Predictors of Refugee Adjustment: The Importance of Cognitive Skills and Personality

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Abstract

In light of the recent worldwide migration of refugees, determinants of a more or less successful integration are heavily discussed, but reliable empirical investigations are scarce and have often focused on sociodemographic factors. In the present study, we explore the role of several individual characteristics for refugee adjustment in the areas of institutional, interpersonal and intrapersonal adaptation. In a sample of 4,527 refugees ($M = 33.6$ years, 38% women), we investigated the predictive power of sociodemographic characteristics, cognitive skills and personality factors. Both, cognitive skills and personality, showed incremental predictive validity beyond sociodemographic factors for refugee adjustment comparable across contextual factors. The study underscores the importance of personality providing important implications for understanding integration processes and optimizing interventions on personal, social, and societal levels.

Keywords: refugee adjustment, personality, labor market, integration, migration

Predictors of Refugee Adjustment: The Importance of Cognitive Skills and Personality

In the last few years, the world has been facing an unprecedented refugee crisis. Due to destabilization in the Middle East and North Africa over 65 million people worldwide were forced to leave their homes (The UN Refugee Agency, UNHCR, 2017). Consequently, many European countries have experienced a massive influx of refugees, posing major challenges to policy and society. Besides immediate help and a rapid decision about refugees' legal status, a successful sustainable integration of refugees who hope to gain permanent residence in the host country involves actions for their adjustment on institutional, interpersonal, and intrapersonal levels. To become successfully integrated, refugees should be able to become economically self-sufficient, socially embedded, psychologically healthy, and satisfied.

In contrast to other types of immigrants (who have voluntarily left their countries in search of better economic opportunities or family reunification), forced migrants or refugees (who have fled their countries due to fear of political, religious, or ethnic persecution) are a special group of concern, facing specific and typically greater difficulties adapting to the host country. Refugee migration is more the result of a previous unbearable living situation and, thus, likely unplanned, disorganized or forced. Therefore, refugees often struggle the most with poor knowledge in the host country's language (Bloch, 2004) caused by a lack of preparedness and fewer social connections to locals (although they are potentially well educated compared to other immigrant groups; Liebau & Salikutluk, 2016). For refugees, entry into the labor market takes longer, and they tend to have lower employment rates and incomes than other immigrants (Fix & Passel, 1994; Salikutluk, Giesecke, & Kroh, 2016). Refugees face a heightened risk for loneliness (Dolberg, Shiovitz-Ezra, & Ayalon, 2016) because they have had to leave behind former relationships, a

practice that is associated with poor health and increased mortality (Luo, Hawkley, Waite, & Cacioppo, 2012). Moreover, refugees are at higher risk for a variety of psychiatric disorders such as post-traumatic stress disorder, chronic pain, and depression, mostly related to their exposure to violence, forced migration, and uncertainty in the host country (Fazel, Wheeler, & Danesh, 2005; Hollifield et al., 2002; Schock et al., 2016). Given these challenges, predictors of refugees' successful integration into the host country's mainstream society have become the subject of an intensive and ongoing debate. In the present research, we move beyond general insights into migration and the examination of sociodemographic factors in specific samples by adding both cognitive and personality traits to the investigation of refugee adjustment in a large and diverse sample of refugees.

Previous Research on Refugee Adjustment

Following the tradition of Berry's (1997) acculturation framework, the migrant adaption process is described within a psychosocial stress and coping model with a *culturalized* view on the individual and the demands of a cross-cultural transition thus focusing on how two cultures merge and whether cultural habits and beliefs are retained or lost. Berry (1997) postulated four different ways for minorities to accumulate, called integration, assimilation, separation, and marginalization, differentiating the amount of cultural identification with both, the culture of origin and the new host-mainstream culture. Other conceptual approaches on migrant adaptation refer to the process through which migrants reorganize or rebuild their former lives and living standards after relocating to a new sociocultural context by focusing on the migrant's ability to access the labour market and regain pre-migration levels of occupational status (e.g. Aycan & Berry 1996). However, the stress and coping perspective stands as the most popular and widely

applied conceptual scheme in studying acculturation and cultural transition in the existing literature (Ward & Kennedy, 2001).

Despite the rich tradition on the study of immigration and integration processes more generally (e.g., Alba & Foner, 2014; Berry, 1997), only a few studies have specifically investigated the adjustment of refugees with the available data being mostly restricted to small, nonrepresentative samples (with the exception of studies on physical and mental health, see e.g., Porter & Haslam, 2005). In fact, the overwhelming focus in research on refugees has not been on such issues as social or economic integration but on mental health (for a review, see Fazel et al., 2005). Moreover, most studies have followed a “group”-centered perspective: The main goal has usually been to identify and describe contextual and economic factors that are common to most individuals under study.

In line with existing theoretical frameworks of refugee integration (e.g., the model of *refugee economic adaptation*; Kuhlman, 1991), previous empirical research on individual differences in adjustment has mainly analyzed the effects of sociodemographic factors and aspects of previous education. Studies of migrants more generally have, for example, shown that length of time in the host country predicted employment (Correa-Velez, Barnett, & Gifford, 2013) and interpersonal adaptation in terms of contacts with natives (Martinovic, Tubergenm & Maas, 2009). Also, formal education is particularly important in predicting occupational status and labor market integration (Jackson, Goldthorpe, & Mills, 2005). Accordingly, studies investigating specific refugee populations have also found that education, language acquisition, gender, citizenship, ethnicity, previous work experiences, and participation in training courses are powerful predictors of employment status and household income (Potocky-Tripodi, 2003; Renner

& Senft, 2013). In addition, sex differences have been identified, indicating that women were less likely to be employed than men (Potocky-Tripodi, 2001). With respect to intrapersonal adjustment, Berry and Hou (2016) found that years since immigration and age at arrival, perceived discrimination, and unemployment were negatively associated with life satisfaction with generally lower levels of satisfaction for refugees compared with other immigrants.

A Personality Approach to Refugee Adjustment

The power of cognitive skills and personality in predicting consequential outcomes in the native population is well-established in the personality literature (Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). By incorporating these individual differences, we aimed to develop a more complete and fine-grained explanation for the varying degrees of refugee adjustment. Research on integration indeed hints at the potential importance of personality by emphasizing the role of personal agency, abilities, and adaptability to find niches (e.g., in the labor market) or to establish a helpful social network (Smither & Rodriguez-Giegling, 1982; Tabor, Milfont, & Ward, 2015). For example, Ryan, Dooley and Benson (2008) extended previous models, such as the ‘acculturative stress’ model by Berry (1997), by developing the *Resource-Based Model of Migrant Adaptation* focusing on the experience of forced migrants in Western countries. Here personal resources are explicitly mentioned including both skills and personal traits that can be seen as a ‘toolkit’ that is provided by one's culture and previous experience to manage the new situation and demands. Moreover, research on coping strategies (i.e. adaptively changing efforts to manage stress) has consistently shown that personality factors play an important role in almost every aspect of the coping process including the likelihood of applying a certain coping strategy as well as the

effectiveness or outcome of the respective coping strategy (DeLongis & Holtzman, 2005; Carver & Connor-Smith, 2010).

In personality research, the *theory of personality coherence* by Caspi and Moffitt (1993) suggests external life changes and transition periods to be major catalysts for personality differences to be magnified. When environmental events – such as the forced resettlement into the host country – disrupt previously existing life conditions, the theory assumes an accentuation of personality differences with a powerful organizing effect on behavior during those periods of change. Broken down, differences in the willingness to take risks that are hardly visible under normal conditions will be elevated in such periods of change, which could trigger important behavioral consequences leading the one to actively seek for job opportunities while the other remains passive. Those external life changes are characterized by novelty – new country, new culture, politics and habits –, ambiguity – with respect to permit of residency or family reunion –, and uncertainty – concerning how to behave in the host society or future opportunities – forming a period of social discontinuity. Swidler (1986) already stated the move to a new cultural community as “culture shock” requiring people to reorganize their activities and to regain control over the changing situation and their lives. Because of the novelty and uncertainty along the process of adaption refugees are faced with, there is a press to behave fast and efficient which leads to an activation of deep and familiar personality characteristics (Caspi & Moffitt, 1993).

We, therefore, expected both cognitive skills and personality traits to predict institutional adjustment, particularly labor market participation (Heckman & Kautz, 2012; Roberts et al., 2007). Human intelligence as a broad cognitive capacity, which manifests itself in novel situations requiring change or adaptation (Sternberg, 1985), has been found to be a powerful predictor of

occupational success (Deary et al., 2005; Roberts et al., 2007). Integration into a new social and economic system and not always a welcoming native population can be seen as a situation that requires the optimal use of existing cognitive skills in a relatively novel environment. In navigating through a new educational and occupational system, refugees also need to actively seek opportunities, to present their own abilities, and to compete in the job market.

Such a process should further be facilitated by a proactive and resilient personality structure. Indirect evidence for this idea stems from a study by Thum (2014), who showed that an internal locus of control (i.e., a strong belief that one has control over one's life) has a positive effect on an immigrant's probability of securing employment. According to the *Conservation of Resources (COR) Theory* (Hobfoll, 2001), individuals seek to satisfy their basic psychological needs which for refugees includes a sense of living in a safe and stable environment as well as a sense of belonging to a community and a the feeling of being esteemed. To establish and fulfill these based needs, refugees have to feel they have some control over their life conditions and destiny, i.e. an elevated internal locus of control. Another potential personality factor constitutes risk-taking tendencies as they have been shown to be important for entry into professional life (Pfeifer, 2008) and educational decisions (Obermeier & Schneider, 2015), also representing the situation refugees face in their host country. Here, the COR theory (Hobfoll, 2001) outlines that 'individuals strive to obtain, retain, protect, and foster things that they value' by stressing a personal and active striving such as a willingness to take risks rather than only reacting to the environment. Personality should also affect adjustment in inter- and intrapersonal domains. Social dynamics (e.g., a more or less smooth selection and maintenance of social interactions and relationships) are intimately connected to personality differences, and they feed back into a more

or less positive self and satisfied identity (Back et al., 2011). Consequently, personality aspects, particularly individual differences in communion (warmth, prosociability, tendency to get along with others) and agency (assertiveness, tendency to get ahead) have been shown to predict social outcomes such as friendship quality and quantity (Back & Vazire, 2015) as well as intrapsychic adjustment, including self-esteem, subjective health, and well-being (Roberts et al., 2007). Whereas the influence of personality on inter- and intrapersonal adjustment of refugees has not yet been investigated, there is indirect evidence for such effects from the field of migration research. Compared with sociodemographic factors, communal personality factors such as likeability showed a larger effect on acculturation in Vietnamese refugees (Smither & Rodriguez-Giegling, 1982). Integration was also associated with agentic and proactive characteristics such as sociability, activity level, and sensation seeking (Schmitz & Berry, 2009).

The present study used a large, representative sample of refugees in Germany to provide initial empirical evidence on individual predictors of refugee adjustment. We investigated three main adjustment domains: (a) institutional adaptation represented by employment status, (b) interpersonal adaptation in the sense of cross-cultural social networks, and (c) intrapersonal adaptation operationalized through a person's current subjective health status, life satisfaction, and self-esteem. We used three sets of predictor variables, sociodemographic characteristics, cognitive factors, and personality characteristics (see Figure 1). Regarding personality traits, we focused on proactive, agentic characteristics, including aspects such as willingness to take risks and sense of control, as well as communal characteristics, including an individual's tendency to reciprocate social behavior. In addition, to provide an even more nuanced view on the effects of individual differences, and given the importance of environmental conditions for acculturation

and integration processes (Schachner, de Vijver, & Noack, 2017), we also explored the role of certain control and contextual factors (residency status and living conditions). We followed this path to investigate the influence of more or less strict environmental situations forming the basis for individual differences to take action (Caspi & Moffitt, 1993). As Caspi and Moffitt already mentioned in their original work, individual differences in personality are supposed to be stronger in environmental settings in which the range of behavioral reactions is less restricted compared to highly structured settings.

Method

Participants

The present study was based on a representative survey of recently arrived refugees to Germany carried out collectively by the Institute for Employment Research (IAB), the Research Centre of the Federal Office for Migration and Refugees (BAMF-FZ), and the German Socio-Economic Panel (SOEP). The so-called IAB-BAMF-SOEP Refugee Survey is conceptualized as a longitudinal study that provides an outstanding database for analyzing the processes by which refugees become integrated into German society. The first available wave of the survey comprised a representative sample of 4,527 individuals aged 18 and older. The target population was randomly drawn from the German Central Register of Foreigners and consisted of individuals who entered Germany between January 1, 2013, and January 31, 2016, and officially submitted an application for asylum, irrespective of the outcome of their asylum procedure and their current legal status. The majority of individuals in our target population arrived in 2015 and were still in the application process at the time of fieldwork. The overall response rate of the IAB-BAMF-SOEP Survey of Refugees was 48.7% which can be seen as excellent compared to other sub-samples of

that kind in Germany. The survey was conducted in person by trained interviewers with the assistance of computers. The questionnaire was available in seven languages (65% were presented in German/Arabic) to ensure a correct understanding and the interviewer could contact a hotline provided by the survey institute to assist for special questions (for further details see Kroh et al., 2017).

The present study used the total sample of 4,527 refugees ($M = 33.6$ years, 38% women). Multiple regression models were computed to predict indicators of successful adjustment in three main areas of integration (see Table 1 for descriptive statistics). Given that some of the adjustment indicators were more important or desirable for certain ages, we excluded all participants older than 60 years of age ($N = 60$). We further excluded individuals who had immigrated to Germany before 2013 ($N = 128$) or missing information on the basic household questionnaire ($N = 21$). The final sample comprised 4,318 individuals. The majority of refugees (50% total, 37% women) were Syrian nationals, whereas the second (13% total, 37% women) and third (12%, 38% women) largest groups were from Iraq and Afghanistan, respectively. The remaining 25% were spread among different countries (e.g., Albania, Eritrea, Pakistan). At the time of the interview, 54% of the total sample (37% women) indicated their status as having a residence permit, which usually includes unrestricted access to the labor market.

Measures

All instruments were established SOEP instruments that were available in the questionnaire we used (for further details, see TNS Infratest Sozialforschung; 2016). All data will be provided for scientific purposes to the international research community via the SOEP Research Data Center at the German Institute for Economic Research, Berlin, Germany. Due to

strict provisions by German data protection laws, the data are not yet publicly available. Signing a data distribution contract¹ is a precondition for getting access to the SOEP data. The scientific use file of the SOEP with anonymous microdata is made available free of charge to universities and research institutes for research and teaching purposes. Code for all analyses performed in this manuscript can be accessed at osf.io/8xpb7.

Integration outcomes. Employment status was coded within a binary variable where 1 indicated any kind of employment (e.g., full-time or marginal employment) and 0 indicated no employment. Concerning social contacts, respondents were asked to estimate the number of Germans they had gotten to know and had frequently been in touch with since their arrival. As an extremely high number of new contacts did not seem realistic, we set data points exceeding 20 contacts (3.98% of the sample) to 20. For the assessment of life satisfaction, participants indicated how satisfied they felt with their current lives, all things considered, on an 11-point scale ranging from 0 (*completely dissatisfied*) to 10 (*completely satisfied*). Subjective health was measured with the item “How would you describe your current health?” Responses were given on a 5-point scale ranging from 1 (*bad*) to 5 (*very good*). Finally, self-esteem was assessed with a single item on a 7-point scale ranging from 1 (*not at all*) to 7 (*totally agree*). Participants indicated their agreement with the statement: “I take a positive attitude toward myself.”

Sociodemographic factors. We included age centered as well as quadratic age to observe nonlinear effects. The total number of months in Germany was calculated as the difference between the time of the interview and the month of arrival. Religious affiliation was represented

¹ The data distribution contract can be requested with the form provided here:
http://www.diw.de/documents/dokumentenarchiv/17/diw_01.c.88926.de/soep_application_contract.pdf.

by two binary dummy variables indicating participants' affiliation with Islam and other religions, respectively in reference to affiliation to Christianity.

Cognitive factors. Cognitive factors included a measure of cognitive ability, integration program participation, self-rated language skills, and educational attainment. For cognitive ability, participants were administered the Symbol Digit Test (SDT), which is a validated speed-constrained ultra-short test of cognitive ability constructed for the SOEP (Lang, Weiss, Stocker, & von Rosenblatt, 2007). The raw score for the number of correct items was used as the independent variable largely representing processing speed. Participation in a training course ("integration course") conducted by the BAMF was assessed with a single binary coded item. Furthermore, respondents rated their German language skills (speaking only) on a 5-point scale ranging from 1 (*very good*) to 5 (*not at all*; reverse coded for analyses). Finally, we were interested in participants' level of education. Therefore, dummy variables were generated to identify level of education. Thus, there were four educational variables (for middle school degree, high school degree, vocational education, and university degree), each coded 1 (*yes*) or 0 (*no*).

Personality characteristics. We measured locus of control as a unidimensional factor by asking participants how much they agreed with seven items (e.g., "*How my life goes depends on me*") on a 4-point scale ranging from 1 (*applies completely*) to 4 (*does not apply*), reverse coded. For the total score, higher values of locus of control in our models indicate higher levels of internal control. Subsequently, respondents were asked different statements about their willingness to reciprocity seen as the intrinsic motivation to respond to the behavior of another person, answering on a 7-point Likert scale ranging from 1 (*does not apply to me at all*) to 7 (*applies to me perfectly*). Three items each assessed two opposing aspects, namely the willingness to engage

in positive (willingness to return favors) and negative (willingness to harm those who previously harmed you) reciprocity. Participants were further asked to estimate their willingness to take risks versus their avoidance of risks on an 11-point scale ranging from 0 (*fully unwilling to take risks*) to 10 (*fully willing to take risks*). The Cronbach's α values for the scales were acceptable to good (between .55 and .75) for the personality factors. More information on scale development, (retest) reliability, and mean scores for SOEP participants are provided in SOEP Scales Manuals (Richter et al., 2017; Jacobsen, Kilkar & Schupp, 2017; https://www.diw.de/sixcms/detail.php?id=diw_01.c.554370.de).

Contextual factors. We observed two contexts of importance for refugees. The current status of residency was represented by a binary variable coded 1 for participants with a permission to reside (e.g., entitled to asylum or settlement permit) and 0 for all other types of residency status. The kind of living situation was captured within a variable differentiating a shared (communal) accommodation (0) from private homes (1).

Strategy for Analysis

Prior to testing our prediction models, we inspected each predictor as well as all adjustment parameters for gender differences. We used stepwise multiple regression analyses to develop models for predicting each of the adjustment indicators of our defined areas of institutional, interpersonal, and intrapersonal adjustment. For each adjustment indicator, we first included sociodemographic factors (i.e., age, age², gender, months in Germany, religious affiliation Islam/Christianity) in the model, followed by the group of cognitive factors (i.e., cognitive ability, training course participation, self-rated German language skills, school degree

middle/high, vocational education, university) in the second step, and finally by the personality characteristics (locus of control, positive/negative reciprocity, risk appetite).

The best model was chosen based on the predictive power of the independent variables over and above the group of predictors in the previous step as well as whether an additional group offered, at least, one additional significant predictor. For our dichotomous outcome (i.e., employment), we computed logistic regression models, which provided odds ratios that could be interpreted as the probability of employment for a one-unit change in the predictor. For the remaining adjustment parameters, we computed multiple linear regressions. With respect to interpersonal adjustment, subjective health, life satisfaction, and self-esteem were z-standardized to determine the change in standard deviations resulting from a one-unit change in the predictor. For a better interpretation, the number of new German contacts was included as a continuous variable without any standardization. For all regression models, continuous variables (i.e., months in Germany, self-rated language skills, locus of control, reciprocity, risk appetite) were centered, whereas the variable for cognitive ability was z-standardized. Missing data were replaced using stata's "impute" command, a regression-based method to estimate missing values based on other variables in the data set. To further inspect gender effects, we computed moderated multiple regression models that included gender as a moderator with interaction terms for each predictor. Moreover, we performed moderated multiple regression models with our two contextual factors (i.e., residency status and living situation) to investigate the predictive power of our set of indicators depending on different environmental situations with more or less uncertainty and behavioral opportunities.

Because of the large sample size, statistical power in the final multiple regression analyses was excellent for detecting even small effects (e.g., the statistical power was .999999998 for $r = .10$ and .91 for $r = .05$).

Results

As shown in Table 1, about 10% of the sample indicated being officially employed (6% full time, 2% part time, and 2% marginally employed), while men were more likely to have a job than women (Cohen's $d = 0.33$, $p < .001$). On average, men had made five new German contacts compared with fewer than four contacts for women (Cohen's $d = 0.22$, $p < .001$). The average levels of subjective health, life satisfaction, and self-esteem were at the upper ends of the respective scales with higher levels of subjective health for men (Cohen's $d = 0.31$, $p < .001$) in contrast to higher levels of overall life satisfaction for women (Cohen's $d = 0.15$, $p < .001$). With respect to the set of predictors, participants were 33 years old on average with an average duration of 19 months in Germany. All predictors showed reasonable variation, while differences between men and women stood out for participation in training courses (Cohen's $d = 0.26$, $p < .001$), self-rated language skills (Cohen's $d = 0.37$, $p < .001$), locus of control (Cohen's $d = 0.17$, $p < .001$), negative reciprocity (Cohen's $d = 0.10$, $p < .001$), and risk appetite (Cohen's $d = 0.22$, $p < .001$) with higher values for men than women. Taken together, all observed gender differences were in the range of small effects. A table including all zero-order correlations between predictors and outcome variables is presented in the supplemental material (Table S1).

The results from the final multiple regression analyses are illustrated in Figures 2, 3, and 4 (additional information is presented in the Supplemental Material in Tables S2 and S3). We report unstandardized coefficients in parentheses. The dependent variables new German contacts,

subjective health, life satisfaction, and self-esteem were standardized before analysis. For each stepwise multiple regression model that was computed, including the second and last group of predictors (i.e., cognitive skills and personality factors) led to an increase in the prediction (see Table S2 in the Supplemental Material) hence showed additional factors with predictive power. Therefore, results for the full regression models including all sets of predictors are presented for each of the adjustment factors.

Institutional adjustment (odds ratios shown in Figure 2). The regression model for employment with all predictors produced a pseudo R^2 of .15. For the sociodemographic factors, months in Germany ($b = 0.056, p < .001$) was positively associated with employment status, indicating that the opportunity for employment increased with the duration of time spent in the host country. For age² ($b = -0.197, p < .001$) and gender ($b = -1.287, p < .001$), beta coefficients were negative, suggesting that women were less likely to be employed and that the positive age effect was more pronounced at younger ages. For cognitive factors, lower cognitive ability ($b = -0.140, p < .05$), greater self-rated language skills ($b = 0.619, p < .001$) and having a school degree (high: $b = 0.471, p < .01$) predicted the likelihood of employment in a positive direction². For the personality factors, risk appetite ($b = 0.064, p = .001$) showed a positive effect, suggesting that a greater willingness to take risks was a positive predictor of employment.

Interpersonal adjustment (standardized betas shown in Figure 3). In the group of sociodemographic factors, months in Germany ($b = 0.007, p < .001$) was a positive predictor of

² Given the positive correlation (.05; $p < .001$) between cognitive ability and employment status, the negative b -coefficient can likely be interpreted as suppressor effect. Additional follow-up analyses revealed that the prediction weight for cognitive ability alone is positive and significant. By adding education, the effect went insignificant and by adding months in Germany it turned negative.

the number of new German contacts, whereas gender had a negative coefficient ($b = -0.097, p < .01$), indicating less interpersonal adjustment for women. As expected, greater self-rated language skills ($b = 0.296, p < .001$) were positively associated with the number of friends. Participation in training courses ($b = -0.084, p < .01$) was negatively associated holding the effect of all other predictors constant. Having a vocational education ($b = 0.188, p < .01$) as well as cognitive ability positively predicted ($b = 0.048, p < .01$) the number of new social contacts. Finally, in the group of personality factors, locus of control ($b = 0.054, p < .001$), willingness to take risks ($b = 0.014, p < .01$) were positively associated with social contacts while a negative reciprocity such as the willingness to harm someone who previously harmed you ($b = -0.038, p < .01$) was associated with less social contacts. Overall, 13% of the variation in new social contacts could be explained by the set of predictors.

Intrapersonal adjustment (standardized betas shown in Figure 4). For health, a total of 14% of the variance could be explained. With respect to sociodemographic factors, a younger age ($b = -0.247, p < .001$) and being a man ($b = -0.212, p < .001$) were associated with better self-rated health. As was found for interpersonal adjustment, cognitive skills were important in predicting subjective health—especially training course participation ($b = 0.133, p < .001$), greater self-rated language skills ($b = 0.063, p < .001$), as well as a middle school degree ($b = 0.077, p < .05$). Adding personality factors to the prediction showed higher locus of control ($b = 0.123, p < .001$) and to a smaller degree, higher positive reciprocity ($b = 0.093, p < .001$) were positively related to higher subjective health ratings whereas a negative reciprocity was negatively associated ($b = -0.028, p < .05$) to subjective health. Exploring the next indicator of intrapersonal adjustment, a total of 5% of the variance could be explained in overall life satisfaction. Here, being female ($b = .188, p <$

.001) and living in Germany for longer ($b = 0.007, p < .001$) as well as being affiliated to Islam ($b = 0.129, p < .01$) was associated with higher levels of life satisfaction. For the cognitive factors, greater self-rated language skills ($b = 0.089, p < .001$) positively predicted life satisfaction, whereas higher cognitive ability ($b = -0.052, p < .01$) and a high school degree ($b = -0.129, p < .01$) negatively predicted subjective well-being. For personality, perceived internal locus of control ($b = 0.142, p < .001$) was positively related, thus indicating that individuals who had a higher sense of control over their lives had more satisfaction. In addition, positive reciprocity also had a positive effect ($b = 0.097, p < .001$). For the third indicator of intrapersonal adjustment, self-esteem, the personality factors of locus of control ($b = 0.066, p < .001$), positive reciprocity ($b = 0.321, p < .001$), and negative reciprocity ($b = -0.058, p < .001$) were among the strongest predictors. Within sociodemographic factors, only another religious affiliation than Islam ($b = -0.128, p < .05$) showed a small negative effect on self-esteem. In addition, cognitive ability ($b = -0.039, p < .05$) was negatively associated with self-esteem while greater self-rated German language skills predicted self-esteem in a positive way ($b = 0.050, p < .01$). In total, up to 7% of the variance in self-esteem could be explained, mostly by the personality factors.

Follow-up analyses included gender as a moderator (for a detailed presentation of the results, see Table S4 in the Supplemental Material). For institutional adjustment, the model in which gender was included as a moderator with interaction terms for each predictor revealed significant interaction effects for age ($b = 0.489, p < .05$) and cognitive ability ($b = 0.356, p < .05$) in the direction of stronger effects for woman as well as religious affiliation to Islam ($b = -0.711, p < .05$) in the other direction. Regarding interpersonal adjustment, gender did not show a significant interaction effect with any of the predictors in the model. Finally, for intrapersonal

adjustment, the models in which gender was included as a moderator revealed interaction effects with respect to life satisfaction for age in the direction of more negative effect for women ($b = -0.107, p < .01$) while there was another interaction effect with negative reciprocity in the direction of stronger effects for women ($b = 0.058, p < .05$). For self-esteem, internal locus of control showed an interaction effect with stronger effects for women ($b = 0.086, p < .01$), whereas for subjective health, there were no significant interaction effects. Moderation effects are shown in Figure 5. Overall, all interaction effects observed for gender were in the range of small effects.

The role of contextual factors. (for a detailed presentation of the results, see Table S5 and S6 in the Supplemental Material) As a final step, we computed moderated multiple regressions including residency status (i.e., having a long-term goal to stay in the country) and respectively living condition (i.e. collective vs. private accommodation) as moderators. Overall, the models showed only a few moderation effects (see Figure 5 for all moderations with a significance of $p < .01$). With respect to the status of residency, interactions were significant for age squared ($b = -0.217, p < .05$) regarding the likelihood of employment suggesting a higher likelihood to be employed for middle-aged refugees with a permission to reside. In the prediction of new German contacts, residency status showed interaction effects with the number of months in Germany ($b = -0.011, p < .001$) as well as the personality factor risk appetite ($b = -0.023, p < .05$) showing lower effects for individuals with a secure status of residency. Within the area of intrapersonal adjustment, we found an interaction between residency status and training course participation ($b = -0.147, p < .05$) in predicting health as well as between the willingness to take risks ($b = -0.024, p < .01$) and residency status on life satisfaction all in the direction of lower effects in the context of permission to reside. For self-esteem, an interaction with positive reciprocity reached

significance ($b = 0.144, p < .01$) showing higher self-esteem for individuals with positive reciprocity within the context of a secure status of residency. For the contextual factor living conditions, interaction effects were of importance for age squared ($b = -0.256, p < .05$) in the prediction of employment status showing a stronger association between age and employment status for individuals in collective accommodations. With respect to life satisfaction, the kind of living situation showed interaction effects with cognitive ability ($b = 0.076, p < .05$) and positive reciprocity ($b = 0.105, p < .05$) in the direction of stronger effects within decentralised accommodations. For the prediction of self-esteem depending on living condition, we found two interactions, with age ($b = 0.085, p < .05$) and negative reciprocity ($b = 0.060, p < .05$). For the remaining adjustment outcomes, there were no significant interaction effects. Overall, prediction effects were in general comparable across contextual factors with only a few and specific moderator effects especially for residency status reaching a significance level of $p < .01$ which should be applied here given the number of multiple effects tested.

Discussion

The present study was based on a large and diverse, representative sample of refugees in Germany coming from a variety of home countries. To extend our understanding of integration processes beyond that provided by previous studies, we applied an individual-centered approach focusing on the role of cognitive skills and personality traits for adjustment outcomes. The most important implication from this study is that successful refugee adjustment to a new country depends to a certain degree on individual differences in personality traits, attitudes and competencies. Consistent with previous research, sociodemographic characteristics were important predictors of adjustment. Duration of stay was a positive predictor of all outcome

domains, whereas age was negatively linked only to health. Female refugees had lower chances of employment (see also Lamba, 2003), lower chances of making new social contacts, and a lower health status, but they were more satisfied with their lives than male refugees were. The increased likelihood of employment for men compared to women can be interpreted as a reflection of the broader literature on gendered inequalities in the workplace.

Beyond sociodemographic characteristics, the presents study has shown that cognitive factors are of importance across all domains of adjustment. Self-rated language skills and previous education predicted institutional, inter- und intrapersonal refugee adjustment, a finding that is in line with previous research on the role of education (Potocky-Tripodi, 2003) and language capacities (Hayfron, 2001). Following the European Commission (2001), 'it is broadly agreed that the acquisition of language skills is critical for integration' which highlights the knowledge of the host country language as a necessary prerequisite to advancing one's education. Given that education is generally amenable to intervention, a big impact on refugee adjustment can be made through interventions targeting already existing education and potential educational enhancement.

We also found some unexpected results that warrant further investigation, such as the negative effect of a school degree (high or even university degree) on employment and life satisfaction or self-esteem. This could be understand on the basis that refugees were not able to rebuild their previous occupational status especially at the upper end of the occupational system, at least within this short period of time since their arrival in Germany. Also, embracing either Islam or Christianity did not predict adjustment for refugees in the areas of employment or social adjustment. This is surprising given that European citizens favor asylum seekers with a Christian

rather than a Muslim orientation (Bansak, Hainmueller, & Hangartner, 2016). Within intrapersonal adjustment, we found an exception in the direction of a positive relation between Islam and life satisfaction and other religious affiliation be negatively related to self-esteem with fits into research presented by Schweitzer, Greenslade and Kagee (2007) emphasizing religious coping as a successful coping style for many refugees buffering personal stress. Also, a strong belief system can help refugees cope with past traumas (Brune, Haasen, Krausz et al., 2002) while believing in a higher power allows refugees to regain control of their lives and find emotional stability (Schweitzer et al., 2007).

Results indicate that not only does the successful adjustment of refugees to a new country depend on sociodemographic factors, self-rated language skills, and a solid education, but it is also shaped by individual differences in personality traits. Refugees with a higher appetite for risks had a higher chance of employment and to find new social contacts, whereas a sense of internal control and the willingness to reciprocate in a positive way predicted the number of new social contacts, self-esteem, satisfaction with life, and a better health status. These findings underscore the power of personality differences (Roberts et al., 2007) in the context of refugee adjustment. Personality traits may shape the short term performances of refugees, how they perceive a given situation (Rauthmann, Sherman, & Funder, 2015), and how they cope with and recover from a stressor such as fleeing their country of origin (Carver & Connor-Smith, 2010). The latter idea is also in line with research on posttraumatic growth (PTG), as a favorable developmental course after such a forced displacement (Tedeschi, Park, & Calhoun, 1998). Indeed, facets of PTG such as *relating to others* or *personal strength* have shown strong conceptual commonalities with the personality aspects we measured, namely, positive reciprocity and perceived locus of control.

Considering the specific context refugees are confronted with, which includes more or less uncertainty and unpredictability related to the legal status of residency for example, our results showed that the positive effect of risk appetite was more pronounced in the context of an unsecure residency status for inter- and intrapersonal adjustment parameters. Positive reciprocal behavior toward others, however, gained of importance in a more stable environment such as a private living situation or a secure status of residency. Overall, the context in which previous personality characteristics unfolds seems to be of additional importance as proposed by Caspi & Moffit (1993).

Future research that builds on the present large-scale investigation might add other potentially relevant factors as soon as more waves of the longitudinal study will be available. This might include host-related characteristics, such as the population size of refugees' local communities, proportion of foreign-born residents, and strength of the local economy (cf. Potocky-Tripodi, 2003) as well as other personal characteristics that have been shown to predict psychological adjustment in the acculturation context, such as sense of coherence (Ying & Akutsu, 1997) and sense of belonging (Berry & Hou, 2016). In doing so, future work might also try to unravel the intertwined nature of the various intrapsychic, interpersonal, and institutional adjustment indicators. Social support, for example, can be seen as an aspect of successful social integration, but it also represents an important resilience factor for health (e.g., Schweitzer, Melville, Steel, & Lacherez, 2006). Also, social relations and unemployment are important predictors of later mental health (Carlsson, Olsen, Mortensen, & Kastrup, 2006). For the validation of such causal relationships and to identify interaction effects among different adjustment areas, further longitudinal investigations are necessary.

Applying an individual differences approach to the study of refugee adjustment underscored the importance of cognitive skills and personality factors: Even if all refugees face the same challenges in the same context, some of them will be able to take full advantage of opportunities, whereas others will have difficulties. Hence, perhaps one of the most important challenges for host societies is to consider this diversity in order to release the full potential of the skills of those seeking integration. Refugee resettlement policies, programs, and practices are well advised to tailor interventions to refugees' cognitive skills and to try to promote non-cognitive skills such as a greater sense of control over one's life and a positive attitude toward others in terms of positive reciprocity.

Author Contributions

All authors contributed to the study concept and design. Statistical analyses were performed by DR and EH. JS is member of the PI-team of the IAB-BAMF-SOEP Refugee Survey. Results were discussed with MB and JS. EH drafted the manuscript, and all remaining authors provided critical revisions. All authors approved the final version of the manuscript.

Declaration of Conflicting Interests

The authors declare that they have no conflicts of interest with respect to their authorship or the publication of this article. Any opinions, findings, and conclusions expressed are those of the authors and do not necessarily reflect the views of the Institutes that carried out the IAB-BAMF-SOEP Refugee Survey.

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Tables

Table 1. Descriptive Statistics

	Total <i>N</i> = 4,318	Men <i>N</i> = 2,689 (62%)	Women <i>N</i> = 1,629 (38%)
<i>Integration outcomes</i>			
Employment (% yes)	10.4%	14.1%	4.2%
New social contacts <i>M</i> (<i>SD</i>)	4.74 (5.73)	5.21 (5.97)	3.97 (5.21)
Subjective health <i>M</i> (<i>SD</i>)	3.92 (1.13)	4.05 (1.09)	3.71 (1.15)
Life satisfaction <i>M</i> (<i>SD</i>)	7.26 (2.32)	7.13 (2.43)	7.48 (2.12)
Self-esteem <i>M</i> (<i>SD</i>)	6.28 (1.13)	6.31 (1.11)	6.24 (1.16)
<i>Sociodemographic factors</i>			
Age <i>M</i> (<i>SD</i>)	33.13 (9.76)	32.83 (10.0)	33.63 (9.26)
Months in Germany <i>M</i> (<i>SD</i>)	18.99 (9.22)	18.61 (8.81)	19.61 (9.84)
Religious affiliation: Islam (% yes)	69.8%	71.1%	67.7%
Religious affiliation: Christianity (% yes)	14.6%	13.5%	16.3%
<i>Cognitive factors</i>			
Cognitive ability <i>M</i> (<i>SD</i>)	24.73 (8.58)	25.53 (8.70)	23.39 (8.19)
Training course (% yes)	34.6%	39.2%	27.1%
Language skills <i>M</i> (<i>SD</i>)	2.57 (0.92)	2.69 (0.92)	2.36 (0.89)
School degree: Medium (% yes)	23.6%	24.5%	22.1%
School degree: High (% yes)	30.7%	31.7%	29.0%
Vocational education (% yes)	6.1%	7.5%	3.9%
University (% yes)	13.2%	13.4%	12.9%
<i>Personality characteristics</i>			
Locus of Control <i>M</i> (<i>SD</i>)	4.23 (1.08)	4.30 (1.08)	4.11 (1.07)
Reciprocity: positive <i>M</i> (<i>SD</i>)	6.68 (0.65)	6.67 (0.65)	6.68 (0.64)
Reciprocity: negative <i>M</i> (<i>SD</i>)	1.79 (1.28)	1.84 (1.30)	1.71 (1.23)
Risk appetite <i>M</i> (<i>SD</i>)	4.51 (3.29)	4.80 (3.30)	4.04 (3.23)
<i>Contextual Factors</i>			
Residency Status (% residence permit)	54.4%	55.5%	52.6%
Living situation (% private)	66.2%	62.3%	72.7%

Note. *M* = mean, *SD* = standard deviation.

Figures

Figure 1.

Figure 2.

Figure 3.

Figure 4.

Figure 5.

Figure caption

Fig. 1. Illustration of the prediction model for refugee adjustment.

Fig. 2. Odds ratios for employment in the area of institutional adjustment. A single asterisk indicates a significance level of $p < .05$, two asterisks indicate $p < .01$, and three asterisks indicate $p < .001$.

Fig. 3. Standardized beta coefficients for new German contacts in the area of interpersonal adjustment. A single asterisk indicates a significance level of $p < .05$, two asterisks indicate $p < .01$, and three asterisks indicate $p < .001$.

Fig. 4. Standardized beta coefficients for health (black), life satisfaction (dark red), and self-esteem (light red) in the area of intrapersonal adjustment. A single asterisk indicates a significance level of $p < .05$, two asterisks indicate $p < .01$, and three asterisks indicate $p < .001$.

Fig. 5. Interaction plots for all significant interaction effects ($p < .01$). For residency status, individuals with a permission to reside were labeled as “working allowed”.