Time heals all wounds? Investigating Syrian refugee's pre-migration, during flight and post-migration stressors and their psychological distress levels after resettlement

Timo Schnepf

Master of Science Student in Sociology and Social Research

Matriculation Number: 5603005

Semester: 05

Institute for Sociology and Social Psychology

Seminar: Migration and Integration to Europe

Supervised by Hakan Yücetas

Winter Term 2019/2020

E-mail: tschnepf@smail.uni-koeln.de

February 12, 2020

Contents

List of Tables

List of Figures

Acronyms

PTSD post-traumatic stress disorder

PIN people in need

NEDF negative experiences during the flight

OCHA United Nations Office for the Coordination of Humanitarian Affairs

LCP life course perspective

1 Motivation, research questions and paradigmatic framework

According to the United Nations Refugee Agency, in June 2019 there were about 26 million refugees worldwide, 2/3 coming from Syria, Afghanistan and South Sudan (BBC, 2019). At the end of 2016 more than one million refugees had fled to Germany, applying for asylum (UN High Commissioner for Refugees, 2017). Individuals who have to flee from their country are exposed to several stressors, before, during and after their flight. They are personally affected or witness destruction, persecution and violence in their home country. The flight is often taken under risk of life and after resettlement they find themselves in a new culture with an unknown language, worrying about the outcome of their asylum application. In short, stress is an accompaniment in their life. It is no surprise, that psychologocical distress, or in the following just called distress, and mental problems are much more prevalent among refugees than within the native population (for a meta-analysis see Porter and Haslam (2005)).

Moreover, "stressful" life events are not only playing a vital role for deciding to migrate or not. Current research increasingly acknowledges that, besides "objective factors such as human [...] capital" (Walther et al., 2019, p. 3), mental health and psychological well-being play a "decisive role for integrational processes" (Lindert et al., 2009, p. 4) as well. Therefore it is surprising that distress and its determinants are not very well understood (see e.g. Lindert et al. (2009, p. 247) and Kim et al. (2019, p. 386)). Especially research concerning "temporal delineations in [traumatic] [...] events" is scarce (Sangalang et al., 2019, p. 910). This means that little is known about the *proportional roles* of pre-, during flight and post-migration stressors with regards to their impact on current distress levels.

My assignment wants to contribute to this research gap by applying a *life course perspective* on Syrian refugee's mental health. I want to investigate the proportional roles of previous life events such as war exposure and flight experiences and compare them to current stressors such as family separation and worries about the asylum application outcome. Thus, my research questions are: i) how is pre-migration exposure to war associated with a refugee's psychological distress level in the host country? And ii), accounting for pre-migration stress, how do stressors during the flight and post-migration stressors affect the individual's dis-

tress level? This assignment is strongly oriented at two studies conducted by Sangalang et al. (2019) and Walther et al. (2019) with the differences that I use representative data for Germany, not the United States, and that I examine sub-national spatial differences in pre-migration traumatic exposure. This is the first attempt I know where characteristics of refugees are investigated on a sub-national region of origin.

The *life course perspective* is a paradigmatic framework which takes a person's whole life into account. The main assumption is that a person's environment to a specific time point can have lasting effects on a persons life path (Hutchison, 2015, p. 20). Although not specifically designed for investigating refugee's mental health the approach provides a basic understanding of how timing, environment and crucial events can shape a person's lasting mind and behaviour. We can understand refugee's traumatic experiences as "life events", which are "[s]ignificant occurrence[s] involving a relatively abrupt change that may produce serious and long-lasting effects" (ibid., p. 22). According to the American Psychiatric Association, mental health problems and traumata are closely related to having direct exposure to or witnessing an event that "involves actual or threatened death or serious injury and violence" (after Sangalang et al. (2019, p. 909)). Thus, although the life course perspective (LCP) is usually found in other research contexts, such as educational or family research, migration research also can profit from this approach. The life course perspective provides a measurement of events and their "stress impact" on individuals, the so called " Holmes and Rahe Schedule of recent events" (Hutchison, 2015, p. 26). Unfortunately, migration issues are not yet covered explicitly by this instrument.

2 Previous Research

There is a lot of medical research conducted on refugee's post-traumatic stress disorder (PTSD) and some sociological and psychological research conducted on refugee's distress, life satisfaction or well-being (see e.g. Walther et al. (2019)). However, this research either focusses on comparing migrants/refugees from (usually two) different countries of origin or it focusses on comparing refugees from one country in comparison to the native population. A literature review by Bogic et al. (2015) reveals that most research on refugee's distress

comes from the United States, predominantly drawing on one specific data source, the "National Latino and Asian American Study" (see for example Crager et al. (2013), Gong et al. (2011), Li (2015), and Sangalang et al. (2019)). Research concerning "temporal delineations in [traumatic] [...] events" is rare (Sangalang et al., 2019, p. 910), thus "it is unclear whether migration leads to an increase or to a decrease in mental health burden" (Lindert et al., 2009, p. 247).

Bogic et al. (2015) conducted a systematic literature review focussing on refugee's long-term[1] mental health (depressions, PTSD and undefined anxiety disorder). They found a strong heterogeneity between depressive symptoms across countries. The meta-analysis found that "refugees originating from Middle East or Sub-Saharan Africa tended to report the lowest prevalence (16 to 29.1%) whilst "[r]efugees originating from former Yugoslavia tended to have somewhat higher rates of depression (31.7 to 42%)" (ibid., p. 23). Bogic et al. (ibid.) also conducted a "narrative review" on associated factors with mental health including pre-migration traumata. They found that "a higher number of [war related] traumatic experiences was the most common factor consistently found to be positively associated with mental disorders ($\geq$ 75% of the studies)" (ibid., p. 34). Prevalence of depression among women was slightly higher than for men. Of specific importance for this assignment is their finding, that there is "an independent effect of war trauma exposure on current mental health status even after post-migration factors were taken into account, a finding that suggests a significant and lasting impact of war experience" (ibid., p. 36).

Sangalang et al. (2019, p. 912) was the closest literature regarding my research question[2]. They measured pre-migration trauma exposure with twenty-six items[3] concerning different potential traumatic experiences in the country of origin. They used the summed values of those twenty-six items and time of exposure was considered. In their sample of Asian and Latino-American refugees (n=657) they found for Asians a mean score of 1.88 traumatic experiences and for Latinos a mean score of 2.28. Ten post-migration stress factors such as discrimination experiences or struggle concerning the legal status in the USA were summed

[1] They only investigated literature which aims at a refugee population living at least five years in the respective host country.

[2] Though, the researchers tackled my field of interest, a mayor drawback of their survey is that the majority of their refugee participants already was a long time in the USA (residing less than five years were only about 10% of the sample).

[3] Items were for example whether the refugee "saw dead bodies" or whether she/he was a civilian in a war zone (Sangalang et al., 2019, p. 911).

up to measure "acculturation stressors".

They measured psychological distress with a summative score containing four items, each on a five point Lickert-scale, how often they felt e.g. "tired for no good reason"/"restless" in the last month. They found for both, Latinos and Asians, a similar distress score of about 11.7. This measurement is closely related to the SOEP-Refugee survey measurement of psychological distress[4].

Sangalang et al. (2019, p. 912) find significant evidence for a correlation between pre-migration traumata and post-migration psychological distress. Among Asian/Latino refugees they find an increase of $\hat{\beta_{Asians}} = 0.55$ (CE = [0.16, 0.95]) / $\hat{\beta_{Latinos}} = 0.60$ (CE = [0.4, 0.8]) points on the distress scale for each additional traumata experienced in the respective country of origin. This coefficients can be assessed as relatively low on a summative distress scale ranging from 1 to 20. Family conflicts ($\hat{\beta_{Asians}} = 0.74$ / $\hat{\beta_{Latinos}} = 1.25$) had the strongest influence on distress for both groups. Acculturation stress was only significantly associated within Asian refugee's distress with $\hat{\beta_{Asians}} = 0.40$. The study shows, that there are crucial differences between influential factors on distress between refugees from different countries.

A Canadian survey conducted in 1999 descriptively analysed by Rousseau and Drapeau (2004) found that Arabian migrants (including refugees, n = 750) had higher mean psychological distress scores when they were exposed to different types of pre-migration traumata. The highest mean was found for migrants which experienced personal/family persecution with 1.59 in comparison to those who did not experience this with a score of 1.37 (on a four points index scale). There was no significant mean difference in psychological distress between Arabs who witnessed violent acts and those who did not (measured with a χ^2 test).

A recent article from Walther et al. (2019) takes advantage of the rich dataset from the SOEP-Refugee sample. They analysed the effects of post-migration stressors such as the refugee's anxiety of being deported or the family reunification status on the individual's distress. Based on the work of Porter and Haslam (2005), they wanted to understand better why the group of refugees has higher levels of distress even when compared to other groups which were exposed to war and violence, i.e. migrants, that do not have the refugee status. Thus, the specific circumstances of a refugee status, unclarity of their remaining in the host country,

[4] Although the authors refer to two different sources of their scales (see Sangalang et al. (2019, p. 912) and Jacobsen et al. (2017, p. 30) and the SOEP survey asks for distress in the last two weeks.

family reunification questions and issues with the housing situation emerged (see Walther et al. (2019, p. 7)).

They find that "protection and suspension of deportation, both of which grant a mere one-year right to stay, are linked to elevated levels of psychological distress compared to the positive outcome of being granted the legal status of refugee" and that "awaiting the outcome of the legal proceedings, either for the initial asylum application or after an appeal to a negative decision has been submitted, is associated with significantly higher levels of psychological distress" (ibid., p. 8). In descending order, the strongest effects on distress have: family separation ($\hat{\beta} = 0.98$), each additional negative flight experience ($\hat{\beta} = 0.74$) and suspension of deportation ($\hat{\beta} = 0.71$) (ibid.). Surprisingly, currently being in education was associated with higher levels of distress ($\hat{\beta} = 0.40$), working had a significantly decreasing effect on distress ($\hat{\beta} = -0.40$). Concerning their control variables, they find higher levels of distress for women than for men. They also found a positive relation between age and distress. Refugees from Afghanistan had the highest levels of distress, followed by Syrians, Iraqis and Eritreans. The longer a refugee is in Germany, the lower her/his distress level.

3 Syria at the end of 2015

In this section I want introduce briefly to the Syrian civic war with its temporal and spatial development. Figure 1 gives an overview of the time of interest, beginning with January 2011. In Summer 2011 the Syrian governmental reacted to democratic aspirations of wide parts of the public ("Arabic Spring") with violent repression. Therefore different oppositional groups armed themselves. The biggest oppositional group, the "Free Syrian Army" (FSA), is beaten at the end of 2012. We see a moderate increase in the number of official asylum applications in Germany. The ongoing territorial gains of the government, supported by aerial strikes starting in summer 2013, had two effects. First, the few oppositional groups were split up. Second stepped into this gap of power soldiers from the "Islamic State of Iraq and the Levant" (ISIL, or nowadays only IS). Their appearance and the war against them from the Syrian government led to the so called "Refugee crisis" Europe was facing in 2015. We see a tremendous increase in asylum applications starting in spring 2014 (with about 2500 applications in May) and almost horizontally increasing with the governmental intervention in summer 2015 (to about 30.000 applications in August 2015).

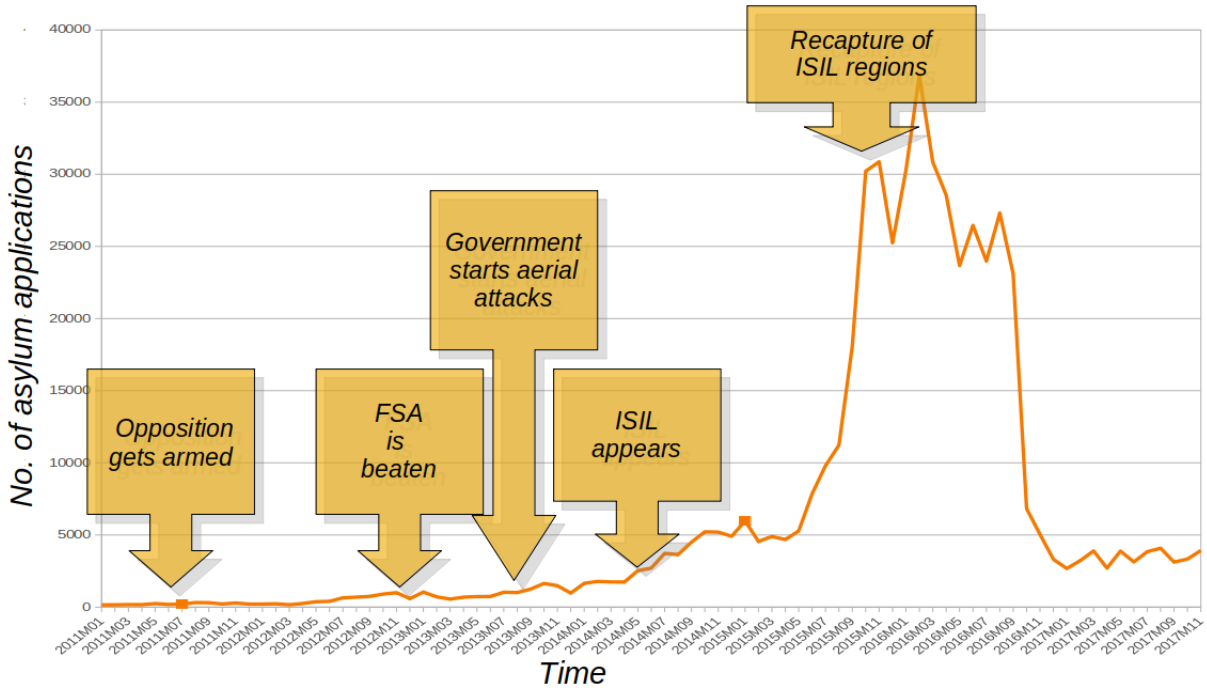

Figure 1: Asylum applications in Germany and crucial events in Syria. Source asylum aplli-cations: Bundesinnenministerium (2020), source events: Wikipedia (2020). Own depiction.

The United Nations Office for the Coordination of Humanitarian Affairs assesses the Syrian Crisis as the globally largest protection crisis with a deteriorating trend, statistically speaking: "[s]ince 2011, an average of 50 Syrian families have been displaced every hour of every day" (OCHA, 2015, p. 3). And "[h]umanitarian partners estimate that upwards of 250,000 people have been killed in the conflict, including tens of thousands of children" (ibid., p. 4). The parties of the conflict "continue to engage in indiscriminate attacks on densely populated areas with barrel bombs and mortar attacks" (ibid., p. 24). Thus, OCHA estimates, that at the end of 2015 there are about 13.5 million PIN with about 25.000 trauma cases per month. The geographical analysis of OCHA reveals that:

> "there are clear geographical variations. Besieged areas face high restrictions on movement and access to services. Over 80 sub-districts in Syria report that over 50 per cent of the population face movement restrictions. Over 50 per cent of sub-districts assessed in Aleppo, Dar'a, Deir-ez-Zor, Homs, Idleb and Quneitra identified lack or loss of civil documentation as a significant protection issue. Child labour was identified as a key issue of concern in 55 per cent of the country. Child recruitment is reported in 45 per cent of the country, including Al-Hasakeh, Ar-Raqqa and Deir-ez-Zor" (ibid., p. 25).

The map 6 in the appendix shows severity levels across Syria.

4 Hypotheses

Drawing on the life course perspective, previous research findings and the spatial analysis of OCHA (2015, p. 25), I want to derive the following hypotheses concerning the effects of pre-, during flight, and post-migration stressors on psychological distress:

HYPOTHESES A: *Exposure to violence and war in the district of origin has a lasting positive effect on psychological distress. Thus, the higher the proportion of PIN in the refugee's district of origin, the higher her/his level of psychological distress after resettlement.*

HYPOTHESES B: *Traumatic experiences during the flight have lasting positive effects on psychological distress. Thus, the more traumatic experiences during the flight a refugee was exposed to, the higher her/his level of psychological distress after resettlement.*

HYPOTHESES B.A: *After controlling for flight-related traumatic experiences, a positive effect of pre-migration stressors on psychological distress should remain.*

HYPOTHESES C: *Current, or post-migrational stressors such as family separation and uncertain asylum application outcomes have a strong positive impact on a refugee's psychological distress level. Thus, refugee's psychological distress levels are higher in comparison to refugees who do not suffer from those two factors.*

HYPOTHESES C.A: *After controlling for current stressors, a positive effect of pre-migration stressors on psychological distress should remain.*

I will not "hypothesize after the result is known", i.e. I avoid "harking" (Kerr, 1998). I checked for general plausibility in my data only by using (bivariate) Pearson-Correlation coefficient investigations. However, I assume, that several drawbacks of my pre-migration stressor measurement (PIN-index), see section 5.2, could blur my results.

5 Data, Sample and Operationalisation

I want to draw on two data sources. To capture the refugee's distress level, potential flight induced stressors, post-migration stressors and other covariates, I will draw on data from the German "Socio-economic panel" (SOEP), i.e. its refugee sub-sample "IAB-BAMF-SOEP Survey of Refugees". The SOEP-Refugee Survey only asks questions about traumatic experiences during the flight. Presumably, to not "re-traumatize" the participators, questions of traumatic experiences in their country of origin are held very broadly. For example by asking the respondents about their reason of flight or about their opinion about the current situation in their country of origin. I will enrich the SOEP data with information about potential traumatic pre-migration exposures to war and violence by merging data from the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), concerning the assessment of the severity of PIN in Syria's 14 districts. I want to test, whether those regional data can help us to understand better differences in refugee's distress levels after resettlement.

5.1 SOEP-IAB-BAMF-Refugee Survey

My unit of analysis are refugees which left Syria *from 2010 onward* and applied for asylum in Germany between the 1. January 2013 and 31. January 2016 (Kroh et al., 2016, p. 1). I focus on Syrian refugees predominantly because of the provided number of cases. My sample consists of 1997 individuals, 37% are female (see also table 1). The mean age is around 34,4 years (median age = 34 years). My sample experienced by mean 10.3 years of schooling. The majority of refugees lived in the capital, Damascus with 25% of the sample, followed by Aleppo with 23% (for all districts, see in the appendix table 2). At the date of the survey, 71% were married and 62% had at least one child.

On the outcome side, I want to use the "mental distress" PHQ-4 scale developed by Kroenke et al. (2009) as a measure for psychological distress (as done by Walther et al. (2019) as well)[5]. The distress-index is a summative index generated by four Lickert-scale items ranging each from 0 to 3. Questions are e.g. "How often have you felt negatively affected by...":

[5]The SOEP-Refugee sample (M5) also allows investigations concerning PTSD, but as I am more interested in a broader view of psychological conditions, I use the measurement of distress as I assume that it also covers refugees with stronger psychological problems.

"...[l]ow spirits, melancholy or hopelessness?" or "[being] [u]nable to stop or control worrying?". Values range from 0 ("not at all") to 3 ("almost every day").

Concerning my exposure variables, my operationalisational approach of pre-migration exposure to violence is being discussed in section 5.2. Traumatic factors during the flight are measured by a summative variable called "flight trauma", which counts the occurrences of six potential traumata, i.e. "sexual harassment", "physical violence", "shipwreck", "robbery", "blackmailing" and "prison". One drawback is, that "other" stressful experiences, which are not in this list, will not be considered. I also wanted to ensure, that I capture "strong" stressors. Therefore, I did not consider the negative experience "fraud".

I want to measure post-migration stressors in two ways, orienting at the factors elaborated by Walther et al. (2019). The SOEP survey provides a variable measuring "how many concerns of not being allowed to stay in Germany" a respondent has. The scale ranges from 1 ("Many concerns") to 3 ("No, no concerns"). I will use this variable categorically with dummies. Walther et al. (ibid.) showed a strong impact of concerns regarding the future on distress (see section 2). The second core variable of Walther et al. (ibid.) was family separation, i.e. the wish to reunite. I also included this variable the following way: The dummy variable becomes one when the respondent states planing to bring her/his spouse or at least one of her/his children to Germany. Zero indicates i) not having children/ a spouse or ii) not planing to reunite.

Acculturative stressors are measured mostly dichotomous, i.e. if respondents i) have attended a integration course, ii) if they are currently working or iii) in education. From the self-assessment question "How good can you speak German?" I generated a reversed variable, ranging from 1 ("not at all") to 5 ("very good").

I operationalised the level of education by the years the respondent was in any form of general education. I calculated a variable called "time of arrival" as a measure of months since the refugee came to Germany.

5.2 Humanitarian Needs Overview by the United Nations

As the vast majority of the SOEP sample migrated between 2012 and 2015, I will use OCHA data specific for that year. By doing so, I want to bypass the problem of rapidly changing

environments due to war. For example can a peaceful district in Syria's East in 2012 become a center of conflict when ISIL troops besiege it in 2015. Only using data from one timepoint would not consider those changes. However, as conflicts can even change within a few months (or even days), my data are only an approximation. Unfortunately, contacting the researches at OCHA was not fruitful and I did not get the required (processed) data with shorter time spans. I had to help myself by extracting those information from the corresponding annual reports (OCHA, 2013, p. 6, 2014, 2015, p. 24).

To assess a district´s "potential of traumatization", I want to use the PIN index. This figure is an estimate of individuals who suffer from different factors such as "grave violations of international humanitarian rights law", "gender based violence", as well as shelter, food and water shortcomings. The estimates base on several sources such as governorate profiles, landscape satellite images or expert feedbacks (e.g. red cross), to name a few. I will set the PIN-index in proportion of the estimated population in the district, to end up with one comparable figure for the years 2012/2013, 2014 and 2015 for each of Syria's 14 official districts[6].

I mentioned in section 4, that my findings could be blurry with this approach. I see mainly one mayor drawback which is not of general concern but more of an organisational issue: the PIN-index refers to the district level. This often are large geographical areas. For example is the district of Homs with 42 thousand square kilometres bigger than Northrhine-Westfalia. Although sub-district data are available, I did not get them for different time points and not in a clean manner (only distressf format), as mentioned above. However, I want to present here - nevertheless - another approach of accessing sensitive information of individuals with war exposure.

[6]As also OCHA works with population estimates based on 2012, I will also have to use these outdated population estimates (OCHA, 2014, p. 2).

6 Findings

6.1 Uni- and bivariate Findings

The highest proportion of people in need can be found in Quneitra (73%) and Idlib (66%). The district Al-Hasakah has the lowest proportion of people in need (36%)[7]. Investigating the PIN index across time, we see a clear connection between the development of the situation in Syria (see section 3) and our index. When in 2013 29% of the Syrian population was in need (OCHA, 2013), the proportion rose heavily to 47% in 2014 (OCHA, 2014), when ISIL appeared, and found its peak in 2015 with 60% (OCHA, 2015), when the government started the war agains ISIL.

About 70% made negative experiences during the flight. Besides "other negative experiences", "fraud" was stated most often (20%), followed by "imprisoned", stated by 13%. 8% of all Syrians refugees experienced a shipwreck. Only considering "strong" negative experiences, 71% reported none of them. 17% reported one negative flight experience, 8% two, and 3% three strong negative experiences (for the definition, see section 5.1).

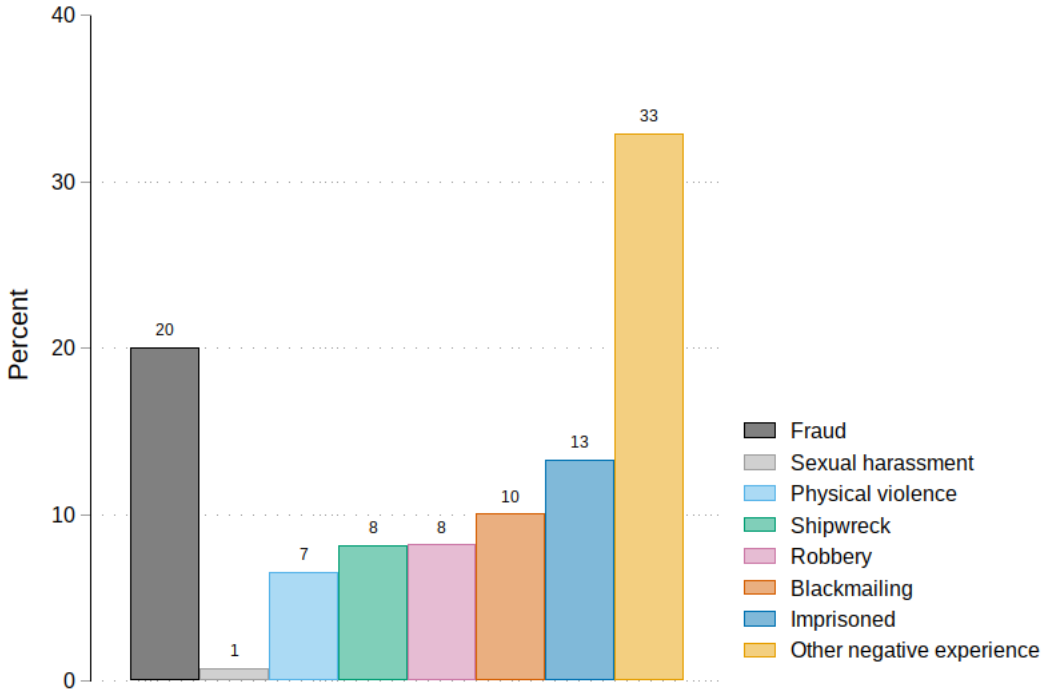

Figure 2: Percentage of negative flight experiences. Multiple answers possible.

[7]Table 2 in the appendix shows the sample distribution for Syria's 14 districts as well as the corresponding people in need.

Concerning post-migrational stressors, 57% of all Syrian refugees have no worries about their outcome of the asylum application, 25% have "some worries", 18% state "strong worries". 13% were either separated from her/his children or spouse and wanted to reunite with them in Germany.

With regards to the outcome variable, I find in the sample a mean score of 3 on the psychological distress index[8], with a standard deviation of 2.6. Going through the stress factors in chronological order, I find a moderate significant ($p <= 0.1$) association between the district's PIN and a refugee's distress level. Individuals which fled from a district with a PIN score of about 15% had a mean distress score of 2.58. People from districts with a PIN score of about 60% had distress levels of about 3.23 ($\Delta = 3.23 - 2.58 = 0.65$).

The number of potentially traumatic experiences during the flight had a relatively strong impact on distress[9]. The strongest associations with psychological distress is found for post-migration stressors. Refugees seeking for family reunification have a mean distress score of 3.9, those without unification ambitions score much lower with 2.7. Also worrying about the asylum application process has a strong impact on distress with a score difference of almost one between those who worry strongly and those who do not worry at all ($\Delta = 3.48 - 2.56 = 0.92$).

Exploring the correlation matrix in figure 3, I found an important association between pre-migration PIN scores and a post-migration factor: PIN scores and German speaking skills were correlating relatively strong (r = -0.13). At first glance, there was no obvious association. The less severe a region was, the better the German skills. The crucial hint was, when looking at the correlation between German skills and time since arrival (r = 0.25). Time seems to confound both, the PIN score and German speaking skills. Refugees which came in an earlier phase of the civic war were less confronted with its outcomes, i.e. violence and destruction. They also had more time to learn German here in Germany. This implies for the multivariate analysis, that time of arrival and my PIN index measure similar things. One approach to deal with this is to exclude "time of arrival" in the multivariate analysis.

[8]The index is ranging from 0 to 12. For an detailed overview of the sample distribution of psychological distress, see figure 5 in the appendix. For the summary statistics of all variables of interest, see table 1.

[9]Not in the heatmap, r = 0.11.

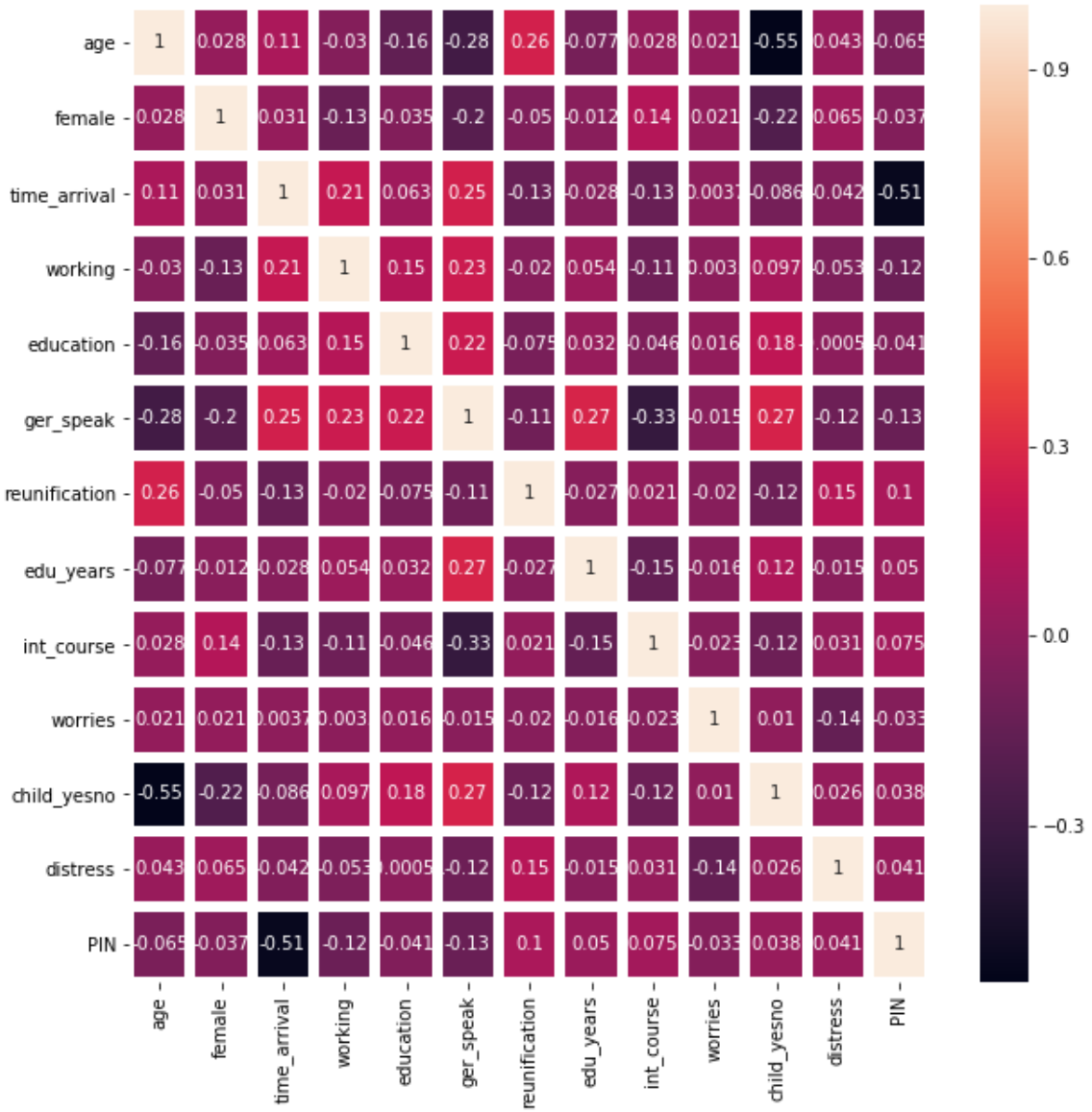

Figure 3: Heatmap of variables of interest. Pearson Correlation in boxes.

6.2 Multivariate Findings

The data allow to investigate each of the chronological stress factors one by one. To see, whether an effect of war exposure on distress lasts after resettlement, I will use a nested OLS-regression model. I will add in each model during flight and post migration stressors to see, if the "life event" of war exposure is still significant. Moreover, a comparison of pre-, during flight and post-migration stressors will be described. I want to model the relationship between pre-, during flight and post-migration stressors and psychological distress the following way:

$$distress_i = \beta_{cons} + \beta_{PIN} \times PIN_i + \beta_{NEDF} \times NEDF_i + \sum_{j=1}^{2} (\beta_{j,WORRIES} \times WORRIES_{j,i}) + \beta_{REUNITE} \times REUNITE_i + \beta_{\mathbf{i}} \mathbf{X_i} + \varepsilon_i$$

$\mathbf{X_i}$ is a matrix of control variables including acculturation factors on distress which are: currently in work, in education, an integration course, German speaking skills and other controls as there are gender, age and years of education. $\beta_{\mathbf{i}}$ is the corresponding vector of coefficients.

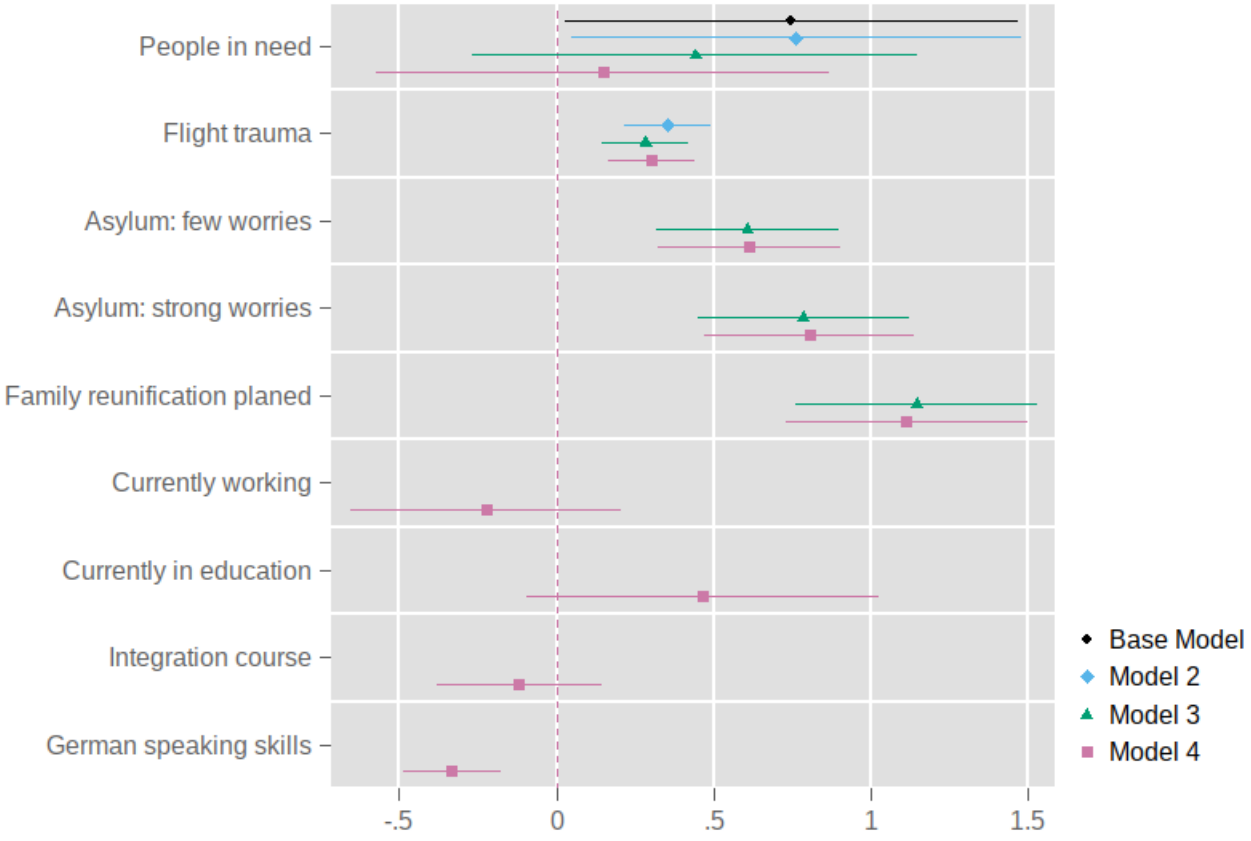

Figure 4: Coefficient plot for distress. Controlling for education (in years), gender and age.

Figure 4 shows the main results in a coefficient plot, corresponding to table 3 in the appendix. The base model (1) only regresses the PIN-index on psychological distress, controlling for age, gender and education. The effect (point) and its confidence intervals (lines) are visualised in black. Although I find a relatively strong effect of the PIN index ($\hat{\beta}_{PIN} = 0.75$), the prediction gets smaller, when comparing predicted distress levels for refugees from districts with 20% of PIN with districts with about 60% of PIN. Then, our effect shrinks to $\hat{\beta}_{PIN-REAL} = 0.29$. This mean difference is more realistic, as the majority of refugees comes from districts with a PIN-score between 20% and 60% and our regression coefficient $\hat{\beta}_{PIN}$

predicts a mean difference between regions with zero PIN and with 100% PIN. The wide confidence intervals refer to a high variability of the PIN-index as it contains a wide geographical area with "clear geographical variations" (OCHA, 2015, p. 25). However, model (1) suggests a not-sample related, i.e. significant, effect to an α level of 5% for the refugee's district's war exposure at the time she/he fled. For such a blurry instrument, an unexpected finding. The data in model (1) support HYPOTHESES A, that pre-migration stressors/trauma impact a refugee's psychological post-migration distress level. Although the refugee is not in danger any more.

Including negative experiences during the flight (NEDF) in model (2), I find a significant positive relationship between NEDF and psychological distress with an effect size of $\hat{\beta}_{NEDF} = 0.35$. This means that - by mean - each additional negative flight experience increases the distress level of 0.35 score points. Thus, my data support HYPOTHESES B. The data also can not falsify HYPOTHESES B.A, that the found effect of pre-migration stressors on psychological distress holds after including NEDF, i.e. that both stressors have an "own" effect on distress. The effect of PIN even increases slightly after including NEDF. Finally, comparing effect strength of pre-migration and during flight stressors, we see in table 4, that the standardized coefficient of PIN is much smaller than the one from NEDF with $\Delta = b_{NEDF} - b_{PIN} = 0.124 - 0.051 = 0.073$.

Model (3) includes the stressors "separation from family" and "worries about the outcome of the asylum application". Figure 4 presents the model's effects in green with a triangular dot. In comparison to refugees who have no worries about the outcome of their application process, we find significantly higher distress levels for those, having "few worries" ($\hat{\beta}_{few-worries} = 0.609$), and those, having "strong worries" ($\hat{\beta}_{strong-worries} = 0.785$). As these two variables are dichotomous, we can interpret them as mean differences of distress levels, after controlling for the other variables in the model. At least for those, having strong worries about their asylum application, I would assess this as a relatively strong effect.
However, the strongest effect in all models can be found for refugees who were separated from their spouse/child(ren) and plan to reunite, with $\hat{\beta}_{PR} = 1.146$, in comparison to those refugees who do not have either spouse or children or do not plan to reunite. This means that the descriptively found mean difference of 1.2 distress score-points holds after controlling for several covariates. Moreover, the model indicates, that refugees suffer (slightly) more from

family separation than from an unclear outcome of their asylum application[10]. I can not falsify HYPOTHESES C based on this sample's data. After adding those two post-migration stressors, the effect of my pre-migration stress measurement, PIN, shrinks but remains positive. However, now the wings (the confidence interval) cross zero which makes the effect insignificant. Therefore, my last HYPOTHESES C.A has to be falsified in terms of significance. The positive effect of PIN can not be distinguished any more of a random outcome due to sample selection variation. I suggest, that the PIN level influences my two post-migration variables in that way, that individuals from regions with higher levels of severity could be more frightened of a negative outcome of their asylum application as they fear to be sent back. Severe regions also might influence family separation as families from severe regions have a higher pressure to migrate/separate than those from less severe regions. This might have led to the situation that I measured in model (1) and (2) indirectly the post-migration variables in model (3). The decrease of $\hat{\beta}_{PIN}$ across the models indicates that[11].

In the last model (4) I introduced acculturation factors related to psychological distress (pink square dots and lines). The key message is that all other effects described above remain almost the same after controlling for acculturation factors. The biggest difference can be found for the PIN effect which shrinks down almost to zero. This is no surprise, as the variable "German speaking skills" is closely related to the time of arrival. Thus, I "subtract" something of the direct effect of the PIN-score on psychological distress, when adding the German speaking variable (see also section 6.1).

The right-skewed distribution of my independent variable brings heteroskedasticity. Thus, I also calculated a model with a logarithmized dependent variable, ln(distress). My findings remained almost[12] the same and for the sake of better interpretation I stayed with the unlogarithmic model for my interpretations.

[10] The difference between the standardized coefficients in model (3) in table 4 is $\Delta = b_{Reunite} - b_{strong-worries} = 0.147 - 0.115 = 0.032$.

[11] Moreover, I checked, that worries are not varying significantly between times of arrival. One could imagine, that refugees which resettled earlier have e.g. higher worries than those who are just a few months in Germany. This, however, is not the case.

[12] The only thing which changed was the order of effect strength comparing the stressors in a standardized model. The logarithmic model showed in comparison to the unlogarithmized model, that having strong worries was stronger associated with distress than seeking for family reunification.

7 Conclusion

In this assignment I wanted to investigate the influence of pre-, during flight and post-migration stressors on refugee's psychological distress levels. To do so, I enriched the "SOEP-Refugee Survey" with spatial information concerning the Syrian civic war from the United Nations Office for the Coordination of Humanitarian Affairs. This allowed me to investigate the influence of traumatic life events for a longer time span and compare them among each other. My findings suggest, that pre-migration stressors, measured as the proportion of "people in need" in a specific Syrian district, still influence a refugee's distress level, although there is no exposure to war and violence any more. The effect, however, is only about $1/3$ the size of negative experiences during the flight, and about $1/5$ the size of the strongest impact on distress, seeking for family reunion (see table 4). I assume, that high variation in my variable "people in need" (as it covers wide geographical areas) wrestled down the models significance calculations. I suggest for further research to use sub-district data to tackle this issue[13].
To put it in a nutshell, the data indicate that Syrian refugees suffer most and to a similar extend from family separation and from an unclear outcome of their asylum application, meaning from current, post-migration stressors. From this cross-sectional perspective, it seems, that the more time passes by, the less affected the individuals are from potentially traumatic experiences[14].

Further research could dive deeper into the refugee's life events (e.g. considering stays in refugee camps). Also research concerning the influence of different coping strategies and personal ressources seem to be "low hanging fruits" thanks to the SOEP data. As Li (2015) showed, are pre-, during flight and post-migration stressors moderating the respective following life event, metaphorically speaking, negative experiences seem to "sum up" within a individual's psyche. I think quantitative methods seem to be a promising approach to disentangle those effects.

Together with new approaches in refugee research to take psychological patterns as impor-

[13] Although those data are available from the OCHA, the SOEP data unfortunately do not provide information of the refugee's municipality of origin.
[14] However, longitudinal data which measure psychological distress levels at different time points would be needed, to investigate this assumption soundly. Note also, that this only holds for distress in general, and might presumably be different for pathologic distress levels, such as PTSD.

tant factors of integration into account (Lindert et al., 2009, p. 4) , the SOEP-Refugee survey seems to be a powerful tool to do so. It allows to investigate the determinants of refugee's psychological distress levels in a non-clinical, European and longitudinal sample. My assignment contributes to the current state of research and investigates the impact of life events before, during and after migration on refugee's well-being. In times where global migration movements do not seem to slow down, a stronger focus on this field might support better policy decision making by affected governments. This is furthermore an urging issue, as "the risk of having a serious mental disorder is substantially higher in war refugees than in the general population, even several years after refugee resettlement" (Bogic et al., 2015, p. 35).

References

BBC (2019). *More than 70 million displaced worldwide, says UNHCR*. URL: https://www.bbc.com/news/world-48682783 (visited on 02/02/2020) (cit. on p. 1).

Bogic, Marija, Anthony Njoku, and Stefan Priebe (2015). "Long-term mental health of war-refugees: a systematic literature review". In: *BMC international health and human rights* 15, pp. 29–29 (cit. on pp. 2, 3, 18).

Brown, Geofrey and Thomas Harris (1989). *Life events and illness*. Guilford Press.

Bundesinnenministerium (2020). *2015: Mehr Asylanträge in Deutschland als jemals zuvor*. URL: https://www.bmi.bund.de/SharedDocs/pressemitteilungen/DE/2016/01/asylantraege-dezember-2015.html (cit. on p. 6).

Crager, Mia, Tracy Chu, Bruce Link, and Andrew Rasmussen (2013). "Forced Migration and Psychotic Symptoms: An Analysis of the National Latino and Asian American Study". In: *Journal of Immigrant & Refugee Studies* 11, pp. 299–314 (cit. on p. 3).

Faustmann, Anna (2018). "Psychische Gesundheit im Kontext von Migration und Flucht - eine integrationswissenschaftliche Perspektive". In: *Resonanzen - E-Journal für biopsychosoziale Dialoge in Psychosomatischer Medizin, Psychotherapie, Supervision und Beratung* Bd. 5 (Nr. 2).

Georgiadou, Ekaterini, Eva Morawa, and Yesim Erim (2017). "High Manifestations of Mental Distress in Arabic Asylum Seekers Accommodated in Collective Centers for Refugees in Germany". In: *International journal of environmental research and public health* 14.6, pp. 1661–7827.

Goebel, Jan, Markus M. Grabka, Stefan Liebig, Martin Kroh, David Richter, Carsten Schröder, and Jürgen Schupp (2018). "The German Socio-Economic Panel Study (SOEP)". In: *Journal of Economics and Statistic* (cit. on p. 24).

Gong, Fang, Jun Xu, Kaori Fujishiro, and David Takeuchi (2011). "A life course perspective on migration and mental health among Asian immigrants: The role of human agency". In: *Social science & medicine* 73, pp. 1618–26 (cit. on p. 3).

Heptinstall, Ellen, Vaheshta Sethna, and Eric Taylor (2004). "PTSD and depression in refugee children". In: *European Child & Adolescent Psychiatry* 13.6, pp. 373–380.

Hollifield, Michael, Teddy D. Warner, Nityamo Lian, Barry Krakow, Janis H. Jenkins, James Kesler, Jayne Stevenson, and Joseph Westermeyer (2002). "Measuring Trauma and Health Status in RefugeesA Critical Review". In: *JAMA* 288.5, pp. 611–621.

Hutchison, E. D. (2015). *A life course perspective*. Thousand Oaks (cit. on p. 2).

Jacobsen, Jannes, Julius Klikar, and Jürgen Schupp (2017). *Scales Manual IAB-BAMF-SOEP Survey of Refugees in Germany – revised version*. SOEP Survey Papers 475 Series C. Berlin: DIW/SOEP (cit. on p. 4).

Kerr, Norbert L. (1998). "HARKing: Hypothesizing After the Results are Known". In: *Personality and Social Psychology Review* 2.3, pp. 196–217 (cit. on p. 7).

Kim, Isok, Mary Keovisai, Wooksoo Kim, Sarah Richards-Desai, and Asli C. Yalim (2019). "Trauma, Discrimination, and Psychological Distress Across Vietnamese Refugees and Immigrants: A Life Course Perspective". In: *Community Mental Health Journal* 55.3, pp. 385–393 (cit. on p. 1).

Kroenke, Kurt, Robert Spitzer, Janet Williams, and Bernd Löwe (2009). "An Ultra-Brief Screening Scale for Anxiety and Depression: The PHQ-4". In: *Psychosomatics* 50, pp. 613–21 (cit. on p. 8).

Kroh, Martin, Herbert Brücker, Simon Kühne, Elisabeth Liebau, Jürgen Schupp, Manuel Siegert, and Parvati Trübswetter (2016). *Das Studiendesign der IAB-BAMF-SOEP-Befragung von Geflüchteten*. SOEP Survey Papers 365: Series C. Berlin: DIW/SOEP (cit. on p. 8).

Li, Miao (2015). "Pre-migration Trauma and Post-migration Stressors for Asian and Latino American Immigrants: Transnational Stress Proliferation". In: *Social Indicators Research* 12 (9), pp. 47–59 (cit. on pp. 3, 17).

Lindert, Jutta, Ondine S. von Ehrenstein, Stefan Priebe, Andreas Mielck, and Elmar Brähler (2009). "Depression and anxiety in labor migrants and refugees - A systematic review and meta-analysis". In: *Social Science & Medicine* 69.2, pp. 246–257 (cit. on pp. 1, 3, 18).

Miller, Kenneth and Andrew Rasmussen (2010). "War Exposure, Daily Stressors, and Mental Health in Conflict and Post-Conflict Settings: Bridging the Divide between Trauma-Focused and Psychosocial Frameworks". In: *Social Science Medicine* 70, pp. 7–16.

OCHA (2013). *Humanitarian Needs Overview: Syria*. United Nations Office for the Coordination of Humanitarian Affairs (cit. on pp. 10, 11).

– (2014). *Governorates Profile: Syrian Arab Republic*. United Nations Office for the Coordination of Humanitarian Affairs (cit. on pp. 10, 11).

– (2015). *Humanitarian Needs Overview: Syrian Arab Republic*. United Nations Office for the Coordination of Humanitarian Affairs (cit. on pp. 6, 7, 10, 11, 15, 24).

– (2019). *Humanitarian Needs Overview 2019: Syria*. OCHA - United Nations Office for Coordination of Humanitarian Affairs.

Porter, Matthew and Nick Haslam (2005). "Predisplacement and Postdisplacement Factors Associated with Mental Health of Refugees and Internally Displaced Persons: A Meta-Analysis". In: *JAMA : the journal of the American Medical Association* 294, pp. 602–12 (cit. on pp. 1, 4).

Rasmussen, Andrew, Mia Crager, Ray E. Baser, Tracy Chu, and Francesca Gany (2012). "Onset of Posttraumatic Stress Disorder and Major Depression Among Refugees and Voluntary Migrants to the United States". In: *Journal of traumatic stress* 25.6, pp. 705–712.

Rousseau, Cecile and Aline Drapeau (2004). "Premigration exposure to political violence among independent immigrants and its association with emotional distress." In: *The Journal of nervous and mental disease* 192 12, pp. 852–6 (cit. on p. 4).

Sangalang, Cindy C., David Becerra, Felicia M. Mitchell, Stephanie Lechuga-Peña, Kristina Lopez, and Isok Kim (2019). "Trauma, Post-Migration Stress, and Mental Health: A Com-

parative Analysis of Refugees and Immigrants in the United States". In: *Journal of Immigrant and Minority Health* 21.5, pp. 909–919 (cit. on pp. 1–4).

SOEP Group (2019). *SOEP-Core – 2017: Person mit Biografie (M3-M5, Erstbefragte, mit Verweis auf Variablen*. SOEP Survey Papers 680: Series A – Survey Instruments (Erhebungsinstrumente). Berlin: DIW Berlin/SOEP.

UN High Commissioner for Refugees (2017). *Global Trends: Forced Displacement in 2016*. Ed. by UNHCR. URL: http://www.refworld.org/docid/594aa38e0.html. (visited on 02/02/2020) (cit. on p. 1).

Walther, Lena, Lukas M. Fuchs, Jürgen Schupp, and Christian von Scheve (2019). *Living conditions and the mental health and well-being of refugees: Evidence from a large-scale German panel study*. eng. SOEPpapers on Multidisciplinary Panel Data Research 1029. Berlin (cit. on pp. 1, 2, 4, 5, 8, 9).

Wikipedia (2020). *Syrian civic war*. URL: https://en.wikipedia.org/wiki/Syrian_civil_war (visited on 02/06/2020) (cit. on p. 6).

Zimmerman, Cathy, Ligia Kiss, and Mazeda Hossain (2011). "Migration and Health: A Framework for 21st Century Policy-Making". In: *PLOS Medicine* 8.5.

Appendix

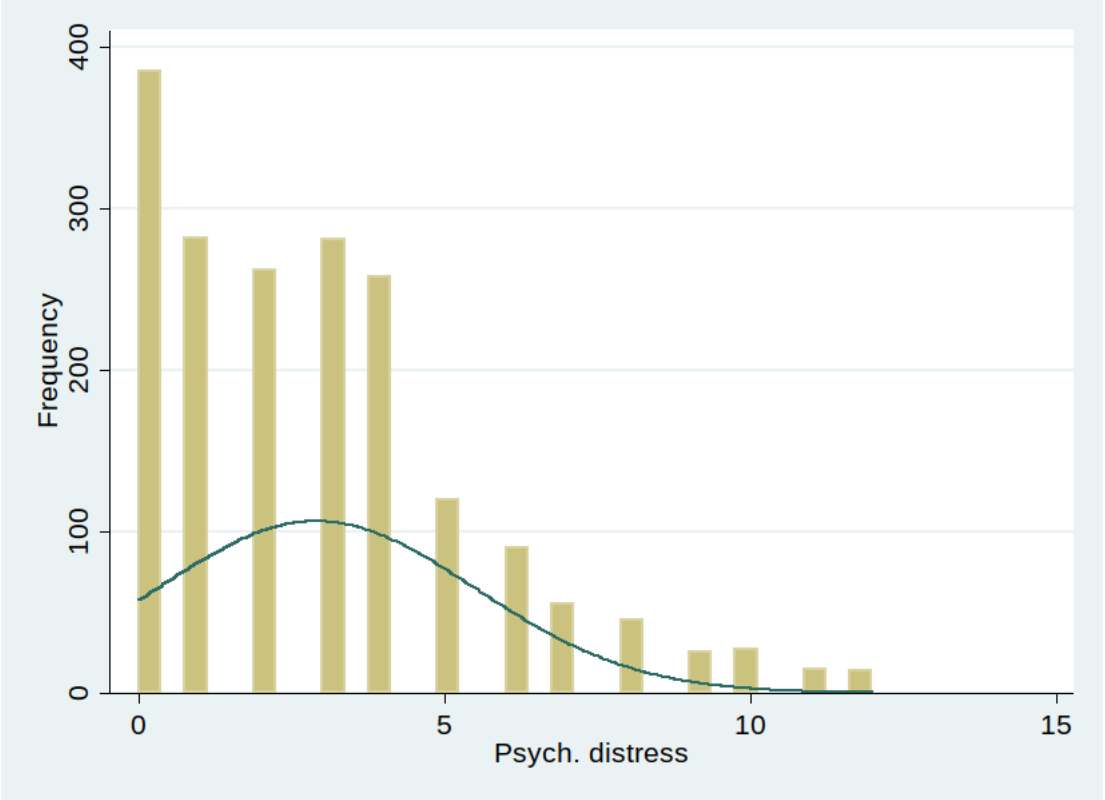

Figure 5: Distribution of psychological distress in sample

Table 1: Summary statistics

	n	mean	sd	min	max
Age	1996	34.38727	10.64213	18	83
Female	1997	.3700551	.4829401	0	1
Years general education	1771	10.29927	2.835747	1	20
Psychological distress	1859	2.90156	2.615161	0	12
Percent PIN	1981	.4700593	.1727597	.0708108	.9666666
PIN (Percent-Groups)	1981	4.107017	1.89621	1	9
Flight: Fraud	1997	.2068102	.4051197	0	1
Flight: Sex. Harass.	1997	.008012	.0891729	0	1
Flight: Violence	1997	.0676014	.2511235	0	1
Flight: Shipwreck	1997	.0841262	.2776465	0	1
Flight: Robbery	1997	.0846269	.2783955	0	1
Flight: Blackmailing	1997	.1036555	.3048894	0	1
Flight: Imprisoned	1997	.1372058	.3441507	0	1
Flight: Others	1997	.3390085	.4734913	0	1
Integration course	1976	.5890688	.4921273	0	1
Future worries	1952	2.391906	.7754538	1	3
Any children	1978	.3710819	.4832165	0	1
Months since arrival	1944	17.23817	8.208388	0	56
Currently working	1997	.0931397	.2907009	0	1
Currently in education	1997	.0505759	.2191849	0	1
German speaking skills	1996	2.573647	.9334158	1	5
Family reunification planed	1997	.128693	.3349438	0	1

Table 2: Sample after districts and its PIN

District	n	Percent of PIN
Aleppo	470	54 %
Al-Hasakah	388	36 %
Ar-Raqqah	32	51 %
As-Suwayda	6	51 %
Damascus	506	43 %
Daraa	95	48 %
Deir ez-Zor	87	55 %
Hama	67	45 %
Homs	121	42 %
Idlib	99	66 %
Latakia	45	49 %
Quneitra	18	73 %
Rif Dimashq	33	63 %
Tartus	14	47 %
Total	1981	47 %

Source: OCHA (2015), Goebel et al. (2018)

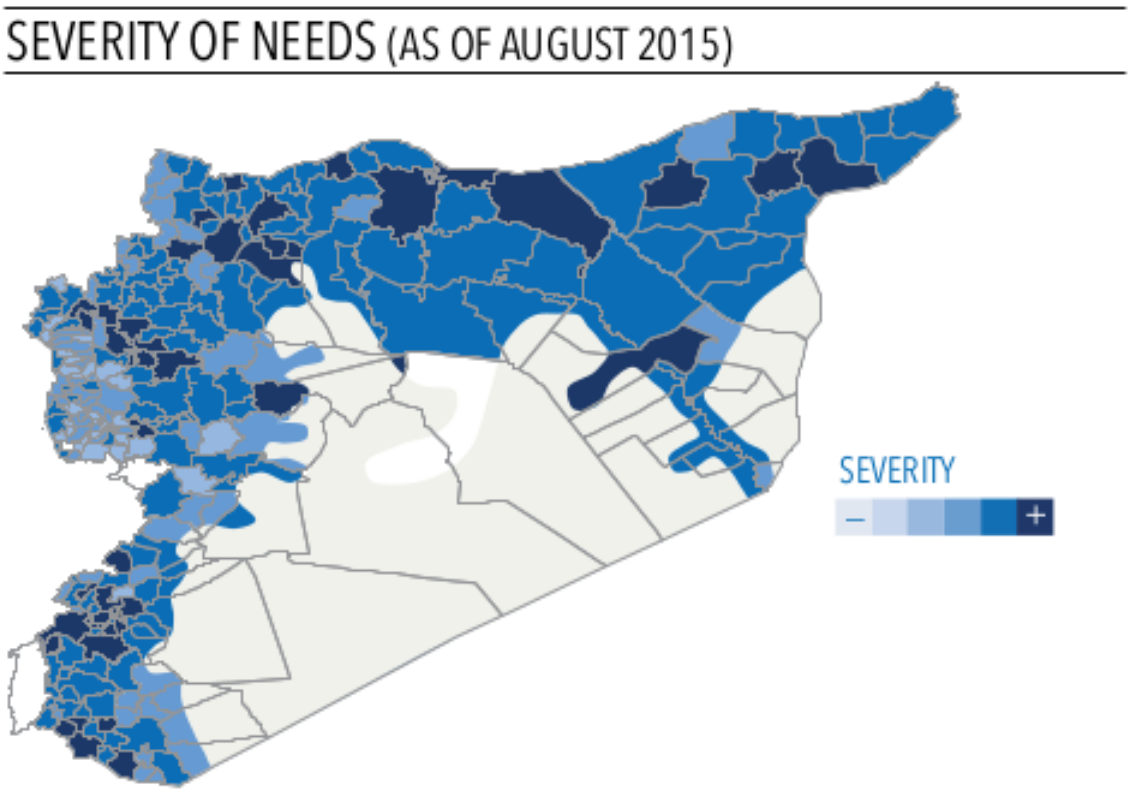

Figure 6: This map shows OCHA's assessment of severity levels for sub-district levels of Syria. Source: OCHA (2015, p. 25)

Table 3: Regression table on psychological distress

	(1)	(2)	(3)	(4)
People in need	0.748*	0.763*	0.441	0.149
	(2.04)	(2.09)	(1.22)	(0.41)
Age	0.0126*	0.0151*	0.00547	-0.000160
	(2.04)	(2.45)	(0.87)	(-0.02)
Female	0.355**	0.428**	0.481***	0.363**
	(2.66)	(3.21)	(3.67)	(2.70)
Years general education	-0.0122	-0.0151	-0.0171	0.00940
	(-0.53)	(-0.67)	(-0.76)	(0.40)
Flight trauma		0.352***	0.284***	0.301***
		(5.00)	(4.06)	(4.32)
Asylum: few worries			0.609***	0.615***
			(4.09)	(4.15)
Asylum: strong worries			0.785***	0.805***
			(4.58)	(4.72)
Family reunification planed			1.146***	1.115***
			(5.85)	(5.71)
Currently working				-0.224
				(-1.02)
Currently in education				0.467
				(1.63)
Integration course				-0.119
				(-0.89)
German speaking skills				-0.332***
				(-4.14)
Constant	2.125***	1.854***	1.926***	2.950***
	(5.60)	(4.87)	(5.09)	(6.33)
Adjusted R^2	0.007	0.021	0.058	0.067
Observations	1628	1628	1628	1628

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Regression table on psychological distress with beta coefficients.

	(1)	(2)	(3)	(4)
People in need	0.051*	0.051*	0.030	0.010
	(2.04)	(2.09)	(1.22)	(0.41)
Age	0.051*	0.061*	0.022	-0.001
	(2.04)	(2.45)	(0.87)	(-0.02)
Female	0.066**	0.079**	0.089***	0.067**
	(2.66)	(3.21)	(3.67)	(2.70)
Years general education	-0.013	-0.016	-0.018	0.010
	(-0.53)	(-0.67)	(-0.76)	(0.40)
Flight trauma		0.124***	0.100***	0.106***
		(5.00)	(4.06)	(4.32)
Asylum: few worries			0.103***	0.104***
			(4.09)	(4.15)
Asylum: strong worries			0.115***	0.119***
			(4.58)	(4.72)
Family reunification planed			0.147***	0.143***
			(5.85)	(5.71)
Currently working				-0.025
				(-1.02)
Currently in education				0.041
				(1.63)
Integration course				-0.023
				(-0.89)
German speaking skills				-0.119***
				(-4.14)
Adjusted R^2	0.007	0.021	0.058	0.067
Observations	1628	1628	1628	1628

Standardized beta coefficients; t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$