Received: 31 August 2018 | Revised: 31 March 2019 | Accepted: 15 April 2019

DOI: 10.1002/ejsp.2592

RESEARCH ARTICLE

EASP WILEY

Psychological individual differences as predictors of refugees' local language proficiency

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Funding information
Stichting NOA

Abstract

Learning the local language is important for the successful integration of immigrants. Previous research has identified a number of sociodemographic factors that are associated with the effectiveness of local language acquisition among immigrants, but little is known about the influence of psychological differences on immigrants' local language acquisition. In the present research, individual differences in general mental ability (GMA), work search intention, and personality traits Conscientiousness and Openness were studied among recently arrived Syrian (n = 1054) and Eritrean (n = 500) refugees in the Netherlands. The results revealed that in addition to the effects of age of arrival, local length of stay, premigration educational attainment, and psychological distress, GMA and work search intention were positively associated with refugees' local language proficiency. Additionally, work search intention was found to strengthen the effect of GMA on local language proficiency. No positive linear effects were observed for Conscientiousness and Openness. Some evidence was found for curvilinear relationships between psychological predictors and local language proficiency. Implications are discussed.

KEYWORDS

conscientiousness, general mental ability, local language proficiency, openness, refugees, work search intention

1 | INTRODUCTION

From 2014 until the end of 2017, about 4 million refugees entered Europe, and many of them have applied for asylum (UNHCR, 2017). Given the differences between their home culture and the culture of residence, refugees face challenges with adjustment (Berry, 1997; Rudmin, 2003). Earlier research showed that successful integration and adjustment require learning the local language, which is associated with positive outcomes in social well-being, work, and education (e.g., Joly, 1996). Research among earlier waves of immigrants showed that host country language proficiency is positively related to psychological well-being (Beiser & Hou, 2001), employment (Aldashev, Gernandt, & Thomsen, 2009; Bloch, 2002), and higher earnings (Chiswick & Miller, 2007; Dustmann, 1994; Shields & Price, 2002). In contrast, immigrants with poor local language skills were shown to have a higher chance of being marginalised from the community, to be more dependent on social networks, and to have less access to the labour market (Bloch, 2002; Schellekens, 2001; Valtonen, 1994).

Several earlier studies have investigated predictors of local language acquisition of immigrants and refugees (see Chiswick & Miller, 2007; Esser, 2006). However, this research suffers from several shortcomings. First, most of these studies have focused on sociodemographic factors as predictors of local language acquisition

and have ignored psychological differences. Second, these studies focused predominantly on labour and family immigrants or made no distinction between such voluntary immigrants and refugees (Fennelly & Palasz, 2003). In comparison to voluntary immigrants, refugees are generally more highly educated (Liebau & Salikutluk, 2016), show lower employment rates (Salikutluk, Giesecke, & Kroh, 2016), are at higher risk for a variety of psychiatric disorders (Fazel, Wheeler, & Danesh, 2005; Hollifield et al., 2002; Schock, Böttche, Rosner, Wenk-Ansohn, & Knaevelsrud, 2016), and are worse at acquiring the local language (Chiswick & Miller, 2001, 2007; Van Tubergen & Kalmijn, 2005). For these reasons, findings from voluntary immigrant samples cannot be generalized to refugee samples. Lastly, previous research has typically used self-reports (Beenstock, Chiswick, & Repetto, 2001; Carliner, 2000; Chiswick & Miller, 2002; Van Tubergen, 2010) or interviews (e.g., Van Tubergen & Kalmijn, 2005; Van Tubergen & Wierenga, 2011) to assess local language proficiency. Although the interview-based measure is arguably a more valid criterion than self-reports, objective measures of local language proficiency, such as standardized tests, would further increase the validity of research findings (Edele, Seuring, Kristen, & Stanat, 2015).

To address these concerns, the present research draws on the psychological literature of personnel selection and academic performance (e.g., Judge & Zapata, 2015; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007; Schmidt & Hunter, 1998; Von Stumm, Hell, & Chamorro-Premuzic, 2011), investigating the predictive validities of individual differences for local language acquisition. Specifically, we test the impact of general mental ability (GMA), work search intention, and the personality traits Conscientiousness and Openness on local language proficiency among a recent wave of Syrian and Eritrean refugees residing in the Netherlands.

1.1 | Local language proficiency

The majority of studies on immigrants' local language proficiency have been conducted in the field of sociology and economics and they typically draw on the standard theoretical model (Chiswick & Miller, 2001, 2007; Esser, 2006; Hwang & Xi, 2008; Mesch, 2003). This model contends that there are three general determinants of immigrants' local language acquisition: (a) exposure, that is, the extent to which immigrants hear and read the local language, (b) incentives, that is, the advantages one can obtain by mastering the local language weighted against the costs of learning the local language, and (c) efficiency, that is, the innate abilities to learn and acquire a new language (Chiswick & Miller, 2007). Based on this model, a number of sociodemographic predictors of local language acquisition have been identified, including gender (e.g., Beiser & Hou, 2000; Kristen, Mühlau, & Schacht, 2016; Van der Slik, Van Hout, & Schepens, 2015), length of stay in the country of residence (e.g., Carliner, 2000; Van Tubergen & Kalmijn, 2005), age of arrival (e.g., Kristen et al., 2016), and premigration education level (Beiser & Hou, 2000; Hayfron, 2001; Hou & Beiser, 2006; Van Tubergen, 2010). Mental health has also been studied often among immigrants and refugees (e.g., see Fazel et al., 2005; Porter & Haslam, 2005), and good mental health has frequently been associated with better local language acquisition (Beiser & Hou, 2001; Chiswick & Miller, 2001; Van Tubergen & Kalmijn, 2005; for exceptions, see Van Niejenhuis, Van der Werf, & Otten, 2015; Van Tubergen, 2010). Although these findings are informative, we argue that this literature fails to recognize that psychological and individual differences—in addition to situational and external factors—could also influence local language acquisition among migrants (Dörnyei, 2005).

Little is known about psychological predictors of local language acquisition among refugees. In the psychological literature of individual differences and personnel selection (e.g., Judge & Zapata, 2015; Roberts et al., 2007; Schmidt & Hunter, 1998), researchers have identified several important psychological predictors of performance in the domains of work and education, such as cognitive ability and personality traits. We expect that these psychological individual differences show similar or stronger relationships with local language acquisition compared to the effects that are observed in studies on academic performance. There is evidence that transition periods in life function as a catalyst for personality differences to be magnified (Caspi & Moffitt, 1993). That is, under conditions of change—such as refugees' forced resettlement into a new country that brings with it an unfamiliar culture—personality traits become accentuated and have a stronger effect on behavior, compared to their strength under ordinary and undisrupted life conditions. This phenomenon might strengthen the effect of individual traits on local language acquisition of refugees. In the following section, the theoretical and empirical basis of psychological predictors of learning performance is reviewed with a particular focus on local language acquisition.

1.2 | Psychological predictors

1.2.1 | General mental ability

GMA (or intelligence) has been defined as "the ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by taking thought" (Neisser et al., 1996, p. 77). GMA determines an individual's capability to learn and perform well on tasks. GMA is a positive predictor for a number of performance indicators, including academic performance and achievement (Deary, Strand, Smith, & Fernandes, 2007; Duckworth & Seligman, 2005; Sternberg, Grigorenko, & Bundy, 2001), attained occupational level (Schmidt & Hunter, 2004), training success (Salgado, Anderson, Moscoso, Bertua, & De Fruyt, 2003), and work performance (Schmidt & Hunter, 1998, 2004). GMA is also a predictor of local language proficiency in non-immigrant samples (e.g., Dörnyei, 2005; Pishghadam & Khajavy, 2013; Skehan, 1991). To the authors' best knowledge, only one study on local language proficiency among immigrants (in this study, voluntary immigrants) assessed GMA, and these researchers found a positive effect of GMA on local language proficiency (Edele et al.,

2015). In line with these findings, we predict that GMA is positively associated with local language proficiency among refugees (H1).

1.2.2 | Work search intention

Immigrants' local language proficiency is positively associated with employment and voluntary work (Bloch, 2002; Dustmann & Fabbri, 2003; Potocky-Tripodi, 2004). A possible explanation for this is that refugees who seek a job are more motivated to learn the local language. Correspondingly, recent findings on Syrian refugees in the Netherlands and in Greece showed that job search self-efficacy—the belief that one is competent in searching for and finding employment (Saks & Ashforth, 1999)—is positively correlated with local language proficiency (Pajic, Ulceluse, Kismihók, Mol, & den Hartog, 2018). Research has also shown that immigrants' employment history is a predictor of local language proficiency (Beiser & Hou, 2000). Drawing on these findings, we predict that work search intention is positively related to local language proficiency among refugees (H2).

1.2.3 | Personality traits

Two widely accepted personality taxonomies are the five- (the Big Five; Costa & McCrae, 1992) and six-dimensional model (Ashton et al., 2004). One of the traits in these models is the personality factor that is known as Conscientiousness (Costa & McCrae, 1992). Individuals high in Conscientiousness are organized, responsible, and industrious (Lee & Ashton, 2004). Conscientiousness is one of the strongest non-cognitive predictors of academic achievement (Noftle & Robins, 2007; O'Connor & Paunonen, 2007; Robbins et al., 2004), and it even predicts academic success when it is assessed in childhood (Shiner, Masten, & Roberts, 2003). Alongside education, local language acquisition also requires discipline to learn, and it can therefore be anticipated that refugees high in trait Conscientiousness do better in local language acquisition. Although we are not aware of direct evidence for this link, there is one relevant study among Dutch sixth-grade children which showed that Conscientiousness and Openness are positively related to foreign language vocabulary, grammar, and reading test-scores (Verhoeven & Vermeer, 2002). Correspondingly, we predict that Conscientiousness is positively associated with local language proficiency among refugees (H3).

Another relevant personality trait is labelled Openness (or Openness to Experience; Costa & McCrae, 1992; Lee & Ashton, 2004). Individuals high in Openness are aesthetically sensitive and intellectual (Lee & Ashton, 2004), and they are hence expected to have a higher proclivity for learning a foreign language. Openness is associated with academic success (but see Busato, Prins, Elshout, & Hamaker, 2000), SAT scores (Noftle & Robins, 2007), and final grades (Farsides & Woodfield, 2003). In addition to the previously mentioned study by Verhoeven and Vermeer (2002) that showed a positive association between Openness and indices of foreign language skills, another study among students found that HEXACO Openness is correlated with subjective self-reported local language fluency (r = 0.20; Gargalianou, Muehlfeld, Urbig, & van Witteloostuijn, 2015). Lastly, a recent study among international students in the Netherlands found a small positive effect of Openness on local language proficiency (Van Niejenhuis, Otten, & Flache, 2018). In line with these findings, we predict that Openness is positively associated with local language proficiency among refugees (H4).

1.2.4 | Interaction effects

Multiplicative models in the industrial/organizational (I/O) psychology explicate that performance is a function of ability (typically operationalized as GMA) times motivation, suggesting that the positive effect of GMA on performance is stronger at higher levels of motivation (Klehe & Anderson, 2007; Maier, 1955; Mitchell & Nebeker, 1973). Although a recent meta-analysis on this issue concluded that the interaction effect between GMA and motivation explains little additional variance in job performance (Van Iddekinge, Aguinis, Mackey, & DeOrtentiis, 2018), this meta-analysis only included measures of motivation, but not the general personality trait Conscientiousness. Studies that examined Conscientiousness as a moderator of GMA for predicting job performance reveal inconsistent findings: Some studies found no support for an interaction (Mount, Barrick, & Strauss, 1999; Sackett, Gruys, & Ellingson, 1998), whereas other studies revealed support for interaction effects between GMA and achievement motivation related facets of Conscientiousness (Perry, Hunter, Witt, & Harris, 2010), and between GMA and contextualized measures of achievement motivation (Hirschfeld, Lawson, & Mossholder, 2004). In educational psychology, the effect of GMA on grade point average was found to be stronger at higher levels of (the facets of) Conscientiousness (Bergold & Steinmayr, 2018; Di Domenico & Fournier, 2015; Ziegler, Knogler, & Bühner, 2009; but see Zhang & Ziegler, 2015). Openness has also been found to moderate the effect of GMA on academic performance, such that the effect of GMA on academic performance is stronger at lower levels of Openness (Bergold & Steinmayr, 2018; Di Domenico & Fournier, 2015; Zhang & Ziegler, 2015). GMA and Openness have a compensatory effect on performance, and hence, the lower one's level of Openness, the larger is the relative contribution of GMA on performance (see Ziegler, Danay, Heene, Asendorpf, & Bühner, 2012).

Although work search behaviour and Conscientiousness are moderately related (r = 0.30; Kanfer, Wanberg, & Kantrowitz, 2001), their shared variance is small enough to predict additive interaction effects of GMA with both work search intention and Conscientiousness. Whereas Conscientiousness covers one's general level of industriousness and orderliness (DeYoung, Quilty, & Peterson, 2007), work search intention can be considered a more specific, contextualized measure of motivation—and contextualized measures show higher validities than non-contextualized measures (e.g., see Shaffer & Postlethwaite, 2012). In line with these findings, we anticipate that GMA interacts with work search

intention, Conscientiousness, and Openness for predicting local language proficiency among refugees. Thus, we predict that the effect of GMA on local language proficiency among refugees is stronger at higher levels of work search intention (H5), at higher levels of Conscientiousness (H6), and at lower levels of Openness (H7).

1.3 | Exploratory curvilinear analyses

In addition to testing the hypotheses, nonlinear relationships between the predictors and local language proficiency are explored. To our knowledge, no previous literature has reported curvilinear effects of predictors of second language learning. Nonetheless, previous studies have revealed inverted U-shaped relationships between Conscientiousness and task and contextual performance (Janssen, 2001; LaHuis, Martin, & Avis, 2005; Le et al., 2011; Whetzel, McDaniel, Yost, & Kim, 2010; Wihler, Meurs, Momm, John, & Blickle, 2017; but see Robie & Ryan, 1999), training performance (Vasilopoulos, Cucina, & Hunter, 2007), and grade point average (Cucina & Vasilopoulos, 2005). We are only aware of one study that revealed a nonlinear—in this case, a U-shaped—relationship between Openness and grade point average (Cucina & Vasilopoulos, 2005). Regarding GMA, some scholars have theorized that the positive effect of GMA on performance weakens at higher levels of the construct (Jensen, 1998; te Nijenhuis & Hartmann, 2006; Robertson, Smeets, Lubinski, & Benbow, 2010). Empirical work, however, has failed to find support for this proposition in the context of work (Coward & Sackett, 1990) and education (Coyle, 2015; Lubinski, 2009; Park, Lubinski, & Benbow, 2008; Ziegler & Peikert, 2018). To our knowledge, there is no literature on curvilinear relationships between work search intention and performance indicators.

2 | METHOD

2.1 | Participants

We obtained data of refugees from 81 countries (mostly from the Middle East and Africa), but we only report the findings of refugees from Syria (n = 1,054) and refugees from the East-African country Eritrea (n = 500), as they comprise the largest refugee groups in the current data set (M_{age} = 29.14 years, SD = 8.76; 72.5% males). Previous research has shown that refugees from these countries flee from harsh societal climates and they typically report having undergone traumatic events and to having suffered from mental health problems (Dagevos, Huijnk, Maliepaard, & Miltenburg, 2018; Sterckx, Fessehazion, & Teklemariam, 2018). The complete list of countries and sample sizes is included in the Supporting Information (SI; Table S1). The average age of arrival was M = 27.53 (SD = 8.60). The sample sizes were not a priori determined, as the principal aim of the assessments initially concerned refugee consultation instead of research. Also, the seven hypotheses in this study are presented as confirmatory hypotheses, but for the sake of transparency, we indicate that this study was not pre-registered. From the analyses, we have excluded five participants because of suspicious response patterns (i.e., identical responses on all items, or only extreme responses), and we have excluded two participants because they have reported a length of stay in the Netherlands that is substantially higher than the length of stay reported by the other participants (i.e., 87 and 214 months; 8.48 and 24.33 SD above the mean).

The average local length of stay in the Netherlands was 16.95 months (SD = 8.26), and the Syrian refugee group (M = 16.19, SD = 8.27) had a shorter local length of stay than the Eritrean refugee group (M = 18.61, SD = 8.01), $t(1516) = -5.33$, $p < 0.001$. The refugee participants resided in one of four large Dutch municipalities, and some refugees conducted the assessment through an invitation of the Foundation for Refugee Students (UAF), which is a foundation that supports refugees with providing education and finding work. Less than half of the participants were married (43.2%), and 47.0% of the participants reported having no family in the Netherlands at the time of assessment. Attained education levels at the country of origin were converted by Nuffic, a Dutch certificated agency, to match the standards of the European Qualifications Framework (EQF). Defined by the EQF standards, 18.0% of the participants attained level 2 (cf. basic education), 22.5% participants attained level 3 (cf. vocational secondary education), 29.5% participants attained level 4 (cf. associate's degree), 27.9% participants attained level 6 (cf. bachelor's degree), and 2.1% of participants attained level 7 (cf. master's degree). The majority of the refugees had worked in their country of origin (62.8%), reporting work experience of less than 1 year (6.6%), 1–2 years (15.4%), 2–5 years (17.3%), 5–10 years (12.6%), 10–20 years (6.8%), and more than 20 years (4.1%).

2.2 | Procedure

A Dutch psychological consultancy agency that focuses on the development of psychological tests and the assessment of individuals for work and educational-related purposes has gathered data among a large group of refugees through assessments for municipalities and NGOs since the year 2016. The inclusion criteria of the consultancy agency for assessing refugees were being at least 18 years old, having a residency permit, and being literate. Through a formal letter, refugees were requested to take part in an online assessment. In this letter, it was emphasized that participation was voluntary and that the assessment could help with finding a job or an education, and therefore stimulate integration into Dutch society. A large proportion of the invited refugees agreed to participate. Although the exact value is unknown, employees at the municipalities estimated the response rate to be at least 95%. The assessments were typically administered in a distraction-free room of the municipality's town hall. One or more councillors were present to help respondents with questions if necessary, and no communication with others was allowed during the assessments. No compensation was offered in return for participation.

2.3 | Materials

The measures were developed in Dutch and had subsequently been translated into Modern Standard Arabic (for Arabic refugees, including Syrians) and into Tigrinya (for Eritrean refugees) by a certified translation agency. Thus, all assessment components (i.e., the instructions, the tests, and the questionnaires) were administered in the refugees' mother tongue. The full assessment consists of sociodemographic questions, two GMA subtests, scales for self-reported competencies, personality traits, and work motivation, a posttraumatic stress disorder checklist (the PCL-5; Blevins, Weathers, Davis, Witte, & Domino, 2015), a measure of psychological distress (the K10; Kessler et al., 2002), and a Dutch and an English language proficiency test. Here, we only describe the instruments that are relevant to the present study. Readers who are interested in the test environment or who would like to see sample items of the two GMA subtests are referred to the footnote.[1]

2.3.1 | Measurement invariance and refugee group differences

To investigate whether the assessed instruments have similar validities among the two refugee groups, we tested for metric measurement invariance—that is, whether item and factor loadings are equivalent across the Syrian and the Eritrean refugee group (see SI for the syntax). Scholars have recommended considering support for metric invariance when ΔCFI ≤ 0.01 (Cheung & Rensvold, 2002). Comparing latent variable models for Syrian and Eritrean refugees, based on the ΔCFI ≤ 0.01 cut off, we found support for metric invariance for the measures of work search intention (ΔCFI = 0.002), Conscientiousness (ΔCFI = 0.006), Openness (ΔCFI = 0.008), and local language proficiency (ΔCFI = 0.008), but not for GMA (ΔCFI = 0.016) and psychological distress (ΔCFI = 0.013). Given the small deviations of the latter two instruments and the unequal sample ratio in this research, we considered it unnecessary to remove items from the GMA test and the psychological distress scale. We have also conducted Confirmatory Factor Analyses to the instruments in our study, and the fit indices are reported in the SI (Table S2).

2.3.2 | General mental ability

GMA was assessed by two non-verbal subtests of the multicultural capacities test (MCT-M; Van den Berg, 2001). The subtests were developed to measure fluid intelligence (Cattell, 1971), and aimed to reduce or eliminate a potential bias that might be imposed by cultural background when using tests that contain cultural elements such as language or knowledge (Van de Vijver & Tanzer, 1997). One subtest is labelled *Components*, in which candidates have to select two out of the six spatial parts that can make up one displayed figure. The other subtest is labelled *Exclusion*, in which candidates have to select the figure that does not match the other four presented figures. The Components subtest has a time limit of 9 minutes, and the Exclusion subtest has a time limit of 7 minutes. Earlier empirical work showed evidence for the cross-cultural applicability of the MCT-M and its predictive validity in the domains of social functioning and academic achievement among native Dutch candidates and among several Dutch migrant groups (Van den Berg, 2001). In the present study, a total score for GMA was computed by adding up the number of correctly answered items of the two subtests. The correlation between the two subtests was $r = 0.55$, $p < 0.001$. The alpha coefficient of the two subtests in the current sample was 0.92.

To support the aggregation of the two subtests into one total score of GMA, we conducted confirmatory factor analyses using the R package Lavaan (version 0.05-23.1097; Rosseel, 2012). We compared two latent variable models. One model is the hypothesized hierarchical bi-factor model that includes a general factor of cognitive ability in addition to two factors that represent the two subtests. The other model is a correlated-factors model with two latent variables that represent the two subtests. The models were analyzed using the maximum likelihood estimation method, and missing values were dealt with by using full information maximum likelihood (El-Sheikh, Abonazel, & Gamil, 2017). The analyses indicated that the hierarchical bi-factor model (χ^2 (1,650) = 2,747.02, $p < 0.001$, CFI = 0.937, TLI = 0.932, RMSEA = 0.021, SRMR = 0.032), has a better fit than the correlated two-factor model (χ^2 (1,719) = 3703.18, $p < 0.001$, CFI = 0.885, TLI = 0.881, RMSEA = 0.027, SRMR = 0.046), χ^2 (59) = 956.16, $p < 0.001$, justifying the aggregation of the two subtests of the MCT-M into one total score.

2.3.3 | Work search intention

We assessed work search intention with a 10-item subscale of a work motivation questionnaire (AWV; NOA, 2005). Research has shown convergent validity for this instrument with other work motivation instruments (Dusseldorp, Hofstetter, & Sonke, 2018). Example items are "How much time do you spend on searching for vacancies on the internet?", and "How frequently do you approach employers for job opportunities?". Participants were instructed to rate on a 5-point Likert scale how much time they spend on such activities, ranging from 1 = *Not at all* to 5 = *Very frequently*. In the current sample, the alpha coefficient of this scale was 0.91.

2.3.4 | Conscientiousness and Openness

To assess the personality traits Conscientiousness and Openness, we used the MPT-BS-QS Basic (Holtrop, Born, de Vries, & de Vries, 2014; NOA, 2009), which is a short (60-item) version of a personality inventory that consists of six factors, and that corresponds to the HEXACO model of personality (Lee & Ashton, 2004). In the present article, we focus exclusively on Conscientiousness and Openness, as we consider these traits to be the most relevant for predicting

[1]To see some sample items of the two GMA subscales that were completed by the refugee participants, readers can visit the webpage: https://www.noa-online.net/practicequestions/mct-m. After clicking the Start-button, readers can enter their e-mail address, to which procedure instructions will be sent. After logging in, readers are in the test environment, where they can select the Components and Exclusion subtests and see some GMA practice questions.

TABLE 1 Overall and refugee group specific descriptive statistics, effect sizes, and bivariate correlations of study variables

Variable	M_O	SD_O	M_S	SD_S	M_E	SD_E	*d*	1	2	3	4	5	6	7	8	9	10
1. Gender	0.28	0.45	0.28	0.45	0.27	0.44	0.02	—	0.09*/−0.07	−0.29**/−0.11*	0.10**/0.10	−0.01/0.07	−0.05/−0.08	−0.18**/−0.05	−0.03/−0.10*	−0.16*/−0.13**	0.01/−0.18**
2. Age of arrival	27.53	8.60	29.05	9.78	24.69	5.71	0.54**	0.06*	—	−0.13**/−0.20**	0.11*/−0.07	0.03/0.03	−0.09*/0.07	0.04/0.12**	0.08**/0.08	0.08**/0.09*	−0.18**/−0.12*
3. Local length of stay	16.95	8.26	16.19	8.27	18.61	8.01	0.30**	−0.24**	−0.17**	—	−0.10**/−0.02	0.05/0.02	0.04/0.02	0.05/−0.11*	−0.03/0.02	−0.02/0.00	0.29**/0.35**
4. Educational attainment	2.43	1.50	2.32	1.58	2.89	1.00	0.43**	0.09**	0.06*	−0.07*	—	−0.10**/−0.03	0.21**/−0.12	0.11**/−0.11	0.12**/−0.07	0.13**/−0.10	0.28**/0.12
5. Psychological distress	1.74	0.72	1.75	0.74	1.70	0.67	0.06	0.02	0.04	0.04	−0.10**	(0.89/0.84)	−0.11**/−0.10*	−0.07**/−0.06	−0.05/−0.13**	−0.02/−0.07	−0.15**/−0.07
6. GMA	32.29	10.83	35.75	9.87	24.94	8.93	1.15**	−0.04	0.05*	−0.03	0.10**	−0.08**	(0.91/0.81)	0.11**/0.12**	0.07*/0.06	0.16**/0.14**	0.30**/0.33**
7. Work search intention	2.44	0.93	2.23	0.88	2.87	0.91	0.72**	−0.13**	−0.02	0.04	0.12**	−0.07**	−0.05*	(0.91/0.88)	0.16**/0.23**	0.27**/0.25**	0.15**/−0.01
8. Conscientiousness	3.86	0.45	3.97	0.42	3.65	0.45	0.74**	−0.05	0.15**	−0.06*	0.05	−0.07*	0.21**	0.06**	(0.68/0.63)	0.63**/0.62**	−0.01/0.08
9. Openness	3.90	0.53	4.00	0.50	3.69	0.53	0.60**	−0.14**	0.14**	−0.05*	0.06*	−0.03	0.26**	0.15**	0.66**	(0.84/0.74)	−0.01/0.06
10. Local language proficiency	18.46	17.62	18.98	18.57	17.34	15.37	0.10	−0.04	−0.15**	0.26**	0.26**	−0.13**	0.29**	0.09**	0.03	0.02	(0.97/0.97)

Note: The subscript O, S, and E respectively represent the overall sample (N_O = 1,547), the Syrian refugee group (n_S = 1,053), and the Eritrean refugee group (n_E = 494). *d* = Cohen's *d* effect size, where 0.10 = small, 0.30 = medium, 0.50 = large (Cohen, 1988). Gender, Male = 0, Female = 1. Correlations for the entire sample are shown below the diagonal. Correlations for, respectively, Syrian and Eritrean refugees are shown above the diagonal, separated by a slash. Similarly, the values between brackets represent the alpha coefficients for Syrian and Eritrean refugees, respectively. The possible range of scores are 1.00–5.00 for psychological distress, work search intention, Conscientiousness, and Openness, 0–60 for GMA, and 0–80 for local language proficiency. The actual range of scores are 1.00–5.00 for psychological distress and work search intention, 1.70–5.00 for Conscientiousness, 1.60–5.00 for Openness, 1–57 for GMA, and 0–78 for local language proficiency.
Abbreviation: GMA, general mental ability.
*$p < 0.05$.
**$p < 0.01$ (two-tailed).

local language acquisition. The correlations between the other four personality dimensions and the study variables are reported in the SI (Table S3). Ten items were used to assess each personality dimension. Example items of Conscientiousness are "I do things very precisely", and "I think carefully before I act", and example items of Openness are "I often come up with plans to do new things", and "I have often more than one idea on how to do something". The alpha coefficients of Conscientiousness and Openness in the current sample were respectively 0.69 and 0.83. Participants were instructed to rate on a 5-point Likert scale how much they agree or disagree with each statement, ranging from 1 = *Totally disagree* to 5 = *Totally agree*. The two personality scales correlated quite highly, $r = 0.66$, $p < 0.001$, so we conducted a confirmatory factor analysis to verify the underlying two-factor structure. Results showed that the two-factor structure fits the data reasonably well (χ^2 (151) = 859.63, $p < 0.001$, CFI = 0.908, TLI = 0.895, RMSEA = 0.055, SRMR = 0.042), and significantly better than a one-factor solution (χ^2 (152) = 983.97, $p < 0.001$, CFI = 0.891, TLI = 0.878, RMSEA = 0.059, SRMR = 0.044), $\Delta\chi^2$ (1) = 124.34, $p < 0.001$.

2.3.5 | Local language proficiency

Local (Dutch) language proficiency was assessed using an instrument that had been developed by the psychological consultancy agency that gathered the data (NOA, 2006). In this test, participants read two short stories written in Dutch (in total 198 words), which include sentences with 80 incomplete words. Participants were instructed to complete the word fragments such that they make meaningful words in their context, within a 15-minute time limit. Scores on this test could range from 0 (no word fragment completed correctly) to 80 (all word fragments completed correctly). Previous unpublished research has shown that the scores on this test correlate strongly with scores on a Dutch language test that is used nationwide (NT2; CINOP, Citogroep, Bureau ICE, & BVE Raad, 2002), supporting the construct validity of the test. Specifically, the Dutch language proficiency test that was used in the current study correlated with the NT2 subtests of reading ($r = 0.65$), writing ($r = 0.78$), vocal understanding ($r = 0.48$), and speaking ($r = 0.50$) (NOA, 2006). In the current sample, the alpha coefficient of the Dutch proficiency test was 0.97.

2.4 | Control variables

2.4.1 | Demographic variables

To establish the relative importance of psychological differences in local language acquisition above and beyond the effects of sociodemographic predictors, the variables gender, age of arrival in the Netherlands, length of stay in the Netherlands, and premigration educational attainment were included in the analyses. Previous research has revealed mixed findings regarding the relationship between gender and local language acquisition among immigrants. Some studies reported greater local language proficiency among female immigrants (e.g., Van der Slik et al., 2015), whereas other studies reported greater levels of local language proficiency among male immigrants (e.g., Beiser & Hou, 2001; Dustmann & Fabbri, 2003; Fennelly & Palasz, 2003; Van Tubergen, 2010), or showed no gender differences (e.g., Van Niejenhuis et al., 2015). Previous research has shown that local language proficiency among immigrants is negatively associated with age of arrival in the country of residence (e.g., Kristen et al., 2016), and positively associated with local length of stay (Carliner, 2000; Van Tubergen & Kalmijn, 2005) and premigration education level (Beiser & Hou, 2000; Hayfron, 2001; Hou & Beiser, 2006; Van Tubergen, 2010).

2.4.2 | Psychological distress

Despite some exceptions (Van Niejenhuis et al., 2015; Van Tubergen, 2010), most previous research findings revealed a negative effect of psychological distress on local language proficiency (Beiser & Hou, 2001; Chiswick & Miller, 2001; Van Tubergen & Kalmijn, 2005). Psychological distress was measured with the 10-item Kessler Psychological Distress Scale (K10; Kessler et al., 2002). Participants were asked to indicate on a 5-point Likert scale how often they experienced or felt something during the last 30 days. Example items are "About how often did you feel nervous?", and "About how often did you feel hopeless?". Previous research has demonstrated that the K10 is a reliable and valid tool to assess anxiety and depressive disorders in clinical and in non-clinical populations (e.g., Cairney, Veldhuizen, Wade, Kurdyak, & Streiner, 2007; Furukawa, Kessler, Slade, & Andrews, 2003; Kessler et al., 2003), and it has shown predictive validity for several psychiatric disorders (Donker et al., 2010). Good psychometric qualities of the K10 were also demonstrated among non-Western samples, supporting the cross-cultural validity of the instrument (Fassaert et al., 2009). In the current sample, the alpha coefficient of this scale was 0.87.

3 | RESULTS

3.1 | Preliminary analyses

Independent sample *t*-tests were conducted to as an exploratory investigation of differences in test and scale scores between Syrian and Eritrean refugees. The analyses showed that Syrian refugees scored higher on GMA, $t(1{,}058.47) = 21.46$, $p < 0.001$, Conscientiousness, $t(1{,}541) = 13.57$, $p < 0.001$, and Openness, $t(1{,}541) = 11.26$, $p < 0.001$, whereas the Eritrean refugees scored higher on work search intention, $t(1{,}545) = -13.25$, $p < 0.001$. No refugee group differences were observed for psychological distress, $t(1{,}451) = 1.11$, $p = 0.27$, and local language proficiency, $t(1{,}147.38) = 1.82$, $p = 0.07$. Table 1 shows the means, standard deviations, effect sizes, and correlations between study variables of the total sample and of the Syrian and Eritrean refugees separately.

GMA showed the strongest correlation with local language proficiency ($r = 0.29$, $p < 0.001$), followed by local length of stay ($r = 0.26$, $p < 0.001$) and educational attainment ($r = 0.26$, $p < 0.001$), age of arrival ($r = -0.15$, $p < 0.001$), psychological distress ($r = -0.13$,

TABLE 2 Hierarchical regression analysis with predictors of local language proficiency

	Local language proficiency					
	Model 1		Model 2		Model 3	
Variable	*β*	95% CI	*β*	95% CI	*β*	95% CI
Gender (male = 0, female = 1)	0.01	[−0.04, 0.07]	0.03	[−0.02, 0.09]	0.03	[−0.05, 0.05]
Age of arrival	−0.12***	[−0.18, −0.07]	−0.13***	[−0.18, −0.08]	−0.13***	[−0.18, −0.08]
Local length of stay (months)	0.31***	[0.25, 0.36]	0.31***	[0.26, 0.37]	0.31***	[0.26, 0.37]
Educational attainment	0.28***	[0.23, 0.33]	0.25***	[0.20, 0.30]	0.25***	[0.20, 0.31]
Psychological distress	−0.11***	[−0.16, −0.05]	−0.08**	[−0.13, −0.03]	−0.08**	[−0.13, −0.03]
GMA			0.29***	[0.24, 0.34]	0.28***	[0.23, 0.34]
Work search intention			0.06*	[0.01, 0.12]	0.07**	[0.02, 0.12]
Conscientiousness			0.03	[−0.04, 0.09]	0.02	[−0.05, 0.08]
Openness			−0.06	[−0.13, 0.01]	−0.07	[−0.14, 0.00]
GMA × Work search intention					0.09**	[0.04, 0.14]
GMA × Conscientiousness					−0.04	[−0.11, 0.03]
GMA × Openness					−0.05	[−0.12, 0.02]
R^2	0.20		0.28		0.29	
F	55.04***		47.21***		37.30***	
ΔR^2			0.08		0.01	
ΔF			30.23***		5.75*	
f^2	0.25		0.39		0.40	

Note: f^2 = Cohen's f^2, where $0.02 \le f^2 < 0.15$, $0.15 \le f^2 < 0.35$, and $f^2 \ge 0.35$ represent small, medium, and large effect sizes, respectively (Cohen, 1988).
Abbreviations: 95% CI = 95% confidence interval; GMA, general mental ability.
*$p < 0.05$.
**$p < 0.01$.
***$p < 0.001$.

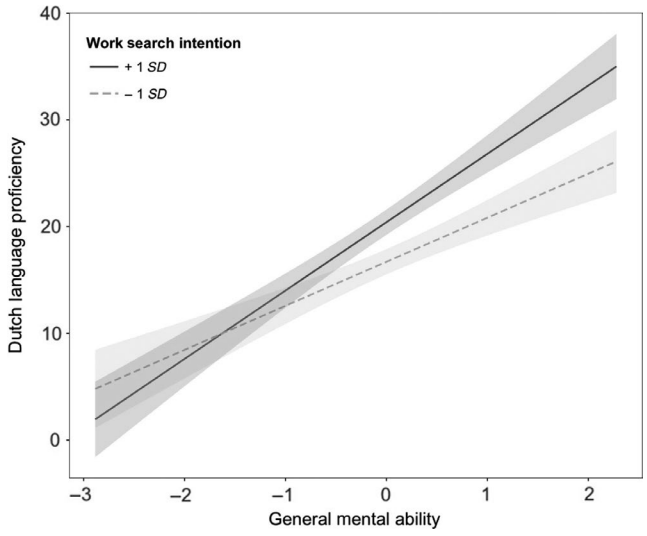

FIGURE 1 The relation between general mental ability (*z*-scores) and refugees' Dutch language proficiency at + 1 and −1 *SD* of work search intention. The gray area around the lines illustrates the 95% standard error confidence interval

$p < 0.001$), and work search intention ($r = 0.09$, $p < 0.001$). No significant correlations were observed between local language proficiency and Conscientiousness ($r = 0.03$, $p = 0.24$) or Openness ($r = 0.02$, $p = 0.37$). There was also no significant difference between men ($M = 18.92$, $SD = 17.38$) and women ($M = 17.28$, $SD = 18.28$) on local language proficiency, $t(1545) = 1.70$, $p = 0.09$.

3.2 | Hypothesis testing

In order to investigate the unique predictive validity of the variables of interest on local language proficiency, we conducted a hierarchical regression analysis with three steps (Table 2). The first step (Model 1) included the control variables gender, age of arrival, local length of stay, premigration educational attainment, and psychological distress. In the second step (Model 2), GMA, work search intention, Conscientiousness, and Openness were added, testing H1, H2, H3, and H4, respectively. In the third step (Model 3), the interaction terms of GMA with work search intention (H5), GMA with Conscientiousness (H6), and GMA with Openness (H7) were included. We expected that every predictor and interaction term would explain unique variance in local language proficiency. In Table 2, beta coefficients and their confidence intervals were reported to present the effects of the predictors of local language proficiency. The R^2 and the Cohen's f^2 statistic in Table 2 respectively indicate the total explained variance of the model and the corresponding effect size, where $0.02 \le f^2 < 0.15$ is a small effect,

$0.15 \leq f^2 < 0.35$ is a medium effect, and $f^2 \geq 0.35$ is a large effect (Cohen, 1988).

No differential effects of the predictors of local language proficiency were observed between the two refugee groups. Specifically, refugee group did not moderate the effect of GMA (β = 0.06, t = 1.50, p = 0.13), work search intention (β = 0.05, t = −1.48, p = 0.14), Conscientiousness (β = 0.05, t = 0.82, p = 0.41), Openness (β = 0.05, t = 0.87, p = 0.39), and the interactions between GMA and work search intention (β = −0.02, t = −0.18, p = 0.75), Conscientiousness (β = 0.06, t = 0.89, p = 0.37), and Openness (β = −0.01, t = −0.32, p = 0.85). Therefore, the hierarchical regression analysis was conducted for the entire sample.

Model 1 (Table 2, Model 1) of the hierarchical linear regression analysis showed that local language proficiency is not associated with gender (β = 0.01, t = 0.47, p = 0.64), it is negatively associated with age of arrival (β = −0.12, t = −4.49, p < 0.001), positively associated with local length of stay (β = 0.31, t = 11.03, p < 0.001) and premigration educational attainment (β = 0.28, t = 10.34, p < 0.001), and negatively associated with psychological distress (β = −0.11, t = −3.91, p < 0.001). Model 1 explained 19.7% variance in local language proficiency, which corresponds to Cohen's f^2 = 0.25, indicating a medium effect size.

In Model 2 (Table 2, Model 2), GMA (β = 0.29, t = 10.82, p < 0.001) and work search intention (β = 0.06, t = 2.32, p = 0.02) showed a positive relationship with local language proficiency above and beyond the effects of the control variables, supporting H1 and H2. In contrast to the predictions of H3 and H4, no significant relationships were observed between refugees' local language acquisition and Conscientiousness (β = 0.03, t = 0.75, p = 0.45) or Openness (β = −0.06, t = −1.67, p = 0.10). Overall, Model 2 explained 7.9% additional variance over and above Model 1 (i.e., in total 27.6% explained variance), F(4, 1,116) = 30.42, p < 0.001, which corresponds to Cohen's f^2 = 0.39, indicating a large effect size.

Model 3 showed an interaction effect between GMA and work search intention on local language proficiency (β = 0.09, t = 3.37, p = 0.001), such that the effect of GMA on local language proficiency was stronger at higher levels of work search intention, supporting H5 (Figure 1). A simple slope analysis showed that the positive relationship between GMA and local language proficiency was stronger at +1 *SD* of work search intention (β = 0.36, t = 10.28, p < 0.001) compared to −1 *SD* of work search intention (β = 0.23, t = 6.78, p < 0.001). In contrast to the predictions of H6 and H7, no evidence was found for interaction effects between GMA and Conscientiousness (β = −0.04, t = −1.10, p = 0.27) and between GMA and Openness (β = −0.05, t = −1.39, p = 0.17) on local language proficiency. Model 3 explained 1.1% additional variance in local language proficiency over and above Model 2, F(3, 1,113) = 5.90, p = 0.001. The total amount of explained variance in local language proficiency of Model 3 is 28.7%, corresponding to Cohen's f^2 = 0.40, indicating a large effect size.[2]

[2]The multiple regression analysis was also conducted without the control variables. The results are comparable to the results with the control variables, except for Openness. In the model without control variables, Openness (β = −0.09, p = 0.003) as well as the interaction term of GMA and Openness (β = −0.07, p = 0.04) are significantly negatively associated with local language proficiency.

3.3 | Exploratory curvilinear analyses

To test for curvilinear relationships of the predictors with local language proficiency, we compared a linear regression model, $y = b_0 + b_1x$, with a quadratic regression model, $y = b_0 + b_1x + b_2x^2$, where y is the dependent variable local language proficiency, and where x represents the total score on one of the four predictors. Unique variance in local language proficiency was explained by the quadratic terms of Conscientiousness (F(1, 1,540) = 6.83, p = 0.001, ΔR^2 = 0.01), Openness (F(1, 1,540) = 3.90, p = 0.02, ΔR^2 = 0.01), and GMA (F(1, 1,542) = 10.36, p = 0.001, ΔR^2 = 0.01), but not work search intention (F(1, 1,544) = 0.25, p = 0.62, ΔR^2 < 0.001). Conscientiousness and Openness revealed inverted U-shaped relationships with refugees' local language proficiency (see Appendix, Figure A1), whereas the relationship between GMA and local language proficiency showed an exponential trend (see Appendix, Figure A1c).

4 | DISCUSSION

Drawing on the literature of psychological individual differences and personnel selection (e.g., Judge & Zapata, 2015; Roberts et al., 2007; Schmidt & Hunter, 1998), the present study examined the utility of psychological traits to explain differences in local (Dutch) language acquisition among Syrian and Eritrean refugees in the Netherlands, above and beyond factors that have been studied in prior empirical work. Specifically, we examined the incremental validity of GMA, work search intention, and the personality traits Conscientiousness and Openness, above and beyond sociodemographic variables and psychological distress in the prediction of refugees' local language proficiency.

4.1 | Theoretical implications

This study contributes to the literature on refugees' local language acquisition in several important ways. First, most previous research on local language acquisition investigated voluntary immigrants, and only a few studies have investigated refugees exclusively (Fennelly & Palasz, 2003). We replicated some earlier findings among a sample of Syrian and Eritrean refugees residing in the Netherlands. The findings showed that local language proficiency levels were about similar for men and women, but higher among refugees who were younger, who had a longer length of stay in the Netherlands, who had a higher premigration education level, and who experienced lower levels of psychological distress. The latter finding is especially important, as some earlier studies did not find a negative link between psychological distress and local language acquisition among immigrants (Van Niejenhuis et al., 2015; Van Tubergen, 2010). This could possibly be explained by our use of more reliable and valid instruments of psychological distress and language proficiency.

Second, to our knowledge, we are the first to simultaneously test the effects of individual differences in GMA, work search intention,

and personality traits as predictors of immigrants' local language acquisition. The results revealed that, above and beyond the effects of the sociodemographic variables and psychological distress, refugees' level of local language proficiency is most strongly and positively associated with GMA, and to a lesser extent, yet still significantly and positively associated with work search intention. Unexpectedly, no positive relationships were found between Conscientiousness (i.e., being organized and industrious) and Openness (i.e., being aesthetically sensitive and intellectual) and refugees' local language proficiency. Exploratory analyses revealed inverted U-shaped relationships of these latter two personality traits with local language proficiency. That is, higher local language proficiency scores were observed around the mean of the traits' continuum, while both extreme ends of the continuum tend to display lower scores. Additionally, evidence was found for a curvilinear relationship between GMA and local language proficiency, such that this link is stronger at higher levels of GMA. Altogether, the findings indicate that cognitive ability and work motivation are positively related to refugees' local language proficiency, but that the personality traits Conscientiousness and Openness are not linearly positively associated with local language proficiency among refugees.

We propose two explanations for the lack of support for linear positive relations of Conscientiousness and Openness with refugees' local language proficiency. One possible explanation is that the effect of personality on behaviour—as some theorists have argued—is limited in collectivistic cultures, due to individuals' higher responsibility to social roles and relationships (Heine, 2001; Markus & Kitayama, 1998; Shweder, 1991; for a discussion, see Church & Katigbak, 2017). According to this view, refugees' embeddedness in their social role is of more relative importance than their personality traits in predicting behaviour. Another possible explanation is self-selection in personality—that is, a phenomenon where individuals with certain personality profiles are more or less inclined to migrate, resulting in smaller variance in migrants' personality traits (Boneva & Frieze, 2001). Earlier research among non-refugee samples has found that immigration was predicted by low Conscientiousness and high Openness (Ciani & Capiluppi, 2011; Jokela, 2009; Tabor, Milfont, & Ward, 2015). Self-selection among refugees would manifest itself in a smaller range of test scores, decreasing the statistical power to detect relationships between psychological characteristics and local language acquisition. Unfortunately, it was impossible to test this hypothesis in the current study, as we have no assessment data of a representative sample of Syrian or Eritrean citizens residing in their home country.

The third contribution of this study is the investigation of interaction effects of GMA with work search intention, Conscientiousness, and Openness. Earlier research had shown that the positive effect of GMA on performance is stronger at higher levels of achievement motivation and at lower levels of Openness (e.g., Bergold & Steinmayr, 2018; Di Domenico & Fournier, 2015; Ziegler et al., 2009). This study showed that the effect of GMA on refugees' local language proficiency was stronger at higher levels of work search intention. We found no support that Conscientiousness or Openness moderated the relationship between GMA and refugees' local language proficiency.

4.2 | Strengths, limitations and future directions

The present study has several strengths. First, we studied participants from two samples of refugees that have been underexplored in the literature. Psychological traits and their predictive validity in the domain of work and education have been rarely studied in Middle-Eastern samples (Henrich, Heine, & Norenzayan, 2010). We showed that the relationships between the assessed psychological predictors and local language proficiency were comparable for Syrian and Eritrean refugees. Another strength of this study lies in the large sample sizes of the refugee groups, which allow for reliable effect estimates. The use of an objective measure of local language proficiency is also a strength of this study. Previous research has shown that objective measures of language proficiency reveal substantially different findings from self-report measures of language proficiency (Edele et al., 2015). Furthermore, the subtests that were used in this study measure fluid (non-verbal) intelligence, which indicates that there is no contamination with the dependent variable. Lastly, as there were potential incentives associated with assessment results (i.e., opportunities in work and education), we believe that the participants were motivated to respond honestly to the questionnaires and perform well on the ability tests. This supports the validity of the research findings (Duckworth, Quinn, Lynam, Loeber, & Stouthamer-Loeber, 2011).

Despite the strengths of the current research, there are also some limitations. One limitation is that there has been no substantial empirical validation so far of the cross-cultural personality inventory that was used in the present study. It is therefore somewhat uncertain whether Conscientiousness and Openness were measured adequately, although the operationalizations of these constructs show similarities to the well-validated HEXACO model of personality. Second, given that our study has a cross-sectional design, considerable caution is necessary when deriving conclusions about the causal nature of the findings. Although a causal relationship with local language acquisition is rather indisputable for some predictors (e.g., age of arrival, local length of stay, premigration educational attainment, and GMA), other predictors such as psychological distress, work search intention, and personality traits could as well be influenced by mastering the local language, or these relationships could also be bidirectional.

An important avenue for future research is to replicate our findings among other refugee and non-refugee migrant groups and in other countries. For instance, cross-country differences have been found in local language acquisition (e.g., Fennelly & Palasz, 2003; Van der Slik et al., 2015), and immigrants who originate from countries with a larger linguistic distance (i.e., a larger dissimilarity between languages) show a slower local language acquisition (Chiswick & Miller, 2001; Kristen et al., 2016). We also advocate for the use of personality inventories that have been validated across cultures, such as the HEXACO personality inventory (Lee

& Ashton, 2004) or the International Personality Item Pool (IPIP; Goldberg, 1999). Alternatively, researchers could use emic (i.e., local-specific) personality inventories, such as The South African Personality Inventory (Fetvadjiev, Meiring, Van de Vijver, Nel, & Hill, 2015) or the Arab Personality Inventory (Zeinoun, Daouk-Öyry, Choueiri, & Van de Vijver, 2017). Additionally, researchers could examine the effect of personality traits at the level of their facets. Research has shown that personality facets could display substantially different correlations with a criterion compared to their overarching personality dimensions (e.g., Moon, Hollenbeck, Marinova, & Humphrey, 2008). In the present research, we examined the effects of refugees' individual differences after a relatively short duration in the country of residence—that is, on average about 17 months. Future research could investigate the predictive validity of psychological individual differences in local language proficiency after a longer local length of stay.

Beyond the future directions considered so far, we advocate for longitudinal research investigating refugees' individual differences in personality and cognitive abilities as predictors of local language acquisition. Such research could also be extended to other relevant outcomes for refugees, such as employment and social adjustment. Another suggestion for future research is to examine psychological differences between refugees and people from the same country who did not migrate under harsh societal circumstances. This would offer insights into the potential psychological precursors of migration. In this respect, research so far has only focused on voluntary migrants and students, mostly from Western countries (Boneva & Frieze, 2001). Finally, research could explore potential influences of local resettlement policies and practices on local language acquisition (see Koopmans, 2010).

5 | CONCLUSION

The present study investigated the relationship between refugees' psychological individual differences and local language acquisition. We revealed that in addition to the effects of sociodemographic variables and psychological distress, refugees' local language proficiency is positively associated with GMA and work search intention, and that the effect of GMA on local language proficiency is stronger at higher levels of work search intention. No linear positive relationships were found between personality traits Conscientiousness and Openness and local language proficiency, but some evidence was found for curvilinear relationships between these personality traits and local language proficiency. The findings suggest that among refugees, psychological individual differences in cognitive ability and work motivation are important for learning the local language.

ACKNOWLEDGEMENTS

Grateful acknowledgement is provided to Remko van den Berg, Jacek Buczny, and Reinout E. de Vries for their assistance with the data collection and the statistical analyses. We also thank the NOA foundation for financial support.

CONFLICT OF INTEREST

The authors declare having no conflict of interest in whatsoever is relevant to the publication of the current paper.

ETHICAL STATEMENT

The authors declare that this research is conducted ethically, the results are reported honestly, the manuscript is original, the authorships reflect individuals' contributions, and that all the assessed measures are mentioned in the article.

TRANSPARENCY STATEMENT

Requests of data sharing need to be discussed with the owner of the data, NOA B.V. Questionnaire items are not publicly available because of commercial reasons.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

How to cite this article: Asfar D, Born MP, Oostrom JK, van Vugt M. Psychological individual differences as predictors of refugees' local language proficiency. *Eur J Soc Psychol*. 2019;00:1–16. https://doi.org/10.1002/ejsp.2592

APPENDIX

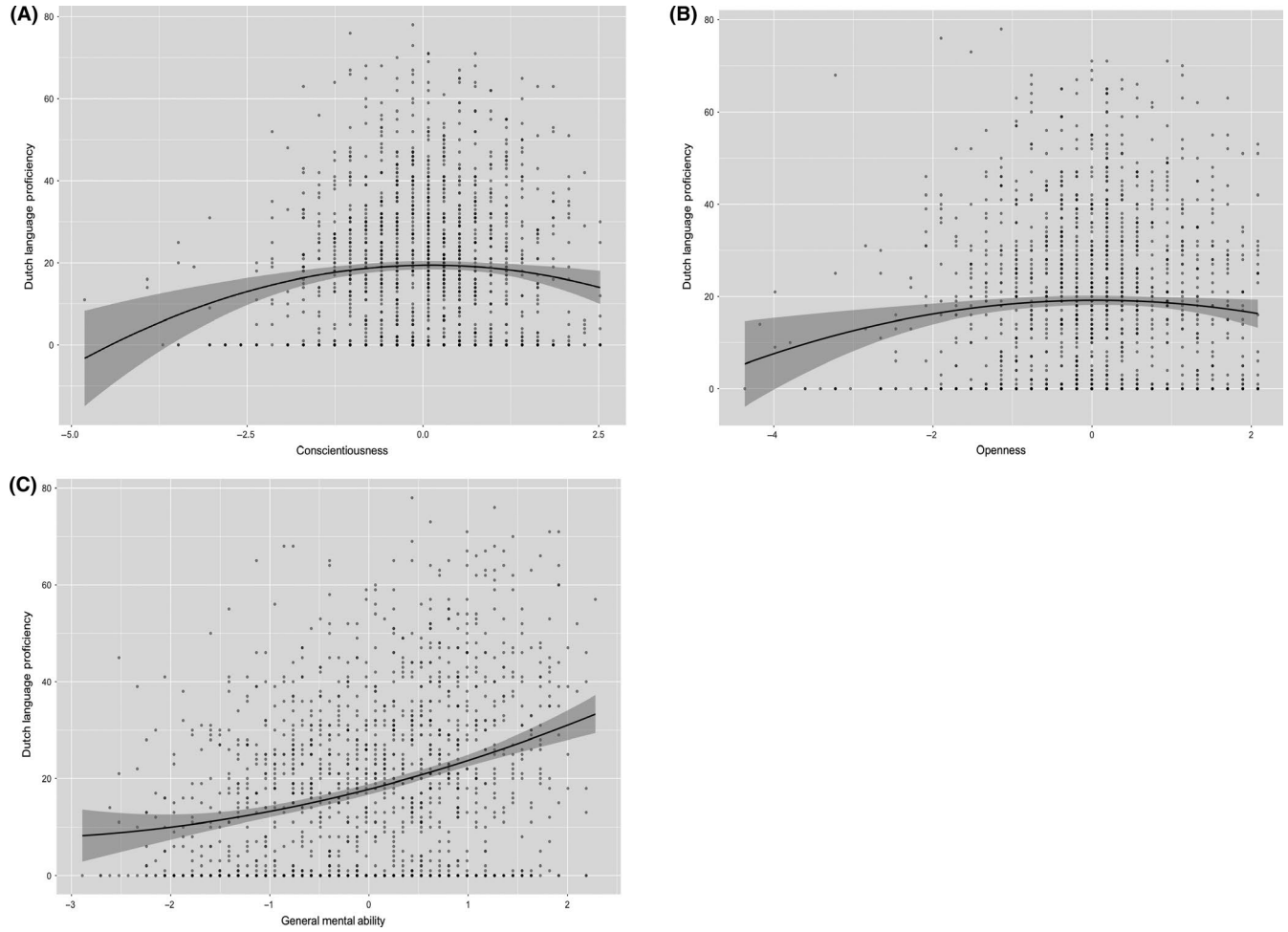

FIGURE A1 (a) The inverted U-shaped relationship between Conscientiousness (*z*-scores) and Dutch language proficiency scores. (b) The inverted U-shaped relationship between Openness (*z*-scores) and Dutch language proficiency scores. (c) The curvilinear relationship between general mental ability (*z*-scores) and Dutch language proficiency scores