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Abstract:

This paper examines the role of trauma in the short-term integration of Syrian refugees in Germany. Drawing from the literature, and using dose-response and stress process theory, we presume that there is a negative effect of experiencing traumatic events, pre- and during migration, on integration. We concentrate our analysis on a sub-population of asylum seekers and refugees from Syria that have arrived in the last refugee wave in 2014/2015, who have a high incidence level of severely traumatizing events. We use the Qualifications, Potentials and Life Courses of Syrian Refugees (QPLC) survey, which has a module on pre- and during-migration stressors and measures structural integration as well as German language acquisition. In contrast to the a priori assumptions in the literature, we find that there is actually a positive effect of potentially traumatizing experiences on cognitive-cultural integration, i.e., language acquisition, and close to zero effect on structural integration, i.e., employment and education enrolment. We posit that due to possible higher motivation to remain in the new country, in the short run, Syrian refugees and asylum seekers seem to be integrating despite the added burdens of having experienced traumatic events.

Zusammenfassung:

Der Beitrag beschäftigt sich mit der Relevanz von potentiell traumatisierenden Erlebnissen für die Integration von Syrischen Flüchtlingen in Bayern. Ausgehend von der weitverbreiteten Annahme und in Einklang mit dem Dosis-Wirkungs-Prinzip und der Stressprozess Theorie, gehen wir von einem negativen Effekt traumatischer Erlebnisse vor und während der Flucht auf die folgenden Integrationsprozesse aus. In den Analysen untersuchen wir Asylsuchende und anerkannte Flüchtlinge aus Syrien, die hauptsächlich 2014 und 2015 nach Deutschland kamen und extrem häufig potentiell sehr traumatisierende Ereignisse erlebt haben. Verwendet werden die Daten der ‘Qualifications, Potentials and Life Courses of Syrian Refugees’ (QPLC) Umfrage, die ein Modul zu solchen Stressfaktoren vor und während der Migration enthält sowie Messungen zu struktureller Integration und Spracherwerb. In Kontrast zu der weitverbreiteten Annahme negativer Effekte, zeigen sich in den Analysen positive Effekte des Erlebens (potentiell sehr) traumatischer Erlebnisse für kognitiv-kulturelle Integration (Spracherwerb) und nahezu keine Effekte für strukturelle Integration (Erwerbstätigkeit und Bildungsbeteiligung). Wir folgern daraus, dass das hohe Ausmaß an (potentiell sehr) traumatischen Erlebnissen keinen negativen Einfluss auf die Integration von Asylsuchenden und anerkannten Flüchtlingen aus Syrien hat, zumindest nicht in dem beobachteten frühen Stadium des Aufenthalts in Deutschland. Die Befunde deuten darauf hin, dass mehr potentiell traumatisierende Erlebnisse die Motivation im Zielland zu bleiben verstärken.

Keywords:

Refugees, traumatization, integration, Germany

JEL Classification:

I10, J15, J24, J61

The Role of Trauma on Integration: the Case of Syrian Refugees

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von der weitverbreiteten Annahme und in Einklang mit dem Dosis-Wirkungs-Prinzip und der Stressprozess Theorie, gehen wir von einem negativen Effekt traumatischer Erlebnisse vor und während der Flucht auf die folgenden Integrationsprozesse aus. In den Analysen untersuchen wir Asylsuchende und anerkannte Flüchtlinge aus Syrien, die hauptsächlich 2014 und 2015 nach Deutschland kamen und extrem häufig potentiell sehr traumatisierende Ereignisse erlebt haben. Verwendet werden die Daten der 'Qualifications, Potentials and Life Courses of Syrian Refugees' (QPLC) Umfrage, die ein Modul zu solchen Stressfaktoren vor und während der Migration, sowie Messungen zu struktureller Integration und Spracherwerb enthält. In Kontrast zu der weitverbreiteten Annahme negativer Effekte, zeigen sich in den Analysen positive Effekte des Erlebens (potentiell sehr) traumatischer Erlebnisse für kognitiv-kulturelle Integration (Spracherwerb) und nahezu keine Effekte für strukturelle Integration (Erwerbstätigkeit und Bildungsbeteiligung). Wir folgern daraus, dass das hohe Ausmaß an (potentiell sehr) traumatischen Erlebnissen keinen negativen Einfluss auf die Integration von Asylsuchenden und anerkannten Flüchtlingen aus Syrien hat, zumindest nicht in dem beobachteten frühen Stadium des Aufenthalts in Deutschland. Die Befunde deuten darauf hin, dass mehr potentiell traumatisierende Erlebnisse die Motivation, im Zielland zu bleiben, verstärken.

Schlüsselwörter: Geflüchtete, Traumatisierung, Integration, Deutschland

Over the previous decades, international migration has become an increasingly diverse and widespread phenomenon (e.g., De Vroome/Van Tubergen 2010). Recently push factors, e.g., wars, conflicts, hunger crises, have grown in importance compared to pull factors, e.g., labor shortages in receiving countries. This change has prompted an increase in other forms of migration, especially in the movement of asylum seekers and refugees[1], to gain more relevance in the political discourse compared to the previously dominating labor and family migration (see also Massey et al. 1998: 13). While there is extensive research and knowledge on labor and family migration, less research has been conducted on refugees (De Vroome/Van Tubergen 2010). The few studies focusing on refugees' economic integration, e.g., labor market outcomes (e.g., OECD 2016: 10) or language learning (e.g., Chiswick/Miller 2001: 404) find that they integrate slower compared to other types of migrants.

It is likely that specific aspects of refugee migration are relevant for the slower integration process. Refugees have often experienced war, suppression and other potentially traumatic situations before and during migration (ECRE 2017: 14). Health problems can in turn be an important explanation for slower integration (e.g., Dietrich et al. 2019, De Vroome/Van Tubergen 2010, Hauff/Vaglum 1993, OECD 2016: 41). Several studies have correlated the existence of witnessing traumatic events with consistently higher incident rates of mental health problems (e.g., Böttche et al. 2016: 1136; Bustamante et al. 2018, Crepet et al. 2017, Kane et al. 2014, Kirmayer et al. 2011, Lindert et al. 2009). The call, brought forward by NGOs and others (e.g., EFD 2018: 12; Dietrich et al. 2019: 80; McKinsey Global Institute 2018: 1; Leopoldina 2018: 4) for authorities to (systematically) screen refugees for physical and mental health problems at arrival and to provide immediate psychological trauma therapy to avoid these problems becoming an obstacle for integration, has some face validity.

[1] If not specified otherwise, we use the term "refugee" colloquially and mean all persons who left their home country for humanitarian reasons, irrespective of their legal status. This includes recognized refugees, persons who have been granted asylum, asylum seekers, tolerated persons, etc.

The above reasoning, however, neglects that extant research falls short of establishing the mechanisms by which traumatic experiences occurring before and during migration, or rather their resultant health problems, hinder integration. Moreover, most previous studies cannot distinguish whether traumatic experiences before arrival or post migration stressors lead to obstacles in integrating in the new country. Previous research has focused on the relationship between the number of traumatic experiences and the conditions under which they result in psychological distress, depression, or post-traumatic-stress disorder (e.g., Cheung Chung et al. 2018). This research, however, rarely connects mental health problems to integration activities or outcomes. Moreover, it is often based on small or selective clinical samples. Other research compares labor migrants to refugees and consistently finds higher rates of mental health problems (e.g., Lindert et al. 2009) and adverse integration outcomes for the latter (e.g., OECD 2016). In these studies, it remains unclear whether traumatic experiences before and during migration or higher levels of post-migration stress trigger mental health problems.

All migrants have some additional burden of adjusting to a new environment (e.g., Bustamante et al. 2018; Foster 2001, Haasen et al. 2008). However, several factors can lead to possibly higher post-migration stress on refugees. Refugees often have less time to plan and prepare for migration (Chiswick/Miller 2001: 394) and often receive more precarious, e.g., short-term, residence statuses (ECRE 2017: 12). Therefore, they may experience higher levels of post-migration stress. Yet, as most of these studies are based on data collected years after migration and usually do not include information on pre-migration trauma, it is uncertain whether higher levels of post-migration stress, traumatic experiences before and during migration, or some combination of the three is the underlying reason for the hindrances witnessed in integration.

The present paper overcomes both problems outlined from the literature by using data for a representative sample of Syrian migrants collected shortly after their arrival in Germany. The data include measures for integration and activities leading to integration. Moreover, we have detailed information on a comprehensive set of potentially traumatic events experienced. This information

includes the time they occurred and the effect they had on a person. We find that Syrian refugees experienced an incredible amount of traumatic experiences in Syria and during their flight to Europe. In our study, we focus on the structural integration outcomes of these recently arrived refugees, through measuring entry into the job market and the educational system in the new country, as well as language acquisition (cognitive-cultural integration), which unarguably is key for entry into the structural sphere and most other aspects of integration. Overall, we find that there is actually a positive effect of traumatic experiences on cognitive-cultural integration, i.e., language acquisition, and close to zero effect on structural integration outcomes, i.e., employment and education. Undoubtedly, traumatization and mental health problems can take a longer period than observed in our data to develop and become an obstacle for integration. Therefore, appropriate measures to screen and treat Syrian refugees should be taken in any case, given the high number of traumatic experiences present.

Traumatic experiences and prevalence of mental health problems

In principle, most migrants experience major adjustment stressors before, during and after migration (Foster 2001). Previous research has documented a wide variety of mental health issues associated with these stressors, such as: "anxiety, depression, posttraumatic stress disorder (PTSD), substance abuse, and higher prevalence of serious psychiatric disorders" (Foster 2001: 154). Foster (2001: 155ff.) distinguishes four stages of "immigrant trauma": (1) pre-migration trauma, e.g., related to the events that triggered migration; (2) traumatic events during transit to the new country, e.g., assaults during illegal trafficking or witnessing the drowning of loved ones; (3) continuing traumatic experiences during the process of resettlement, e.g., being temporarily housed in crowded camps or long phases of insecurity regarding a temporary or permanent residence permit; and (4) post-migration stress due to substandard living conditions in the target country or due to unemployment, etc.

Refugees by definition have on average higher levels of pre-migration trauma compared to labor or family migrants. They often also have less time to plan and prepare for migration

(Chiswick/Miller 2001: 394); therefore, they may experience more potentially traumatic events during transit. Similarly, we can also expect more stressors for refugees in the last two stages of migration, i.e., after arriving in the target country. This is especially so with regard to the massive movement of refugees to European countries in 2015 and 2016 (BAMF 2019). In the case of Germany, the process of being granted asylum or refugee status was often long drawn and living conditions in hastily assembled housing facilities, in many cases, were suboptimal.

Stress process theory assumes that stressful or traumatic events or experiences challenge one's coping mechanisms and that the capacity to adapt to continued hardships is finite (e.g., Beiser et al. 1989). Depending on individual differences in personal coping resources and social environment, the accumulation of stressors can overwhelm the individual and result in increased vulnerability. The dose-response concept derives a similar prediction (e.g., Böttche et al. 2016: 1136; Foster 2001: 157; Miller/Rasmussen 2010: 10). Furthermore, cumulative trauma experiences have been found to correspond to the severity of depression and PTSD symptoms. The association of accumulated trauma experience with psychological distress and psychiatric disorders has also been documented in general population samples (Turner/Loyd 1995). However, several factors have been identified as helpful coping instruments such as relocating as a family (Foster 2001: 154) or knowing someone in the target country (Böttche et al. 2016).

Further psychiatry literature identifies migration as a grief process (e.g., Carta et al. 2005). They suggest that refugees are more prone to mental health problems. In this concept, migration is viewed as a process of loss and change. The theory stipulates that labor and family migrants may mourn their separation from their homeland, family and friends. This separation is temporary, however, as labor migrants can, in theory, always return home or visit their home country. In contrast, refugees face an unforeseeable period to grieve over the loss of their home environment, as they typically cannot return. Carta et al. (2005: 4) suggest that grief is additionally heightened when migration was undertaken under adverse conditions. They also point to the importance of reception

conditions in the new country. This corresponds to the argument above that refugees potentially experience further post-migration stress.

To our knowledge, in all studies where depression, anxiety symptoms and post-traumatic stress disorder (PTSD) scores were measured (e.g., Cardozo et al. 2004; Crepet et al. 2017), refugees show higher prevalence rates for mental health problems at arrival compared to other migrants or compared to the general population (e.g., Rasmussen et al. 2012). This is regardless of the target country or measurements used and is in line with the theoretical arguments outlined above. Moreover, meta-analytic studies show higher prevalence rates for mental health problems in refugees, with significant between-study heterogeneity related to differences in pre-migration conditions depending on the country of origin as well as post-migration conditions related to the resettlement country (Bogic et al. 2015, Lindert et al. 2009, Steel et al. 2009). A similarly high prevalence of mental health problems is documented, also with considerable variation across contexts, in a study covering 90 refugee camps in 15 low- and middle-income countries (Kane et al. 2014).

Indeed, some studies establish a direct link between experiencing trauma and their effects on mental health. Unlike the above-mentioned work, these studies include data on exposure to traumatic events or experiences. With few exceptions, [the number of] traumatic experiences are highly correlated with mental health problems (Cardozo et al. 2004; Cheung Chung et al. 2018). One exception is social functioning, which was not correlated with exposure to traumatic experiences (Cardozo et al. 2004: table 4). Some studies find differences in prevalence rates when studying the same population in different target countries (Cheung Chung et al. 2018 studied Syrians in Turkey and in Sweden). These differences point to the potential relevance of the setting in the target country. However, these differences could also result from selective migration patterns.

To our knowledge, there is only one study available on the refugee populations in Germany that considers trauma. Dietrich et al. (2019) use data on a small sample of first-time entrants into the German unemployment register from Syria or Iraq (N=163). They report 59.4 percent having at least one traumatic experience, where 8 percent screened positive for PTSD. The number of violent

experiences proved to be a strong predictor of the severity of the PTSD symptoms of avoidance or hyper-arousal. This relationship is almost unchanged, even when controls for resources, residence status and social origin were added.

From these studies it follows that refugees, who on average experience more often traumatic events, have a higher susceptibility for mental health problems compared to labor or family migrants. Relevant moderators are personal and social coping resources, such as being resilient or being close to family. However, in general, these empirical studies do not directly determine whether traumatic experiences before and during migration lead to the documented mental health problems and decrease in integration outcomes seen in the literature or whether this is due to higher levels of post-migration stress or if it is a combination of all.

Refugees, mental health and integration

We understand integration as "the processes that increase the opportunities of immigrants and their descendants to obtain the valued 'stuff' of a society, as well as social acceptance, through participation in major institutions such as the educational and political system and the labor and housing markets" (Alba/Foner 2015: 5). In this paper, we focus on the structural dimension of integration, i.e., access to and placement in the educational system and the labor market. Furthermore, we consider language acquisition, i.e., cognitive-cultural integration, as an essential investment into realizing structural integration. Upon deciding to invest in activities that allow for the further accumulation of receiving country-specific human capital, learning the language of the new country, if not already known, becomes an essential first step. The process of integration can be conceptualized as investment decision in line with human capital theory (e.g., Chiswick/Miller 2001, Esser 2006: 39ff., Kalter/Granato 2002). Migrants can invest their time and resources into receiving country-specific capitals and therein integrate, e.g., getting a "good" job. Alternatively, a migrant could decide to invest into the ethnic or origin country spheres, e.g., into ethnic economies, or to not invest and

stick with the status quo. For the purposes of our research, we simplify the decision to invest into a binary choice to invest into the receiving countries language and structural spheres, or not to invest.

The investment decision generally depends on three theoretical constructs: opportunity, motivation and costs. (Perceived) opportunities are a necessary condition to invest, while the combination of motivation and (perceived) costs determines individual decisions (for details see Esser 2006: 41f.). The next sections detail the connections between the specific conditions with these theoretical constructs. We also elaborate on the specific expectations regarding refugees and the additional influence of (potentially) traumatic experiences. Note that specific conditions can be connected to more than one theoretical construct. We restrict the discussion on conditions that vary in our sample, but omit conditions, like cultural distance, that are constant by design.

The *opportunities* for structural integration, i.e., hard restrictions and the perceived likelihood that an investment succeeds, are typically connected to age at arrival in the new country (-) and education (+) (see e.g., Esser 2006: 46; signs in brackets denote the presumed relationship of specific conditions to the theoretical constructs). This is most obvious with regard to language acquisition, for example. Young children have a very high efficiency with learning a new language that decreases with age (e.g., Esser 2006: 93). In addition, individuals with more education are typically more efficient in language learning. There is no reason to expect differences for refugees regarding age at migration and education compared to other migrants. However, refugees often face additional restrictions, which are tied to their residence status. For refugees in Germany, access to the labor market, to state funded language classes and to the educational system depend on the state of their asylum application. Typically, Syrians get access soon after arrival to language courses and the labor market. Moreover, within the educational system several additional tracks were made available to them to catch up on educational degrees. However, given the initial temporary residence status (one year or three years), which is only prolonged as long as the reasons to flee the country of origin persist, refugees differ with regard to the anticipated payoff period of investments. Anticipating employers' awareness of unstable residence statuses, we expect that the opportunities for more costly

long-term investments, e.g., investing in receiving country-specific education, are lower when the residence status is undecided or very short-term as in subsidiary protection. Moreover, especially with regard to language acquisition, and to some extent also structural integration, the duration of stay affects opportunities. Having a network of contacts from the home country in the destination country should also affect opportunities for structural integration positively. However, having such a co-ethnic network may decrease opportunities for language acquisition. Finally, with regard to language acquisition, having the partner and children present may decrease the opportunities for everyday language learning.

The *motivation* for structural integration, i.e., the perceived utility of an investment compared to sticking with the status quo, is typically connected to the intent to stay (+) and to education (+). With regard to refugees, the mechanics of residence law reinforce and create additional incentives for refugees who are interested in a long-term stay. If they want to achieve a residence status which is not conditioned on the reasons to flee in the origin country, they need to show economic independence, e.g., have a secure job, as well as show a certain degree of German language competence, at least B1 (intermediate) German language abilities. We expect a non-linear relationship with regard to the effect of educational resources from the country of origin on integration into the educational system in the new country. Migrants and refugees with tertiary degrees should only be motivated to invest if their degrees are not recognized. Moreover, familial situation may also influence the motivation to invest in structural integration. For example, having a partner and children may induce an individual to invest in the labor market (+) but be a demotivation to undertake further human capital investment in the form of entry into the education market (-). In terms of language learning, the presence of family can decrease (-) the motivation to learn for adults, which is attributed to the presence of children who more easily learn the language and can then help with translation.

The *costs* for an investment in structural integration are typically connected to education at the country of origin (-). It is assumed that a person with higher level of education would generally find it easier to adopt to a new context. Moreover, co-ethnic networks may help in orientation and

help finding work hence decreasing the search costs. Finally, the existence of receiving country-specific language skills, in our case German, decreases the associated costs of structural integration, e.g., it is easier to find a job or to enroll in the educational system.

Potentially traumatic experiences and their presumed mental health problems, conditional on a person's coping resources, may also influence opportunity, motivation and costs. Having experienced traumatic events, as suggested by the stress process theory and dose-response concept, could lead to the finite agency that an individual possesses to deal with new stressful events, such as integrating into a new society, to diminish. Traumatic experiences, therefore, could lower the perceived opportunities for integration. This is especially so for cognitively demanding long-term investments, i.e., those into educational degrees. This in turn could increase the perceived cost of integrating. On the other hand, having had several (traumatic) experiences in the home country and on route to the receiving country might reinforce the motivation to stay long term and to invest more, given the above specified conditions of residence permits in Germany. Moreover, the mitigating effects of coping mechanisms may decrease the overall cost of integration, e.g., through family support for integration endeavors and perseverance against the hardships associated with the experience.

When considering current health and mental state (anxiety/depression/stress), as with most of the previous research, similar arguments can be made as to those above. We expect that feeling anxious, depressed or stressed may decrease opportunities and increase costs in a similar manner to experiencing traumatic events. Having a better subjective health perception would lead to decreases in the costs and increase in perceived opportunities. However, note that it remains unclear whether pre-migration traumatic experiences or post-migration adaption stress has caused the differences in health and prevalence of depressive symptoms. Table 1 summarizes the expected relationships of conditions to the theoretical constructs of the investment model of integration.

Table 1: Individual conditions and expected relationships to the investment model of integration

	Opportunities			Motivation			Costs		
	Lang.	Empl.	Educ.	Lang.	Empl.	Educ.	Lang.	Empl.	Educ.
Conventional conditions									
Age at arrival in DE	-	-	-						
Education in CO.									
medium	+	+	+	+	+	+		-	-
high	++	++	++	+	+			--	--
Co-ethnic network in DE	-	+	+					-	-
Full refugee/asylum status (vs. subsidiary or other)	+	+	+						
Duration of stay in DE	+	+	+						
Intent to stay: long-term				+	+	+			
German language ability		+	+					-	-
Family available: having partner or children, who are in DE	-			-	+	-			
Traumatic experiences & coping resources									
Traumatic experiences	-	-	--	+	+	+	+	+	+
Traumatic experiences * Family available	+	+	+				-	-	-
Traumatic experiences * resilience high	+	+	+				-	-	-
Current health & depression									
Health	+	+	+				-	-	-
Feeling anxious/ depressed/ stressed	-	-	-				+	+	+

Note: "Lang." stands for "German language ability", "Empl." stands for "Employed (currently)", "Educ." stands for "Education (currently enrolled)", "CO" stands for "country of origin", and "DE" for "Germany". "*" denotes interaction effects, "-"/"+" the direction of the presumed relationship to the theoretical constructs, empty cells indicate that we do not expect an effect.

The general conditions that affect integration are well documented in the literature (e.g., Berry 1997, Esser 2006). However, far less is known regarding the relevance of mental health resulting from traumatic experiences. There is extensive research on PTSD, commonly defined as a mental disorder causing distress, which is caused by traumatic experiences with life threatening characteristics, and is usually associated with additional problems, e.g., depression, alcohol/drug dependency, or personality disorders (Nygaard et al. 2017: 1). PTSD is often described as leading to both physical and non-physical changes to the person (WHO 2016). For these reasons it is often assumed that individuals dealing with mental health problems, like depression or PTSD, have a harder

time to focus on integration activities, like language learning or entering the labor market (see also Dietrich et al. 2019).

To our knowledge empirical studies mostly provide support for an association between mental health and integration – however, none of them can convincingly distinguish whether the documented association points to an effect of mental health on integration or vice versa. Using data on a sample of refugees in the UK, Cebulla and colleagues (2010) find that those who described themselves as having poor health were less likely employed and showed slower improvement of English language skills over time. Khoo (2010) reports similar results for self-reported health and mental health scores for refugees in Australia, though the effects are only significant for males. A study with a small and selected sample of refugees seeking treatment in Switzerland documented an association between poor social integration and psychological symptoms (Schick et al. 2016). Haasen and Reimer (2008) use small and highly selective samples of Russian and Iranian migrants in Germany to document a correlation between acculturation stress and mental distress, which are similar for both groups. Moreover, these studies mostly examine long-term integration outcomes.

We found two studies with very similar data compared to our study: in one, the sample was very small, and arguably the context, Vietnamese refugees who were resettled in the capital region of Norway in the 1980ies, may have differed on several dimensions from our own (Hauff/Vaglum 1993). The authors find that experiences of war trauma are independently related to labor market outcomes, i.e., when age, sex and mental health (measured after arrival) were controlled for. Due to the small sample, the number of controls was restricted. Notably, the effect on labor market participation three years after resettlement was positive. The authors argue that this finding is in line with those having experienced severe trauma being motivated to give priority to immediate economic security, i.e., joining the labor force, instead of investing into more long-term occupation potential, e.g., into further educational acquisition. In line with this argument, a study on refugees enrolled in language courses in Norway found negative effects of violent trauma on the motivation for language training (Iversen et al. 2014).

Research setting: Syrian refugees in Bavaria

We examine refugees from Syria, a country that has experienced long-term political and military strife most notably from 2011. The crisis in Syria has produced a large-scale movement of people escaping the current civil war. Many of these individuals reached Germany in the immigration wave of 2015/2016. Indeed, Syrian refugees are still the largest group of asylum seekers in Germany (BAMF 2019: 18), comprising of 27.3 percent of asylum applications in 2018. After the Turkish and Polish populations, they now constitute the third largest foreign population in Germany (Destatis 2019). They also have the highest likelihood to receive the legal right to stay in Germany (BAMF 2019: 38) and therefore, they are given more resources and help from authorities to integrate, e.g., more rapid access to education, employment and administrative help, compared to other groups of recent asylum seekers.

Studying Syrian migrants in Germany shortly after their arrival is strategic for examining the role of traumatization on integration. On average individuals in our sample have been in Germany for 1.5 years. 87.5 percent of the sample have been in the country less than two years (minimum stay was 2 months; maximum stay was 3.8 years). Using our sample, we are therefore able to observe the initial stage towards integration in this population. Due to the Syrian civil war, we can clearly establish a prominent series of countrywide events, wherein traumatic events have occurred and were experienced. Given the reports on the situation in Syria and on the major transit routes in the years since 2011, there is reason to believe that almost all individuals living in Syria at the time were at risk of experiencing traumatic events.

Method

Data and Procedures

We use the survey data collected by the Qualifications, Potentials and Life Courses of Syrian Asylum Seekers in Bavaria (QPLC) project. The QPLC survey targeted persons aged 18 or older with

Syrian nationality who entered Germany starting from 2014 in order to apply for protection, and who lived in Bavaria during the field period (May to December 2017). It used multi-stage weighted random sampling on regional district/town, facility and within facility level, with the assumption that the number of target group individuals per geographical region is proportional to the number of refugees housed. 275 interviews were conducted. The response rate was 46.8 percent. Even with a comparatively small sample, the QPLC project found no large difference between the realized sample and population averages from the German national statistics office of 2016 (Khourshed et al. 2019).[2] Interviews were collected using Computer Assisted Personal Interviewing (CAPI) by bilingual interviewers, who were from Syria or neighboring countries and who spoke a similar Arabic dialect.

Measures

We use two measures of *structural integration* by looking at the pathways of entrance into the labor market – direct (employment) and indirect, i.e., acquiring labor market skills through first completing an academic or vocational course. Structural integration variables are binary and capture whether a person is currently in employment (full-time, part-time and in-company training) or in education (tracks towards secondary school or university degrees, vocational training or professional courses/retraining, but not language or integration courses). *Cognitive-cultural integration* is assessed by looking at the ability individuals have at successfully understanding their receiving country counterparts, through examining language abilities. Language abilities were measured by a combined score from two exercises given to respondents: one that asked respondents to recognize the proper German noun and article of five pictures shown and the second asked respondents to correctly place words into three or five sentences. The language test score used was created using a one-parameter logistics model.

[2] The QPLC sample seems to exhibit some differences with the IAB-BAMF-SOEP 2016 sample. The differences are rather due to migration patterns exhibited by this population rather than sampling strategy (for details see Khourshed et al. 2019).

The *measures for the specific conditions* of integration are: age at arrival in Germany, education in country of origin (ISCED levels), duration of stay in the new country and intent to stay [categories are: uncertain ("don't know"), short-term ("one year", "a few years", "until Syria is safe") and long-term ("forever")]. We measure co-ethnic network in Germany through a binary variable that takes into account if the respondent knew someone in Germany and contacted this person before leaving Syria. Residence status distinguishes between full refugee/asylum status, which is the most long term and secure status, subsidiary protection and other status, e.g., the asylum application is still processed. Note that as language ability is an essential condition for structural integration, we use the above described language test as an independent variable for employment and education. Furthermore, in all models we *control* for gender.

To measure *traumatic experiences*, the QPLC uses an adapted version of the survey of lifetime traumatic events originally developed by Breslau and Kessler (2001), including the extensions to measure the direct effect of traumatic experiences on people who lived in war-torn countries developed by Shmotkin and Litwin (2009). The survey asks respondents to recall if they have experienced any of 10 events that cover wartime injury or death, terrorism and experiences in Syria and on their route out of the country. Four of the items refer to experiences that directly affect the respondent's well-being and life, four refer to events affecting close friends or family members and two items look at events that have occurred to strangers. Respondents were then asked to identify when these events happened and the effect that they may have had on them (great, moderate, or little effect). In this analysis, we concentrate on all 10 events that have occurred since the break out of the civil war in 2011. We further break down the trauma variable into three categories: experiencing none of the 10 events since 2011, experiencing one and experiencing more than one. We construct the traumatic events variables in this way, as we cannot assume that there is an equidistance between numbers of traumatic events experienced. In separate analyses, we found no evidence of an additional effect beyond the distinction made here.

In our second specification, we take into account the coping mechanisms available to an individual that may mediate the effects of experiencing traumatic events. We use two measures for coping mechanisms: first, a measure for family support, which combines the existence and location of family members. The binary indicator is set to one if the respondent has a partner and/or children and they are with the respondent, and to zero in all other constellations. Second, we use a measure for resilience derived from the Brief Resilience Scale (BRS) developed by Smith and colleagues (2008). The BRS was developed to measure the "coping abilities" in a given population and has been validated in other studies. The scale involves six-items, which runs from one to five and divides the population into three rankings: low, normal and high resilience.

In the third specification we add overall self-rated health. The QPLC project asks respondents to rate their health using a five-point scale from excellent to poor at the time of the interview. We also include a binary measure for mental state, where respondents were asked if they generally feel anxious, depressed and/or stressed.

Multiple imputation

We used multiple imputation to impute missing values on independent variables in order to maximize the use of available information and minimize complete case analysis bias (Rubin, 1987).[3] We imputed mostly small fractions on several independent variables (see Table A1). The language test, which serves as both an independent and dependent variable, was imputed for those respondents for whom highly correlated interviewer assessments of German abilities were available as an auxiliary variable ($r = 0.58$, $p < 0.01$). The structural integration measures were not imputed. Listwise deletion on all three dependent variables results in an analysis sample of 252 cases, i.e., 91.6 percent of all observations.

[3] Variables were imputed 25 times using chained equations as implemented in the statistical software package Stata 14.2. Missing values are replaced iteratively using a sequence of univariate imputation methods with fully conditional specification of prediction equations.

Identification

The above discussion suggests that a reduced-form equation relates integration, i.e., the structural integration outcomes labor market access and entry into the educational system, as well as language acquisition, to specific conditions that shift the supply and demand curves determining perceived utility of these investments. Thus, the reduced-form equation can be written as:

$$Integration_i = F(Opportunity_i, Motivation_i, Costs_i, X_i)$$

where X_i represents individual specific characteristics, such as gender.

Using the specific conditions affecting opportunity, motivation, and costs outlined above, the model generates three conceptual equations, one for each integration outcome of interest: current employment, current education and German language abilities. For a list of the variables considered in each equation and specification, with their hypothesized signs, please refer to Table 1.

We estimate three specifications for each outcome. The first includes the conventional conditions for the opportunity, motivation and costs as a baseline model. The second adds traumatic experiences, coping resources (resilience and having the immediate family around) and their interaction. In the third specification, we replace the latter with measures for current perceived health and an indicator for currently feeling anxious, stressed or depressed to see if taking the current overall (mental) health state, is an influential predictor of integration. Note that the second specification relies solely on the potential effects of pre- and during migration traumatic experiences on the outcomes. In contrast, the third specification captures potential effects of all four stages of "immigrant trauma" (Foster 2001), including continued trauma during resettlement and post-migration stress. Hence, we further define the specifications as:

Specification 1:

$$Integration_i = \alpha + Conv.Cond._i\,\beta + \gamma Female_i + \epsilon_i$$

Specification 2:

$$Integration_i = \alpha + Conv.Cond._i \beta + Trauma_i \delta + CopingResources_i \theta + Trauma_i * CopingResources_i \tau + \gamma Female_i + \epsilon_i$$

Specification 3:

$$Integration_i = \alpha + Conv.Cond._i \beta + \varphi Health_i + \vartheta FeelingAnxiousDepressedStressed_i + \gamma Female_i + \epsilon_i$$

where ϵ_i is an independent identically distributed error term.

We identify the effect of traumatic experiences and the other conditions on the structural integration outcomes using linear probability models and OLS models for the language test. All models are estimated with robust standard errors.

Analysis

Our sample is relatively young with a mean age of 29 years old at arrival. Most have a lower to upper secondary degree from their home country and have been in Germany for an average of 18 months. Most of the sample are not married, but of those, most live with their partners and children. In terms of intent to stay, a little over 40 percent are unsure, while a third would like to stay long-term. Finally, as expected, the majority have a more secure residence status (full refugee/ asylum) rather than less secure, i.e., subsidiary protection.[4] For a full description of the control variables used in our analysis see Appendix A, Table A1.

Traumatic experiences

Examining the distribution of traumatic events in the sample, we find that the majority of traumatic events reported occurred since the beginning of the Syrian civil war (Figure 1). Moreover, there is a strong concentration of reported events between 2013 and 2016, which, arguably, was the

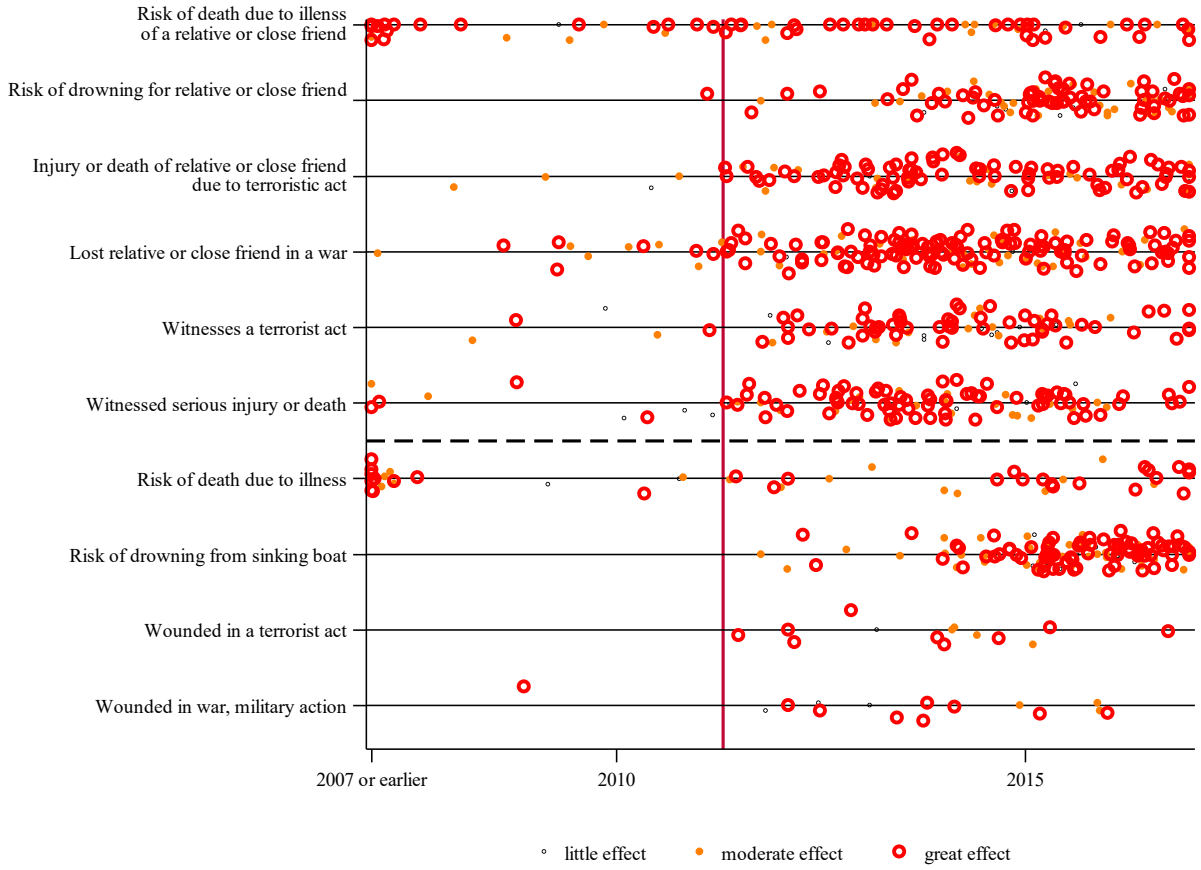
[4] The major difference between the more secure statuses and subsidiary protection is those with the latter are not entitled to easily bring their family with them to Germany, and initially only have the right to stay for one year rather than three before having to reapply for further stay.

most intense period of the Syrian civil war. Reporting events related to the war are more present in years that correspond to the increase in attacks by the Syrian regime (2014 to 2016) and Daesh's advance in 2013.[5] Furthermore, we find that traumatic experiences related to flight are more commonly reported from 2015, i.e., when large numbers of Syrian refugees made their way to Europe. For example, "risk of drowning from a sinking boat" is more likely reported as occurring in the timeframe from 2015 to 2017 than prior, while "loss of a close friend or relative" and "witnessed serious injury or death" is reported more evenly throughout the entire time frame. In the analysis below, we will focus on events that occurred since the beginning of the Syrian civil war in 2011. We find that only 15 percent of the respondents state they have not experienced any of the ten traumatic events since 2011, 12 percent experienced one of the events, while the majority, 73 percent have experienced more than one traumatic event.

The high frequency of several traumatic events experienced corresponds to field reports of high incidences of trauma in this population (ECRE, 2017; Leopoldina, 2018). Figure 1 also shows that the vast majority of incidents are reported to have had a great effect on respondents' life. The results hardly change when limiting the trauma measure to only experiences with great effect. By itself, the observed high frequency of traumatic experiences suggests that the widely proclaimed argument in the literature, that the potentially high mental health cost that comes from experiencing trauma, can indeed lead to detrimental effects on the process of integrating in a new society.

[5] The military crackdown on protests occurred since April 2011; Daesh expanded its territories from November 2012 to April 2013; chemical attacks and massacres by mercenaries and Syrian army forces occurred since 2014. The resurgence of Assad's power started from 2013 with the raids and violence on rebel-controlled locations in Syria and the Russian intervention to aid Assad started in 2015 (Davenport, 2017).

Figure 1: Traumatic experiences reported



Note: We used jittering (5 percent) to prevent over plotting. Events reported before 2007 were set to 2007. The vertical red line marks the onset of the civil war in Syria in spring 2011. The horizontal dashed line separates the four traumatic events affecting the respondent's own well-being and life from the events witnessed to others and the events affecting relatives and close friends.

However, although the presence and frequency of traumatic events is clearly witnessed in this sample, one can argue that perhaps the pervasiveness of the phenomenon does not hold for the entire Syrian population. That is, some groups of individuals may have experienced more traumatic events concerning the war and flight out of the country more than others. Additional analyses show that such a selection is not, largely, the case (see Appendix B).

Integration

Table 2 provides summary statistics of the integration outcomes observed. For structural integration, we find that 9.5 percent of the sample state that they are currently employed, and 15.9 percent are enrolled in an educational track. These percentages may seem relatively small; however,

these measures are taken at a time close to arrival. Hence, there may be delays in acquisition of these tracks until sufficient language is learnt. The summary statistics for the cognitive-cultural aspect of integration indicates that there is a large variance in the performance when it comes to German language abilities.

Table 2: Summary statistics of integration measures

	Imputed data	Original data				
	Proportion/ Mean	Proportion/ Mean	St. dev.	Min.	Max.	N
Employed (currently)	not imputed	0.095		0	1	252
Education (currently enrolled)	not imputed	0.159		0	1	252
German language abilities	-0.114	0.003	0.799	-2.29	1.58	202

We now turn to the regression analysis predicting integration (Tables 3, 4 and 5). We will first discuss the results from our baseline model (specification 1 in columns M1) then discuss the results taking into account trauma and coping mechanisms (specification 2 in columns M2, M2a, M2b) and finally look at the effects of current health and mental state (specification 3 in column M3). Tables 4 and 5 for the structural integration outcomes show average marginal effects from linear probability regressions, while the cognitive-cultural integration in Table 3 shows OLS results. We ran several robustness checks; the results did not differ much from the findings presented below (for details see Appendix C).

For the most part, we find the signs of the *conventional conditions for integration* in line with our theoretical expectations. The magnitude of the effect of the age an individual arrived in Germany is relatively small for all outcomes, but negative as expected, and significant in the case of education (Tables 3, 4, 5, M1). This suggests that, net of other conditions, the opportunity of integration is lower as age increases. Education at the country of origin is significant and mostly in line with the hypothesized signs in Table 1 for all three outcomes. For language acquisition, compared to primary or less education, all with more education learn more German (or learn faster), with an increase of

0.4 to 0.5 points. Regarding current employment, compared to all other education levels, those with a tertiary level of education show a significant positive effect of 15 percent. This relation is reversed for education. Here we find a positive and significant effect for those with lower secondary education levels to invest in education in the new country of 11 percent probability increase. Whereas we had expected gradual effects for medium and high levels of education, regarding the general pattern, the effects of education at the country of origin are in line with our expectations. The effects for age at arrival and education at the country of origin, with their sign and magnitudes, hold in all other specifications. Having a pre-migration co-ethnic network in Germany has insignificant, and close to zero, effects on all three dependent variables in the baseline specification 1 (column M1 in Tables 3 to 5). This effect changes in the second specification, see below.

Having either a secure (full refugee/asylum) or insecure (subsidiary protection) residence status does not seem to have any significant effects on our integration measures. Duration of stay and intent to stay, however, do seem to drive some integration investments. In the case of cognitive-cultural integration we find a highly significant effect of duration in the new country on German language test scores, with an increase of 0.30 points. This effect is almost constant in the other specifications. Short-term intent to stay in Germany, compared to uncertain intentions, decreases the German test score by 0.31 points (Table 3, M1); the effect stays similar in the other specifications as well. For current employment, we find a close to zero effect of duration, but a positive and significant effect of 15 percent of short-term intent to stay. In educational enrollment, we find an overall positive significant effect of duration in Germany of [mostly] 7 percent. Intent to stay has close to zero effect. Taken together these results imply that the longer one is in Germany, the more investments are undertaken in education while direct access to the labor market occurs if there is short-term intent to stay. The findings regarding intent to stay are not completely in line with the theoretical mechanisms outlined above, we had expected those with long-term intent to stay to be motivated more to investment than those with short-term or uncertain intent to stay.

The findings regarding the availability of family are partially in line with the theoretical framework. For educational enrollment, we find a negative and highly significant effect of -11 percent (Table 5, M1). This is in line with theory, suggesting that the motivation of education is greatly decreased given the presence of family. For the other integration outcomes, German language abilities and current employment, the effects are smaller and not significant (Table 3 and 4, M1). Finally, German language ability for the structural integration outcomes, employment and education, are all positive and in the case of employment show a significant effect of around 6 percent probability increase, which is maintained in the other specifications. Regarding gender, we do not find significant differences. This is mostly due to also controlling for family composition. Most females (65.6 percent) have their family present and often report that family duties keep them from engaging in integration activities, whereas only 21.5 percent of males have family who is with them in Germany.

Table 3: Cognitive-cultural integration: German language test

	M1	M2	M2a	M2b	M3
Female	-0.21	-0.20	-0.17	-0.22	-0.13
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)
Age arrived in DE	-0.01	-0.01	-0.01	-0.01	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Education (Ref.: primary or less):					
Lower secondary	0.49***	0.46***	0.45***	0.47***	0.44***
	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)
Upper second. +	0.40**	0.37**	0.37**	0.35**	0.38**
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)
Tertiary	0.50**	0.52**	0.49**	0.47**	0.46**
	(0.21)	(0.21)	(0.21)	(0.21)	(0.21)
Co-ethnic network in DE	-0.19	-0.22*	-0.21*	-0.22*	-0.22*
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Residence status (Ref.: other status)					
Subsidiary protection	0.29	0.30	0.29	0.33	0.27
	(0.26)	(0.25)	(0.26)	(0.26)	(0.26)
Full refugee/asylum status	0.36	0.39	0.37	0.39	0.33
	(0.26)	(0.25)	(0.26)	(0.25)	(0.26)
Duration stay DE (years)	0.30***	0.30***	0.33***	0.31***	0.31***
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
Intention to stay (Ref.: uncertain)					
Short-term	-0.31*	-0.29*	-0.31*	-0.28*	-0.27*
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)
Long-term	-0.16	-0.15	-0.19*	-0.14	-0.17
	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
Family available	0.08	0.11	0.13	-0.26	0.06
	(0.15)	(0.14)	(0.14)	(0.28)	(0.14)
Resilience high			-0.21		
			(0.28)		
No traumatic exp. (ref.)					
1 traumatic exp.		0.38*	0.48**	0.26	
		(0.21)	(0.24)	(0.28)	
> 1 traumatic exp.		0.28*	0.18	0.04	
		(0.16)	(0.20)	(0.22)	
*Traumatic exp. * Coping resources*					
1 traum. exp. * Resilience high			-0.66*		
			(0.39)		
> 1 traum. exp. * Resilience high			0.48		
			(0.32)		
1 traum. exp. * Family available				0.11	
				(0.41)	
> 1 traum. exp. * Family available				0.53	
				(0.32)	
Health (self-assessed)					0.13***
					(0.05)
Feeling anxious/ depressed/ stressed					0.10
					(0.13)
Constant	-0.80**	-1.04***	-1.05***	-0.86**	-1.36***
	(0.31)	(0.34)	(0.35)	(0.35)	(0.35)
Adj. R^2	17.2	18.2	20.5	19.1	19.7

Note: Effects from OLS regression models with robust standard errors. Standard errors in parentheses. Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. N=252.

Table 4: Structural integration: current employment

	M1	M2	M2a	M2b	M3
Female	-0.04	-0.04	-0.06	-0.04	-0.02
	(0.04)	(0.04)	(0.05)	(0.04)	(0.05)
Age arrived in DE	-0.00	-0.00	-0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Education (Ref.: primary or less):					
Lower secondary	-0.04	-0.04	-0.04	-0.03	-0.04
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Upper second. +	-0.02	-0.02	-0.02	-0.01	-0.02
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Tertiary	0.15*	0.15*	0.15*	0.16*	0.15*
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Co-ethnic network in DE	-0.03	-0.03	-0.02	-0.03	-0.04
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Residence status (Ref.: other status)					
Subsidiary protection	0.02	0.01	0.02	0.02	0.01
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Full refugee/asylum status	0.05	0.05	0.05	0.05	0.05
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Duration stay DE (years)	-0.01	-0.01	-0.02	-0.01	-0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Intention to stay (Ref.: uncertain)					
Short-term	0.15**	0.14**	0.14**	0.14**	0.15**
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Long-term	0.02	0.02	0.03	0.02	0.01
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
German language abilities	0.06**	0.06**	0.06**	0.06**	0.05**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Family available	-0.04	-0.04	-0.03	-0.07	-0.04
	(0.04)	(0.04)	(0.05)	(0.11)	(0.04)
Resilience high			-0.11		
			(0.09)		
No traumatic exp. (ref.)					
1 traumatic exp.		-0.05	-0.10	-0.09	
		(0.07)	(0.09)	(0.10)	
> 1 traumatic exp.		0.00	-0.02	-0.01	
		(0.06)	(0.08)	(0.10)	
*Traumatic exp. * Coping resources*					
1 traum. exp. * Resilience high			0.17		
			(0.11)		
> 1 traum. exp. * Resilience high			0.06		
			(0.10)		
1 traum. exp. * Family available				0.11	
				(0.12)	
> 1 traum. exp. * Family available				0.03	
				(0.12)	
Health (self-assessed)					0.03*
					(0.01)
Feeling anxious/ depressed/ stressed					0.02
					(0.04)
Constant	0.09	0.10	0.13	0.11	-0.03
	(0.07)	(0.09)	(0.10)	(0.11)	(0.09)
Adj. R^2	6.4	6.1	5.7	5.5	6.8

Note: Effects from linear probability models with robust standard errors. Standard errors in parentheses. Significance: * p < 0.10, ** p < 0.05, *** p < 0.01. N=252.

Table 5: Structural integration: actual educational enrolment

	M1	M2	M2a	M2b	M3
Female	0.02	0.02	0.03	0.01	0.02
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Age arrived in DE	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Education (Ref.: primary or less):					
Lower secondary	0.11*	0.11*	0.10*	0.12**	0.13**
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Upper second. +	-0.04	-0.04	-0.05	-0.05	-0.04
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Tertiary	-0.07	-0.07	-0.07	-0.08	-0.07
	(0.06)	(0.06)	(0.06)	(0.07)	(0.06)
Co-ethnic network in DE	0.00	0.00	-0.00	0.00	0.01
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Residence status (Ref.: other status)					
Subsidiary protection	-0.01	-0.00	-0.00	0.01	-0.02
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Full refugee/asylum status	0.05	0.06	0.06	0.06	0.04
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Duration stay DE (years)	0.07**	0.07**	0.06*	0.07**	0.07**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Intention to stay (Ref.: uncertain)					
Short-term	-0.03	-0.02	-0.00	-0.02	-0.03
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Long-term	-0.08	-0.08	-0.07	-0.07	-0.08
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
German language abilities	0.03	0.02	0.04	0.02	0.03
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Family available	-0.11***	-0.12***	-0.12***	-0.30***	-0.12***
	(0.04)	(0.04)	(0.04)	(0.10)	(0.04)
Resilience high			0.12		
			(0.12)		
No traumatic exp. (ref.)					
1 traumatic exp.		0.05	-0.00	-0.01	
		(0.10)	(0.10)	(0.14)	
> 1 traumatic exp.		-0.02	0.01	-0.13	
		(0.06)	(0.07)	(0.10)	
*Traumatic exp. * Coping resources*					
1 traum. exp. * Resilience high			0.39		
			(0.24)		
> 1 traum. exp. * Resilience high			-0.07		
			(0.14)		
1 traum. exp. * Family available				0.10	
				(0.18)	
> 1 traum. exp. * Family available				0.25**	
				(0.12)	
Health (self-assessed)					-0.01
					(0.02)
Feeling anxious/ depressed/ stressed					-0.10**
					(0.05)
Constant	0.31***	0.31***	0.30***	0.38***	0.40***
	(0.09)	(0.11)	(0.11)	(0.12)	(0.13)
Adj. R^2	16.1	15.8	19.0	16.7	16.9

Note: Effects from linear probability models with robust standard errors. Standard errors in parentheses. Significance: * p < 0.10, ** p < 0.05, *** p < 0.01. N=252.

We will now turn to the second specification taking into account the effects of trauma. Note that we first look at a specification without the interactions for coping mechanisms. With regard to cognitive-cultural integration, we find a positive effect of experiencing at least one or more than one traumatic event (Table 3, M2). Experiencing one event increases the language test score by 0.38 points compared to experiencing none. The increase is only 0.28 points when more than one traumatic experience was reported. Furthermore, the effect of co-ethnic networks for language acquisition, changes in specification 2 (columns M2 vs. M3 in Table 3). Ceteris paribus, net of the influence of traumatic experiences, we find the expected dampening effect on learning German. For the structural outcomes, we find that the coefficients for one or more than one traumatic event are very close to zero, and none of these are significant at any conventional level (Table 4 and 5, M2). In order to find positive effects of traumatic experiences, the implication is that refugees with more traumatic experience have a very high motivation to stay in the new country and to that end learn the language, which absorbs possible negative effects of traumatic experiences via lower opportunities or higher costs from trauma. Furthermore, that we find positive results on cognitive-cultural integration compared to structural integration is not, in itself, surprising as in line with our expectations, language acquisition is a natural first step into structural integration. Moreover, the effects witnessed could also partially be due to the limited role of costs of language learning in this population. The costs of language courses and language learning have been decreased immensely by the German state and a culture of welcoming in the general public for Syrian refugees. Finally, structural integration may take more time than we observe on average in these data.

Given individual differences in coping resources, the above described results might mask negative effects of traumatic experiences, if these coping resources were systematically related to the number of traumatic events experienced. Adding coping mechanisms, i.e., their expected interactions with traumatic experiences, we find that the overall effects of traumatic experiences remain about the same. Starting with cognitive-cultural integration, remarkably refugees with high resilience and one traumatic experience show considerably lower language test results (the interaction effect is negative

and marginally significant, Table 3 column M2a). For the group of highly resilient refugees with more than one traumatic experience this effect no longer appears. The interaction effect, albeit insignificant, switches signs to be positive. Moreover, the main effect of one trauma, i.e., the effect of traumatic experience for less resilient refugees still increases the test score performance even more by 0.48 points. Turning to the structural outcomes, the interactions between trauma and resilience are positive but insignificant (Table 4 and 5, M2a). Interacting the second coping mechanism, family availability, with trauma leads to mostly positive, yet rather small and insignificant, effects on all three integration outcomes. Yet, we find a significant impact of the family coping resource with experiencing more than one trauma on education, e.g., an increase of 25 percent on enrollment probability. Predicted probabilities show however, that taken with the negative main effect of family presence, this implies that regardless of this coping resource, an individual ends up not being either negatively or positively affected by family presence in terms of educational enrollment. Hence, as we do not find systematic and substantial overall changes to the established effects of trauma, coping mechanisms do not seem to be playing a great role as expected from the literature. Indeed, this may be the case as the expected effects of traumatic experiences, i.e., significant negative effects, do not actually seem to be present. Therefore, it could simply be the case that regarding the effects on integration outcomes there is little to "cope" with.

Turning to our third specification, which relies on the current overall health and mental state of the individual, we find the expected effects either in the self-assessed health or mental state measure. For language acquisition, we find that a one-point increase in self-assessed health significantly increases the language test score by 0.13 points (Tables 3, M3). Mental state, measured as feeling anxious, depressed or stressed has no significant effect. The same pattern is observed for employment: health significantly increases the probability of employment by 3 percent, while mental state shows no significant effect (Table 4, M3). For the more long-term educational investment, in contrast, we observe no significant health effect, but feeling anxious, depressed or stressed decreases the probability of educational enrolment by 10 percent (Table 5, M3). The coefficients of the

conventional conditions hardly change. These findings are in line with our expectations. Good overall health and better mental health is expected to help in integration. However, while adding these measures significantly improve the model fit, the explanatory power, e.g., when comparing the adjusted share of variance explained with specification M2, does not improve much. Hence, though (mental) health is important it may not play as a large role as suggested. Furthermore, note that current health and mental state may also be influenced by post-migration adaption stress, which is not specific to refugee migration.

Summary and conclusions

We analyzed the effect of traumatic experiences before and during migration on integration for a representative sample of Syrian refugees. Our study addresses a few key factors that were missing in the literature. First, we propose possible mechanisms as to how traumatic experiences influence integration investments. Second, we use measures of traumatization that distinctly capture pre and during migration stressors. Third, the data was collected, on average, only 1.5 years after arrival; therefore, the potential reverse effects of post-migration adjustment stress causing mental health problems which may in turn foster further integration problems can be regarded as minimal.

We find that Syrian refugees in Germany experienced a high number of traumatic events in Syria and during their flight to Europe. The analyses show that the whole population arriving in Germany was at risk of experiencing traumatic events; hence, it is not surprising that frequency rates of one or multiple traumatic experiences is very high. While we could not directly analyze, whether traumatization led to mental health problems, we could relate pre-migration trauma to integration outcomes. In sum, we find, contrary to the popular expectation, positive and often significant effects of one or more than one traumatic experience on cognitive- cultural (language) integration outcomes, and close to zero and insignificant effects of traumatic experiences on structural integration. This pattern of effects suggests that refugees with more traumatic experiences have a higher motivation to integrate than refugees who did not experience these traumatic events. While the design does not

allow ruling out negative effects on opportunity and costs of integration, apparently the motivation aspect is more important. Finding positive effects of traumatic experiences for cognitive-cultural integration, but not for the structural outcomes is not surprising as often language acquisition is a necessary step into entering structural spheres. Including coping mechanisms did not change the overall results on traumatization. These findings suggest that the existent priors on the negative effects of experiencing (more) traumatic events on integration outcomes in the short-run is erroneous.

Refugees not only differ from other migrant groups with regard to having experienced more traumatic events before and during migration. They also often have less time to plan and prepare for migration. Therefore, they may experience higher levels of post-migration stress. Indeed, we find that differences in current (mental) health are predictors for all three integration outcomes investigated. These measures incorporated pre, during and also post-migration stressors. However, they seldom changed the overall results, nor did they add considerably more explanatory power to the explanation.

In sum our findings contradict popular expectations but are actually in line with psychiatric literature that espouses that people have a high capability of dealing with difficult situations and that often experiencing trauma does not automatically determine developing mental health problems (e.g., Jakšić et al. 2012: 256). Public debate presumes a straightforward causal chain of pre-migration traumatic experiences increasing the likelihood of mental health problems, and these, in turn, interfering with activities leading to integration. This reasoning neglects alternative mechanisms potentially at work. Moreover, most of the limited empirical work to support this reasoning, due to data limitations, may have confused post-migration adjustment stressors with pre-migration traumatization. Our results suggest that in the short-run especially highly traumatized refugees may choose to embark in integration especially in the case of language learning. The fact that we see this result, even when coping mechanisms are factored in, suggests that pull factors after experiencing trauma are a driving force into making the decision to integrate at some level, e.g., that the motivation to integrate outstrips the opportunity and costs associated with it.

This study also informs the question on whether the integration of refugee migrants is an exceptional case of the general immigrant integration process. In comparison to traumatic experiences and current (mental) health, conventional conditions identified in other mostly non-refugee migrant populations, e.g., education or age at arrival, play a substantially larger role in Syrian refugees' integration in Germany. Even though some of the expected relationships did not show, the share of variance explained by conventional predictors of integration is considerably higher than the specific conditions associated with refugees. Some of these unexpected effects can be explained in the context of the specific migration history. For example, having a co-ethnic network in the new country can have positive effects on integration outcomes for newcomers in general. Assuming that the vast majority of the contacts reported in our sample have only been marginally longer in the country, puts the unexpected result into perspective. With regard to the unexpected effects of the intention to stay, we suggest that the temporary residence status of refugees, contingent on the conflicts and other reasons to flee from their home country, plays a central role in the expected length of stay. Thus, while refugee integration is special to the extent that traumatic experiences increase the motivation for integration and expected length of stay needs a more elaborate measure than used in this paper, we conclude that in general the mechanisms at work do not differ substantially from the general immigrant integration process.

This study suffers from some limitations. The culture of welcoming in the general public especially for Syrian refugees might have been a resource, also to cope with traumatic experiences, which is not available to the typical refugee. Unfortunately, the lack of a control group does not allow us to explore this further. Other large-scale studies that would allow comparing different refugee groups and other migrants did not collect data on traumatic experiences pre and during migration. [6] Moreover, due to the small sample size, and the cross-sectional nature of the QPLC study, we are

[6] To our knowledge, the only large-scale panel study on refugees in Germany that collected data on traumatic events, the IAB-SOEP-BAMF study, only asks for potentially traumatic events during transit, but not on events being experienced in the country of origin (TNS 2016). Moreover, only 61 percent of respondents answered the questions on traumatic experiences during transit (Brenzel et al. 2019).

limited in identifying causal effects. One way to mitigate this problem is by conducting a power analysis, which, in essence, would allow the researcher to determine the needed sample size to estimate statistical significance. Unfortunately, this method requires established priors on the effect's magnitude. As outlined in the literature review, unfortunately, to our knowledge, this prior does not actually exist, nor can one be easily assumed, given the nature of the treatment of concern (effects of traumatic experiences on structural and cognitive-cultural integration). Therefore, the possible mechanisms outlined above need to be further tested. Moreover, our measure for trauma, while based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) and grounded in research on the measurement of traumatization and PTSD, cannot be as thorough as a full mental health screening. Finally, another concern is the use of retrospective self-reports on traumatic experiences, where some individuals may have exaggerated on the events they experienced. However, we do find that the number and timing of reported events fit the reports on intensity of the conflict and the timing of mass emigration from Syria reasonably well.

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Appendix A

Table A1: Summary statistics

	Imputed data	Original data				
	Proportion/ Mean	Proportion/ Mean	St. dev.	Min.	Max.	N
Employed (currently)	not imputed	0.095		0	1	252
Education (currently enrolled)	not imputed	0.159		0	1	252
German language abilities	-0.114	0.003	0.799	-2.29	1.58	202
Traumatic experiences						243
No traumatic experience	0.151	0.152		0	1	
1 traumatic experience	0.119	0.119		0	1	
> 1 traumatic experience	0.730	0.728		0	1	
Health (self-assessed), 1=poor 5=excellent	3.350	3.352	1.294	1	5	250
Feel anxious/ depressed/ stressed	0.293	0.290		0	1	248
Female	0.242	0.242		0	1	252
Age arrived in DE	28.969	28.976	10.862	16	66	250
Education						250
Primary or less	0.281	0.280		0	1	
Lower secondary	0.292	0.292		0	1	
Upper secondary & short-cycle tertiary	0.311	0.312		0	1	
Tertiary	0.115	0.116		0	1	
Co-ethnic network in DE	0.337	0.337		0	1	252
Residence status						208
Other status	0.115	0.096		0	1	
Subsidiary protection	0.239	0.236		0	1	
Full refugee/asylum status	0.646	0.668		0	1	
Duration of stay in Germany (DE) (in years)	1.529	1.523	0.667	0.17	3.83	248
Intention to stay						249
Uncertain	0.417	0.418				
Short-term	0.189	0.189		0	1	
Long-term	0.394	0.394		0	1	
Family available	0.321	0.321		0	1	252
Resilience high (scored higher than 4.3 on Brief Resilience Scale)	0.207	0.209	0.407	0	1	249

Appendix B: Selection into (more) traumatic experiences?

Although the presence and frequency of traumatic events is clearly witnessed in this sample, one can argue that perhaps the pervasiveness of the phenomenon does not hold for the entire Syrian population. That is, some groups of individuals may have experienced more traumatic events concerning the war and flight out of the country more than others. We show that this is not, largely, the case. For instance, as the youth took a greater role in the civil uprising in Syria, one can argue that the younger cohorts felt the brunt of traumatic events, e.g., that the youth report higher traumatization levels compared to older age groups. Therefore, we look at the number of own traumatic events between age groups. A one-way ANOVA test did not show significantly different means of frequencies in reporting trauma between the five age groups, roughly representing 20 percent of the age distribution for each group ($F(4, 269) = 0.29$, $p = 0.89$).[7] Following this same line of thought, one can also argue that there may be differences in reporting across physical health. That is unhealthy individuals may report more frequently that they experienced traumatic events. Indeed, when we break up the number of reported (own) traumatic events we find a slightly higher number of reported own events for those who state they have poorer health. However, a difference in means test confirms, that these differences in the number of traumatic events experienced between reported subjective health groups near arrival are not significant (one-way ANOVA: $F(4, 257) = 1.23$, $p = 0.30$).

Two other key characteristic that can differentiate experiencing traumatic events during a war are educational and, very closely related, socio-economic status. The median level of traumatic events experienced are three to four, across education levels, and the differences are not significant (one-way ANOVA $F(3, 261) = 0.96$, $p = 0.41$). Hence, the frequency of events seems to be widespread across educational backgrounds. We furthermore break up the ISEI measure for socio-economic status into four groups categorizing the type of work conducted (machine operator/craft worker,

[7] We also do not find a significant difference in means between groups when we look at reported high impact events. The same holds when we look at the number of traumatic events experienced overall in the same time-period.

sales/clerical work, technician, professionals/managers). Similar to education, we do not find a difference in reporting own traumatic events between groups (one-way ANOVA $F(3, 261) = 0.96$, $p = 0.41$).

Moreover, one can also state that there could be differences between people who arrived earlier in Germany compared to more recent arrivals. For example, people who left later during the war may have experienced more events than earlier movers. Therefore, we divide the sample into four sections: up to 1 year, from 1 year to 1.5 years, from 1.5 to 2 years and more than 2 years in Germany. The one-way ANOVA analysis does not reveal any differences in reported traumatic events between groups ($F(3, 262) = 1.12$, $p = 0.34$).[8]

There are two factors, however, where we see differences in reporting, when considering traumatic events directly affecting the respondent: gender and residence status received in Germany. These differences in reporting do not persist when we consider all traumatic events reported. There is a weakly statistically significant difference between gender as determined by a one-way ANOVA ($F(1, 270) = 2.75$, $p = 0.098$). A Tukey post-hoc test reveals that men report more own traumatic events as compared to women (0.292 ± 0.176 events). Moreover, there is a highly significant difference in means between residence status groups regarding reporting own traumatic events (Ref./Asyl, Sub. Prot., Other, No Info.: $F(3, 271) = 3.94$, $p = 0.008$). A Tukey post-hoc test reveals, however that the significance in reporting own traumatic events lies with all categories as compared to the category "No-information".[9] We control for these factors in the multivariate analyses below.

Overall, we notice a pattern within our sample of a high number of traumatic events reported, that have had a high impact on respondents and that are largely irrelevant of the characteristic of the

[8] These patterns, age and length of stay, do not only hold for events that occurred since the beginning of the civil war but also for more recently experienced events (e.g., when restricted to the previous two years).

[9] Other status vs. No Info (0.909 ± 0.312 events, $p= 0.020$); Sub. Prot. vs. No Info (0.66 ± 0.241 events, $p= 0.034$); Ref./Asyl. vs. No Info (0.469 ± 0.194 events, $p= 0.078$); Sub. Prot. vs. Other status (-0.249 ± 0.317 events, $p= 0.862$); Ref./Asyl. vs. Other status (-0.439 ± 0.283 events, $p= 0.410$); Ref./Asyl vs. Sub. Prot. (-0.190 ± 0.203 events, $p= 0.784$).

respondent. Hence, these findings suggest that experiencing trauma in the last few years in Syria was so pervasive as to affect the majority of the population in Syria throughout this time.

Appendix C: Robustness of results

In order to ensure that our results are robust, we have conducted several additional analyses. In some of these, we redefine our measure of integration, also including intentions or activities like searching for work. We also have included other definitions of the traumatic events, e.g., only focusing on events with reported great effect or only based on the four events that had a direct effect on a person. Moreover, with regard to the stress process theory and the dose-response concept, we also used count measures and additional non-linear specifications of the number of traumatic events. We also have run tests restricting the time that the event has occurred to two years, to see if events that occurred recently have a more predominant effect, or if they change the results presented above. The results are surprisingly stable against alternative definitions of the dependent and independent measures, as well as differing specifications.