

Heterogeneous Effects of Unemployment on Mental Health, Depending on Gender and Refugee Status: Evidence from Germany and the United States

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Abstract

In this paper we study how the effect of unemployment on mental health differs depending on gender and refugee status using data from Germany and the United States. For the Germany case study, the effect of unemployment on life satisfaction is estimated using a panel data regression model. To capture possible heterogeneous effects depending on refugee status and gender, interaction terms between employment status and refugee status as well as between employment status and gender are included, yielding two separate regression models. For the United States, a similar model is used with an interaction term for gender and unemployment. Our main findings suggest that females tend to be more adversely affected by unemployment. Applying our model to the German data, the derived results suggest the opposite, i.e. that men are more impacted by unemployment in terms of mental health. Moreover, the analysis suggests that refugee's mental health is more severely impacted by unemployment, though this effect statistically insignificant. Consistent with theory and literature, our primary findings indicate that there are significant heterogeneities in the effect of unemployment depending on individual characteristics.

1 Introduction

Mental health has been a long-existing public health concern, but in recent years it started to gain increased attention. During the 2008-2013 recession, there were increasing suicide rates in the UK and other affected countries. It seems plausible that this phenomenon is related with the increases in unemployment, as suicide rates had been declining before the recession (NHS.UK, 2019). Therefore, understanding the dynamics of mental health and unemployment is increasingly becoming a policy concern.

While there is a wide literature documenting the effect of unemployment on mental health, not as many articles investigate how this effect differs depending on various social and demographic factors. Aiming to provide more insight into this dimension of research, this paper addresses two questions.

Firstly, we ask whether the effect of unemployment on mental health is different for refugees. In 2017 alone, there have been over 538,000 asylum seekers who were granted protection by EU countries, and over 600,000 illegal migrants into the EU (Europarl.europa.eu, 2019), making refugees a salient part of the labour force and population of these countries. Many refugees remain unemployed, due to lack of language skills, education or because they have no permission to work. According to the German Federal Ministry of Migration and Refugees, almost 40% of all registered refugees in Germany were out of work in December 2018. Given the pressing nature of the refugee crisis and the increasing significance of refugees in the working age population of some European countries, this group is especially interesting to analyse. The second objective of this paper is to examine whether there exist heterogeneities in the effect of unemployment on mental health depending on gender. Since women and men have historically had very different experiences in the labor market and are exposed to different social contexts than men, it seems intuitively plausible that heterogeneities exist. Previous efforts to study different effects of unemployment on mental health for males and females have been largely limited to localised studies within a relatively short period of time. Due of this, many existing findings are only representative of restricted geographical locations and points in time. In this research paper, we use nationwide data from the U.S. and Germany, which allows for a more representative analysis. Our research, thus, provides a fresh and better grounded perspective for understanding the mental health effects of unemployment.

2 Literature Review

Several articles have been published that examine the interaction between gender and unemployment. Reviewing previous research, Hammarström (1994) comprehensively looked at the relationship between youth unemployment and general health from a gender perspective utilising Finnish cross-sectional data. Her main finding was that unemployment is most likely causally linked with health deteriorating behaviour, such as increased alcohol consumption, tobacco consumption and illicit drugs use, the effects being stronger for males. Other detrimental consequences of unemployment that are relevant to mental health are a higher suicide rate, increased risk of alienation, lack of financial resources, criminality and future exclusion from the labour market.

Agquist and Starrin (2007) also studied the mental health effects of unemployment for young people, using a sample of young unemployed and trainees. Based on questionnaire data, capturing individual's retrospective accounts of the transition from employment to unemployment or vice versa as well as individual's mental health condition, they find an explicit relationship between unemployment and mental health issues. According to the study, one out of four men and one out of two women perceived that their mental health worsened upon becoming unemployed. This result further suggests that mental health effects of unemployment have a gender dimension. The direction of the effect, however, seems to go in a different direction than Hammarström's work suggests.

More recently, Strandh et al. (2012) investigated how the relationship between unemployment and mental health depends on gender. Their argument is that men and women experience unemployment differently since they aren't exposed to the same social context. Using representative longitudinal data from Sweden and Ireland, the authors look at both differences in mental health among unemployed men and women as well as changes in mental health when exiting unemployment. Based on their findings they conclude that, indeed, unemployment is experienced differently by women in Ireland, where women are less impacted by unemployment. In Sweden, however, there are no apparent differences. Therefore, the authors argue, the relationship between mental health and unemployment is largely context dependent.

A study that had a narrower scope than previous research discussed utilised a mail based survey to examine the effect of job loss for a sample of individuals in Brevard County, Florida, who were put out of work after the Space Shuttle Challenger disaster in 1986

(Leana 1991). Looking at the results from a gender perspective, no evidence was found that women or men respond differently to job loss in terms of psychological distress symptoms. The evidence did suggest, however, that men and women use different coping mechanisms to deal with unemployment. Men relied more on problem-focused activities such as job search, while women relied more on symptom-focused activities such as seeking social support. Moreover, Marital status was found to have a significant effect on several types of coping behaviours, but it did not significantly interact with gender. Although there are some conflicts in the results found so far, the literature does suggest, overall, that the effect of unemployment on mental health is heterogeneous depending on gender.

While there is a wide literature on interactions between unemployment and gender, there is limited evidence how unemployment affects the mental health of refugees. Pernice and Brook (1996) studied several demographic and post-immigration factors related to self-reported symptoms of mental health disorders of immigrants and refugees in New Zealand. Employing data from a survey administered to a sample of immigrants, including 129 refugees from Southeast Asia, they find that unemployment is one of the main predictors of depression and anxiety disorders among refugees.

By conducting a systematic literature review, Bogic Njoku and Priebe (2015) find that out of all articles considered, 84% suggest a positive association between unemployment and mental health disorders among refugees. In evaluation, the literature does suggest that refugees who are unemployed are more affected by a variety of mental health issues. It should be pointed out, however, that none of the studies we found used a comparison group of natives, to identify whether refugees are more affected than other residents in their host country. Providing this comparison between refugees and other residents is precisely the aim of this paper.

3 Theoretical Framework

To provide a theoretical foundation for the relationship between unemployment and mental health, utility theory is a useful framework. Utility can be seen in two theoretically distinct ways; decision utility is inferred from observed choices and material preferences, whereas experience utility more closely matches the notion of happiness or enjoying, and is a subjective state (Carter & McBride, 2011). Experience utility, and the notion of subjective

wellbeing, are arguably more relevant than decision utility when looking at mental health outcomes. Van der Meer (2014) identifies different channels through which employment contributes to subjective wellbeing, which is dependent on physical and social well-being, not just on income. These include receiving stimulation and security from having a job, enjoying social status as an employed person, and receiving an income, which contributes to enjoyment of leisure time through consumption of goods and services. We can therefore see the ways in which unemployment can negatively impact subjective wellbeing. Not only is income lowered, but also one's social status is changed, and stimulation and security are decreased. These latter elements cannot be compensated for by unemployment benefits, which, in a decision utility framework, would be enough to restore utility by merely restoring income to close to previous levels. Thus, unemployment has a severe impact on subjective wellbeing (Cole et al. 2009; Creed and Macintyre, 2001), despite the fact that traditional economic theory considers 'work' to be an inferior good which provides disutility to workers.

This negative impact of unemployment on subjective wellbeing is not shared to the same extent by other individuals who are out of the labour market, such as homemakers and pensioners (Easterlin, 2005). This can play a part in explaining why differences in wellbeing can vary among unemployed men and women, with research finding that men are affected more severely by unemployment than women (Hultman et al. 2006). If people who become unemployed have a different way by which they can receive social approval, stimulation and security, and other things which augment wellbeing, then their happiness may not be negatively impacted so much. For many women, traditionally more so than for men, this may be through being a homemaker. This is reinforced by traditional, and often outdated, norms, which see it as more socially acceptable for women to stay at home while men are the main breadwinners within a household (Stam et al., 2015). Therefore, one might expect women to be less affected than men by unemployment in terms of mental health. Ultimately, however, the direction of the effect depends much on the specific social context which defines the channels through which men and women gain their wellbeing.

Another important determinant of experience utility is reference dependence. Reference-utility theory postulates that there are differences in the way that individuals value their subjective wellbeing depending on their individual starting points, or reference points, and whether outcomes are better or worse relative to this (Tversky & Kahneman (1992); Koszegi & Rabin, 2006). For example, it is found that relative income is more important to

people's subjective wellbeing than absolute income, where relative income refers not only to income levels relative to those of others but also with respect to one's own past experiences and future expectations (Castilla, 2012). Carter and McBride (2011) find that people have an 'S-shaped' satisfaction, or utility function, in which the reference point depends on past expectations, social comparisons and subjective expectations. Aspirations also play an important role in this, with Easterlin (2001) finding that wellbeing is a function of the gap between what a person has and what they aspire to have, with those who achieve their aspirations considering themselves better off. Therefore, it seems plausible that unemployment has such a negative impact on mental health because of the sudden fall in subjective wellbeing relative to the reference point of being employed. Thus, the impact of unemployment on wellbeing may vary depending on how high this reference point was initially. It may be the case that for certain groups, such as refugees, whose reference point may be based on low levels of wellbeing experienced in the country from which they were forced to flee, that unemployment within their new country may not provide such a relative drop in wellbeing, such that they are still relatively content. Hence, it could be hypothesised that refugee's mental health is less negatively impacted by unemployment.

Not only does our wellbeing depend on our reference point, but it is found that reference points shift over time; our aspirations rise as previous ones are satisfied (Easterlin, 2005). This idea is known as the Hedonic Treadmill (or hedonic adaptation/habituation) (Brickman & Campbell, 1971) and explains how people adapt to improving circumstances to the point of affective neutrality. Evidence for this includes findings that lottery winners are generally no happier, and long-term paraplegics no less happy, than before these big changes occurred in their lives (Brickman et al., 1978). Kahneman and Kruger (2006) explain that many seemingly important life events, such as marriage and bereavement, have substantial short-run effects on life satisfaction, but that these effects are generally temporary. A similar impact is found for economic changes, such as large increases in income or standard of living. For example, Easterlin (1995) finds that the average self-reported happiness level did not increase in Japan between 1958 and 1987, although real income increased fivefold. Therefore, it may be interesting to see how the impacts of unemployment on different groups are felt as people's reference point shifts over time.

4 The German Case

4.1 Data and Variables

The empirical analysis is based on the German Socio-Economic Panel, which contains demographic data of roughly 20.000 residents each year, compiled during a cohort study running in Germany since 1984. In this paper, the data used ranges from 1984 to 2016. The main subpopulation of interest, for which data is not available in the U.S. data set, is residents who have been granted official refugee status. The total number of refugees who were interviewed is 2468, where all these responses were recorded in the year 2016. This temporal clustering of the refugee sample is unsurprising, as starting in 2015 large numbers of migrants from Syria and sub-Saharan Africa began to make their way across the Mediterranean Sea and the Balkans to seek asylum in Europe, resulting in what is commonly known as the European "refugee crisis".

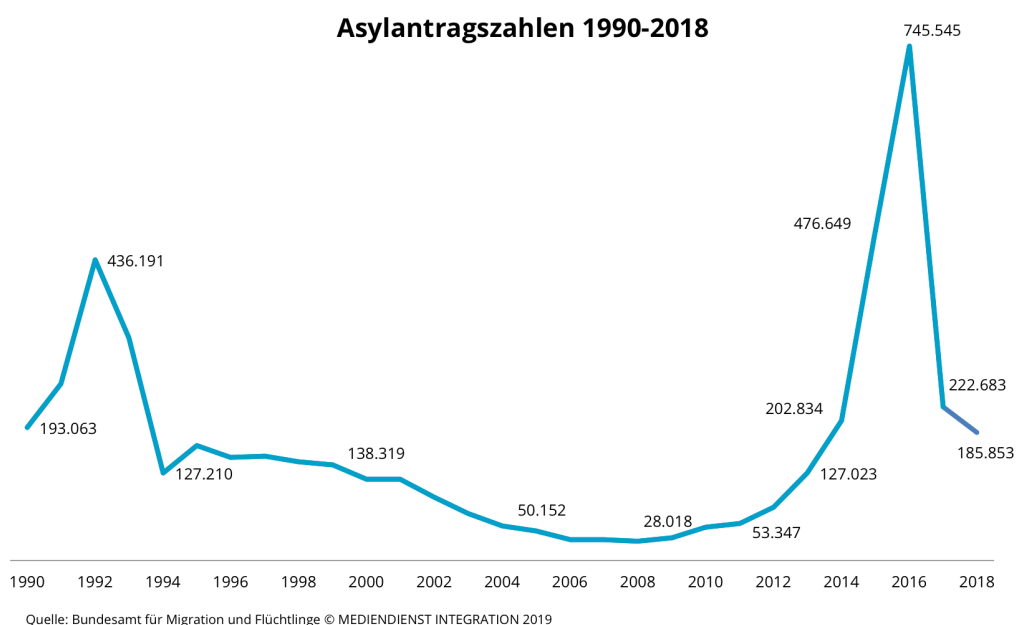


Figure 1: Asylantragszahlen 1990-2018: Number of Asylum Applications per Year

This phenomenon can be strongly seen from the graph above, showing the total number of applications for asylum in Germany since 1990. While the number is quite moderate for most of the period, with the refugee crisis in 2016 the number spikes significantly.

The data set doesn't contain explicit information about individuals' mental health. Instead, overall life satisfaction is used as a proxy. On the survey, individuals are asked the following question: "How satisfied are you at present with your life as a whole?". Respondents are then presented an ordinal scale ranging from 0 to 10, where 0 means "completely dissatisfied" and 10 means "completely satisfied". This measurement of psychological well-being is purely subjective, which leads to problems. Most importantly, interpersonal comparison may not be valid, because people "anchor" their scale at different points. Winkelmann, Liliana, and Rainer Winkelmann (1998) solve this problem by interpreting "anchoring" of the scale as idiosyncratic individual effects. These effects can then be considered using individual fixed effects in a regression model. In this case, however, it is not possible to use individual fixed effects, as two of the main treatment variables (gender and refugee status) are immutable characteristics and would, hence, be absorbed by the fixed effects. We will get back to this problem in the next section. The first main treatment variable used is employment status (Unemployed). For the purpose of this analysis, a binary variable is used, which takes the value 1 if a person is full-time or part-time employed and is coded 0 if a person is unemployed or has irregular or marginal employment. The other main treatment variable is refugee status (Refstat), which is a binary variable taking the value 1 if a person has been officially granted refugee status and is 0 otherwise. Gender is captured by a dummy variable that takes the value 1 for females (Female). Beyond these three variables, the other explanatory variables are age (Age), marital status (Married), years of education (Education) and the number of total months a person has been unemployed before (UnempExp).

4.2 Methodology

The effect of unemployment on life satisfaction is estimated using a panel data regression model. In order to capture possible heterogeneous effects depending on refugee status and gender, interaction terms between employment status and refugee status as well as between employment status and gender (Unempref and Femunemployed) are included, yielding two separate regression models. Moreover, time fixed effects capture possible temporal trends.

As mentioned above, there is an inherent problem with comparing life satisfaction scores across individuals, due to the subjective nature of the measurement. Since individual fixed effects are not viable in this case, the alternative strategy used here is to run two regressions. The first one estimates the effect of employment status on life satisfaction, with fixed effects. The second one does the same, but this time without individual fixed effects. If there is a bias due to anchoring of the scale, this should cause a difference in the effect of unemployment on life satisfaction. Hence, if the difference is negligible, this gives reason to believe that the estimates without fixed effects are trustworthy. Another important potential concern with the models is that there could be reverse causality, i.e. overall life satisfaction has a causal impact on unemployment status. We consider some evidence to assess whether this is the case. Our reasoning is that if the unemployed were inherently dissatisfied, then it should be the case that the unemployed are just as satisfied with their life as those who are employed but have been unemployed in the past. Therefore, we draw a comparison in mean life satisfaction between these different groups in the next section.

After having addressed these two issues of internal validity, we run the two main models:

Model with interaction term for gender:

$$LifeSatisfaction_{it} = \beta_0 + \beta_1 \cdot Unemployed_{it} + \beta_2 \cdot Female_i + \beta_3 \cdot Femunemployed_{it} \quad (1) \\ + \beta_4 \cdot Age_{it} + \beta_5 \cdot Education_{it} + \beta_6 \cdot Married_{it} + Year_t + \varepsilon_{it}$$

Model with interaction term for refugee status:

$$LifeSatisfaction_{it} = \beta_0 + \beta_1 \cdot Unemployed_{it} + \beta_2 \cdot Refstat_i + \beta_3 \cdot Unemprefstat_{it} \quad (2) \\ + \beta_4 \cdot Age_{it} + \beta_5 \cdot Education_{it} + \beta_6 \cdot Married_{it} + Year_t + \varepsilon_{it}$$

It should be noted that in the model with the interaction term for refugee status, it is not possible to control for gender, since all refugees in the sample are male. Furthermore, the refugee-model includes previous unemployment experience as a control, as this could be a factor determining individuals choice to leave their country and seek asylum abroad.

5 The U.S. Case

5.1 Data and Variables

The data used has been sourced from "The Behavioural Risk Factor Surveillance System (BRFSS)" which is USA's premier system of health-related telephone surveys that collect state-level data about 18,000 U.S. residents regarding their health-related risk behaviours, chronic health conditions, and use of preventive services. While the dataset includes survey data from 1984 to 2018, we have only used data 1994 onwards as that is from when the mental health indicator was added to the survey.

The key mental health indicator is a self-reported status which is derived from asking the question, "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?" Hence, the variable is discrete, ranging from 0 to 30. If people refused to answer, or answered by saying "I don't know", the observations were coded as missing values. While the variable is self-reported, it has fewer limitations in terms of comparability across individuals as the unit is number of days, as opposed to an arbitrary scale.

The main dependent variables is employment status ("Unemployed"), which is a dummy variable equalling 1 if a person is currently unemployed and zero otherwise. Beyond this, the additional regressors are relationship status ("NotSingle" taking the value one if a person is married or in a non-married couple), age ("Age") and education level ("Education"). Education level is a categorical variable dividing individuals up as follows: never attended school (1), attended elementary school (2), completed some high school (3), graduated from high school (4), completed some college or technical school (5), is a college graduate (6).

5.2 Methodology

To evaluate how mental health outcomes differ between men and women, with respect to unemployment, we use a cross-sectional dataset, across all 50 American states from 1994 to 2018. We then use a linear regression model using mental health outcome as the dependent variable and unemployment and gender as the independent variables/regressors. There are also other demographic factors such as age, education levels and relationship status that

can cause a bias in our estimates, and hence have been included these as controls.

Since unemployment can be cyclical in nature, or be impacted by other time-variant factors, we want to avoid this bias in our estimates. Therefore, to get closer to causality, we control for those changes that occur economy-wide in a given time period, by running a time (year) fixed effects regression. Since it is a cross-sectional dataset, running entity fixed effects would not be viable.

We use the following Time Fixed Effects model:

$$\begin{aligned}
 \text{MentalHealth}_{it} = & \beta_0 + \beta_1 \cdot \text{Unemployed}_{it} + \beta_2 \cdot \text{Age}_{it} + \beta_3 \cdot \text{Educa}_{it} + \beta_4 \\
 & \cdot \text{NotSingle}_{it} + \beta_5 \cdot \text{Fem}_i + \beta_6 \cdot \text{Fem.unemployed}_{it} + \text{Year}_t + \varepsilon_{it}
 \end{aligned} \tag{3}$$

6 Results

6.1 Germany

Before considering the main results, it is important to test whether the exclusion of individual fixed effects can be expected to have a biasing impact. As described above, the method used here is comparing two regressions for the effect of unemployment on life satisfaction, with and without individual fixed effects. The result from the first regression (Table 1), with time fixed effects only, is that unemployment has a significant negative effect on life satisfaction, both statistically ($p < 0.01$) and in terms of magnitude (unemployment is associated with a 0.226-point drop in life satisfaction). Including individual fixed effects barely changes this result at all, causing the coefficient to decrease in absolute value by less than 1%. This clearly suggests that any bias caused by Individual differences in "anchoring" is negligible. It is still possible, however, that bias in the estimators for the coefficients of the interaction terms for gender and refugee status is introduced by the fact that members from either respective subpopulation systematically "anchor" their life satisfaction scale differently from the remaining population.

Next, we consider evidence to assess whether there is reverse causality. In Table 2, the mean life satisfaction scores are displayed for three categories of individuals: Employed, Unemployed and those who are currently employed but have been unemployed for some time in the past. What can be seen from the table is that, very clearly, unemployment

Table 1: Fixed Effects Regression Output

	Dependent Variable is Life Satisfaction	
	(1)	(2)
Unemployed	-0.226*** (0.018)	-0.225*** (0.010)
Female	0.060** (0.027)	
Age	-0.001 (0.001)	-0.024*** (0.001)
Education	0.018*** (0.005)	-0.011*** (0.002)
Married	0.320*** (0.024)	0.233*** (0.014)
Constant	7.151*** (0.071)	8.250*** (0.035)
Obs.	158868	536111
R-squared	0.0282	0.0064
Individual Fixed Effects	No	Yes
Time Fixed Effects	Yes	Yes

Robust standard errors in parentheses

***p<0.01, **p<0.05, *p<0.1

Table 2: Mean Life Satisfaction

	Mean	Std.Err.	[95% confidence interval]	
Employed (n=311,455)	7.1984	.00297	7.1925	7.2042
Employed with previous unemployment (n=111,276)	6.9901	.00518	6.9799	7.0003
Unemployed (n=264,831)	6.9027	.00385	6.8952	6.9103

is associated with a drop in overall life satisfaction compared with employment (change of ≈ -0.3). Moreover, those who are employed but have been unemployed in the past also have a lower mean score compared with the employed in total (change of ≈ -0.2). This difference, however, is smaller than the drop-in life between the employed and the unemployed. If the unemployed were inherently dissatisfied with their life, then these two differences in life satisfaction should be the same (as noted in the previous section), which suggests that any correlation between unemployment and life satisfaction is not entirely driven by a reverse causal relationship.

The main models both produce the result that unemployment negatively affects life satisfaction, in line with existing literature and theory, the effect being slightly stronger in the gender model. Considering the female subsample (see Table 3), women tend to have slightly lower life satisfaction than men, although this effect is not statistically significant at any standard level once controls are included. The interaction term with unemployment is positive and has a meaningful magnitude, in all models, where the interaction coefficient has a value around 0.2 in models 3 and 4. Moreover, the coefficient is highly statistically significant in all models ($p < 0.01$). This means that, using models 3 and 4 the estimated effect of unemployment for men is roughly -0.33 points on the life satisfaction scale while for women the effect is about -0.13. In other words, the effect of unemployment is about 60% weaker for women than for men. Clearly, this suggests is that for women, becoming unemployed has a less detrimental impact on overall mental health compared to men.

Considering the remaining regressors, age seems to have no significant impact once time fixed effects are included. In contrast, years of education and marital status both have statistically significant positive effects ($p < 0.01$) in all models. The coefficient for age squared is significant at the 10% level but is virtually zero in magnitude, suggesting that the effect of age doesn't change across a person's life span.

Table 3: Effect of Unemployment on Life Satisfaction dependent on Gender

	Dependent Variable is Life Satisfaction			
	(1)	(2)	(3)	(4)
Unemployed	-0.568*** (0.026)	0.339*** (0.027)	-0.333*** (0.027)	-0.322*** (0.028)
Female	-0.119*** (0.029)	-0.031 (0.030)	-0.038 (0.029)	-0.038 (0.029)
Femunemployed	0.358*** (0.034)	0.238*** (0.035)	0.205*** (0.035)	0.201*** (0.035)
Age		-0.020*** (0.001)	-0.001 (0.001)	0.006 (0.004)
Education		0.014*** (0.005)	0.017*** (0.005)	0.017*** (0.005)
Married		0.318*** (0.024)	0.313*** (0.024)	0.299*** (0.025)
Agesq				-0.000* (0.000)
Constant	7.258*** (0.019)	7.756*** (0.068)	7.194*** (0.071)	7.064*** (0.104)
Obs.	164378	158868	158868	158868
R-squared	0.0091	0.0101	0.0292	0.0282
Time Fixed Effects	No	No	Yes	Yes

Robust standard errors in parentheses

**p<0.01, *p<0.05, *p<0.1

For the refugee subpopulation, the results look different. It can be seen from table 4 that refugees tend to have (statistically significantly) higher overall life satisfaction. With an effect of almost at least -0.2 points on the life satisfaction scale in all models, this effect is considerable. The interaction term, in contrast, is always negative with a value around -0.22 in the models 2 and 3. This implies that, for refugees the effect of unemployment is close to -0.36 while for other residents it is -0.14. As such, the results lead to the inference that refugees are much more impacted by unemployment in terms of mental health than other residents. It must be noted, however, that this effect is not statistically significant at any standard level. This is not surprising, given the small number of refugees in the sample and given the temporal clustering of the observations. What this means is that, ultimately, the data don't allow fully conclusive statements about the true interaction effect. Given these empirical results it might be speculated, however, that if there is a non-zero effect, it is more likely to be negative. Similar to before, age has a slight negative effect in the models 1-3. But when age squared is included the effect becomes positive and diminishing (at a very low rate). Years of education and marital status also have a positive effect as before, where this time both effects remain highly statistically significant in all models ($p < 0.01$).

Table 4: The Effect of Unemployment on Life Satisfaction dependent on Refugee Status

	The Dependent Variable is Life Satisfaction			
	(1)	(2)	(3)	(4)
Unemployed	-0.200*** (0.012)	-0.139*** (0.012)	-0.138*** (0.012)	-0.186*** (0.013)
Refstat	0.340** (0.160)	0.317** (0.161)	0.244 (0.161)	0.231 (0.161)
Unemprefstat	-0.128 (0.167)	-0.218 (0.167)	-0.219 (0.167)	-0.175 (0.167)
Age		-0.008*** (0.001)	-0.008*** (0.001)	0.034*** (0.003)
Education		0.002 (0.002)	0.001 (0.002)	0.005*** (0.002)
Married		0.237*** (0.016)	0.242*** (0.016)	0.291*** (0.016)
UnempExp		-0.320*** (0.018)	-0.321*** (0.018)	-0.290*** (0.018)
Agesq				0.000*** (0.000)
Constant	7.412*** (0.010)	7.665*** (0.031)	8.074*** (0.057)	8.557*** (0.078)
Obs.	237046	226829	226829	226829
R-squared	0.0041	0.0344	0.0405	0.0480
Time Fixed Effects	No	No	Yes	Yes

Robust standard errors in parentheses

**p<0.01, *p<0.05, *p<0.1

6.2 U.S.

A coefficient equal to 3 persists for the unemployment dummy variable across all models, signifying that if a person is unemployed, the number of days that their mental health is bad are larger. Which implies that unemployment negatively affects mental health outcomes, as expected in theory and proven in the literature.

Women in general have more bad days of mental health than men – on average 1.15 more days (out of 30).

This regression model shows us that women who are unemployed have (on average) 3.08 number of bad mental health days as compared with women who are employed (i.e. $\beta_1 + \beta_6$). Moreover, we see that unemployment affects women (marginally) more than men, as unemployed men, on average, have 3 bad days of mental health. This result is significant at the 5% level, but not at the 1% level.

When we split categorical variables into their individual values, we observe that people below the age of 65 have a greater number of days of bad mental health, whereas those above 65 have fewer. This is interesting as 65 is the retirement age in USA. At this point it is important to note that while those who are unemployed have worse mental health than those who are not, during a lifespan of an individual, he/she is relatively better-off off during the retired years. However, this result is not of significance to our research question. Further research on this would be possible.

Finally, when comparing results of the time fixed effects model with those in the model without time fixed effects, we do not see any major differences. This implies that the model without fixed effects does not entail a lot of bias in its estimates. Moreover, both our models have significant estimates as all p-values are zero or close to zero.

Table 5: The Effect of Unemployment on Mental Health dependent on Gender

	Dependent Variable is Mental Health	
	(1)	(2)
Unemployed	3.041*** (0.029)	3.011*** (0.029)
Age	-0.032*** (0.000)	-0.034*** (0.000)
Education	-0.388*** (0.004)	-0.397*** (0.004)
Not Single	-1.051*** (0.008)	-1.122*** (0.008)
Fem	1.177*** (0.007)	1.153*** (0.007)
FemUnemployed	0.059 (0.038)	0.077* (0.038)
Constant	6.228*** (0.023)	2.240*** (0.033)
Obs.	3802369	3802369
R-squared	0.038	0.039
Time Fixed Effects	No	Yes

Robust standard errors in parentheses

***p<0.01, **p<0.05, *p<0.1

7 Discussion

To conclude, our first finding, based on the German data, is that the effect of unemployment on mental health is more negative for men than for women. This can be readily explained using our initial theoretical framework, which is mainly based on experience utility. Applying the theory, it could be argued that women may be able to derive utility from non-pecuniary channels to a greater extent than men. For example, unemployed women may still receive mental stimulation from looking after their family and receive social status as a homemaker (Stam et al., 2016).

Using the U.S. data, however, we find that women are marginally more affected by unemployment than men. There are several possible explanations for the difference in results from the two countries. One possibility is that the difference in our results between Germany and U.S. could be driven by the types of data used for these two countries. The German results are drawn from panel data, containing information of the same individuals over time. In contrast, the U.S. results are drawn from cross-sectional data, which means individuals are not tracked over time. Since our mental health measures are self-reported, looking at the same individuals over time is important to reduce bias, suggesting the German results are more robust. Another difference is that the interaction coefficient for gender has very low standard errors using the German data compared to the U.S. data, further suggesting that the former set of results is more reliable. Finally, it cannot be ruled out that the results reflect differing effects of unemployment on mental health for women in the U.S. and Germany. Most plausibly, differences in the structure of the labor market and social context cause women to experience unemployment differently across countries, which is also suggested by studies done by Strandh et al. (2012).

The second main finding is that, although refugees on average have a higher life satisfaction overall, there seems to be a stronger negative impact of unemployment on life satisfaction for refugees than for other residents though not significant. This may seem surprising, because theories of reference dependence seem to suggest that for groups like refugees, unemployment in their host country should result in a lower relative drop in well-being compared to other residents, because their reference point is lower. The reference dependence theory, however, is supported by the general finding that refugees are more satisfied with life on average than non-refugees. To account for the discovered interaction effect, it could be speculated that unemployment comes with a greater social stigma for refugees.

Moreover, unrealistic expectations about their opportunities in the host countries could lead to an inflated reference point. Finally, it is also plausible that refugees are more impacted by unemployment because tend to have weaker social and family networks who are available to support them in case of unemployment, compared to natives.

It must be kept in mind that our results on refugees, although meaningful in terms of the magnitude of the effect, are only indicative since they are not statistically significant, due to small sample sizes of refugees and temporal clustering of the observations. Given this limitation of our research, further work would benefit from larger sample sizes to see if significant results can be derived. Moreover, research could benefit from having refugee data on the U.S., to see whether the results vary and to do a proper cross-country analysis between the U.S. and Germany. This way, it can be explored how different systems for integrating refugees into the labor market and society influence the effect of unemployment on mental health for this group. There also is scope for future research to test a version of the Hedonic Treadmill effect regarding refugees, to see whether their self-reported mental health goes down over time in response to a shifting reference point of being in a new country with higher standards of living. Finally, something that our research has not addressed is what exactly is driving the effect of unemployment on different groups, although some potential explanations have been discussed above. Therefore, future work should break down exactly what is driving the stronger negative effect on the mental well-being of refugees.

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