

## **Jobless, Friendless, and Broke:**

### **What Happens to Different Areas of Life Before and After Unemployment?**

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#### **Abstract**

Using a nationally-representative longitudinal data of the British people, this paper explores how different areas of a person's life evolved before and after unemployment. There is evidence that unemployment is preceded, on average, by a year of dissatisfaction with one's finance and job for both genders. Once entered unemployment, men and women reported a significant and persistent drop in the satisfaction with one's finance and social life, which perhaps explains why there is little overall hedonic adaptation to unemployment. Finally, this paper proposes a two-layer model to study leads and lags in life satisfaction to changes in employment statuses.

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## 1. Introduction

It is known from cross-section and longitudinal studies that self-rated happiness is often significantly lower among the unemployed than people in full-time employment even when household income is held constant across individuals and over time (Clark & Oswald, 1994; Darity & Goldsmith, 1996; Winkelmann & Winkelmann, 1998). Yet the reasons behind why unemployed people are generally unhappy with their lives remain imperfectly understood by social scientists. Relatively little is known, for instance, about what unemployed people think about when they are prompted to answer an overall judgment question such as “How satisfied are you with your life these days?”; which aspects of a person’s life are most and least affected by unemployment; or why there is little evidence of hedonic adaptation to unemployment over time (see Clark et al., 2008; Frijters et al., 2011). These are difficult questions, but they seem important to our understanding of what constitute the non-pecuniary effects of unemployment on individuals.

The current study attempts to make a new contribution to the literature on subjective well-being and unemployment by asking: What happens to different areas of a person’s life in the periods before and after entering a period of unemployment? Using a long-run panel of nationally representative sample of the British population, this paper shows that both male and female unemployment are observed together with a drop in satisfaction with one’s finance, as well as social life. The drop in satisfaction with one’s finance at the year of becoming unemployed is particularly sharp and persistent, and there is little evidence that people eventually reverted back to the levels they were experiencing before entering unemployment. Moreover, there is some evidence to suggest that people reported, on average, lower levels of job and financial satisfaction approximately **one year** prior to becoming unemployed. What this implies is that there may be an endogenous effect to unemployment, which could have either been caused by a continuing deterioration in one’s job conditions or through expectations of future unemployment. In other words, the paper’s results suggest that

not all job losses are entirely unexpected by those in full-time employment. Finally, this paper proposes a new modelling approach to study leads and lags in life satisfaction, namely the two-layer life satisfaction model in which life satisfaction is determined by the effects unemployment has on different domain satisfactions.

There are similarities between this paper and the earlier work by Bernard Van Praag and co-authors (Ferrer-i-Carbonell & Van Praag, 2002; Van Praag et al., 2003) in which longitudinal data from Britain and Germany were used to study the indirect effects of chronic health problems on life satisfaction via their impacts on people's domain satisfactions. However, Van Praag et al.'s seminal research does not incorporate the evolution of domain satisfactions as we do in this paper. The current study is also not the first to use longitudinal data to study the dynamics of life satisfaction before and after unemployment. The study's closest antecedents are Clark et al. (2008), Angeles (2009), Powdthavee (2009), and Frijters et al. (2011). Nonetheless, the first three papers assume that life satisfaction is directly explained by unemployment rather than indirectly through its correlates with different areas of life as the current paper, whilst Powdthavee (2009) examined what happens to different areas of life before and after disability.

## **2. Background**

Previous literature on unemployment and subjective well-being is clear on one point: Unemployed persons are significantly less satisfied with life than those who are in full-time employment. For instance, Clark and Oswald (1994, p. 655), using the first wave of the British Household Panel Survey, conclude that "Joblessness depresses well-being more than any other single characteristic, including important negative ones such as divorce and separation." Based on German panel data, Winkelmann and Winkelmann (1998) report estimates from conditional logit models in which life satisfaction is regressed on a set of personal characteristics, including the unemployment status of the individual. They find the

effect of unemployment on life satisfaction to be negative, statistically significant, and large: It would require a sevenfold increase in income to compensate for the drop in life satisfaction after the onset of unemployment. Powdthavee (2008), using the British panel data, find that the negative effect of unemployment on life satisfaction would require an increase in the annual income of approximately £143,000 (US\$282,000) to compensate. This negative association between measures of life satisfaction and unemployment has also been replicated across a variety of countries, including the USA (Blanchflower and Oswald, 2004), the Latin Americas (Graham and Pettinato, 2001), South Africa (Kingdon and Knight, 2004; Powdthavee, 2007), Russia (Eggers et al., 2006), Switzerland (Frey and Stutzer, 2000), and many other European countries (Di Tella, MacCulloch, and Oswald, 2001). While the picture is not always consistent, many studies report the negative unemployment effect to be larger for men than for women (see, e.g., Clark, 2003; Blanchflower and Oswald, 2004). It should be also noted here that these results represent the “non-pecuniary” effect of personal unemployment upon subjective well-being. Income loss and other indirect effects, which may or may not occur alongside unemployment, are normally controlled for in these estimations<sup>2</sup>.

Once it has been established that unemployment reduces subjective well-being, more recent studies have moved to focus on whether there is hedonic adaptation to unemployment over time. Using a longitudinal study for Germany to address this question, Clark et al. (2001) are among the first to present evidence that unemployment hurts less the longer we are unemployed. Lucas et al. (2004) later confirm this but also conclude that the adaptation process is generally incomplete, i.e., happiness does not bounce back to the level that was experienced by the individual before he or she became unemployed. Clark et al. (2008) and Frijters et al. (2011) report similar results that unemployment starts off bad and stays bad for both men and women.

What explains why adaptation to unemployment is generally incomplete? According to Schkade and Kahneman (1998), adaptation is a process which occurs from a reduction of

attention from the new circumstances. In the unemployment case, adaptation will only occur when the unemployed's attention is withdrawn from their current situations. However, as the evidence suggests, this does not seem to happen on average.

Here, two questions suggest themselves. First, in which life domains do unemployed people focus more of their attention on each time they are prompted to answer an overall judgment question such as "How satisfied are you with your life these days?" And second, what are the implications of the unemployment effects on different life domains on the unemployed's overall life satisfaction? One could hypothesise that the evidence found in previous studies of partial adaptation to unemployment is merely a reflection of a weighted average between zero adaptation in the financial domain – i.e. the unemployed may spend most of their time thinking about their financial situations, regardless of how long they have been unemployed (Powdthavee, 2010) – and complete adaptation in other areas of life<sup>3</sup>. An unemployed person may still attend to his status when prompted with a question about his overall satisfaction with finance, leading to zero or little adaptation in the financial domain, even some several years after having been made unemployed for the first time. However, the focus on his loss of, say, social contacts as a result of becoming unemployed may have shifted away from what it was a few years ago. The idea that the speed and extent of overall hedonic adaptation is a function of the speed and extent of adaptation in different domain-specific areas of life satisfaction has never previously been considered in the economics literature<sup>4</sup>.

### **3. Implementing a Test**

#### **3.1 Data**

The data in this study comes from Waves 6–18 of the British Household Panel Survey (BHPS)<sup>5</sup>. The data is nationally representative of British households, contains over 10,000 adult individuals, and has been conducted between September and Christmas each year since 1991 (Taylor et al., 2002). The dependent variables used in the current study come from the

responses to the seven domain satisfaction questions “*How dissatisfied or satisfied are you with your... (a) health; (b) finance; (c) house; (d) partner; (e) job; (f) social life; (g) amount of leisure time; (h) use of leisure time?*” as well as the response to the global life-satisfaction question “*How dissatisfied or satisfied are you with your life overall?*”. Responses are on a seven-point scale from 1 “*very dissatisfied*” to 7 “*very satisfied*.” Note that participants are asked first about their satisfaction domains before they are asked about their satisfaction with life overall. Only those who answer the domain satisfaction questions, including life satisfaction, are used in the analysis. This includes all unmarried individuals who report some values when prompted to answer the partner satisfaction question. Note that participants are also asked to indicate how dissatisfied or satisfied they are with their jobs. However, because only 13% of the unemployed continued to report some values for job satisfaction, it is not feasible to estimate the dynamic effects of current and lagged unemployment on job satisfaction.

I focus on all individuals of working age (aged 16-65). Because the vast majority of people can be tracked for far shorter periods of time than the available thirteen BHPS waves, I concentrate on three years before and four years (or more) after unemployment, in order to identify any lead and lag effects in the satisfaction domains. This paper also made use of earlier BHPS Waves (Waves 2-5) to generate lag unemployment variables for individuals who featured in the earlier waves of our analysis, i.e. people who had been unemployed for four consecutive years in Wave 6 would have been unemployed in every year since Wave 2 of the BHPS. Additionally, given that people can move in and out of unemployment to various different employment statuses during their time in the panel, the self-employed, the retired, students, the disabled, those looking after home are also included and controlled for in the estimations. This produces 20,434 observations for men and 24,087 observations for women. Of those, approximately 5% of men and 3% of women fall in the unemployed category. Because unemployment may affect men and women in a different way, all the analysis in this

paper is carried out separately by gender. Descriptive statistics of the main variables used in the estimations are presented in Table 1A of the Appendix.

## 3.2 Empirical Strategy

### 3.2.1. Domain Satisfaction Equations

Assume that life satisfaction,  $LS$ , is a function of past, present, and future employment status as followed:

$$LS_{it} = LS\left(\sum_k^K U_{it+k}, \sum_n^N U_{it-n}, \dots\right) \quad (1)$$

where  $LS_{it}$  represents overall life satisfaction of individual  $i$  at time  $t$ ;  $k$  is the  $k$ th year leading to unemployment ( $k = 1, \dots, K$ );  $n$  represents the  $n$ th year individual  $i$  spent in unemployment ( $n = 0, \dots, N$ ). Employment status in this case is represented by a set of dummy variables denoting unemployment,  $U$ , at different time periods. Whilst research has shown that there are leads and lags in  $LS$  to different life events (Clark et al., 2008; Frijters et al., 2011), relatively little is known about the mechanisms that lie behind such dynamics.

This paper follows the method outlined in Frijters *et al.* (2008) and explore the leads to unemployment in eight domain satisfactions, and the lag effects on seven domain satisfactions (all except for job satisfaction) in the BHPS. Assuming instead that  $LS$  is a function of different domain satisfactions,  $DS$ , rather than past, present, and future unemployment as in Eq.1,

$$LS_{it} = f(DS_{1it}, DS_{2it}, \dots, DS_{jit}), \quad (2)$$

and that  $DS$  is a function of past, present, and future unemployment,

$$DS_{jit} = DS\left(\sum_k^K U_{it+k}, \sum_n^N U_{it-n}, \dots\right) \quad (3)$$

where  $j$  denotes the  $j$ th domain satisfaction ( $j = 1 \dots J$ ). The empirical counterpart to Eq.3, which is analogous to the lead and lagged life satisfaction equations estimated in Frijters et al. (2011), can be written as followed:

$$DS_{jit} = \alpha_j + X_{it}'\delta + \beta_{3j}U_{i,t+3} + \beta_{2j}U_{i,t+2} + \beta_{1j}U_{i,t+1} + \beta_{0j}U_{i,t} + \beta_{-1j}U_{i,t-1} + \beta_{-2j}U_{i,t-2} + \beta_{-3j}U_{i,t-3} + \beta_{-4j}U_{i,t-4} + \varepsilon_{jit} \quad (4)$$

where  $j = 1, \dots, 7$ ;  $i = 1, \dots, N$ ;  $t = 1, \dots, T$ . The dependent variable,  $DS_{jit}$ , is recorded on the 1 to 7 scale. There are seven  $DS$  variables which we can estimate using Eq.4, namely satisfactions with health, finance, housing, partner, social life, amount of leisure time, and use of leisure time, i.e.  $J = 7$ . Because only a small fraction of the unemployed continue to report some values for job satisfaction, I decide to ignore the lag effects of unemployment altogether and only estimate the leads to becoming unemployed in the equation where job satisfaction is the dependent variable. In other words, I only examine the dynamics of job satisfaction before but *not* after the person became unemployed. Here, Eq.4 can be re-written to:

$$DS_{JOBit} = \alpha_{JOB} + X_{it}'\delta + \beta_{3JOB}U_{i,t+3} + \beta_{2JOB}U_{i,t+2} + \beta_{1JOB}U_{i,t+1} + \varepsilon_{JOBit} \quad (4a)$$

which will be used to estimate the leads to unemployment in job satisfaction. The variable  $X_{it}$  denotes a vector of standard personal and household controls, including age dummies, log of household income, marital status, education, household size, the number of dependent children (age<16), and year dummies (see, e.g., Ferrer-i-Carbonell & Frijters, 2004). Note,



however, that the lead equation in job satisfaction (Eq.4a) is estimated for individuals in full-time employment only.

Here,  $U_{i,t+3}$  represents a dummy variable that takes a value of 1 if the individual will be unemployed in year  $t + 3$ . The other leading  $U$  dummies are defined similarly. If there is a lead or a potential endogenous effect to becoming unemployed, then we would expect to see the lead coefficients to be negative – assuming that it is undesirable to becoming unemployed or to remain in the same job, and to be more negative the closer the periods of unemployment become. The lead coefficients should, however, be zero if unemployment is unexpected by the individuals. The adaptation effects to being unemployed are captured by four lagged variables: Unemployed at  $t-1$ , Unemployed at  $t-2$ , Unemployed at  $t-3$ , and Unemployed at  $t-4$ . To allow for people with long-term unemployment to be included in the analysis, the lagged unemployment variable at  $t-4$  will take a value of 1 if the person had been unemployed for more than five consecutive years.

Current unemployment is identified by being unemployed today but not in the previous interview. Unemployment of one to two **consecutive** years is identified by  $U_{i,t} = 1$  and  $U_{i,t-1} = 1$ . Longer lags are defined analogously. If there is zero adaptation to unemployment, then we would expect the sum of the later values of  $\beta$  (or the lagged coefficients) to be zero or negative and statistically significant. However, if there is adaptation then the sum of the later values of  $\beta$  to be positive; we will observe individuals “bounce back” from being jobless. If adaptation is complete, then we would expect the sum of the later values of  $\beta$  to be positive, statistically insignificant, and at least of the same size as  $\beta_0$ . In other words, being unemployed for many consecutive years is the same as not being unemployed at all.

Each *DS* equation is estimated separately using fixed effects estimator, which allows us to compare, for example, the satisfaction of those who have been unemployed for 1-2 years to the satisfaction scores reported by the same individuals who have been unemployed for one year. Each equation also controls for age, age-squared, employment statuses, marital statuses, log of household income (including own labour income), household size, number of dependent children (age<16), regional dummies, and wave dummies.

### 3.2.2. Two-layer Life Satisfaction Model

In order to explain life satisfaction, I follow Ferrer-i-Carbonell and Van Praag (2002) and Van Praag et al.'s (2003) description of a two-layer model and assume that *LS* is determined by various different *DS* variables, which is illustrated in Figure 1, and estimate a simple fixed-effects life satisfaction, *LS*, equation with *DS* as explanatory variables:

$$LS_{it} = \sum_j^J \varphi_j DS_{jit} + \eta_{it}. \quad (5)$$

Like the *DS* variables, the dependent variable *LS* is also measured on the 1 to 7 scale. The main effects of *DS* on *LS* are captured by the  $\varphi$  coefficients. Using the estimates obtained from Eq.5 (one with job satisfaction and one without for those whose information on job satisfaction is not available), we can say how different areas of life ultimately shape the dynamics of life satisfaction before and after unemployment. For instance, imagine no adaptation to unemployment in the satisfaction with one's finance even after 4 years of being unemployed, but there is a continuing increase in the individual's satisfaction with the amount of one's leisure time during that 4 years. The shape of adaptation will therefore depend on the relative weight between the financial satisfaction and the satisfaction with the amount of leisure time in the *LS* equation. Eq.5 thus gives a more complete picture of the complex phenomenon of overall lead and lag effects to unemployment.

Finally, as a pedagogical device and for ease of reading, I will treat both *DS* and *LS* as a cardinal construct in all of the regressions: the fixed effects analysis (i.e. Eq.4 and 5) is carried out via ‘within’ regressions.

## **4. Results**

### **4.1. Leads and Lags in Different Areas of Life**

Results from the lead and lag *DS* equations are reported in Tables 1 and 2 for men and women respectively. Given that both tables have a large number of coefficients, for ease of interpretation I have also produced graphs in Figures 2a-2h displaying the dynamics of *DS* (all except for job satisfaction) for men and Figures 3a-3h for women. The horizontal line represents the average satisfaction for those who remained in full-time employment throughout the sampled periods. Only the lead coefficients are reported in the equations where job satisfaction is the dependent variable (see Figures 2h & 3h). For comparative purposes, the last column of Tables 1 & 2 presents the estimates obtained from a reduced form *LS* equation with lead and lag unemployment variables as independent variables. The dynamics of predicted *LS* taken from the reduced form equation is illustrated in Figure 2i for men and Figure 3i for women. All of these unemployment effects are also summarised in Table 3.

Looking across Tables 1&2, we can see that both men and women became statistically significantly dissatisfied with their finance and job at least one year prior to entering unemployment; for both genders, the coefficients on  $U_{i,t+1}$  are negative and statistically well-determined at the 5% level in the financial satisfaction and job satisfaction equations. The results are consistent with the evidence that self-reported dissatisfaction at the workplace correlates well with future quits (Clark, 2001) and job change (Powdthavee, 2011). With respect to the financial domain, one explanation might be that the stress of working for a

failing company – in terms of prospects of getting lesser pay in the future – may weigh heavily on a person before they entered unemployed. Regarding other possible endogenous effects, there is evidence that women, and not men, reported declining satisfactions with health, partner, the amount of leisure, and the use of leisure one year before entering unemployment. However, it remains difficult to distinguish whether the endogenous effect represents a continuing deterioration in one's job conditions or the individual's expectation of pending unemployment. In other words, our results on the lead coefficients should be treated with caution.

In sum, the above results seem to suggest that there may be a lead or an endogenous effect to becoming unemployed in more than one areas of life<sup>6</sup>. If this is the case, then regressions based on the effect of unemployment in the year of occurrence would grossly underestimate the detrimental effects of unemployment.

What explains why the unemployed are significantly unhappy with their lives? One possible explanation for this may be that unemployment is associated on average with a dramatic drop in one's satisfaction with finance and social life. For example, an unemployed man had experienced, on average, a drop of 0.86-point (from -0.218 to -1.078) in the financial satisfaction between  $t+1$  – i.e., one year before entering unemployment – and  $t$  – i.e., the year of unemployment, whilst a drop experienced by an unemployed woman was 0.48-point (from -0.145 to -0.623). For men, the associated drop is huge; it is more than twice the size of the negative effect of getting a divorce. Because personal income is kept constant, the results reflect the subjective changes in the person's evaluation of his or her financial situation rather than real changes. In other words, there is some evidence to suggest that the unemployed may spend a large amount of time worrying about their future incomes rather than their current financial status at the year of entering unemployment. However, given that an individual's level of social interaction is not controlled for in the estimation of domain satisfactions, a drop

in one's satisfaction with social life may have reflected a real change rather than a subjective change brought about by unemployment.

Another interesting finding is that people did not seem to adapt to the drop in financial satisfaction brought about by unemployment, i.e. the sums of the lagged coefficients in the financial satisfaction equation are -0.146 for men and -0.267 for women.<sup>7</sup> By contrast, men rather than women appeared to have adapted completely to the negative shock in one's social life. The reverse is true, however, in the case of satisfaction with one's amount of leisure time: here, adaptation to unemployment is complete only for women and not for men.

Table 2's other results show female unemployment to be associated with a significant drop in the level of satisfaction with one's health one year before and after becoming unemployed. Given that physical health is not conditioned for in the estimation, this is likely to reflect real changes in the person's health rather than changes in subjective evaluation of her health status brought about by future and current unemployment. Unlike in the financial satisfaction equation, where income is kept constant, a person's health may have deteriorated rapidly after becoming unemployed and this would have been reflected in the in the health satisfaction equation. In addition to this, future unemployment is observed to be associated with a significant drop in the level of satisfaction with one's partner, one's social life, one's amount of leisure time and one's use of leisure time only for women (see Table 3).

Perhaps less predictable is the evidence that both male and female unemployment are associated with a significant jump in the level of satisfaction with one's amount of leisure time, whilst at the same time they are also observed to be associated with a sharp drop in the level of satisfaction with one's social life. Assuming that unemployment is typically associated with a real increase in the amount of leisure time, this evidence is consistent with the standard trade-off model between work (disutility) and leisure (normal good) in labour economics. However, this paper's results seem to suggest that more leisure time may not

always be accommodated by an equivalent increase in the amount of time spent with friends and family. In other words, given that time spent with friends and family is one of the largest determinants of happiness in the literature (Helliwell & Putnam, 2004; Powdthavee, 2008), an increase in the amount of leisure time during unemployment may reflect only a quantity -- rather than a quality -- change in how that new free time is now spent.

It is worth noting that the sets of the coefficients on lead and lag unemployment variables in the *DS* equations do not exactly replicate that of those obtained in the reduced form *LS* equation. Put it simply, *LS* does not seem to have a one-to-one relationship with a particular life domain, and that unemployment does not have the same welfare impact upon *LS* as it has on, say, financial satisfaction. This is more apparent when we compare the dynamics of predicted *DS* to the predicted *LS* taken from the reduced form *LS* equation.

The essential findings of Table 1 can be replicated with ordered estimators (see, e.g., Ferrer-i-Carbonell and Frijters, 2004). But as in Oswald and Powdthavee (2008a), as a pedagogical device and for ease of reading, the cardinal methods are preferred here.

To be sure that these results are not being driven by individuals who are in the panel only briefly, I redo the estimations on a smaller balanced panel, i.e. those who appeared in all thirteen selected BHPS waves. Despite some notable increases in the standard errors, the size of the estimated coefficients remains virtually unchanged. A qualitatively similar conclusion can also be made with regard to the speed and extent of leads and lags to unemployment, which suggests that it makes virtually no difference whether a balanced or an unbalanced panel is used in this paper's analysis.

### **4.3. Implied Life Satisfaction Before and After Unemployment**

What are the implications of the above findings on the evolutions of life satisfaction before and after unemployment? To address this question, Table 4 adopts van Praag et al.'s (2003) two-layer model and reports the main effects of *DS* on *LS* (Eq.5) for both men and women. Here, I assume that unemployment enters the life satisfaction function indirectly via its effects on satisfaction with eight different areas of life. Note that the *LS* equations are split into one with job satisfaction and one without, i.e. the sample with missing information on job satisfaction.

The results are consistent with van Praag et al.'s (2003) findings. For men, I find all of the coefficients on the main effects of *DS* on *LS* to be positive and statistically significant at the 1% level. With respect to the coefficient size, the largest determinant of the overall life satisfaction for men and women is satisfaction with one's partner, whilst satisfaction with the amount of leisure time matters the least for both genders. Note that there may well be other determinants of life satisfaction, such as neighbourhood satisfaction and health of children, but information on those aspects is not available in the BHPS.

Figures 3a & 3b plots the predicted *LS* path before and after unemployment for men and women, taking into account each indirect effect of unemployment (unemployment  $\rightarrow$  *DS*  $\rightarrow$  *LS*) on *DS*. Note that for the anticipating periods (e.g.,  $t+3$  to  $t+1$ ), i.e. before the individual has entered unemployment, the *DS* estimates are taken from the *LS* equations where job satisfaction is included as one of the dependent variables. For the periods that followed unemployment (e.g.,  $t$  to  $t-4$ ), the *DS* estimates are taken from the *LS* equations that excluded job satisfaction from their list of explanatory variables. In order to work out the predicted *LS*, I simply multiply the predicted *DS* obtained at different leads and lags of unemployment (Tables 1 & 2) by their corresponding *DS* coefficients obtained in Table 4. For comparative purposes, the predicted *LS* scores in the periods before and after unemployment (Column 9, Tables 1 & 2) are also superimposed into Figure 3a for men and Figure 3b for women.

We can see from the dynamics of *LS* predicted by the two-layer model in Figures 3a & 3b that there is a noticeable drop in *LS* one year before individuals became unemployed. Referring back to our *DS* results, this could perhaps be attributed to the reduction in satisfaction with one's finance and job one year prior to unemployment. At least for men, this is followed by a dramatic drop in the predicted *LS* at the year of unemployment, i.e. at  $t$ , which could perhaps be explained by yet another sharp decline in satisfaction with one's finance and social life. For women, the drop seems to happen gradually after year  $t$ , and could be attributed to the steady decline in satisfaction with one's housing, social life, and the amount of leisure time. It is worth noting here that the drop in the predicted *LS* would have been more dramatic had it not been for the counter-increase in the level of satisfaction with one's amount of leisure time at the first year of becoming unemployed. However, because individuals care more, on average, about income than the amount of leisure time available to them (see Table 4), the offsetting effect on *LS* is only partial.

Evidence on adaptation in *LS*, which starts at the third year of unemployment for men, could perhaps be explained by (a) the complete mean-reversal in the satisfaction with one's social life and (b) positive lag effects in the satisfaction with one's amount of leisure time. Conversely, any evidence of adaptation found in a model where unemployment is assumed to enter the life satisfaction function directly (see, e.g., Clark et al., 2008; Gerlach & Stephan, 1996; Lucas et al., 2004) would have been much more difficult to interpret than a model where different types of association between unemployment and satisfaction with different areas of life are factored into the estimation process. It should also be noted that the direct model and the two-layer model produce almost the same estimates of *LS* for men, which suggests that the two-layer model was able to capture almost everything that the direct model of *LS* captured.

One criticism of this method is that, despite our ability to control for unobserved heterogeneity in the fixed effects estimation, there may still be a time-varying element which



influences both *DS* and *LS*. For example, a random shock from a death of our loved ones may affect both *DS* and *LS* directly. In other words, the two-layer model may be biased due to the underlying correlations between *DS* and *LS*. To correct for this bias, I followed a method outlined in van Praag et al. (2003) and included an error-correction variable, i.e. the first principal component of the (77) error covariance matrix obtained from estimating separately the seven *DS* equations into the estimation of Eq.5. By adding this variable as an additional explanatory variable to the two-layer model, we could assume that the remaining *LS*-error is no longer correlated with the *DS*-errors and that the estimators of the coefficients in Eq.5 do not suffer from an endogeneity bias. This approach is similar to the error-correction model proposed by Heckman (1976). However, similar to Powdthavee (2009), I find that the estimated error-correction variable is not statistically significant in the *LS* equation, thus suggesting that there is no significant time-varying element which influences both *DS* and *LS* and that our fixed effects estimates obtained from Eq.5 are consistent.

## 5. Conclusions

This paper explores the underlying mechanisms behind what unemployed people may be thinking about in the years before and after entering unemployment. It uses a nationally representative longitudinal sample of British people to study the evolutions of satisfaction with different areas of life, including health, income, housing, partner, job, social life, the amount and the use of leisure time, before and after individuals became unemployed. It also examines how changes in different life domains may have shaped the extent and speed of anticipation and adaptation to unemployment in a person's overall life satisfaction.

Among the key findings is the evidence that people became significantly dissatisfied with their finance and job one year before an onset of unemployment. What this suggests is that not all job losses are exogenous, which is consistent with the findings reported in Clark et al. (2009) and Frijters et al. (2011). Once entered unemployment, both men and women typically

recorded a sharp drop in satisfaction with one's finance and social life, while becoming more satisfied with the amount of their leisure time. There is little evidence that people adapted completely to a drop in satisfaction with one's finance, which implies that the unemployed continued to worry about their future incomes even after five years or more in unemployment. This finding is consistent with what would have been predicted by the attention theory (Kahneman & Schkade, 1998). In addition to this, there is some evidence of gender differences in the unemployment effect: while unemployment hurts men more than it does women, women seem to be more affected by future unemployment than do men in our data set.

This paper also offers a new way to think about the trend of life satisfaction following unemployment. By allowing a variety of domain satisfactions to explain life satisfaction, we are able to offer a partial explanation on what happens inside individuals' thought processes at each stage of unemployment. It also offers a more narrowly defined explanation to why there is only partial adaptation to unemployment, which is a common finding in the subjective well-being literature (Clark et al., 2008; Lucas et al., 2004). And given that we are able to identify and understand better the different sources of adverse effects of unemployment on an individual's well-being, we can then build better, in the sense of more realistic and accurate, economic models of the hysteresis and duration dependence of unemployment (see, e.g., Darity and Goldsmith, 1996).

However, like all other studies in social sciences, the current study is not without limitations. First, for simplicity, this paper has assumed that the weighting of  $DS$  in  $LS$  equation is similar over time between unemployed and employed people. Nevertheless, this is perhaps too strong an assumption; in reality, the weighting of  $DS$  probably changes when someone becomes unemployed. Second, while this study is able to control for a number of omitted variables biases – including, for example, individual fixed effects and the common unobserved components to life and domain satisfaction, it might be overly ambitious to claim that

unemployment affects life satisfaction “solely” through domain satisfactions. One reason for this is because the methods used in this paper cannot be used to rule out the possibility of a reverse causality, i.e. one that runs from *LS* to *DS*. In addition to this, it is possible that there may be other unaccounted for variables – for example, some psychological factors such as self-esteem and self-confidence known in the psychological literature to be directly influenced by unemployment. If this is the case, then it may be the case that an event like unemployment affects an individual’s overall well-being such that he rates any self-reported satisfaction lower than previously. While that still does not explain why unemployment affects one domain more than others, the results should still nevertheless be treated with care and with such possibility in mind. And finally, it is unlikely that the (by the BHPS) arbitrary chosen eight domains of satisfaction variables (the *DS* variables) will cover all factors important to the overall life satisfaction. There is bound to be many other areas in life affected by unemployment and further affect individual’s assessment of life satisfaction. Future research will have to come back to this issue of omitted *DS* variables.

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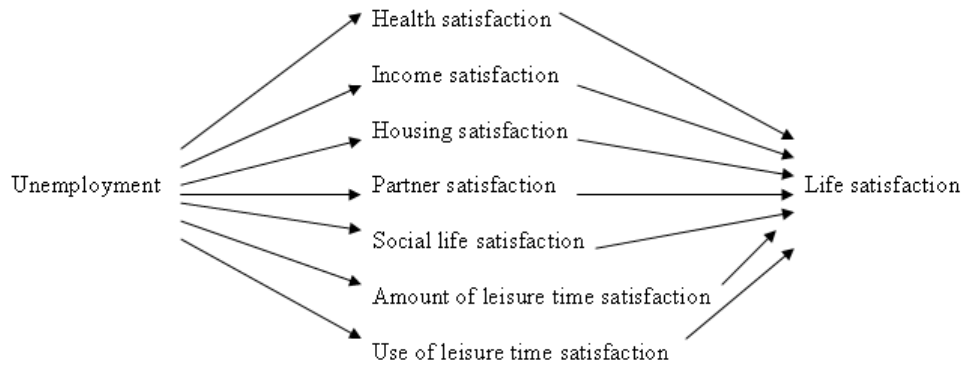
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**Figure 1: The two-layer model**



**Note:** Adapted from Van Praag et al., (2003).



**Table 1: Fixed effects domain satisfaction equations with leads and lags to unemployment, male sample, BHPS 1996-2009**

<b>Dependent variable: Domain satisfaction <i>j</i> and life satisfaction</b>	<b>Health</b>	<b>Finance</b>	<b>Housing</b>	<b>Partner</b>	<b>Job</b>	<b>Social life</b>	<b>Leisure (amount)</b>	<b>Leisure (use of)</b>	<b>Life</b>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Unemployed at t+3	-0.031 [0.062]	-0.139 [0.064]*	0.140 [0.061]*	-0.067 [0.052]	0.119 [0.071]+	-0.093 [0.058]	-0.049 [0.069]	-0.034 [0.064]	-0.105 [0.050]*
Unemployed at t+2	-0.028 [0.063]	-0.112 [0.064]+	0.024 [0.061]	-0.005 [0.052]	-0.134 [0.073]+	-0.078 [0.059]	-0.077 [0.069]	-0.086 [0.064]	-0.036 [0.051]
Unemployed at t+1	-0.027 [0.060]	-0.218 [0.061]**	-0.042 [0.059]	0.015 [0.050]	-0.301 [0.075]**	0.005 [0.056]	-0.024 [0.066]	-0.032 [0.061]	-0.145 [0.048]**
Year became Unemployed	-0.061 [0.065]	-1.078 [0.066]**	-0.074 [0.063]	-0.088 [0.054]	-	-0.263 [0.060]**	0.667 [0.071]**	-0.061 [0.066]	-0.323 [0.052]**
Unemployed at t-1	0.051 [0.051]	-0.120 [0.052]*	0.064 [0.050]	0.120 [0.043]**	-	0.050 [0.048]	-0.004 [0.056]	0.029 [0.052]	0.055 [0.041]
Unemployed at t-2	0.102 [0.048]*	0.025 [0.049]	0.136 [0.047]**	0.048 [0.040]	-	0.124 [0.045]**	0.090 [0.053]+	0.039 [0.049]	0.046 [0.039]
Unemployed at t-3	0.003 [0.045]	-0.021 [0.046]	-0.005 [0.044]	-0.002 [0.037]	-	-0.019 [0.042]	0.003 [0.049]	-0.019 [0.046]	0.028 [0.036]
Unemployed at t-4	0.018 [0.043]	-0.030 [0.044]	-0.049 [0.043]	-0.025 [0.036]	-	0.042 [0.041]	-0.003 [0.048]	0.006 [0.044]	-0.010 [0.035]
$\sum$ unemployment lags	0.174 [0.092]+	-0.146 [0.095]	0.146 [0.092]	0.141 [0.077]+	-	0.196 [0.086]*	0.086 [0.102]	0.055 [0.095]	0.118 [0.074]
$\sum$ current & unemployment lags	0.113 [0.100]	-1.224 [0.102]**	0.071 [0.099]	0.053 [0.087]	-	-0.066 [0.093]	0.752 [0.110]**	-0.005 [0.102]	-0.204 [0.080]**
<b>Observations</b>	20434	20434	20434	20434	24142	20434	20434	20434	20390

<b>Number of person</b>	4428	4428	4428	4428	5407	4428	4428	4428	4425
<b>R-squared</b>	0.03	0.05	0.02	0.05	0.01	0.02	0.04	0.02	0.02

**Note:** +<10%, \*< 5%, \*\* < 1%. Standard errors are in parentheses. Control variables include age, age-squared, log of household income, marital status, education dummies, other employment status, number of dependent children (age<16), household size, regional dummies, and wave dummies.

**Figure 2: The dynamic effects of male unemployment on domain satisfactions**

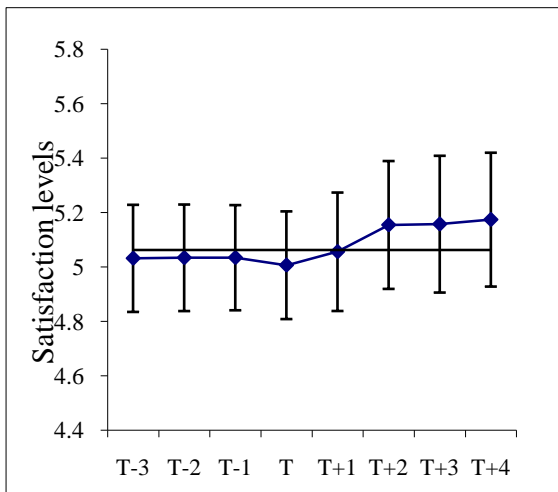


Fig 2a: Satisfaction with health

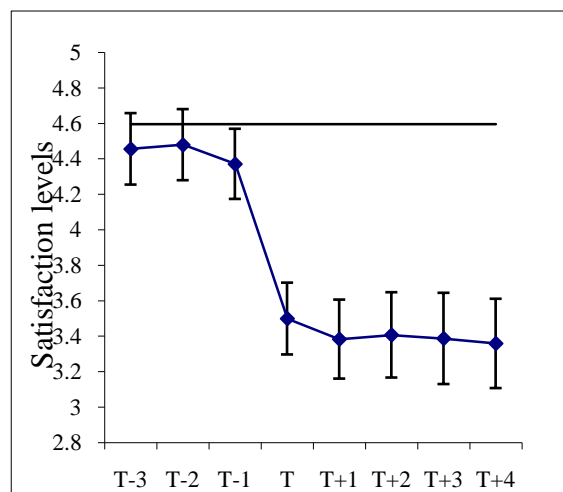


Fig 2b: Satisfaction with finance

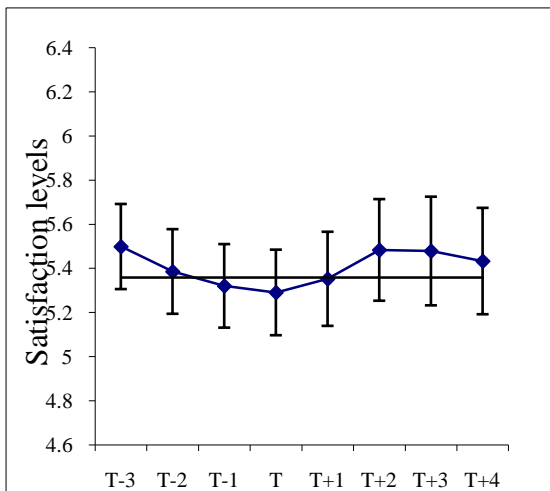


Fig 2c: Satisfaction with housing

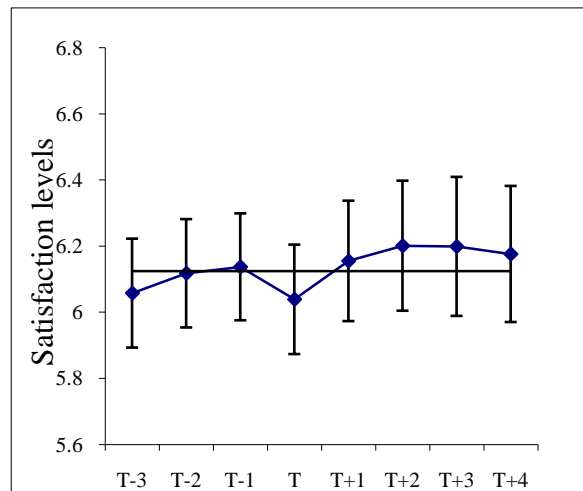


Fig 2d: Effects on satisfaction with partner

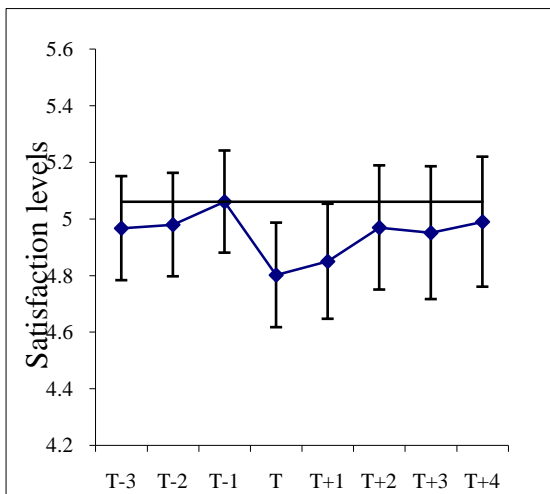


Fig 2e: Satisfaction with social life

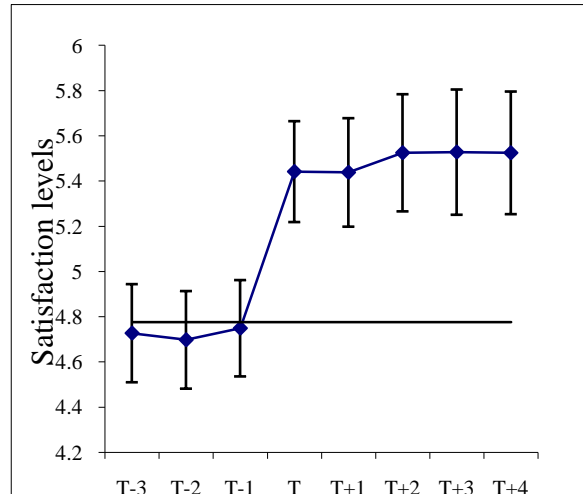


Fig 2f: Satisfaction with amount of leisure time

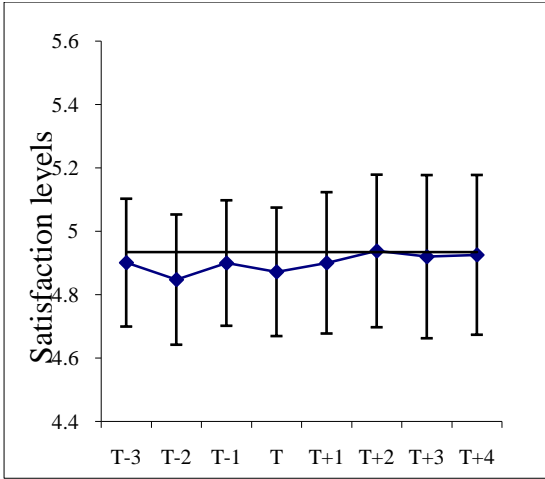


Fig 2g: Satisfaction with use of leisure time

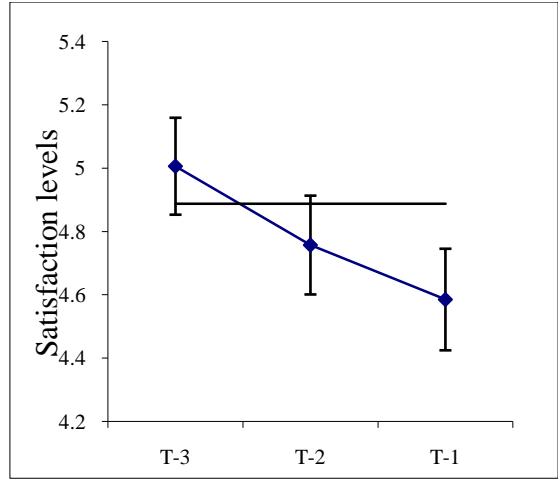


Fig 2h: Satisfaction with job (leads only)

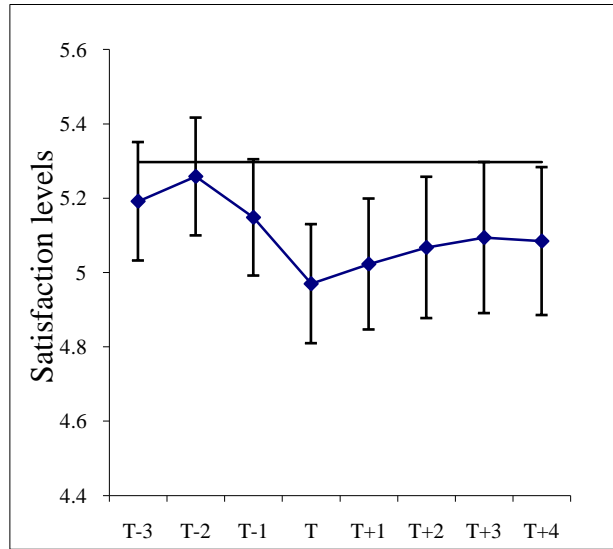


Fig 2i: Life satisfaction

**Note:** Year T is the year of unemployment. 4-standard-error bands (95% C.I.) are reported: two s.e. above and two below. The horizontal lines represent the estimated satisfaction levels if the average individual were to remain in full-time employment throughout the panel, i.e.  $U$  at various stages = 0.

**Table 2: Fixed effects domain satisfaction equations with leads and lags to unemployment, female sample, BHPS 1996-2009**

<b>Dependent variable: Domain satisfaction <math>j</math> and life satisfaction</b>	<b>Health</b>	<b>Finance</b>	<b>Housing</b>	<b>Partner</b>	<b>Job</b>	<b>Social life</b>	<b>Leisure (amount)</b>	<b>Leisure (use of)</b>	<b>Life</b>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Unemployed at t+3	0.135 [0.068]*	0.012 [0.066]	-0.132 [0.066]*	-0.110 [0.056]+	-0.073 [0.076]	0.022 [0.064]	-0.083 [0.071]	0.028 [0.068]	-0.050 [0.055]
Unemployed at t+2	0.086 [0.068]	-0.097 [0.066]	-0.121 [0.067]+	-0.099 [0.057]+	-0.069 [0.078]	0.087 [0.064]	-0.184 [0.072]*	0.092 [0.068]	-0.088 [0.055]
Unemployed at t+1	-0.185 [0.066]**	-0.145 [0.064]*	-0.072 [0.065]	-0.118 [0.055]*	-0.417 [0.079]**	-0.092 [0.062]	-0.177 [0.070]*	-0.172 [0.066]**	-0.221 [0.053]**
Year became Unemployed	-0.152 [0.080]+	-0.623 [0.078]**	-0.043 [0.078]	-0.015 [0.067]	-	-0.163 [0.075]*	0.461 [0.084]**	-0.051 [0.080]	-0.229 [0.065]**
Unemployed at t-1	-0.169 [0.063]**	-0.217 [0.062]**	-0.168 [0.062]**	0.057 [0.053]	-	-0.084 [0.059]	0.055 [0.067]	0.037 [0.063]	-0.067 [0.051]
Unemployed at t-2	0.041 [0.061]	0.004 [0.059]	-0.048 [0.059]	-0.077 [0.050]	-	0.026 [0.057]	-0.012 [0.064]	0.095 [0.061]	0.019 [0.049]
Unemployed at t-3	-0.012 [0.059]	-0.039 [0.057]	-0.025 [0.058]	0.027 [0.049]	-	-0.167 [0.055]**	-0.112 [0.062]+	-0.121 [0.059]*	-0.025 [0.048]
Unemployed at t-4	0.018 [0.057]	-0.015 [0.056]	-0.072 [0.056]	0.023 [0.048]	-	-0.101 [0.053]+	-0.177 [0.060]**	-0.032 [0.057]	0.024 [0.046]
$\sum$ unemployment lags	-0.121 [0.136]	-0.267 [0.132]*	-0.313 [0.133]*	0.030 [0.113]	-	-0.326 [0.127]**	-0.245 [0.143]+	-0.020 [0.136]	-0.049 [0.110]
$\sum$ current & unemployment lags	-0.273 [0.143]+	-0.891 [0.139]**	-0.355 [0.139]**	0.015 [0.118]	-	-0.489 [0.133]**	0.215 [0.150]	-0.071 [0.143]	-0.278 [0.115]*
<b>Observations</b>	24087	24087	24087	24087	23831	24087	24087	24087	24018
<b>Number of person</b>	5258	5258	5258	5258	5748	5258	5258	5258	5256
<b>R-squared</b>	0.02	0.04	0.01	0.02	0.01	0.02	0.03	0.02	0.01

**Note:** +<10%, \*< 5%, \*\* < 1%. Standard errors are in parentheses. For the list of control variables, see Table 1.

**Figure 3: The dynamic effects of female unemployment on domain satisfactions**

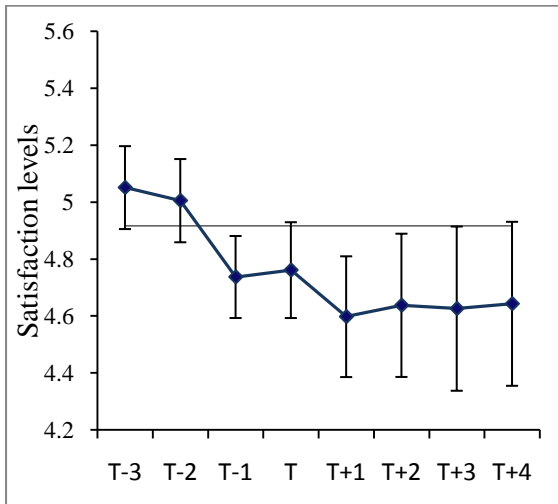


Fig 2a: Satisfaction with health

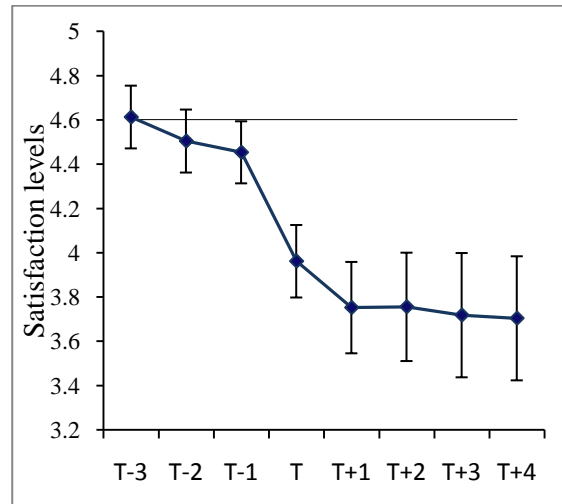


Fig 2b: Satisfaction with finance

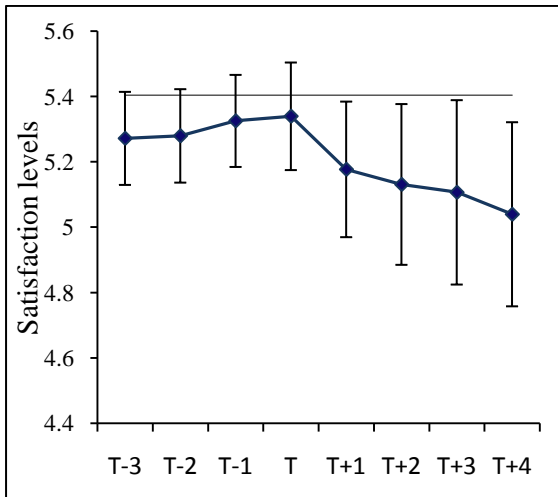


Fig 2c: Satisfaction with housing

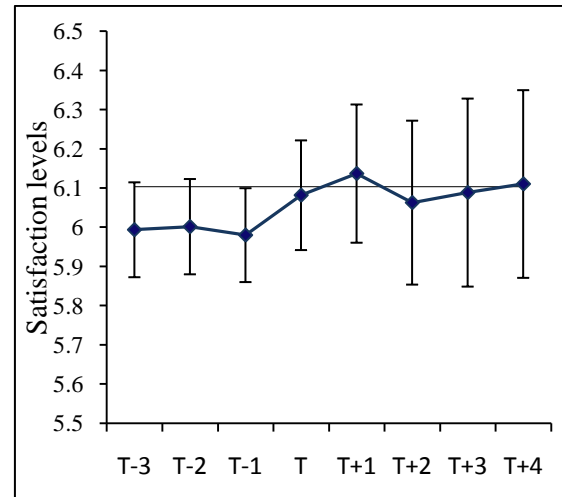


Fig 2d: Effects on satisfaction with partner

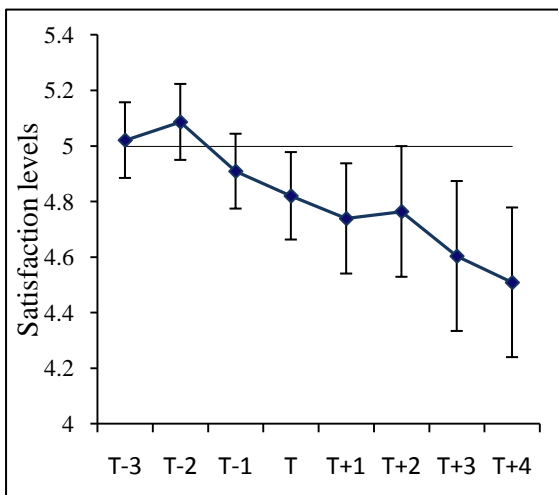


Fig 2e: Satisfaction with social life

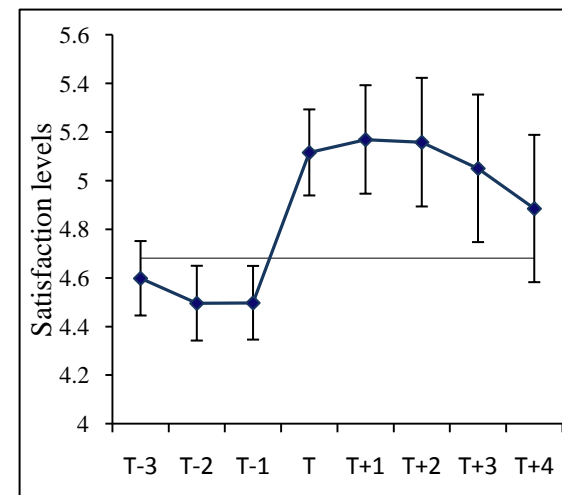


Fig 2f: Satisfaction with amount of leisure time

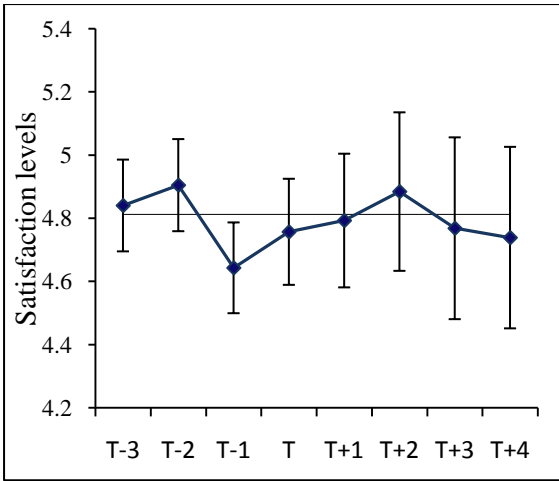


Fig 2g: Satisfaction with use of leisure time

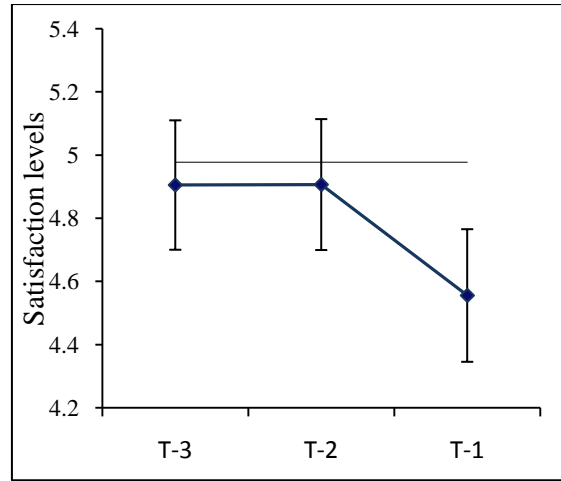


Fig 2h: Satisfaction with job (leads only)

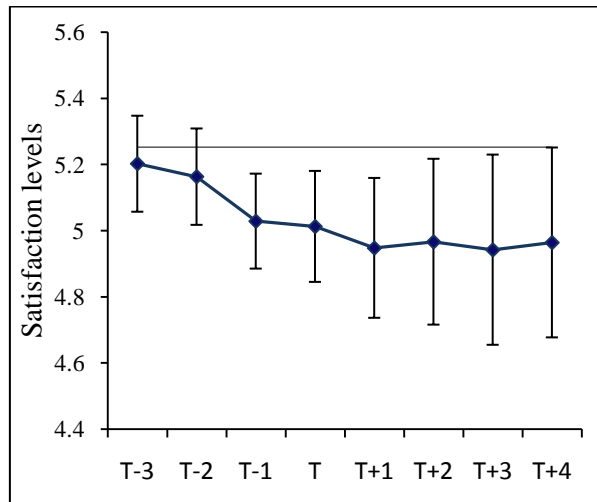


Fig 2i: Life satisfaction

**Note:** Year T is the year of unemployment. 4-standard-error bands (95% C.I.) are reported: two s.e. above and two below. The horizontal lines represent the estimated satisfaction levels if the average individual were to remain in full-time employment throughout the panel, i.e. U at various stages = 0.



**Table 3: Summary of the unemployment effects**

	Men			Women		
	Leads	Current unemployment	Lags	Leads	Current unemployment	Lags
Health satisfaction	NS	NS	+ve	-ve, 1 year	NS	NS
Financial satisfaction	-ve, 1 year	-ve	-ve	-ve, 1 year	-ve	-ve
Housing satisfaction	NS	NS	NS	NS	NS	-ve
Partner satisfaction	NS	NS	NS	-ve, 1 year	NS	NS
Social life satisfaction	NS	-ve	+ve	NS	-ve	-ve
Leisure time (amount) satisfaction	NS	+ve	NS	-ve, 2 years	+ve	-ve
Leisure time (use) satisfaction	NS	NS	NS	-ve, 1 year	NS	NS
Job satisfaction	-ve, 1 year	NA	NA	NS	NA	NA

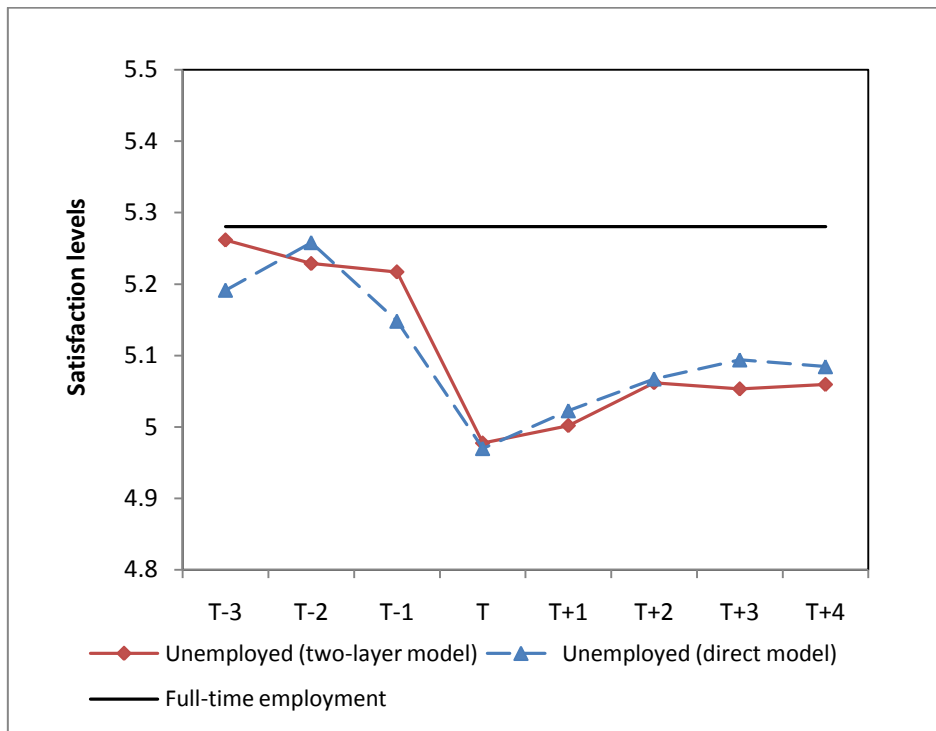
**Note:** NS = not significant at least at the 5% level; -ve = negative effect; +ve = positive effect; NA = not applicable.

**Table 4: Fixed effects life satisfaction regression, BHPS 1996-2009**

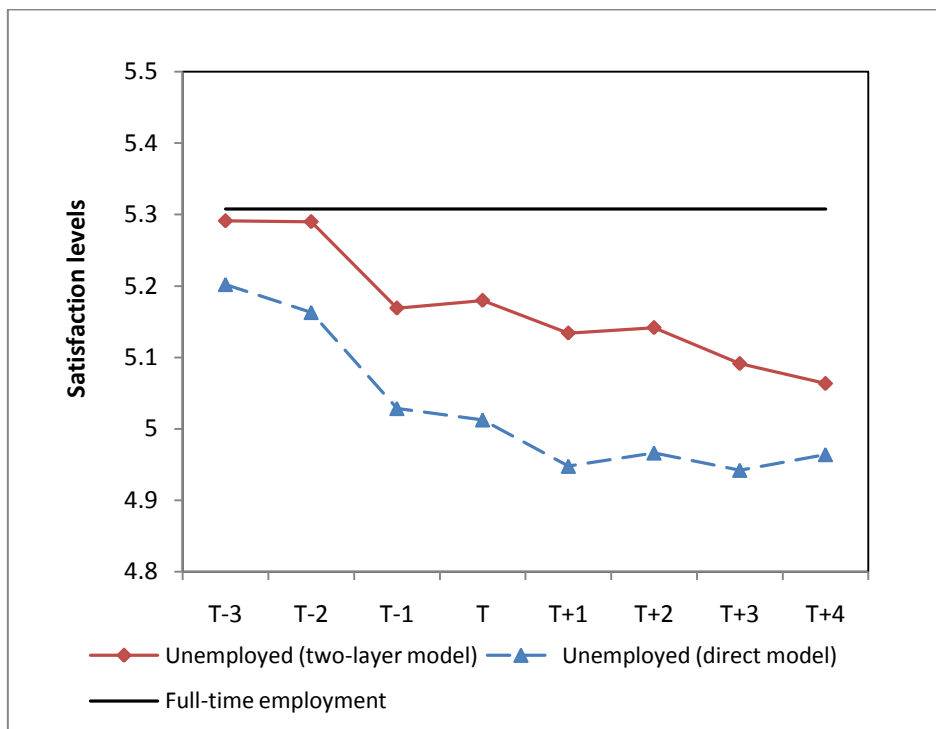
<b>Dependent variable: Life satisfaction</b>	<b>Men</b>		<b>Women</b>	
	<b>With Job Satisfaction</b>	<b>Without Job Satisfaction</b>	<b>With Job Satisfaction</b>	<b>Without Job Satisfaction</b>
Health satisfaction	0.103 [0.004]**	0.116 [0.012]**	0.119 [0.004]**	0.150 [0.007]**
Financial satisfaction	0.071 [0.004]**	0.070 [0.012]**	0.079 [0.004]**	0.069 [0.007]**
Housing satisfaction	0.052 [0.004]**	0.060 [0.012]**	0.054 [0.004]**	0.068 [0.007]**
Partner satisfaction	0.160 [0.005]**	0.069 [0.015]**	0.205 [0.005]**	0.166 [0.009]**
Social life satisfaction	0.132 [0.005]**	0.198 [0.015]**	0.122 [0.005]**	0.161 [0.009]**
Leisure time (amount) satisfaction	0.036 [0.004]**	0.053 [0.013]**	0.046 [0.005]**	0.055 [0.009]**
Leisure time (use of) satisfaction	0.122 [0.004]**	0.205 [0.014]**	0.123 [0.005]**	0.146 [0.009]**
Job satisfaction	0.132 [0.004]**	-	0.085 [0.004]**	-
Constant	1.094 [0.036]**	1.177 [0.116]**	0.978 [0.037]**	1.078 [0.070]**
<b>Observations</b>	37719	6897	36968	14767
<b>Number of person</b>	7419	2750	7786	4515
<b>R-squared</b>	0.35	0.31	0.35	0.29

**Note:** \*\* < 1%. Standard errors are in parentheses. The male and female samples used in the 2<sup>nd</sup> estimation (i.e. without job satisfaction) all had missing information on job satisfaction.

**Figure 3: Predicted life satisfaction before and after unemployment**



**Fig 3a: Men**



**Fig 3b: Women**

**Note:** Year T is the year of unemployment. The two-layer model has job satisfaction as a predictor of life satisfaction, whilst unemployment is assumed to affect life satisfaction directly in the direct model. The horizontal lines represent the estimated satisfaction levels for the average individual who would have remained in full-time employment throughout the panel, i.e.  $U$  at various stages = 0.

**Table A: Descriptive Statistics of the Main Variables, BHPS 1996-2009**

	<b>Men</b>	<b>Women</b>
Life satisfaction	5.161 (1.220)	5.161 (1.295)
Health satisfaction	5.061 (1.517)	4.949 (1.595)
Financial satisfaction	4.509 (1.526)	4.475 (1.591)
Housing satisfaction	5.309 (1.374)	5.283 (1.472)
Partner satisfaction	6.287 (1.161)	6.126 (1.269)
Social life satisfaction	4.922 (1.411)	4.856 (1.512)
Leisure time (amount) satisfaction	4.633 (1.553)	4.579 (1.593)
Leisure time (use of) satisfaction	4.844 (1.499)	4.687 (1.549)
Job satisfaction	4.964 (1.429)	5.044 (1.433)
Unemployment	0.062 (0.241)	0.031 (0.172)

**Note:** The domain satisfaction questions are phrased as follows: *How dissatisfied or satisfied are you with your ... (a) health; (b) finance; (c) house; (d) partner; (e) job; (f) social life; (g) amount of leisure time; (h) use of leisure time?* The global life satisfaction question is phrased *How dissatisfied or satisfied are you with your life overall?* Standard deviations are in parentheses

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<sup>2</sup> For a more exhaustive list of work on the relationship between measures of subjective well-being and unemployment, see the review by Dolan, Peasgood, and White (2008).

<sup>3</sup> It should be noted that a zero adaptation in the financial satisfaction brought about by unemployment is different from previous studies that find high overall adaptation to an increase in income. One explanation for this is that people do not spend a lot of time thinking about income in the years that followed a pay rise. However, the attention of the unemployed may remain focused on their financial situations even after having spent years in unemployment.

<sup>4</sup> The idea that life satisfaction, as well as the speed and extent of overall hedonic adaptation, is a function of an individual's attention has nevertheless been considered before in psychology. Kahneman and Schkade (1998) present simple cross-sectional evidence that the individual's judgment of life satisfaction depends largely upon what the person is focusing his or her attention on at the time of answering the life-satisfaction question. For instance, the unemployed are likely at the beginning to think about their new circumstances many times each day. Adaptation is simply a reduction of attention from the new circumstances over time (for a review, see Wilson & Gilbert, 2008). Dolan and Kahneman (2008) present a review written for economists.

<sup>5</sup> Note that Wave 11 does not contain a set of questions on domain-specific and global life satisfaction. However, it is included in the analysis, given that there is information available on the unemployment variable in every wave. And so, assuming that Wave  $10 = t$ , DS obtained in Wave 12 will have a  $t+2$  rather than a  $t+1$  subscript. Note also that even though we are using Waves 6-18 in our main analysis, the lagged unemployment variable actually runs from Wave 3, i.e., three years before Wave 6.

<sup>6</sup> One may also interpret this result as a reverse causality phenomena, i.e. people who are becoming increasingly unhappy at work may eventually quit their job.

<sup>7</sup> Such a prolonged period of financial worries experienced during unemployment may also contribute to the 'scarring' phenomena experienced by the person after he or she has been re-employed, i.e. unemployment experienced in the past reduces the overall life satisfaction of those who are currently in employment (see Clark et al., 2001; Knabe & Ratzel, 2011).