being. It defines the concept before considering the direct association between economic conditions and well-being. The third section explores evidence for the interaction between 'economic climate' and job insecurity.

Economic climate

The concept of economic 'climate' or 'culture' is discussed in the organisational literature. There, culture is defined as the "normative beliefs and shared behavioural expectations in an organisational unit" (Glisson and James, 2002), and climate as "the shared perceptions of organisational policies, practices and procedures" (Reichers and Schneider, 1990). The effects of shared perceptions of group members have also been considered in relation to work stress (Sinclair et al., 2010) and the 'safety climate' (Zohar, 2003). As Sinclair et al. (2010) note, when organisations experience performance downturns, members of a business unit who share a common fate "seem likely to form similar employment and income-related stress perceptions" (p. 14). They consequently define economic

climate as "employees' shared concerns about their personal economic situation" (ibid). A study by Sora et al. (2008) defines the 'job insecurity climate' as the set of "shared perceptions of powerlessness to maintain the continuity of threatened jobs in an organization" (p. 130). They report that, for a Spanish sample of 550 employees, job insecurity climate influenced employees' job satisfaction and organisational commitment above and beyond the employees' perceptions of their own perceived job insecurity. Similar work by Peiró (2001; 2005) has emphasised the role of the 'stress climate', which considers the stress as collective phenomenon. Using a qualitative approach Lansisalmi et al. (2000) also highlight the 'collective properties' of stress within organisations.

Other studies have considered the 'psychological environment' of work (Briner, 2000). The 'work environment' is defined simply as the environment in which people work, which includes the physical setting, job characteristics (e.g. complexity, workload), broader organisational features (such as culture or history) and the wider economic context, encompassing local labour market conditions or employment sector (p. 299). The 'psychological environment', by contrast, is defined as those features of the work environment that are relevant to worker behaviour. Briner and et al. consider 3 types of psychological phenomena: affect (e.g. emotions, mood), cognitions (e.g. beliefs, perceptions) and behaviours. The psychological environment is thus defined as the "set of those characteristics of work environment that effect how the worker feels, thinks and behaves" (p. 300).

A further insight is provided by the literature on emotional contagion, where it is suggested that concerns about job insecurity are likely to spread though an organisation through groups and informal networks (Hatfield et al., 1994). This 'contagion effect' has been investigated at the family level (Mauno and Kinnunen, 2002) and industry level (Goins and Gruca, 2008). Goins and Gruca show, for example, that the consequences of layoff announcements spillover beyond the announcing firm with companies that are not experiencing layoffs affected by the industry-wide perception of insecurity. At the micro-level, Mauno and Kinnunen (2002) found economic stress to transfer within couples: "if the man experienced a high degree of economic stress, his partner's job insecurity level was elevated and vice versa" (p. 295).

The association between 'economic climate' and well-being

The above findings are important because economic climate – defined as the collective, group-level perception of economic insecurity – has been shown to be an important determinant of individual outcomes (Hofmann and Stetzer, 1998; James et al., 1990; Kopelman et al., 1990; Lindell and Brandt, 2000; Schneider and Bowen, 1985). Glisson and James (2002), for example, highlight how a low stress climate can positively influence work attitudes, including organisational commitment and job satisfaction (p. 787).

Two associations will be considered here: (1) the direct association between economic climate and well-being and (2) the moderating effect of economic climate on the association between job insecurity and well-being. Numerous studies have found local economic conditions to be associated with individual well-being. In a multilevel study of Denmark, Osler et al. (2003) found local levels of unemployment to be directly associated with mortality rates, even after accounting for individual employment status. Clark et al. (2010) show high regional unemployment to be negatively correlated with the life satisfaction of men, although, notably, no association was observed for women. Di Tella et al. (2001) report similar findings for a comparative European sample: national unemployment rates are negatively related with average reported life satisfaction, even if personal unemployment is controlled for. Other studies (Brenner, 1973; Catalano and Dooley, 1977)) have shown that unfavourable economic conditions are associated with indicators of psychological distress. It has been suggested that contexts of uncertainty or recession may also operate indirectly, mediated by changes in employment conditions (Dooley and Catalano, 1984; Dooley et al., 1994). Unfavourable economic conditions, such as recession, are often associated with changes in job status, working conditions or structures, and it may

be these changes that are negatively associated with psychological and physical health (Fenwick and Tausig, 1994). A study by Kravdal (2004), using administrative data for Norway, found local levels of unemployment to be negatively associated with fertility: birth rates were lowest in municipalities where men's or women's unemployment was highest(p. 2). Finally, Anderson and Gascon (2008) report that competition from foreign labour (and the collective sense of insecurity this is associated with) resulted in US workers having increased demands for social insurance. Similar findings have been produced for the UK (see for example Scheve and Slaughter, 2004).

In summary, there exists good evidence to suggest that both job insecurity (at the individual level) and unfavourable economic conditions (at the regional and national level) are negatively associated with individual well-being. This study seeks to further this literature by considering the interaction of these associations.

Data and methods

We combine individual-level data from the 2006 European Social Survey (ESS) and contextual data measuring national 'economic conditions' from the Eurostat database. The ESS is a biennial study of social attitudes and values in Europe, with four rounds conducted to date (from 2002 to 2008). Of the 27 countries present in the 2006 survey, this study focuses upon the 16 from Western Europe[2], excluding 11 from Eastern Europe[3]. The total sample size is 28,150. All models have been weighted to control for sample design and population size. Multilevel weights have been calculated using the population weighted iterative least squares (PWIGLS) method, using formulas presented in Pfefferman et al. (1998).

Analytical approach

To test whether national economic conditions affect the association between job insecurity and well-being we use a two-level moderated regression model. A multilevel approach is required since ordinary least squares (OLS) regression is unable to differentiate between variables at different levels of analysis. OLS tacitly treats both individual and country-level statistics as if they are measured at the same levels, and as such, overlooks the clustering of individuals within countries. Using OLS regression to analyse contextual effects might therefore lead to conclusions based on deflated standard errors. This is particularly relevant when considering contextual variables measured at higher levels, such as national GDP or unemployment.

Following a multilevel approach, the moderating effect of national economic conditions is tested by estimating a cross-level interaction term between five measures of 'economic climate' and the individual's reported job insecurity. In this model the level-1 is the individual and level-2 is the country. The outcome variable is an 11-category ordinal measure of reported life satisfaction, treated here as continuous, ranging from 0 to 10 with a mean of 7.06 and a standard deviation of 2.11 (N = 28,032)[4]. The main explanatory variable is a binary measure of job insecurity, where 1 indicates that a respondents feels it is 'likely' or 'very likely' that they will lose their job in the next 12 months (0 refers to 'not likely' or 'not at all likely'). Five measures of national economic climate will be considered:

[2] Exploratory analysis has suggested that the moderating effect differs between Eastern and Western European countries, so need to analyse these 2 sets of countries differently.

[3] Bulgaria, Estonia, Hungary, Romania, Latvia, Russia, Slovakia, Slovenia and the Ukraine.

[4] Respondents were asked, "all things considered, how satisfied are you with your life as a whole nowadays?" Responses were chosen from a card, where 0 represented 'extremely dissatisfied' and 10 represented 'extremely satisfied'.

1. National aggregate level of 'satisfaction with the state of the economy'
2. Unemployment rate (2006)
3. Average annual rate of change in the unemployment rate (2001-2006)
4. Gross domestic product (2006)
5. Average annual rate of change in gross domestic product (2001-2006)

The first item is derived using a weighted national average of the variable in the ESS dataset, where individuals were asked: "On the whole how satisfied are you with the present state of the economy in [the respondent's country]?" Response categories ranged from 0 ('extremely dissatisfied') to 10 ('extremely satisfied')[5]. Items 2 to 5 were taken from the Eurostat database[6]. The unemployment rate (%) and GDP (purchasing power parities per inhabitant) are measured for 2006, the year of the ESS survey. The models also consider *trends* in these variables. People's perceptions may be affected not only by conditions in 2006 but also by the trends in recent years. Trends in GDP and unemployment are measured as the average annual rate of change between 2001 and 2006. For each year the percentage change on the previous year (in either GDP and unemployment) is calculated. The trend in GDP or unemployment is thus the average of this figure for the 5 year period, 2001 to 2006.

The Null Model

Before considering the moderating effect of national economic conditions we first estimate a simpler model to assess the extent of variation in life satisfaction at the individual and country levels, prior to the addition of explanatory variables. The 'null' model, where i represents individuals (N = 28,150) and j represents countries (N = 14), is given as:

$$\begin{aligned} \text{satlife}_{ij} &\sim N(XB, \Omega) \\ \text{satlife}_{ij} &= \beta_{0ij}(\text{constant}) \\ \beta_{0ij} &= \beta_0 + u_{0j} + e_{0ij} \end{aligned}$$

$$\begin{aligned} u_{0j} &\sim N(0, \sigma^2_{u0}) \\ e_{0ij} &\sim N(0, \sigma^2_{e0}) \\ cov(u_{0j}, e_{0ij}) &= 0 \end{aligned}$$

Where *satlife* refers to life satisfaction, the outcome variable. The variance of *satlife* is partitioned into a within-country variance ($\mathbf{S}^2_{e0}$) and a between-country variance ($\mathbf{S}^2_{u0}$). This model is a random intercepts model: the intercept is allowed to vary between countries. The results for the null model (the model with only a constant term) are given in Table 1. The intra-class correlation (ICC) is 0.126, indicating that, prior to the addition of explanatory variables to the model, 12.6% of the variation in life satisfaction is attributable to country differences. This model includes 28,032 respondents from 14 countries.

The next step was to specify a 'base model'. This is a model that contains the main explanatory variable (job insecurity) and all relevant control variables. Model specification was achieved using backwards

[5] To calculate the national aggregate the individual-level scores were weighted (to control for the sample design used in their country and population weight) and an average calculated for each country.

[6] http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database (accessed 23/02/11)

elimination[7]. A model was specified that includes all job insecurity and all theoretically relevant controls. These include basic demographic variables (age, gender, income) as well as other predictors of life satisfaction such as social support and interaction, perceived economic vulnerability, cohabitation status and whether there are children living in the household. In order to (partially) control for relevant personality differences between individuals, the model also includes a variable measuring 'optimism about the future'. The contribution of each variable, in terms of the reduction in the -2*log-likelihood statistic, was then tested against a $\chi 2$ distribution with d degrees of freedom, where d is the number of parameters introduced. All continuous explanatory variables were centred before being included in the model. As before, this is a random intercepts model: the intercept is allowed to vary across countries but the coefficients for the explanatory variables are held equal. We assume, therefore, that the association between job insecurity and life satisfaction is the same in all countries. The final model is presented in the last column of Table 1.

Overall, the mean level of life satisfaction (having controlled for country differences and the other variables in the model) is 7.52. The intra-class correlation has reduced from 12.6% (in the null model) to 8.7% in the base model. Controlling for job insecurity and the other variables in the model has explained 3.9% of the between country variance in life satisfaction. The country variance is significant at the 5% level[8]. On average, high job insecurity (individuals for whom job loss is 'likely' or 'very likely') is associated with a 0.492 unit decrease in life satisfaction. The control variables behave much as expected, with social interaction[9] and 'living with a partner' being significantly associated with increases in life satisfaction. Low levels of 'optimism about the future' are associated with reduced life satisfaction, as are negative feelings about current household income. This base model includes 11,096 individuals in 14 countries.

Direct effects

To consider whether national economic conditions are *directly* associated with life satisfaction the five measures (GDP, unemployment, etc.) were entered into the model as level-2 explanatory variables. These were tested one at a time: each moderator was removed from the model before testing the next. The basic model is given as:

$$\begin{aligned}
&\text{satlife}_{ij} \sim N(XB, \Omega) \\
&\text{satlife}_{ij} = \beta_{0ij}(\text{constant}) + \beta_1(\text{job insecurity})_{ij} + \beta_2(\text{contextual effect})_j \\
&\qquad + \sum_{l=3}^{p} \beta_l(\text{control variables})_{ij} \\
&\beta_{0ij} = \beta_0 + u_{0j} + e_{0ij} \\
&\\
&u_{0j} \sim N(0, \sigma^2_{u0}) \\
&e_{0ij} \sim N(0, \sigma^2_{e0})
\end{aligned}$$

Where 'contextual effect' refers to the country-level moderator. The results are presented in Table 3. These indicate that, on average, a unit increase in country aggregate score for 'satisfaction with the

[7] Fitting the model using 'backwards elimination' involves specifying an initial model with all theoretical variables and relevant controls, and testing the removal of each explanatory variable in turn (by comparing the change in the -2*log-likelihood statistic).

[8] The change in the -2*loglikelihood statistic for country variance is 737.516.

[9] 'Social interaction' is captured by two variables measuring (a) how often the respondent takes part in social activities (compared to others their age) and (b) how often they meet with family and friends. See Table 1 for details.

present state of the economy' is associated with a 0.342 unit increase in individual life satisfaction. A unit increase in the national unemployment rate is shown to be associated with a 0.076 unit reduction in life satisfaction (significant at 5% level). The average rate of change in unemployment (between 2001 and 2006) is also significantly associated with life satisfaction. A unit increase in the unemployment growth rate is associated with a 0.054 reduction in life satisfaction, controlling for other variables in the model. GDP appears to have no significant association with life satisfaction, whether measured for a single year (2006) or for the 5 year period.

Broadly, these results are consistent with the existing literature. Living in a country where collective assessments of the 'state of the economy' are more positive and unemployment is lower are both significantly associated with higher levels of reported life satisfaction. The direct effect of GDP was found to be non-significant.

Moderation effects

Finally, we can assess whether the combined effect of job insecurity and economic climate has an additional effect on life satisfaction, over and above their separate effects. To test this we include a cross-level interaction term: the product of the binary 'job insecurity' variable and the country-level contextual variable. The basic model is given as:

$$
\begin{aligned}
&\text{satlife}_{ij} \sim N(XB, \Omega) \\
&\text{satlife}_{ij} = \beta_{0ij}(\text{constant}) + \beta_1(\text{job insecurity})_{ij} + \beta_2(\text{contextual effect})_j \\
&\qquad + \beta_3(\text{contextual effect} \times \text{job insecurity})_{ij} + \sum_{l=4}^{p} \beta_l(\text{control variables})_{ij} \\
&\beta_{0ij} = \beta_0 + u_{0j} + e_{0ij} \\
&u_{0j} \sim N(0, \sigma^2_{u0}) \\
&e_{0ij} \sim N(0, \sigma^2_{e0})
\end{aligned}
$$

The results are presented in Table 4. Four of the five contextual variables are shown to significantly moderate the association between job insecurity and life satisfaction (at the 5% level). For individuals reporting high job insecurity, a unit increase in the 'aggregate satisfaction with the economy' is associated with a 0.212 unit increase in life satisfaction, controlling for other variables in the model. The reverse is found for national unemployment: individuals with high job insecurity experience a 0.068 unit reduction in life satisfaction for each unit increase in national unemployment. For individuals with high job insecurity a unit increase in GDP is associated with a 0.007 unit reduction in life satisfaction, while the effect for the trend in GDP is non-significant (at the 5% level).

To test the significance of these interaction terms Table 4 presents the likelihood ratio tests for each moderator. For each contextual variable the reduction in the model -2*log-likelihood statistic achieved by introducing the interaction term is compared against a chi-square distribution with 1 degree of freedom. As the table shows, all moderators except the 'Average rate of change in GDP' contribute significantly to the model when interacted with job insecurity.

To illustrate these moderation effects we can plot the association between the moderator and the outcome for different levels of job insecurity, as show in Figures 1 to 4. The y-axis in each plot is the predicted level of life satisfaction. The x-axis is the moderator (the country-level contextual variable) and the association is plotted for individuals with 'high' and 'low' reported job insecurity. Figure 1 plots the

interaction of job insecurity and the 'aggregate level of satisfaction with the economy'. Both lines have a positive gradient indicating that, regardless of the level of job insecurity, increases in the country aggregate for 'satisfaction with the state of the economy' are associated with increases in life satisfaction. However, this increase is largest for individuals reporting higher job insecurity (as evidenced by the steeper gradient for these individuals). An increase in job insecurity, therefore, is associated with a reduction in predicted life satisfaction for all individuals but the association is strongest in countries where, on average, people are least satisfied with the state of the economy.

A similar 'buffering' effect is shown in Figure 2, which plots the interaction between job insecurity and national GDP. As before, while job insecurity is negatively associated with life satisfaction at all levels of GDP, the strength of the association increases as GDP declines. In countries with high levels of GDP the gap between the 'high' and 'low' job insecurity groups is small, whereas at lower levels of GDP the difference is much larger.

Finally, Figure 3 shows that national unemployment is negatively associated with life satisfaction for all individuals, but the association is strongest for individuals with high job insecurity. Conversely, while job insecurity is negatively associated with life satisfaction at all levels of national unemployment, the effect is strongest in countries where unemployment is highest. National unemployment, therefore, acts to amplify the negative association between job insecurity and life satisfaction.

Discussion and conclusions

Numerous studies have shown perceived job insecurity to be negatively associated with individual well-being. Elsewhere, it has been shown that unfavourable economic conditions may also be negatively associated with well-being. This study sought to extend these findings to test the hypothesis that the association between job insecurity and life satisfaction is moderated by macro-level economic variables, such as national unemployment or GDP. Using a multilevel framework it has shown that, not only are national economic conditions directly associated with life satisfaction but, as hypothesised, they also moderate the association between insecurity and life satisfaction. Whilst job insecurity is negatively associated with life satisfaction for all individuals in the study, the association was strongest in countries where (a) on average, people are least satisfied with the 'present state of the economy' in their country; (b) national GDP is lowest; (c) the unemployment rate is highest, and (d) there has been (on average) an increase in the unemployment rate in the 5 years prior. No moderating effect was found for the trend in GDP.

The study is subject to several limitations. Firstly, the single-item measure of 'life satisfaction' is overly simplistic. It overlooks that individual well-being is, (Van de Walle, 1998) argues, a multi dimensional construct, and is susceptible to influence from any number of exogenous factors, such as the respondent's mood or personality (Coombs, 2006; Krueger and Schkade, 2008) or cultural factors, such as differing value systems or societal norms. Despite these limitations, we are reasonably confident that reported life satisfaction can still provide a useful measure of individual well-being. It has been shown that individuals in similar circumstances give similar responses (Van Praag, 2007) and life satisfaction correlates well with other measures of reported well-being (Smith, 2004). Krueger and Schkade (2008) report that reliability figures for subjective measures of well-being (which include life satisfaction) are "sufficiently high to yield informative estimates" (p. 1843).

Secondly, the study relies on cross-sectional data, and therefore, is limited to describing associations between variables at a fixed point in time. The robustness of the findings could be improved by testing these hypotheses using longitudinal data: do *trends* in the association between perceived insecurity and subjective well-being mirror *trends* in economic conditions? Or does, after successive years of high

unemployment or low GDP, the moderating effect of economic climate begin to dissipate? Further research is undoubtedly required.

Thirdly, the analysis has (for the sake of coherence) not considered how the moderating influence of economic climate may differ among employees with different secondary job characteristics. Other studies have indicated that the relationship between job insecurity and subjective well-being is stronger for some individuals than others, for example, for those with lower levels of autonomy (Büssing, 1999) or social support (Lim, 1997). In the same way, we might expect the moderating effect of economic climate to itself be moderated by such job characteristics.

Notwithstanding these limitations, this study has provided useful evidence to suggest that national economic conditions can buffer, or amplify, the negative association between perceived job insecurity and reported well-being.

References

Anderson, R. G. & Gascon, C. S. (2008) 'Offshoring, economic insecurity, and the demand for social insurance', Working Paper 2008-003A, Federal Reserve Bank of St. Louis, St. Louis

Ashford, S. (1989) 'Content, Causes, and Consequences of Job Insecurity: A Theory-Based Measure and Substantive Test', *Academy of Management Journal,* **32**(4), pp. 803--829.

Axelrod, W. L. & Gavin, J. F. (1980) 'Stress and strain in blue-collar and white-collar management staff', *Journal of Vocational Behavior,* **17**(1), pp. 41--49.

Borg, I. & Elizur, D. (1992) 'Job insecurity: Correlates, moderators and measurement', *International Journal of Manpower,* **13**, pp. 13--26.

Brenner, M. H. (1973) 'Mental illness and the economy', *Cambridge, Mass.*

Briner, R. (2000) 'Relationships between work environments, psychological environments and psychological well-being', *Occupational Medicine,* **50**(5), pp. 299.

Burchell, B. (1994) 'The effects of labour market position, job insecurity, and unemployment on psychological health', *Social change and the experience of unemployment*, pp. 188--212.

Burchell, B., Day, D., Hudson, M., Ladipo, D., Mankelow, R., Nolan, J., Reed, H., Wichert, I. C. & Wilkinson, F. (1999) *Job Insecurity and Work Intensification,* York, Joseph Rowntree Foundation.

Burke, R. J. & Nelson, D. (1998) Mergers and acquisitions, downsizing, and privatization: A North American perspective. IN GOWING, M. K., KRAFT, J. D. & QUICK, J. C. (Eds.) *The new organisational reality: Downsizing, re-structuring, and revitalization*, Washington DC, American Psychological Association.

Büssing, A. (1999) 'Can control at work and social support moderate psychological consequences of job insecurity? Results from a quasi-experimental study in the steel industry', *European Journal of Work and Organizational Psychology,* **8**(2), pp. 219--242.

Catalano, R. & Dooley, C. D. (1977) 'Economic predictors of depressed mood and stressful life events in a metropolitan community', *Journal of Health and Social Behavior,* **18**(3), pp. 292--307.

Cheng, G. H. L. & Chan, D. K. S. (2008) 'Who Suffers More from Job Insecurity? A Meta-Analytic Review', *Applied Psychology: An International Review,* **57**(2), pp. 272--303.

Chirumbolo, A. & Hellgren, J. (2003) 'Individual and Organizational Consequences of Job Insecurity: A European Study', *Economic and Industrial Democracy,* **24**(2), pp. 217--240.

Clark, A., Knabe, A. & Rätzel, S. (2010) 'Boon or bane? Others' unemployment, well-being and job insecurity', *Labour Economics,* **17**(1), pp. 52 - 61.

Coombs, G. (2006) 'Wellbeing and happiness in OECD countries', Macroeconomic Policy Division, Economic Roundup,

Cuyper, N. D. & Witte, H. D. (2005) 'Job Insecurity: Mediator or Moderator of the Relationship Between Type of Contract and Various Outcomes?', *Journal of Industrial Psychology,* **31**(4), pp. 79--86.

De Witte, H. (1999) 'Job insecurity and psychological well-being: Review of the literature and exploration of some unresolved issues', *European Journal of Work and Organizational Psychology,* **8**(2), pp. 155--177.

Di Tella, R., Macculloch, R. J. & Oswald, A. J. (2001) 'Preferences over inflation and unemployment: Evidence from surveys of happiness', *American Economic Review,* **91**(1), pp. 335--341.

Dooley, D. & Catalano, R. (1984) 'The epidemiology of economic stress', *American Journal of Community Psychology,* **12**(4), pp. 387--409.

Dooley, D., Catalano, R. & Wilson, G. (1994) 'Depression and unemployment: Panel findings from the Epidemiologic Catchment Area study', *American Journal of Community Psychology,* **22**(6), pp. 745--765.

Fenwick, R. & Tausig, M. (1994) 'The macroeconomic context of job stress', *Journal of Health and Social Behavior*, pp. 266--282.

Ferrie, J., Shipley, M., Stansfeld, S. & Marmot, M. (2002) 'Effects of chronic job insecurity and change in job security on self reported health, minor psychiatric morbidity, physiological measures, and health related behaviours in British civil servants: the Whitehall II study', *British Medical Journal,* **56**(6), pp. 450.

Friesen, D. & Sarros, J. C. (1989) 'Sources of burnout among educators', *Journal of Organizational Behavior,* **10**(2), pp. 179--188.

Fugate, M., Kinicki, A. J. & Ashforth, B. E. (2004) 'Employability: A psycho-social construct, its dimensions, and applications', *Journal of Vocational behavior,* **65**(1), pp. 14--38.

Glisson, C. & James, L. R. (2002) 'The cross-level effects of culture and climate in human service teams', *Journal of Organizational Behavior,* **23**(6), pp. 767-794.

Goins, S. & Gruca, T. S. (2008) 'Understanding competitive and contagion effects of layoff announcements', *Corporate Reputation Review,* **11**(1), pp. 12--34.

Greenhalgh, L. & Rosenblatt, Z. (1984) 'Job insecurity: Toward conceptual clarity', *The Academy of Management Review,* **9**(3), pp. 438--448.

HäRenstam, A., Marklund, S., Berntson, E., Bolin, M. & Ylander, J. (2006) 'Understanding the organisational impact on working conditions and health', National Institute for Working life, Stockholm

Hartley, J. (1991) *Job insecurity: Coping with jobs at risk*, Sage Publications Ltd.

Hatfield, E., Cacioppo, J. T. & Rapson, R. L. (1994) *Emotional contagion*, Cambridge Univ Pr.

Heaney, C. A., Israel, B. A. & House, J. S. (1994) 'Chronic job insecurity among automobile workers: Effects on job satisfaction and health', *Social Science |& Medicine,* **38**(10), pp. 1431--1437.

Hellgren, J., Sverke, M. & Isaksson, K. (1999) 'A two-dimensional approach to job insecurity: Consequences for employee attitudes and well-being', *European Journal of Work and Organisational Psychology,* **8**(2), pp. 179--195.

Hofmann, D. A. & Stetzer, A. (1998) 'The role of safety climate and communication in accident interpretation: Implications for learning from negative events', *Academy of Management Journal*, pp. 644--657.

Isaksson, K., Hellgren, J. & Pettersson, P. (2000) Repeated downsizing: Attitudes and well-being for surviving personnel in a Swedish retail company. IN ISAKSSON, K., HOGSTEDT, C., ERIKSSON, C. & THEORELL, T. (Eds.) *Health effects of the new labour market*, Kluwer Academic.

James, L. R., James, L. A. & Ashe, D. K. (1990) The meaning of organizations: The role of cognition and values. IN SCHNEIDER, B. (Ed.) *Organizational climate and culture*, San Francisco, Jossey-Bass.

Kopelman, R. E., Brief, A. & Guzzo, R. A. (1990) The role of climate and culture in productivity. IN SCHNEIDER, B. (Ed.) *Organizational climate and culture*, San Francisco, Jossey-Bass.

Kravdal, Ò. (2004) 'The impact of individual and aggregate unemployment on fertility in Norway', *Demographic Research, Volume 6,* **6**, pp. 263.

Krueger, A. & Schkade, D. (2008) 'The reliability of subjective well-being measures', *Journal of Public Economics,* **82**, pp. 3--24.

Kuhnert, K. W., Sims, R. R. & Lahey, M. A. (1989) 'The relationship between job security and employee health', *Group |& Organization Management,* **14**(4), pp. 399.

Lansisalmi, H., Peiro, J. M. & Kivimaki, M. (2000) 'Collective stress and coping in the context of organizational culture', *European journal of work and organizational psychology,* **9**(4), pp. 527--559.

Larocco, J. M., House, J. S. & French Jr, J. R. P. (1980) 'Social support, occupational stress, and health', *Journal of health and Social Behavior*, pp. 202--218.

Larson, J. H., Wilson, S. M. & Beley, R. (1994) 'The impact of job insecurity on marital and family relationships', *Family Relations,* **43**(2), pp. 138--143.

Lim, V. K. G. (1996) 'Job insecurity and its outcomes: Moderating effects of work-based and nonwork-based social support', *Human Relations,* **49**(2), pp. 171.

Lindell, M. K. & Brandt, C. J. (2000) 'Climate quality and climate consensus as mediators of the relationship between organizational antecedents and outcomes', *Journal of Applied Psychology,* **85**(3), pp. 331--348.

Mattiasson, I., Lindgarde, F., Nilsson, J. & Theorell, T. (1990) 'Threat of unemployment and cardiovascular risk factors: longitudinal study of quality of sleep and serum cholesterol concentrations in men threatened with redundancy.', *British medical journal,* **301**(6750), pp. 461.

Mauno, S. & Kinnunen, U. (2002) 'Perceived job insecurity among dual-earner couples: do its antecedents vary according to gender, economic sector and the measure used?', *Journal of Occupational and Organizational Psychology,* **75**(3), pp. 295--314.

Näswall, K., Sverke, M. & Hellgren, J. (2005) 'The Moderating Effects Of Work-Based And Non-Work Based Support On The Relation Between Job Insecurity And Subsequent Strain', *SA Journal of Industrial Psychology,* **31**(4), pp. 57--64.

Orpen, C. (1993) 'Correlations between job insecurity and psychological well-being among white and black employees in South Africa', *Perceptual and motor skills,* **76**, pp. 885--885.

Osler, M., Christensen, U., Lund, R., Gamborg, M., Godtfredsen, N. & Prescott, E. (2003) 'High local unemployment and increased mortality in Danish adults; results from a prospective multilevel study', *Occup Environ Med,* **60**(16), pp. 1--5.

Peiró, J. M. (2005) Stress and coping at work: New research trends and their implications for practice. Granada, Spain.

Peiró, M. J. (2001) Stressed teams in organizations: A multilevel approach to the study of stress in work units. IN PRYCE, J., WEILKERT, C. & TORKELSON, E. (Eds.) *Occupational health psychology: Europe 2001*, Nottingham, UK, European Academy of Occupational Health.

Pfefferman, D., Skinner, C., Homes, D., Goldstein, H. & Rasbash, J. (1998) 'Weighting for unequal selection models in multilevel models', *Journal of the Royal Statistical Society, Series B,* **60**, pp. 23--40.

Reichers, A. E. & Schneider, B. (1990) Climate and culture: An evolution of constructs. IN SCHNEIDER, B. (Ed.) *Organizational climate and culture*, San Francisco, Jossey-Bass.

Reynolds, J. (1997) 'The Effects of Industrial Employment Conditions on Job-Related Distress', *Journal of Health and Social Behavior,* **38**, pp. 105--116.

Roskies, E., Louis-Guerin, C. & Fournier, C. (1993) 'Coping with job insecurity: how does personality make a difference?', *Journal of organizational behavior,* **14**(7), pp. 617--630.

Scheve, K. & Slaughter, M. J. (2004) 'Economic insecurity and the globalization of production', *American Journal of Political Science,* **48**(4), pp. 662--674.

Schneider, B. & Bowen, D. E. (1985) 'Employee and customer perceptions of service in banks: Replication and extension.', *Journal of Applied Psychology,* **70**(3), pp. 423--433.

Seers, A., Mcgee, G. W., Serey, T. T. & Graen, G. B. (1983) 'The interaction of job stress and social support: A strong inference investigation', *Academy of Management Journal,* **26**(2), pp. 273--284.

Sinclair, R. R., Sears, L. E., Zajack, M. & Probst, T. (2010) 'A Multilevel Model of Economic Stress and Employee Well-Being', *Contemporary Occupational Health Psychology: Global Perspectives on Research and Practice*, pp. 1.

Smith, C. (2004) 'Social Wellbeing in New Zealand and the Correlates of Life Satisfaction', *The Social Policy, Research and Evaluation Conference*, pp. 22.

Sora, B., Caballer, A., Peiró, J. & De Witte, H. (2008) 'Job insecurity climate's influence on employees' job attitudes: Evidence from two European countries', *European Journal of Work and Organisational Psychology,* **18**(2), pp. 125--147.

Van De Walle, D. (1998) 'Assessing the welfare impacts of public spending', *World Development,* **26**(3), pp. 365--379.

Van Praag, B. (2007) 'Perspectives from the Happiness Literature and the Role of New Instruments for Policy Analysis', *CESifo Economic Studies,* **53**(1), pp. 42--68.

Wilson, S. M., Larson, J. H. & Stone, K. L. (1993) 'Stress among job insecure workers and their spouses', *Family Relations,* **42**(1), pp. 74--80.

Zohar, D. (2003) Safety climate: Conceptual and measurement issues. IN QUICK, J. C. & TETRICK, L. (Eds.) *Handbook of Occupational Health Psychology*, Washington, DC, APA Books.

Tables and figures

Table 1: Null and base models

	Null model	Base model
Constant	7.504***	7.517***
Household income[gm]		0.009
Age[gm]		-0.005**
Female		0.139***
Reported general health[a]		
Bad/Very Bad		-1.39***
Fair		-0.652***
Good		-0.333***
Takes part in social activities[b]		
'More' or 'much more' than most		0.160***
Meets with friends or relatives[c]		
Once a week or more		0.173***
Has someone to discuss intimate matters with		0.387***
Feelings about household income[d]		
Coping		-0.436***
Difficult		-1.301***
Lives with partner/spouse		0.354***
Children in the household		0.007
Always optimistic about the future[e]		
Disagree or disagree strongly		-0.956***
Neither agree nor disagree		-0.601***
Job tenure[f]		
Limited contract		0.036
Become unemployed, next 12 months[g]		
'Likely' or 'very likely'		-0.492***
σ^2_{u0} (S.E.)	0.408 (0.180)	0.225 (0.095)
σ^2_{e0} (S.E.)	2.923 (0.297)	2.359 (0.234)
ICC	0.122	0.087
-2*loglikelihood:	44014.600	41610.778
AIC	44020.600	41654.778
N (country)	14	14
N (individual)	11096	11096

*** p < 0.001; ** p < 0.01; * p < 0.05

Weighted at the individual level with a standardized combined weight to control for sample design and population size.

Source: European Social Survey, 2006; Eurostat, 2010.

Reference categories:

a 'Very good'

b 'About the same', 'less than' or 'much less than most'

c 'Less often than 'once a week'

d 'Living comfortably'

c 'Agree strongly' or 'agree'

f 'No contract' or 'unlimited contract'

g 'Not likely' or 'not at all likely'

Table 2: 'Direct effect' models

	(1) Satisfaction with economy	(2) Unemployment	(3) Average Δ unemployment	(4) GDP	(5) Average Δ GDP
	B_{ij}	B_{ij}	B_{ij}	B_{ij}	B_{ij}
	*(Control variables omitted from table *)*				
Constant	7.472***	7.498***	7.492***	7.505***	7.516***
Become unemployed, next 12 months					
'Likely' or 'very likely'	-0.492***	-0.546***	-0.546***	-0.492***	-0.492***
(1) Aggregate satisfaction with economy^{gm}	0.342***				
(2) Unemployment rate^{gm}		-0.076			
(3) Average Δ unemployment^{gm}			-0.054*		
(4) GDP^{gm}				0.009	
(5) Average Δ GDP^{gm}					0.032
σ^2_{u0} (S.E.)	0.054 (0.017)	0.208 (0.079)	0.153 (0.053)	0.188 (0.051)	0.224 (0.093)
σ^2_{e0} (S.E.)	2.359 (0.235)	2.388 (0.250)	2.388 (0.250)	2.359 (0.234)	2.359 (0.234)
-2*loglikelihood	41591.449	38766.496	41610.709	41608.214	41610.709
AIC	41633.449	38808.496	41652.709	41650.214	41652.709
N (country)	14	13	14	14	14
N (individual)	11096	10314	11096	11096	11096

*** p < 0.001; ** p < 0.01; * p < 0.05

Weighted at the individual level with a standardized combined weight to control for sample design and population size.

Source: European Social Survey, 2006; Eurostat, 2010.

*Control variables for these models are consistent with those in Table 1: Household income, age, gender, reported general health, social interaction and support, subjective economic vulnerability, presence of children in the household, optimism for the future and job tenure.

'gm' = variable has been grand-mean centred

Table 3: Moderation effects

		(1)	(2)	(3)	(4)	(5)
		Satisfaction with economy	**Unemployment**	**Average Δ unemployment**	**GDP**	**Average Δ GDP**
		B_{ij}	B_{ij}	B_{ij}	B_{ij}	B_{ij}
				Control variables omitted		
	Constant	7.486***	7.506***	7.498***	7.512***	7.519***
	Become unemployed, next 12 months					
	'Likely' or 'very likely'	-0.486***	-0.526***	-0.566***	-0.487***	-0.483***
(1)	Aggregate 'satisfaction with economy'	0.315***				
	× job insecurity	0.212***				
(2)	Unemployment rate		-0.068			
	× job insecurity		-0.079**			
(3)	Average Δ unemployment			-0.050*		
	× job insecurity			-0.029*		
(4)	GDP				0.008	
	× job insecurity				0.007*	
(5)	Average Δ GDP					0.024
	× job insecurity					0.079
	σ^2_{e0}	0.052 (0.017)	0.206 (0.079)	0.151 (0.052)	0.184 (0.049)	0.223 (0.092)
	σ^2_{u0}	2.352 (0.232)	2.385 (0.249)	2.386 (0.250)	2.357 (0.234)	2.358 (0.234)
	-2*loglikelihood:	41560.803	38758.66	38758.492	41599.958	41607.991
	AIC	41604.803	38802.66	38802.492	41643.958	41651.991
	N (country)	14	13	13	14	14
	N (individual)	11096	10314	10314	11096	11096

*** p < 0.001; ** p < 0.01; * p < 0.05

Weighted at the individual level with a standardized combined weight to control for sample design and population size.

Source: European Social Survey, 2006; Eurostat, 2010.

*Control variables for these models are consistent with those in Table 1: Household income, age, gender, reported general health, social interaction and support, subjective economic vulnerability, presence of children in the household, optimism for the future and job tenure.

"gmc" = variable has been grand-mean centred

Table 4: Likelihood ratio tests for contribution of moderation effects

Moderator	-2LL without	-2LL with	Δ	P-value
Aggregate 'satisfaction with economy'	41591.449	41560.803	30.646	0.000
Unemployment rate	38770.442	38758.66	11.782	0.001
Average Δ unemployment	38766.496	38758.492	8.004	0.005
GDP	41608.214	41599.958	8.256	0.004
Average Δ GDP	41610.709	41607.991	2.718	0.099

Figure 1

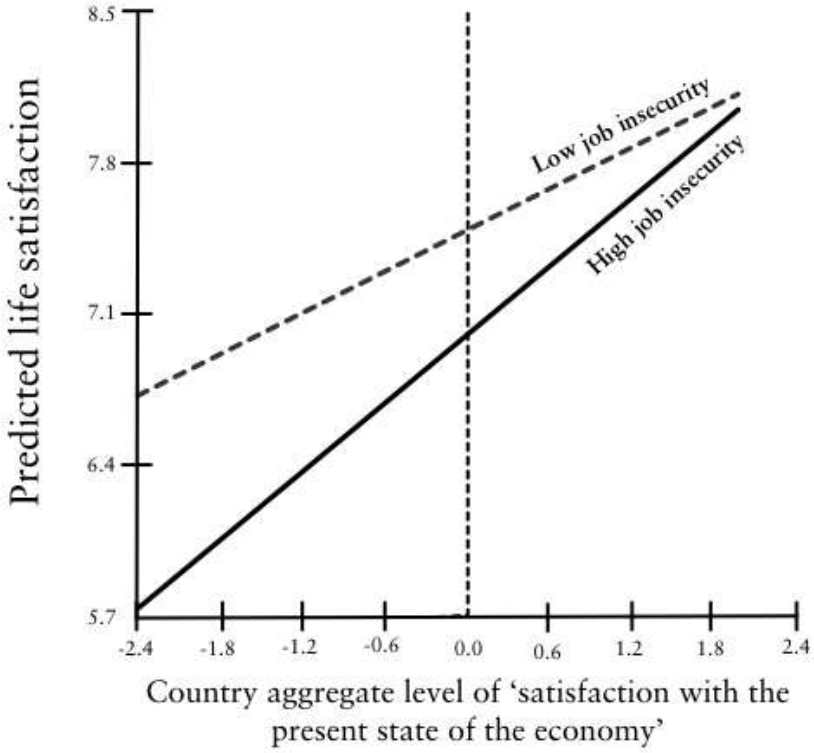


Figure 2

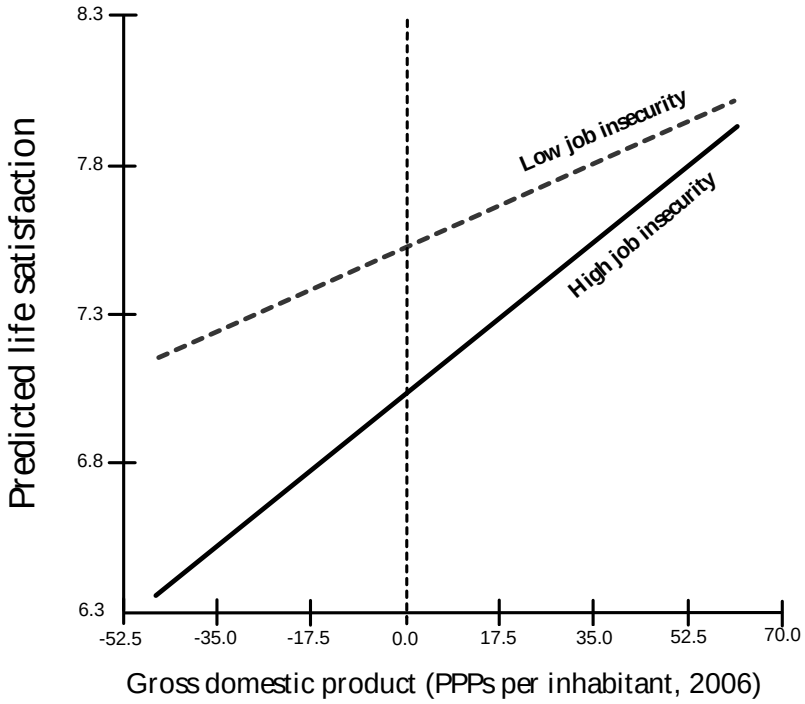
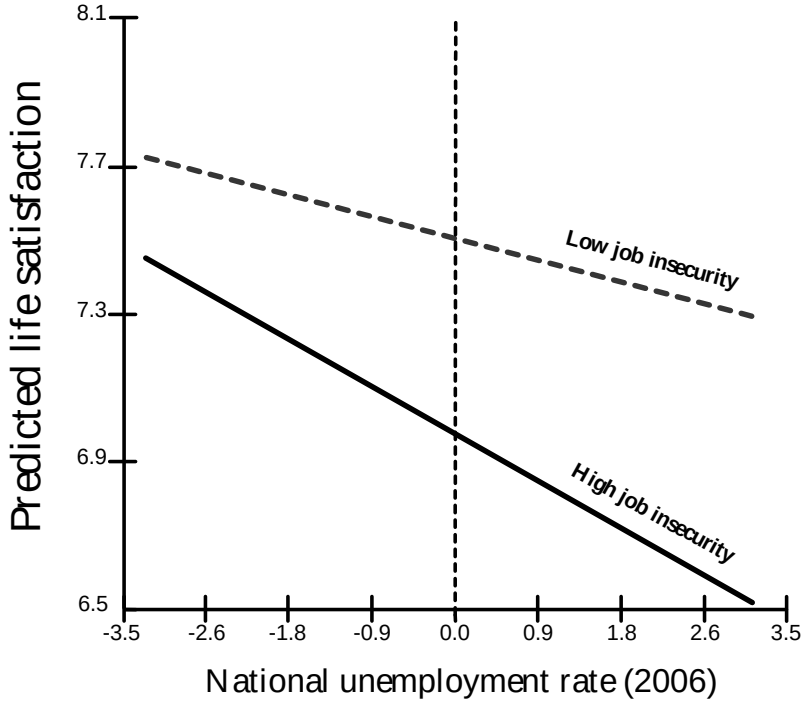

8.3
7.8
7.3
6.8
6.3
Predicted life satisfaction
Low job insecurity
High job insecurity
-52.5
-35.0
-17.5
0.0
17.5
35.0
52.5
70.0
Gross domestic product (PPPs per inhabitant, 2006)

Figure 3


8.1
7.7
7.3
6.9
6.5
Predicted life satisfaction
Low job insecurity
High job insecurity
-3.5
-2.6
-1.8
-0.9
0.0
0.9
1.8
2.6
3.5
National unemployment rate (2006)