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Abstract: The role of relative rank, or interdependent preferences, in explaining individual well-being is a rapidly emerging research area for economists. A typically overlooked issue in this literature is the extent of individual heterogeneity in the degree to which individuals are susceptible to comparison effects. In keeping with the idea that comparison effects are important in the labour market, we find that the well-being of the unemployed is positively correlated with the unemployment of others (neighbourhood unemployment rates), whereas the opposite is true for the population as a whole. The main novelty of this study is that we document significant individual heterogeneity in these effects. Specifically, unemployed males and those with relatively strong social ties in their neighbourhood appear to be much more likely to derive well-being benefits from the unemployment of others. We further show that there are significant differences according to personality traits. We suggest that neglecting to consider individual heterogeneity and focusing on 'average' effects as is the norm in the literature to date will invariably lead to an incomplete, and perhaps superficial, understanding of the role of comparison effects for individual well-being.

Key words: comparison effects; unemployment; subjective well-being

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1. Introduction

Economists are becoming increasingly interested in basing assessments of welfare on experience utility (e.g. self-reported well-being) rather than based solely on observed behaviour (see Lowenstein and Ubel, 2008; Dolan and Fujiwara, 2016 for a review of this literature). Proponents of the use of experienced utility as a welfare criterion for public policy seek to explore what factors affect how happy or otherwise individuals feel, and subsequently use such information to inform economic and social policy (e.g. Donovan and Halpern, 2002; Kahneman and Sugden, 2005; Layard, 2005; HM Treasury, 2008; Dolan and Metcalfe, 2012). Initially most of the work in this area was concerned with understanding the role of internal characteristics of the individual such as socio-demographic characteristics and more recently personality traits (see Dolan et al. 2008 for a review). This work has extended to include an examination of the effect of aspects of the external environment. This includes both the role of aspects of the natural environment (e.g. air pollution, noise, climate etc.), as well as the characteristics of others.

The rationale for examining the characteristics of others when it comes to individual well-being is that there may be spillovers or externalities that exist between individuals. Whereas the accepted mainstream model of human behaviour posits that individuals derive well-being solely from absolute levels be it consumption, income or wealth, psychologists and increasingly economists recognise that individuals also care about their relative position (Luttmer, 2005). That is, in evaluating their own situation, individuals may compare their own circumstances to that of others. In order to better understand the importance of comparison effects for well-being, economists working in this area have typically defined various reference groups that are, a priori, thought to be important for individuals. Within this literature, two distinct approaches can be identified: the first involves defining a reference group based on observable individual characteristics such as all individuals of a similar age, gender and education (Ferrer-i-Carbonell, 2005; Layard, 2010). The second approach,

which we use in this study, is based on a defined geographic location, such as one's local area or neighbourhood (Luttmer, 2005; Clark et al. 2009; Hou, 2014)[1].

Within the existing economics literature, the area in which comparison effects have drawn the most attention to date is that of income. Some of the interesting work in this area includes a study by Clark and Oswald (1996) who found that workers' reported satisfaction levels are inversely related to their comparison wage rates. Looking more specifically at research based around residential location, Luttmer (2005) finds that after controlling for an individual's own income, higher earnings of neighbours are associated with lower levels of self-reported well-being. The implication being that individuals' well-being will be enhanced with poorer neighbours, as they will feel relatively rich. Similar[2] findings have been observed in studies by, amongst others, Ferrer-i-carbonell (2005), Helliwell and Huang, (2010) and Knight et al. (2009).

Whilst income comparisons have drawn the most attention, comparisons have been shown to occur over many different aspects of economic and social life (see Clark 2010 for a review of this work). For example, Blanchflower et al. (2009) find that perceptions of being overweight depend on both relative Body Mass Index as well as absolute levels. More recently, Mujcis and Frijters (2015) find that happiness depends on both relative as well as absolute levels of health. Clark and Lelkes (2009) observe that own religious behaviour is positively correlated with individual life satisfaction, but that average religiosity in the region may also have a positive impact, i.e. people are more satisfied in more religious regions.

[1] It is of course possible to combine both approaches and ascertain reference groups based on individuals with similar socio-demographic characteristics and geographical area. However, doing so typically means that the geographic areas will need to be quite large (e.g. regional level) in order to obtain sufficient numbers of individuals with similar socio-demographic characteristics.

[2] Studies using more spatially disaggregated data (i.e. smaller spatial reference groups) have found that individual well-being is positively associated with the income of close neighbours (Clark et al., 2009; Hou, 2014). One reason put forward to explain these contrasting findings is that when considering relatively small geographic units, the negative consumption externalities of neighbours' incomes may not be strong enough to offset the local public good benefits from having rich neighbours.

Previous research has also suggested that comparison effects could be an important factor in helping us better understand the effects of unemployment on individual well-being. For instance, a number of studies in this area have found that the unemployed are typically much less negatively affected by rising rates of regional unemployment than the employed (Clark and Oswald, 1994; Clark, 2003; 2010; Powdthavee, 2007). Indeed some studies have even found a positive correlation between the regional unemployment rate and the well-being of the unemployed (see Clark 2003). The explanation commonly put forward to explain these findings is that in high unemployment regions, by token of its frequency, unemployment has become a normalised social role and, in turn, the stigma associated with being unemployed is lessened (Flint et al., 2013). In other words, being exposed to rising numbers of individuals who are experiencing similar labour market challenges can evoke positive feelings (e.g. relief) in the unemployed, because it helps them feel relatively better off.

In this study, we also examine the role of comparison effects in helping us better understand the relationship between unemployment and well-being. A novel feature of our study is that we take advantage of a 'neighbourhood' as opposed to a regional measure of aggregate unemployment, in order to shed some further clarity regarding the role of both own, and others' unemployment, on well-being. This is done by spatially linking data from the UK Household Longitudinal Study (UKHLS) (a comprehensive longitudinal household survey recording individual well-being) with a variable capturing levels of aggregate unemployment in 32,482 small areas or neighbourhoods, in England, obtained from the Department for Communities and Local Government. Such spatially disaggregated measures of aggregate unemployment could be important when it comes to examining the role of others unemployment on the well-being of the unemployed, as the larger the units the analysis, i.e. the more space and inhabitants these units cover, the higher the risk of underestimating context effects (Hou, 2014).

Notwithstanding the use of more spatially refined measures of aggregate unemployment than is commonly employed, the main novelty of this work is our examination of the role of individual heterogeneity when it comes to comparison effects. This could be important because as pointed out by Clark (2010), some individuals may be very sensitive to comparison effects, while others much less so. While there is an emerging consensus among economists that relative rank matters, it is not so clear as to who is most likely to be affected by concerns surrounding their relative position, be it in relation to unemployment, income, consumption, health etc. Previous work generally does not take individual heterogeneity into account when studying comparison effects, and the small number of studies that we are aware of in this area that do, have typically just focused on gender or age[3].

In this study, we examine the role of personality traits and social ties within the neighbourhood as sources of individual heterogeneity, when it comes to the relationship between the unemployment of others and own individual well-being. We suggest that the extent to which unemployed individuals are affected by the unemployment of others in their neighbourhood, will depend both on the extent to which they are socially integrated into the neighbourhood, and their personality traits. The importance of understanding the importance of personality traits is underscored by a nascent, yet rapidly emerging area of research, showing that personality can help to predict people's success in life such as labour market outcomes (Mueller and Plug, 2006; Becker at al., 2012) and also moderate the extent to which individuals' well-being is affected in response to changing life events. Personality moderation analysis shows, for example, that marriage is not beneficial to everyone (Boyce et al., 2016) and that economic losses are easier for some individuals to bare (Boyce et al., 2010). It seems reasonable to suggest that in addition to predicting actual economic outcomes such as labour market success, personality traits may also affect the extent to which individuals are affected by ranking concerns when judging their own success (or lack of).

[3] Clark (2003) found significant gender differences when looking at comparison effects in the labour market. Specifically he found the interaction between own and regional unemployment was positive for both sexes, but only significant for men. FitzRoy et al. (2014) found that peer group income had a positive relationship on happiness for those under 45 but a negative one for those over 45.

In relation to social interaction, there is a rich literature to suggest that social networks within the neighbourhood are an important component for individual well-being (Putnam 2000; Shields et al, 2007; Howley et al., 2015). We suggest, in turn, that the extent to which an individual is socially integrated into their neighbourhood will affect the extent to which they are influenced by comparison effects when it comes to their neighbours. Finally, we also examine if comparison effects vary by age and gender.

The key subjective indicator of well-being used in our analysis is responses to the General Health Questionnaire (GHQ). This is perhaps the most common well-being indicator used in the literature in this area. In addition to cross sectional results, we take advantage of the panel nature of our dataset by running individual fixed-effects, thereby controlling for time-invariant unobserved heterogeneity. Before presenting our research design and central findings, in the next section we provide an overview of existing literature in this area. The last section provides a summary and concludes.

2. Previous work

A good starting point for our overview of existing research in this area is an influential study by Clark and Oswald (1994). This study using the British Household Panel Survey (BHPS), found that regions with the highest rate of joblessness had smaller well-being gaps between those who were unemployed and employed. Clark (2003) extended this analysis by using seven waves of the BHPS, and similar to the study by Clark and Oswald (1994), found that unemployment is negatively related with well-being, but also that there are distinct geographic differences to these effects. Specifically, the employed report lower levels of well-being as the regional rate of unemployment rises, whereas the well-being of the unemployed appears to rise. In an extension to this work, Powdthavee (2007) concluded from an analysis of the South African Labor and Development Research Survey that "it may be psychologically easier to be unemployed in a region with a high level of joblessness" (Pownthavee, 2006, p.649).

Consistent with their findings using the BHPS, but only this time using the German Socio-Economic Panel, Clark et al. (2010) also found that aggregate unemployment reduces the wellbeing of employed men, but has a far smaller effect on unemployed men. They also presented evidence that the appropriate distinction may not be between employment and unemployment, but rather between higher and lower levels of labor market security. More recently, findings by Flint et al. (2013) also suggest that living in an area with a high unemployment rate may offer a degree of protection against the negative psychological effects of unemployment. Flint et al. used the claimant count rate as their measure of aggregate unemployment which is calculated by expressing the number of jobseeker's allowance claimants as a percentage of the working-age population. The advantage of using the claimant count as their measure of aggregate unemployment is that they are able to define their reference groups at the local authority district level (327 in the UK), as opposed to regional level (9 regions in England). While much more spatially disaggregated than the regional unemployment measures commonly employed in the literature to date, local authority districts are still a relatively aggregated measure of unemployment, with an average of just over 165,000 individuals per district.

Whilst the research described above suggests that the unemployed may benefit when they are surrounded by others who are also unemployed, or put differently, when their neighbours employment status is similar to their own, some more recent research has emerged which suggests that if indeed they are 'status' effects these are outweighed by 'signal' effects, i.e. others bad experiences will be informative about their own future prospects. Chadi (2014), for example, using the German Socio-Economic Panel found that higher regional unemployment is significantly correlated with lower not higher levels of subjective well-being for the unemployed. Oesch and Lipps (2013) uses both the German Socio-Economic as well as the Swiss Household Panel and also found that unemployment hurts as much, if not more so, when regional unemployment rates are high as when they are low.

Both Chadi (2014) and Oesch and Lipps (2013) note that while researchers have focused on the role of aggregate unemployment in attenuating the harmful effect of unemployment on well-being, one could also suggest that high regional unemployment rates have a particularly negative impact on the well-being of unemployed people, because the fewer the jobs that are available, the bleaker the labour market conditions are for the unemployed. They argue that their studies in turn suggest that status effects could be outweighed by signal effects reflective of the reduced job prospects available to unemployed people in regions with high rates of joblessness.

3. Data

The data used in this analysis comes from Understanding Society: the UK household longitudinal study (UKHLS). This is a comprehensive household survey that started in 2009 with a nationally-representative stratified, clustered sample of around 50,000 adults (16+) living in the United Kingdom. The indicator of subjective well-being we use as our key outcome variable is the General Health Questionnaire (GHQ) which consists of a 12 item scale designed to assess somatic symptoms, anxiety and insomnia, social dysfunction and severe depression. It is probably the most common indicator of subjective well-being used in the literature to date (Goldberg et al., 1997; Jackson, 2007). It consists of a 12 item scale and some examples of the types of statements include: 'Have you recently lost much sleep over worry?'; 'Have you recently felt constantly under strain?' and 'Have you recently been able to enjoy your normal day-to-day activities?'

Each item is accompanied by four possible responses: two of the answers are positive and two are negative. A score ranging from 0 (best psychological well-being) to 36 (worst psychological well-being) for each participant is computed for each individual – the higher the score then the more likely it is that respondents are suffering from some form of psychological distress. For simplicity, we reorder this variable so that individuals are scored from 0 (worst psychological well-being) to 36 (best psychological well-being), and label this variable as psychological well-being.

Neighbourhood unemployment

As alluded to earlier, we define our reference group at the neighbourhood as opposed to regional level. Our neighbourhoods are small geographic areas called Lower Super Output Areas (LSOAs) in England. Lower Super Output Areas are designed to be of a similar population size, with an average of approximately 1,500 residents. For each Lower Super Output Area, the Department for Communities and Local Government in England released a variable in 2015 capturing the prevailing levels of unemployment. This measure is called the employment deprivation index and measures the proportion of the working age population in each LSOA involuntarily excluded from the labour market[4]. This includes people who would like to work but are unable to do so due to unemployment, sickness or disability, or caring responsibilities. In short, this index, which we label as *neighbourhood unemployment* in the analysis that follows, ranks each neighbourhood from least to most deprived when it comes to employment, i.e. neighbourhoods with a bigger score have a greater share of the population unemployed than neighbourhoods with a relatively lower score. As the UKHLS is geo-referenced at the LSOA level, we are able to match each individual in this survey with this measure of neighbourhood unemployment. This means we have a measure of the prevailing level of unemployment in each survey respondent's neighbourhood, as well as their reported well-being, employment status and a variety of individual level controls.

Control/moderating variables

Personality is typically described as encompassing "the psychological component of a person that remains from one situation to another" (Wood and Boyce, 2014) and is most typically captured by psychologists using the influential Five Factor Model (McCrae and Costa, 2008). The Five Factor Model consists of five over-arching traits: agreeableness, conscientiousness, extraversion, neuroticism, and openness. In the psychology literature, this so-called Big Five model is the most

[4] See - https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/464597/English_Indices_of_Deprivation_2015_-_Research_Report.pdf for more details

commonly used taxonomy to capture differences in personality across individuals (McCrae and Costa, 2008). To obtain a measure of the Big Five personality traits, participants in wave 3 of the UKHLS (conducted between 2011 and 2013) were asked to what extent they agree/disagree with 15 statements beginning with the quote "I see myself as someone who". Each statement is classed in one of five categories: extraversion, agreeableness, conscientiousness, neuroticism and openness. A composite score for each personality trait is then derived by summing the scores for each of the individual categories.

The variable we use to reflect the degree to which an individual is socially integrated into the neighbourhood is based on responses to the following question "*I regularly stop and talk with people in my neighbourhood*". Respondents are given 5 options ranging from 1 strongly agree to 5 strongly disagree and asked to select the option that is most applicable to them. In addition to labour force status, based on prior research, we include a rich set of commonly observed predictors of subjective well-being as control variables (see Dolan, 2008 for a review of this literature). These include socio-demographic variables such as age, household income, gender, relationship status, health[5], number of children and education. Finally, we supplement these variables with a full set of regional controls to capture any differences in labor market policies or other sources of heterogeneity that is time-invariant at the regional level[6].

[5] The only measure of health available across all waves is a subjective construct relating to how satisfied individuals are with their own health. Including this measure in the regressions that follow means that we are regressing one subjective construct (health) on another (well-being). Given the lack of alternative health variables, we are left with the decision as to whether to include this measure or none at all. In unreported regressions (available on request) we re-estimated our cross sectional and fixed effects model outlined in table 1 without this measure of health, and our results did not change in any meaningful way.

[6] They are 9 regions in England (12 in the UK as a whole) and they define areas (constituencies) for the purposes of elections to the European Parliament and Eurostat also uses them as Territorial units for statistical purposes. The 9 regions in England are South East, London, North West, East of England, West Midlands, South West, Yorkshire and the Humber, East Midlands, North East.

Analysis

The analysis begins by assuming that well-being (W) is explained by a vector of socio-economic and demographic characteristics (X), unemployment (U) and neighbourhood unemployment levels (NU). This yields the following explanatory model where *a* is the individual fixed effect and r is a set of regional dummy variables:

Support for the idea that the well-being effects from unemployment will vary across neighbourhoods can be obtained when the interaction between the latter two well-being determinants (U*NU) is positive, which would suggest that the well-being gap between unemployed and employed individuals is less in neighbourhoods with relatively high aggregate levels of unemployment. To examine if there are any group level differences in the relationship between neighbourhood unemployment and the well-being of the unemployed, we estimate the equation above for different samples of the population, depending on their gender, age, extent of social ties in the neighbourhood and personality traits.

4. Results

Main effects

Table 1 presents the main effect estimates for the full sample population in England consisting of 167,908 individual observations spread across 6 waves of the UKHLS. Specification 1 outlines the results from a pooled cross sectional model, whereas in specification 2 we take advantage of the panel nature of the dataset by running individual fixed-effects, in order to account for any time-invariant unobserved heterogeneity. To correct for any potential misleading and underestimated standard errors associated with using individual level data that is clustered at the lower super output area level, we used cluster-robust standard errors at the neighbourhood (LSOA) level in our pooled cross sectional model (see Cameron and Miller 2015).

The key explanatory variables of interest are the dummy variable *unemployment,* which represents the difference in psychological well-being between those that are unemployed, as compared to those in full time employment, and *neighbourhood unemployment* which provides our measure of unemployment in the reference group (i.e. others unemployment). The results in relation to unemployment are along expected lines, i.e. unemployed individuals have significantly lower well-being scores than employed individuals.

When it comes to the relationship between neighbourhood unemployment and well-being, our a priori expectations, would be that rising aggregate rates of unemployment would be negatively correlated with well-being for two main reasons. The first is that rising rates of neighbourhood unemployment would be a negative signal regarding future prospects. The second is that much prior literature suggests that, in addition to individual level deprivation, neighbourhood deprivation can adversely affect people's happiness (Ludwig et al. 2012). Looking at the results presented in table 1, we can see that as expected, *neighbourhood unemployment* is negatively correlated with individual well-being. The results relating to our remaining control variables are also all along expected lines and so for parsimony are not discussed (see Dolan et al. 2008).

Insert table 1 here

Interaction effects

Next we test if the unemployment of others (neighbourhood unemployment) moderates the well-being effects from unemployment. We do this by interacting the dummy variable capturing individuals who are unemployed with *neighbourhood unemployment*. The coefficient on the resulting interaction variable are very similar in both specifications (cross sectional and fixed-effects) and is strongly positive and statistically significant ($p < 0.01$). This suggests that the unemployed are less negatively affected by rising rates of neighbourhood unemployment, than the employed.

Next in figure 1, we provide a visual illustration of this interaction effect using the results from the fixed-effects[7] model. As can be seen in this figure, rising rates of neighbourhood unemployment is negatively correlated with the well-being of the employed, but positively related with the well-being of the unemployed. The net result is that there is a smaller well-being gap between the unemployed and the employed in neighbourhoods with relatively high aggregate levels of unemployment. Moreover these differences are substantive as, for instance, the gap in well-being between employed and unemployed individuals in the neighbourhoods with the lowest levels of overall unemployment is just over double that observed in neighbourhoods with the highest rates of unemployment. In other words, individuals appear to be hurt much less by unemployment when surrounded by others who are also unemployed. These differences are in keeping with much prior literature by Clark and others who used regional unemployment rates as their reference group measure of unemployment and supports the suggestion that comparison effects (i.e. the unemployment of others) could be an important factor in helping us better understand the effects of unemployment on well-being.

Insert figure 1 here

Individual heterogeneity – social integration

Next, starting with social integration, we examined if there were any group level differences in these interaction effects. That is, we tested if the well-being of certain subgroups are relatively more likely to be correlated with the unemployment of others. In wave 1, 3, and 6 of the UKHLS, respondents were asked to indicate how much they agreed with the statement: *I regularly stop and talk with people in my neighbourhood"*. We used this variable as a proxy for social integration in the neighbourhood. We then broke the population into two groups based on their response to this question. The first group consists of individuals who strongly agreed with the statement (19% of respondents) and for ease of description we classify this group as having strong social ties in the neighbourhood. The second group consists of individuals who do not strongly agree with the

[7] We used the fixed-effects model to illustrate this interaction effect but the results do not change if we used instead a cross-sectional specification.

statement and again for ease of description we classify this group as having relatively weak[8] social ties in the neighbourhood. Using just waves 1, 3 and 6 we then estimated separate cross sectional and fixed-effects regression models for both groups.

Figure 2a illustrates the interaction effect between unemployment and neighbourhood unemployment for individuals with relatively strong social ties, and 2b illustrates the interaction effect for individuals with relatively weak social ties using the fixed-effects[9] model specification. There are significant differences in the interaction effects across the two groups. First, if we look at figure 2a, we can see that the correlation between neighbourhood unemployment and the well-being of the unemployed is now much more substantive when we just look at individuals with relatively strong social ties in the neighbourhood, as compared to the full sample consisting of all individual survey respondents seen in figure 1. While it is perhaps not too surprising to observe that rising neighbourhood unemployment has a more pronounced effect on the well-being of unemployed individuals with relatively strong social ties in the neighbourhood, what is of note is the substantive magnitude of the positive correlation between rising rates of neighbourhood unemployment and the well-being of this group.

As an illustration, consider how employed individuals enjoy a significantly higher level of well-being than the unemployed in neighbourhoods with relatively high levels of employment (similar to that observed in figure 1), but observe how quickly this well-being gap narrows as neighbourhood unemployment rates rise. In neighbourhoods with high levels of unemployment, the well-being of the unemployed now surpasses that of the employed. In other words, this analysis suggests that, in well-being terms at least, if you talk to your neighbours often, then you may be better off being unemployed than employed in certain neighbourhoods with high overall rates of unemployment. If

[8] We are of course not making any judgement as to whether these social ties are weak, rather it seems fair to say that for these individuals their level of social integration in the neighbourhood is not as strong as the first group.

[9] Both here and elsewhere the results were also very similar when using a cross sectional analysis.

we look at the group with relatively weaker social ties, we again see that neighbourhood unemployment is positively correlated with the well-being of unemployed individuals, but the relationship is much less pronounced than the group with strong social ties, and is not statistically significant.

Insert figure 2a and 2b here

Socio-demographic differences

Next we examine if there are any differences in the interaction effect between own and other's unemployment across socio-demographic groupings. An obvious starting point is in relation to gender. Figure 3a and 3b illustrate the interaction effect between unemployment and neighbourhood unemployment separately for both males and females, again using our fixed-effects specification. For both males and females, there is a significant interaction effect between own unemployment and *neighbourhood unemployment*. In other words, when splitting the sample by gender, we still observe a much smaller well-being gap between unemployed and employed individuals in neighbourhoods with relatively high aggregate rates of unemployment. However, looking at figure 3a and 3b we can see that there are significant gender differences in the relationship between neighbourhood unemployment and the well-being of the unemployed.

Specifically, as evident in figure 3a, there is no significant correlation between neighbourhood unemployment and the well-being of unemployed females. In contrast, there is a substantive positive correlation between neighbourhood unemployment and the well-being of unemployed males. Therefore, our analysis suggests that unemployed males seem to be more likely to derive well-being benefits from the unemployment of others than unemployed females. Similar gender differentials were also found by Clark (2003) when looking at regional unemployment rates. These gender differentials could be the result of different cultural expectations surrounding gender roles being felt by men and women (e.g. there may still be stronger work norms for men in many traditionalist neighbourhoods).

It is perhaps worth noting that while unemployed males seem to be more likely to be positively affected by rising neighbourhood unemployment rates than females, the well-being gap between the unemployed and employed in relatively high unemployment neighbourhoods is still significantly smaller overall for females. This is because while the well-being of employed males does not seem to be affected, to any significant degree, by rising neighbourhood unemployment rates, there is a substantive negative correlation between neighbourhood unemployment and the well-being of employed females. It is unclear as to why the well-being of employed females seems to be more likely to be negatively affected by rising rates of neighbourhood unemployment than males. One possibility is that it reflects gender differences in empathy, i.e. while findings are far from clear cut, some studies have found that women are more likely to empathise with the plight of others than men (see Christov-Moore et al., 2014 for a review of this work).

Insert figure 3a and 3b here

In one of the few studies that we are aware of that sought to specifically examine individual heterogeneity when looking at the role of comparison effects on well-being, Fitzroy et al. (2014) find significant age group differences. Specifically, they find positive effects for comparison income on happiness for the under 45s, and negative effects for those over 45. They explain these findings by suggesting that higher peer group income for those under 45 might be considered a temporary setback, but also as an indicator of better future prospects. On the other hand, older individuals are likely to be less flexible as their careers are more likely to be fully determined and thus status effects as opposed to signal effects relating to future prospects may dominate. Given these findings relating to comparison income, we next thought it would be instructive to examine if we could also uncover any differences in the effect of others unemployment, between individuals aged under, and over 45[10] (see figure A1 and A2 in the appendix). We found no significant differences between both

[10] We also experimented with different age groups, e.g. over and above 30, 50 etc. and no substantive differences emerged.

groups suggesting that when it comes to unemployment, status as opposed to signal effects dominate across all age groups.

Personality traits

In wave 3 of the UKHLS, respondents were presented with a set of personality oriented questions. These questions are used to provide a measure of five over-arching dimensions of individuals' personality, namely openness, conscientiousness, agreeableness, neuroticism and extraversion. While these personality questions were asked just in wave 3 of the UKHLS, personality is generally regarded as fixed across time (see Borghans et al., 2008) and so we assume these personality measures are an adequate proxy for individuals in subsequent waves of the UKHLS (i.e. waves 1,2,4,5 and 6). As the personality measures are time-invariant, they cannot be used directly in the fixed effects[11] model. However, using fixed-effects it is still possible to break the sample into different groups based on their personality traits to see if there are any differences in the relationship between neighbourhood unemployment and the well-being of the unemployed according to personality type.

For descriptive ease, for each personality trait, we divide the sample population in two. Those who score above the mean value for each personality trait and those who score below the mean value. In figure 4a and 4b we first examine if the relationship between neighbourhood unemployment and the well-being of the unemployed differ between those with above and below average levels of conscientiousness. Individuals who score high on conscientiousness tend to be organised and dutiful and to take obligations to others seriously (Bogg and Roberts, 2004).

[11] We did test the relationship between personality traits and psychological well-being using a pooled cross sectional model. In keeping with the existing literature (see Steel et al (2008) for a review of this work) neuroticism, extraversion, agreeableness and conscientiousness were all significantly related with psychological well-being, whereas openness was not.

Looking first at relatively conscientious individuals (i.e. above average conscientiousness scores), there is a broadly similar negative relationship between neighbourhood unemployment rates and the well-being of both the employed and the unemployed (see figure 4a). There are, however, marked differences when looking at individuals with below average scores of conscientiousness. In figure 4b, for instance, we can see that the well-being of the employed is still negatively correlated with rising neighbourhood unemployment rates, albeit a little less so than for conscientious individuals. However, the well-being of the unemployed is now strongly positively correlated with rising neighbourhood unemployment rates. As illustrated in this figure, there is a rapid convergence in well-being scores between the unemployed and employed as neighbourhood unemployment rises, to the extent that there is little difference in well-being between them in neighbourhoods with relatively high rates of neighbourhood unemployment. In short, unemployed individuals who are relatively unconscientiousness appear to be much more susceptible to comparison effects than those with above average conscientiousness scores.

Insert figure 4a and 4b here

Similar to conscientiousness, the relationship between neighbourhood unemployment and the well-being of the unemployed is much stronger for individuals with below average levels of extraversion and agreeableness (see figure B1 and B2 and C1 and C2 in the appendix). In contrast, the relationship between neighbourhood unemployment and the well-being of the unemployed is much stronger for individuals with above average levels of neuroticism (see figure D1 and D2 in the appendix). Neurotic individuals are characterised as being more prone to negative emotions such as anxiety (McCrae and Costa, 2003). Finally, we observed no significant differences in the relationship between neighbourhood unemployment and the well-being of unemployed individuals with above and below average levels of openness (see figure E1 and E2 in the appendix).

Insert figure 5a and 5b here

5. Conclusion

In keeping with previous research, typically using much more spatially aggregated geographic measures (e.g. regional) of unemployment than used in this study, we find significant spatial differences in the adverse psychological effects of unemployment. More specifically, for the employed (or the population as a whole), increases in neighbourhood unemployment is negatively associated with subjective well-being. In contrast, we observed a positive correlation between the neighbourhood unemployment rate and the well-being of the unemployed. This suggests that it is easier psychologically to be unemployed in a neighbourhood with a relatively high rate of unemployment. Put differently, in contrast to their employed counterparts, the unemployed appear to be happier as the unemployment of others rises.

The explanation commonly put forward to explain such findings rests on the presence of social norms in the labour market. Under this interpretation, as the unemployment of neighbours increase, the weaker the norm towards work becomes. The explanation being that individuals are not just affected by their own employment status, but also how that status compares to others. When their own unemployment status, in turn, compares favourably to others, such as being unemployed but living in a neighbourhood with rising rates of joblessness, then the adverse well-being effects from unemployment may be lessened.

As Clark and others working in this field suggest, findings of significant geographic differences in the well-being effects from unemployment could have important labour market implications. This is because smaller reductions in well-being, go along with less motivation to search for employment, when unemployed. As such, well-being differences across neighbourhoods could be one further factor behind the often observed spatial sorting of individuals into areas of disadvantage. Tackling unemployment is a key policy priority and even in developed countries there are persistent regional disparities in employment performance, with labour shortages in some regions co-existing with high

unemployment in other regions (OECD, 2005; 2011). In seeking to uncover the determinants of these geographic differences, the literature has concentrated on the role of, among other things, differences in human capital or other characteristics of the individuals, as well as the physical, economic and policy environment (Clark, 1998; Brunello et al. 2001; Ellhorst, 2003; OECD, 2011; Winters, 2013). Our analysis suggests that differences in the adverse psychological effects of unemployment across neighbourhoods could be one further important contributing factor, and this in turn, can have important policy implications when it comes to labour market analysis.

Specifically, if as suggested by these results, individuals are less negatively affected by unemployment when living in areas with relatively high rates of joblessness, then this might provide a reduced incentive for work in these neighbourhoods. In effect, spatial differences in the psychological effects of unemployment may be one possible explanation for 'hysteresis' in that large numbers of people being unemployed in the same area may lead to a 'culture of unemployment' (Clark, 2003; Oesch and Lipps, 2013). From a policymaking perspective, it may then become more difficult than would be expected from an analysis of the labour market conditions in such a neighbourhood to move people out of unemployment. Similarly if an external shock (e.g. plant closing) hits many (as opposed to few) people in the same neighbourhood at once, then the psychological cost of unemployment will diminish and in turn the pressure to both search for and accept new employment diminishes. This means that, irrespective of labour market opportunities, it may be relatively more difficult to transition people from unemployment to employment when living in neighbourhoods with relatively high rates of unemployment.

Notwithstanding our use of more spatially disaggregated measures of unemployment than is commonly employed in the literature in this area to date, the main novelty of this work is that we have outlined how there is likely to be significant individual heterogeneity in the extent to which unemployed individuals are susceptible to comparison effects. Specifically, we observed that males

and/or individuals with relatively stronger social ties in the neighbourhood were much more likely to be affected by the unemployment of others. A plausible explanation in relation to gender is that the social work norm is stronger for men than women, in particular in more traditionally oriented households where males are seen as the breadwinners. In relation to social ties, it seems reasonable to suppose that individuals well-being will be more strongly influenced by the characteristics of neighbours with whom they have a closer relationship with (i.e. talk too often).

A rapidly expanding research area is the role that personality plays in people's success in life. In this study we find that personality may also play an important role in how an individual judges that success. Specifically, our analysis suggests that the well-being of unemployed individuals who are relatively unconscientiousness and relatively more neurotic are much more likely to be positively affected by the unemployment of others. Our findings also suggest that individuals with below average levels of agreeableness and extraversion are more likely to witness a rise in well-being in response to rising aggregate unemployment rates.

To conclude, looking at differences across groups instead of just focusing on average effects helps us in understanding when and to whom comparison effects are likely be important in explaining the role of life events (be they positive or negative) on well-being. Neglecting to consider such heterogeneity and focusing on 'average' effects as is the norm in the literature to date, will invariably lead to an incomplete and perhaps superficial understanding of the role of comparison effects for individual well-being. In future work, we hope to look at other domains where comparison effects have been shown to be important such as in income and health and see if similar patterns emerge regarding individual heterogeneity.

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Table 1: Psychological well-being regression results

Pooled cross sectional OLS regression results			**Fixed-effects**	
	Coef.	Robust Std. Err.	Coef.	Std. Err.
Log equivalent household income	0.195***	0.027	0.055**	0.026
Age	-0.071***	0.006	-0.098***	0.020
Age squared	0.001***	0.000	0.001***	0.000
Female	-1.000***	0.034		
In a relationship	0.325***	0.045	0.440***	0.069
Number of children	0.004	0.022	-0.008	0.034
Education - no formal education is the reference category				
Has a degree qualification	0.100	0.062	-0.194**	0.107
Has a teaching qualification	0.110	0.075	-0.090	0.113
A Levels	0.075	0.065	-0.179**	0.099
GCSE	0.173***	0.064	-0.082	0.100
Satisfaction with health - completely dissatisfied is the reference category				
Mostly dissatisfied	1.438***	0.123	0.688***	0.068
Somewhat dissatisfied	0.531***	0.123	0.258***	0.068
Neither satisfied or dissatisfied	1.735***	0.127	0.870***	0.072
Somewhat satisfied	2.669***	0.122	1.350***	0.068
Mostly satisfied	4.305***	0.119	2.020***	0.064
Completely satisfied	5.870***	0.121	2.520***	0.713
Employment status - Employed is the reference category				
Self-employed	0.101	0.060	0.112	0.076
Retired	0.209***	0.069	-0.083	0.080
Familycare	-0.605***	0.073	-0.406***	0.073
Training	-0.348***	0.075	-0.265***	0.089
Disabled	-5.207***	0.152	-2.640***	0.117
Other	-0.805**	0.457	-0.303	0.417
Unemployed	-2.055***	0.170	-1.730***	0.071
Neighbourhood unemployment	-1.298***	0.299	-1.270**	0.606
Regional dummies unreported for parsimony				
Interaction effects				
Unemployment*neighbourhood unemployment	2.56***	0.636	2.30***	0.755

*** statistically significant at 1% level, ** statistically significant at 5 % level, * statistically significant at 10 % level

Figure 1: Unemployment*neighbourhood unemployment interaction effect (p value = 0.002)

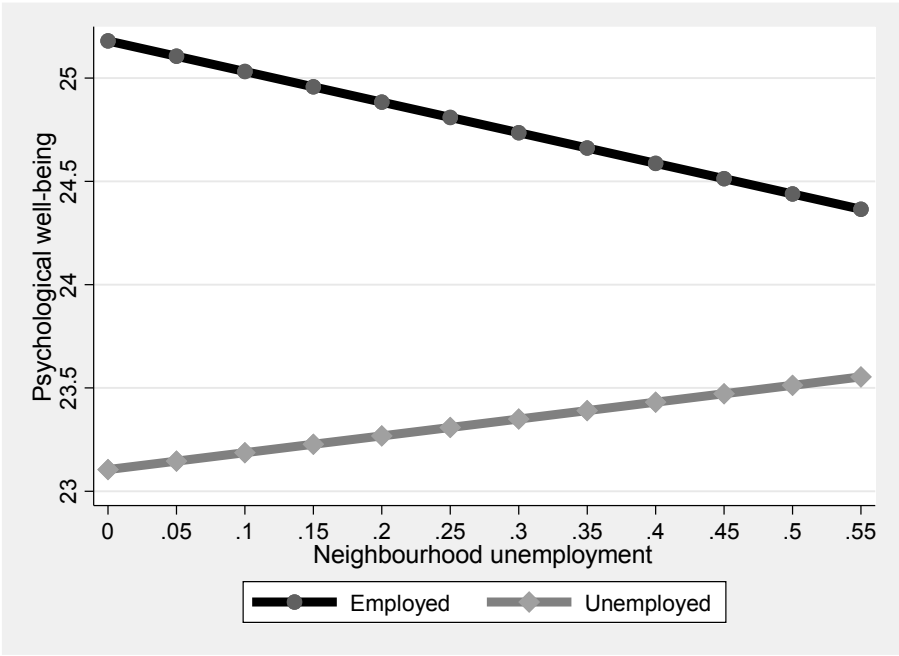


Figure 2a: Interaction effect for those who strongly agree with statement: *I regularly stop and talk with people in my neighbourhood* (p value = 0.095)

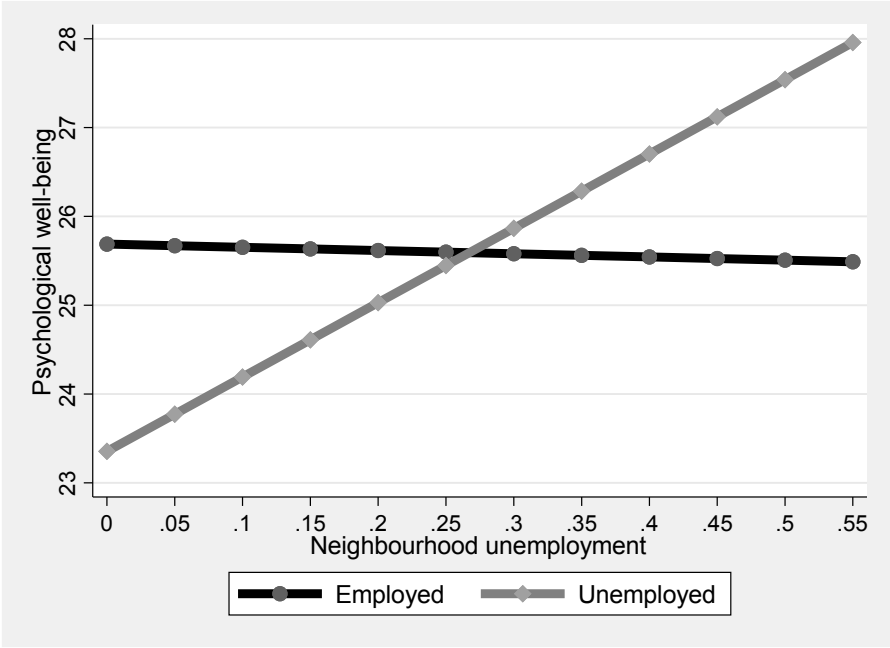


Figure 2b: Interaction effect for those who do not strongly agree with statement: *I regularly stop and talk with people in my neighbourhood* (p value = 0.68)

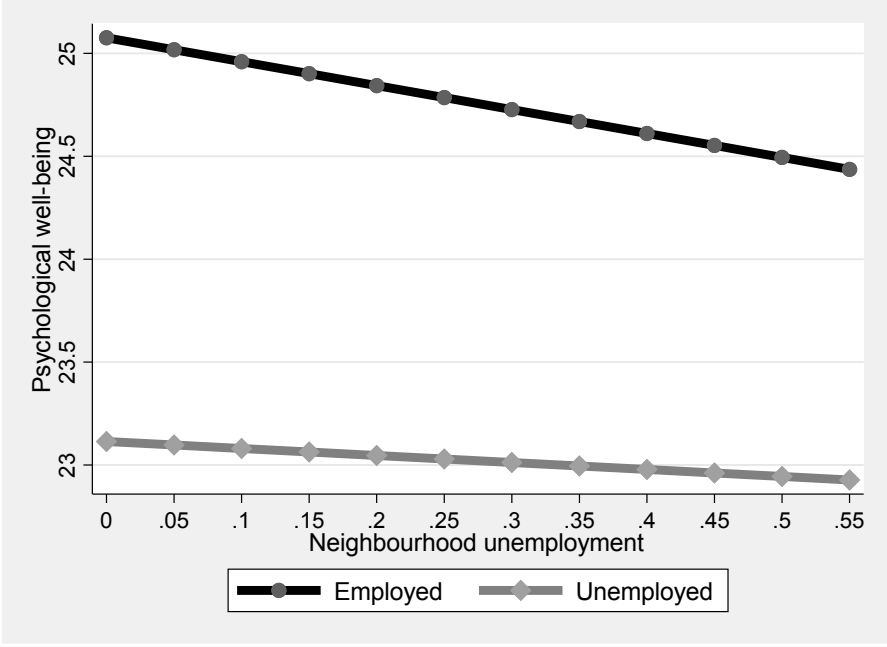


Figure 3a: Interaction effect for males (p value = 0.060)

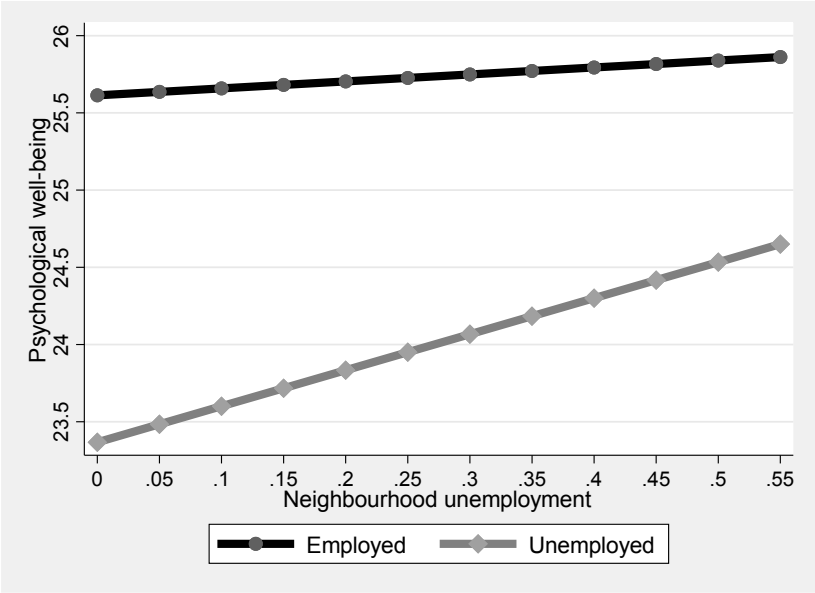


Figure 3b: Interaction effect for females (p value = 0.023)

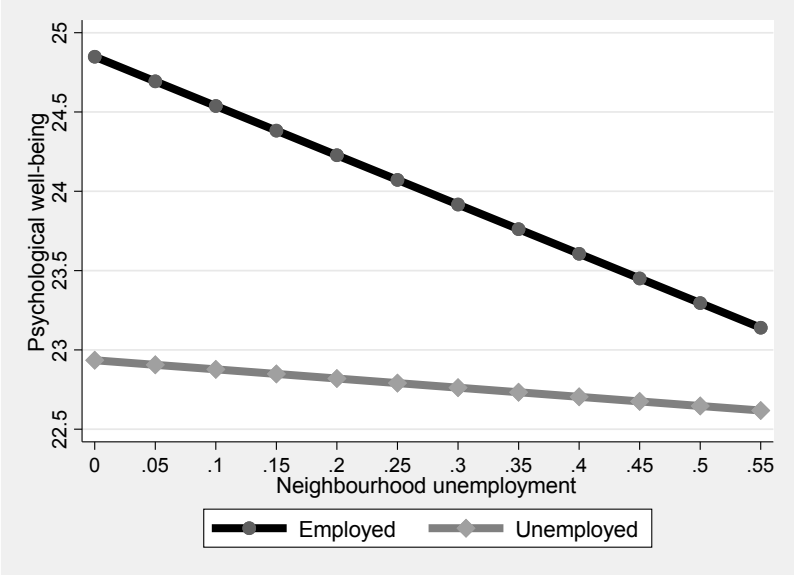


Figure 4a Interaction effect for those with above average levels of conscientiousness (p value .842)

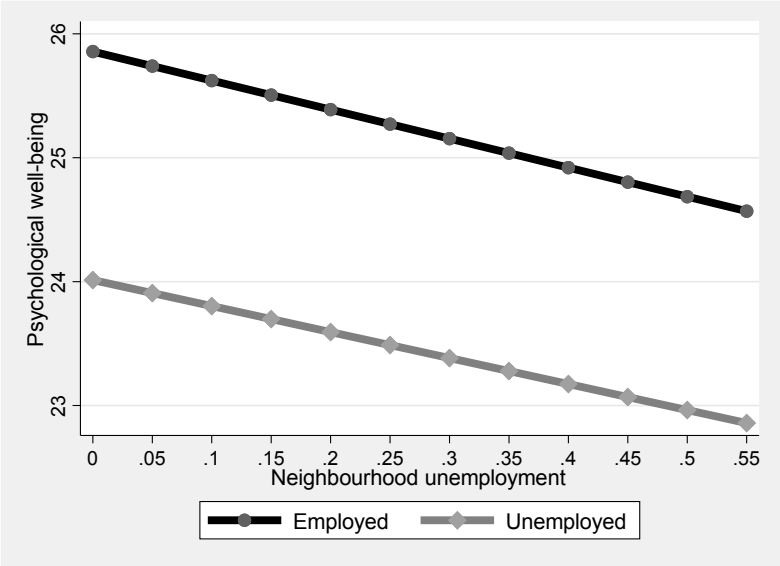
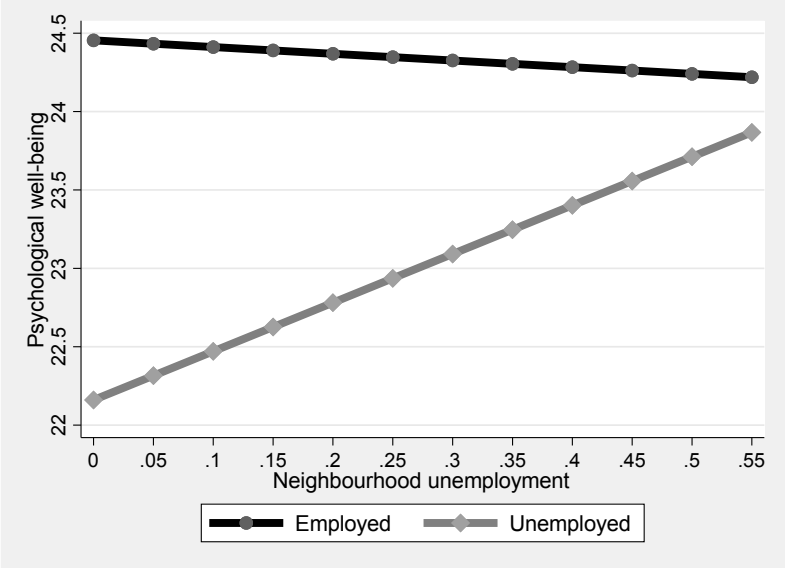


Figure 4b Interaction effect for those with below average levels of conscientiousness (p value = .002)



Appendix

Figure A1 Interaction effect for those aged over 45 (p value = 0.233)

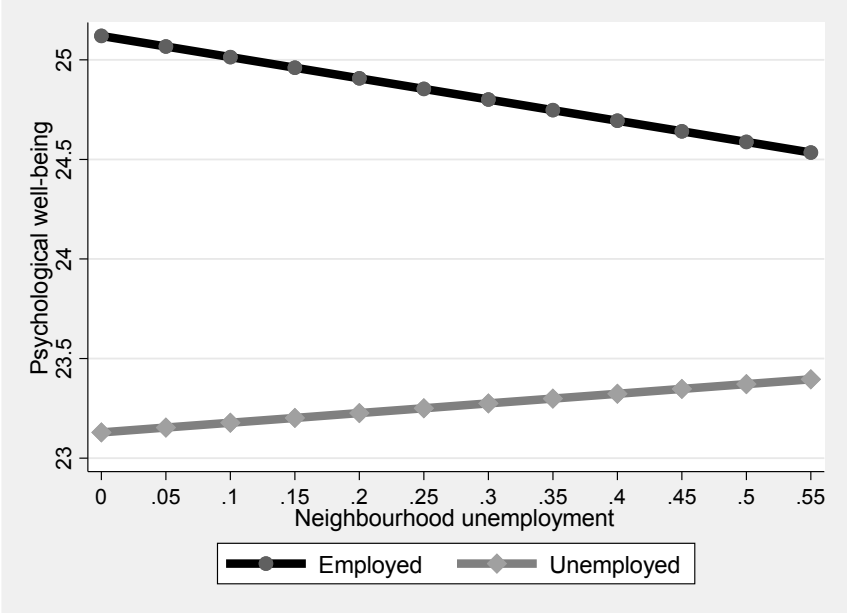


Figure A2 Interaction effect for those aged under 45 (p value = 0.015)

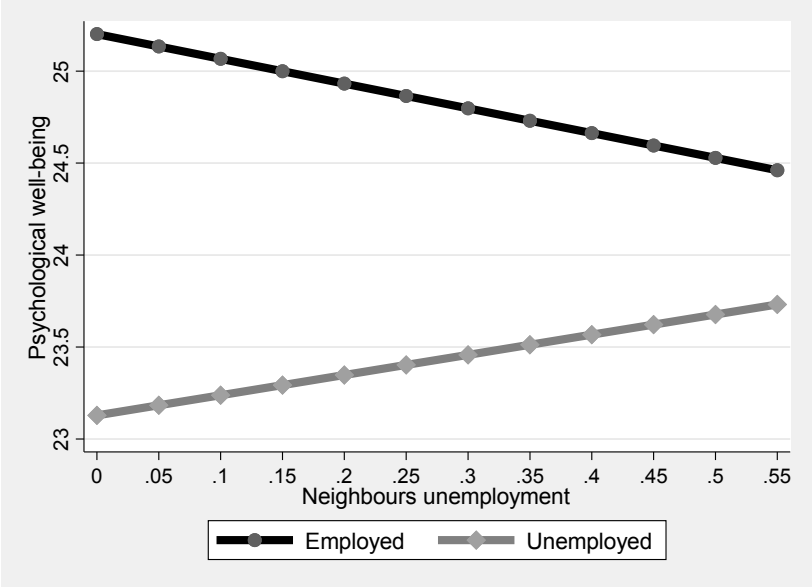


Figure B1: Interaction effect for those with above average levels of agreeableness (p value = 0.038)

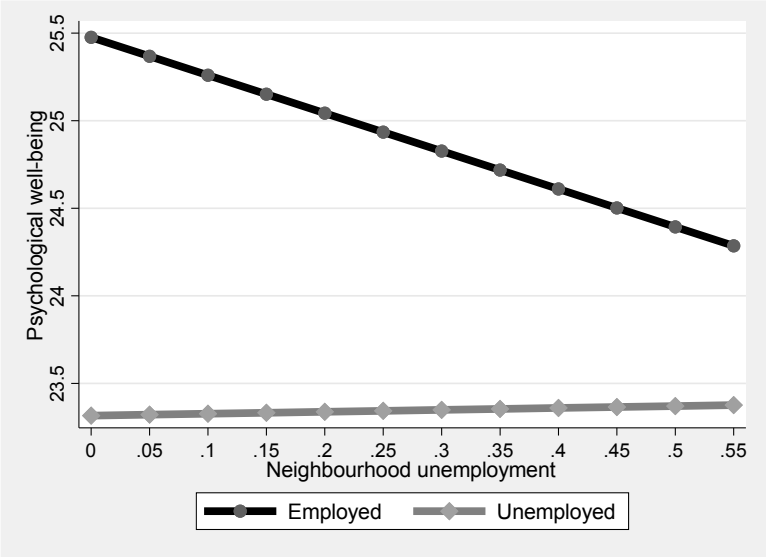


Figure B2: Interaction effect for those with below average levels of agreeableness (p value = 0.116)

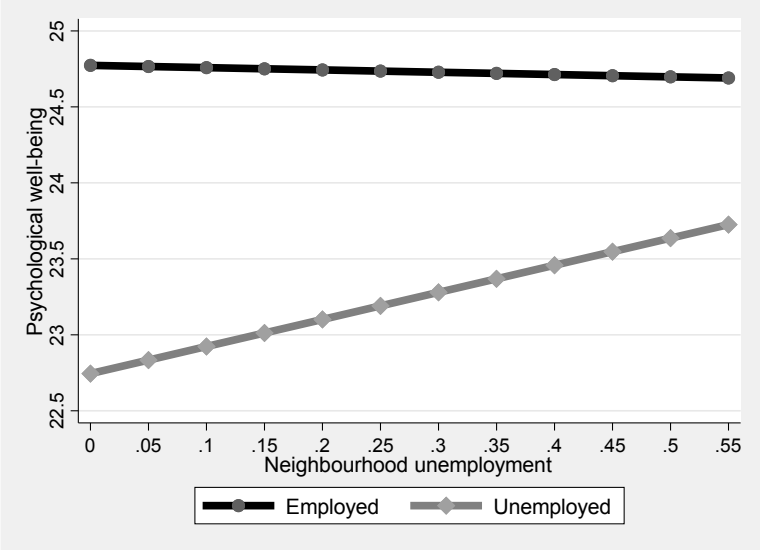


Figure C1: Interaction effect for those with above average levels of extraversion (p value = 0.150)

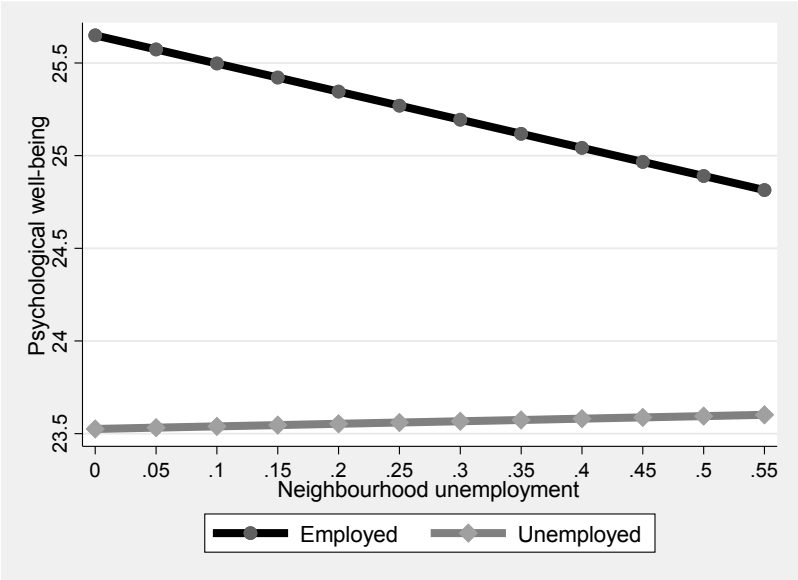


Figure C2: Interaction effect for those with below average levels of extraversion (p value = 0.022)

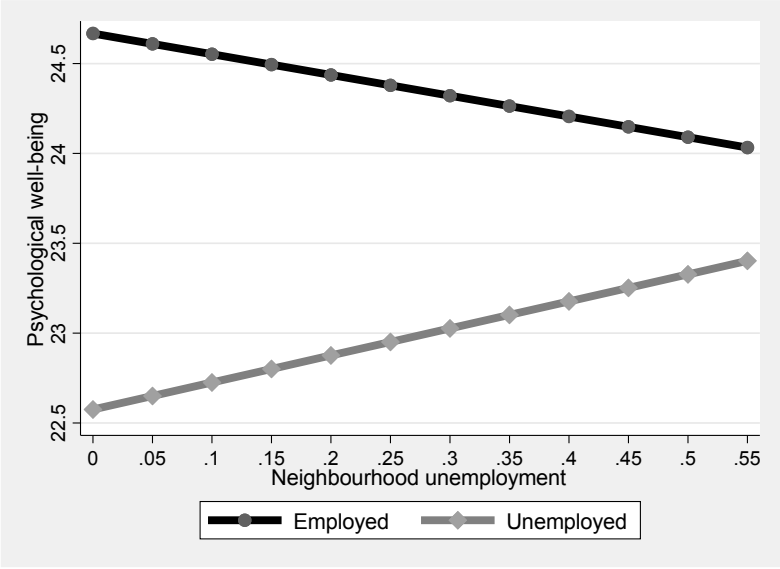


Figure D1: interaction effect for those with above average levels of neuroticism (p value = 0.003)

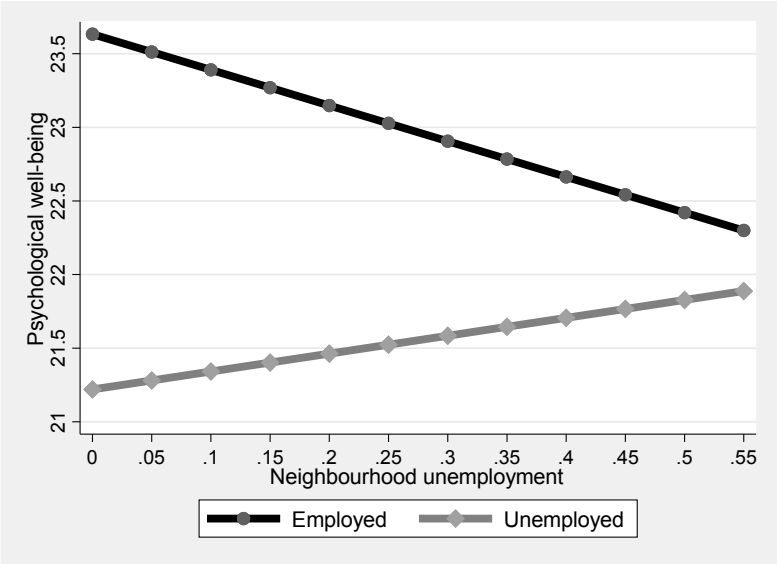


Figure D2: interaction effect for those with below average levels in neuroticism (p value = 0.873)

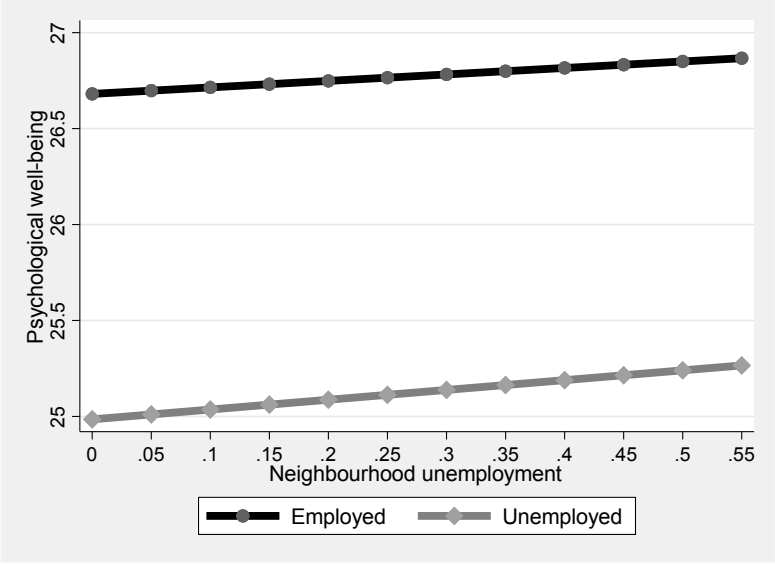


Figure E1: interaction effect for those with above average levels of openness (p value = 0.097)

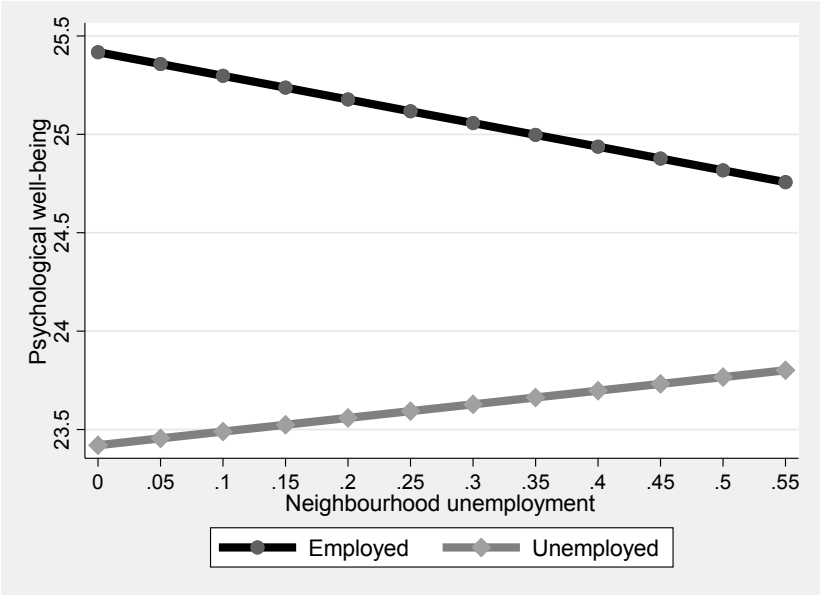


Figure E2: interaction effect for those with below average levels of openness (p value = 0.041)