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Brief Report

Personality predicts migration within and between U.S. states

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ABSTRACT

We examined the role of personality in predicting the propensity to migrate within and between U.S. states. The participants were from the national Midlife in the United States study (MIDUS; $n = 3760$). Personality traits of the Five Factor Model were used to predict the probability of migrating within and between U.S. states during a follow-up period of 7–11 years. High openness and low agreeableness increased within- and between-states migration, while high extraversion increased within- but not between-states migration. Conscientiousness and neuroticism were not related to migration probability. Personality traits correlated with neighborhood satisfaction, but this did not account for the association between personality and migration propensity. The findings suggest that personality may influence migration patterns in the United States.

1. Introduction

Migration is a central demographic process in directing population dynamics and creating social differences between geographical areas. Recent studies have suggested that personality differences may be relevant in understanding residential mobility. Silventoinen et al. (2008) found that Finnish twins with high extraversion and high neuroticism were more likely to migrate to their neighboring country Sweden than those with low extraversion and neuroticism. In another study of Finns, Jokela, Elovainio, Kivimäki, and Keltikangas-Järvinen (2008) found that high sociability increased internal rural-to-urban migration and predicted longer distances covered by migrant individuals. Furthermore, high emotionality tended to increase migration propensity and predicted shorter migration distances, while high activity increased general migration propensity.

Cross-sectional studies in other countries also suggest associations between personality and residential mobility. Camperio Ciani, Capiluppi, Veronese, and Sartori (2007) observed personality differences between Italian islanders and mainlanders, the former being more introverted, conscientious and emotionally stable, and less open to new experiences, than the latter. Furthermore, individuals who had migrated from the islands to the mainland were more extroverted and open to experiences than those who had stayed in the islands. In an Australian study not assessing residential mobility per se, Murray et al. (2005) found that people residing in remote parts of Australia tended be less open to experiences and more introverted than those living in more central locations.

The complex process of migration can be assessed in several ways and different types of migration may be influenced by different determinants related to particular social environments. It is therefore of interest to assess whether personality predicts migration propensity in the United States where this association has not been previously studied. Furthermore, the mechanisms connecting personality differences with migration propensity are yet poorly understood. Jokela et al. (2008) suggested that the association between high emotionality and increased migration propensity might be mediated by an association between emotionality and neighborhood dissatisfaction, since dissatisfaction with current residential area increases the probability of moving away (Lu, 1999). However, we are not aware of any studies examining the association between personality and neighborhood satisfaction.

The present study applied a prospective longitudinal study design to examine the role of personality in migration propensity in the United States. We examined whether five basic personality traits (extraversion, neuroticism, agreeableness, conscientiousness, and openness to experience) predicted residential mobility within and between U.S. states over a period of 7–11 years. Based on previous research reviewed above, we hypothesized that extraversion, neuroticism, and openness to experience all increase migration behavior. We also examined whether personality was associated with neighborhood satisfaction, and whether this association mediated the influence of personality on migration.

2. Methods and materials

2.1. Participants

The participants were 3760 women ($n = 2065$) and men ($n = 1695$) participating in the MacArthur Foundation Survey of Midlife Development in the United States (MIDUS) in 1995–1996

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(Brim et al., 2007) and its follow-up phase in 2004–2006 (Ryff et al., 2006). The study is based on a nationally representative random-digit-dial sample of noninstitutionalized, English-speaking adults, aged 25–74 years, selected from working telephone banks in the coterminous United States. The original sample (n = 7108) includes main respondents (n = 3487), their siblings (n = 950), a city oversample (n = 757), and a twin subsample (n = 1914). Data were collected in a telephone interview and with a mail questionnaire. In the present study, we included all participants who had data on relevant independent and dependent variables at the two data collection phases. The time interval between baseline and follow-up phase was determined by subtracting the participant's age at baseline from age at the follow-up phase. Based on this measure the follow-up time interval ranged from 7 to 11 years (mean = 9 years, SD = 0.6 years).

2.2. Measures

Residential mobility was determined on the basis of migration within and between U.S. states. The data did not include explicit information on migration, but in the follow-up the participants reported how many years they had resided in their current neighborhood and current state. This allowed us to determine whether the participant had moved between baseline and follow-up: if the time between baseline and follow-up (determined by the age difference between data collections) was more than the time the person had lived in current neighborhood, then the participant was classified as having moved from baseline neighborhood. If the time was less, the participant was classified as living in the same neighborhood as at baseline.

The method used to assess migration could not determine whether participants who had lived in their current neighborhood exactly the same number of years as the follow-up interval had moved or were still living in their baseline residence, so these participants were excluded from the analyses. We also applied sensitive analyses to evaluate whether the results remained similar when migration was assessed with a more stringent indicator, i.e., when including only participants who had lived in their current residence more than one year.

Personality was assessed with a model based on the Five Factor Model, including indicators of extraversion, neuroticism, agreeableness, conscientiousness, and openness to experience (see Johnson & Krueger, 2004). The participants were asked to rate how well 25 different adjectives described them (1 = not at all, 4 = a lot). The trait scales consisted of 4–8 adjectives as follows: *extraversion* (outgoing, friendly, lively, active, talkative; Cronbach's alpha in the present sample α = 0.74), *neuroticism* (moody, worrying, nervous, calm [reversed]; α = 0.71), *agreeableness* (helpful, warm, caring, softhearted, sympathetic; α = 0.78), *conscientiousness* (organized, responsible, hardworking, careless [reversed]; α = 0.51), and *openness to experience* (creative, imaginative, intelligent, curious, active, broad-minded, sophisticated, adventurous; α = 0.74). With the exception of the fairly low reliability of conscientiousness, the reliability estimates indicated acceptable internal consistencies.

Neighborhood satisfaction was determined on the basis of two measures. *Perceived neighborhood quality scale* consisted of four items (I feel safe being out alone in my neighborhood during the daytime, I feel safe being out alone in my neighborhood at night, I could call on a neighbor for help if I needed it, People in my neighborhood trust each other). *Perceived inequality in home scale* consisted of six items (I live in as nice a home as most people, I'm proud of my home, Most people live in a better neighborhood than I do, I don't like to invite people to my home because I do not live in a very nice place, I feel very good about my home and neighborhood, It feels hopeless to try to improve my home and neighborhood situation). The participants rated the items on a four-point scale. The Cronbach's reliabilities of neighborhood quality and inequality scale were α = 0.68 and α = 0.80, respectively.

We wanted to assess whether personality predicted migration propensity independently of sociodemographic factors potentially related to migration behavior, so gender, age, race, education, employment status, marital status, and parenthood status at baseline were included as covariates. Education was assessed on a 12-point scale (0 = less than grade school, 12 = PhD or equivalent academic degree). Dichotomous variables were created for employment status (0 = not in paid employment, 1 = employed), marital status (0 = not married, 1 = married), and parenthood status (0 = no children, 1 = one or more children). Based on participants self-reports, race was coded into three categories (white, n = 3496; black, n = 129; other, n = 135). Age at baseline ranged from 20 to 75 with a mean of 46.4 (SD = 13.0).

2.8. Statistical analysis

The association between personality and residential mobility was assessed with logistic regression analysis. We first assessed the association between migration and personality traits separately and then fitted a stepwise regression model including all statistically significant traits. In order to facilitate interpretation of effect sizes, odds ratios were calculated for standardized personality scales (Means = 0, SD = 1). The association between personality and neighborhood satisfaction was assessed with linear regression analysis.

We were interested in the role of personality in predicting within- and between-states migration propensity. Between-states migration naturally involves neighborhood change, which may confound analyses of within-state migration. In order to keep the outcomes of within- and between-states migrations separate, we assessed within-state migration only in participants who had not migrated across states. As the sample included biological relatives, all the participants were not independent of each other. Standard errors for regression coefficients were therefore computed using robust estimator with family clustering. The results were illustrated by categorizing participants into groups based on their personality scores (low = below 1 SD of mean, average = within 1 SD of mean, high = above 1 SD of mean) and calculating the predicted probabilities of migration in these groups.

3. Results

First we assessed the association between personality and neighborhood satisfaction. As shown in Table 1, measures of neighborhood satisfaction were significantly related to all of the five personality traits. When sociodemographic factors and personality traits were used to predict neighborhood quality in a single multivariate linear regression model, extraversion (B = 0.08, SE = 0.01, p < 0.001), neuroticism (B = −0.07, SE = 0.01, p < 0.001) and conscientiousness (B = 0.04, SE = 0.01, p < 0.001) but not openness (B = 0.01, SE = 0.01, p = 0.28) or agreeableness (B = 0.01, SE = 0.01, p = 0.52) were significant. Likewise, in a multivariate model neighborhood inequality was significantly related to extraversion (B = −0.06, SE = 0.01, p < 0.001), neuroticism (B = 0.06, SE = 0.01, p < 0.001) and conscientiousness (B = −0.08, SE = 0.01, p < 0.001) but not to openness (B = −0.01, SE = 0.01, p = 0.22) or agreeableness (B = −0.01, SE = 0.01, p = 0.13). R^2-values of the two linear regression models indicated that the sociodemographic covariates accounted for 9.6% and 9.1% of the variation in perceived neighborhood quality and inequality, respectively. Including personality traits to the models increased R^2-values to 16.1% and 17.9%, implying that personality accounted for 6.5% and 8.8% of the variance in

Table 1
Correlations between independent variables (n = 3680).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(1) Gender	–													
(2) Age	02	–												
(3) Race, African American	05	−05	–											
(4) Race, Other	−04	−14	–	–										
(5) Working status	−06	−35	03	01	–									
(6) Parenthood	06	27	01	−05	−10	–								
(7) Marital status	−10	06	−10	−15	−03	30	–							
(8) Education	−09	−10	−06	−09	13	−16	03	–						
(9) Extraversion	06	−01	04	03	01	01	01	−02	–					
(10) Neuroticism	11	−14	−03	02	00	−04	−06	−10	−16	–				
(11) Openness	−08	−07	05	04	03	−10	−08	21	51	−17	–			
(12) Agreeableness	26	08	03	00	−04	03	−03	−09	53	−05	34	–		
(13) Conscientiousness	11	03	−01	−04	05	00	05	10	27	−20	27	29	–	
(14) Neighborhood quality	−10	15	−15	−11	−01	11	20	08	19	−20	12	10	17	–
(15) Neighborhood inequality	03	−16	11	10	04	−08	−22	−10	−20	21	−14	−14	−26	−52

Note. Decimal periods omitted. All correlations with $r \geqslant |03|$ are statistically significant ($p < 0.05$ at minimum).
Gender (0 = Men, 1 = Women), Working status (0 = not working, 1 = working), Parenthood (0 = no children, 1 = has children), Marital status (0 = not married, 1 = married). Variable 3 is coded here so that it reflects the difference between white and African American participants. Variable 4 is coded so that it reflects the difference between white participants and participants with other racial backgrounds (excluding African American participants).

perceived neighborhood quality and inequality, respectively, when adjusted for the role of sociodemographic variables.

3.1. Within-state migration

Of the participants who had not migrated between states, 1127 (32.7%) had migrated within state during the follow-up period. When assessed in separate logistic regression models, within-state migration was predicted by openness (OR = 1.13, SE = 0.04, $p = 0.002$) and extraversion (OR = 1.12, SE = 0.04, $p = 0.003$), but not by neuroticism (OR = 0.98, SE = 0.04, $p = 0.58$), conscientiousness (OR = 0.99, SE = 0.04, $p = 0.85$) or agreeableness (OR = 0.99, SE = 0.04, $p = 0.73$). We therefore entered openness and extraversion into a multivariate regression model and then assessed whether any of the three traits added to the prediction of migration when openness and extraversion were controlled. Neuroticism and conscientiousness were not significant, but agreeableness predicted lower likelihood of mobility in the multivariate model (Table 2, model 1, step 1). Fig. 1 shows the predicted probabilities of within-state migration by personality trait levels.

Controlling for sociodemographic factors and neighborhood satisfaction did not substantially alter the associations between personality and migration probability (step 2). When the more stringent migration measure was used, the regression coefficients of the personality traits remained very similar to those in step 2 (Openness OR = 1.11, SE = 0.06, $p = 0.05$; Agreeableness OR = 0.90, SE = 0.05, $p = 0.04$; Extraversion OR = 1.25, SE = 0.07, $p < 0.001$; n = 3022; see the method section for the description of the migration measure).

3.2. Between-states migration

During the follow-up period, 359 (9.2%) participants had migrated from their baseline state to another state. In separate models, between-states migration was predicted by openness (OR = 1.19, SE = 0.08, $p = 0.007$), but not by extraversion

Table 2
Predicting within- and between-states migration by personality and sociodemographic factors. Two separate nested logistic regression models, OR (SE).

	Model 1: Within-state migration		Model 2: Between-states migration	
	Step 1	Step 2	Step 1	Step 2
Openness[z]	1.11* (0.05)	1.09†	1.32*** (0.09)	1.29*** (0.10)
Agreeableness[z]	0.90* (0.04)	0.91* (0.05)	0.86* (0.05)	0.88* (0.06)
Extraversion[z]	1.12* (0.06)	1.25*** (0.07)	–	–
Gender	1.20* (0.10)	1.09 (0.10)	0.84 (0.10)	0.80† (0.10)
Age	0.95*** (0.00)	0.95*** (0.00)	0.97*** (0.00)	0.97*** (0.01)
Race/Ethnicity				
White	1.00	1.00	1.00	1.00
African American	0.93 (0.20)	0.70 (0.16)	0.85 (0.27)	0.76 (0.24)
Other	1.42 (0.28)	1.05 (0.21)	0.61 (0.21)	0.55† (0.20)
Employment status	–	0.98 (0.09)	–	0.94 (0.13)
Parenthood status	–	0.94 (0.10)	–	0.90 (0.13)
Marital status	–	0.58*** (0.05)	–	0.84 (0.10)
Education	–	1.02 (0.02)	–	1.03 (0.03)
Neighborhood quality[z]	–	0.83*** (0.04)	–	0.84* (0.06)
Neighborhood inequality[z]	–	1.25*** (0.06)	–	1.00 (0.07)
n	3299	3299	3760	3760

Gender (0 = Men, 1 = Women), Employment status (0 = not in paid employment, 1 = employed), Parenthood status (0 = no children, 1 = has children), Marital status (0 = not married, 1 = married). Neuroticism and conscientiousness did not predict migration, so they were omitted from the models.
Note.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.
† $p < 0.10$.
^{z} Standardized odds ratios.

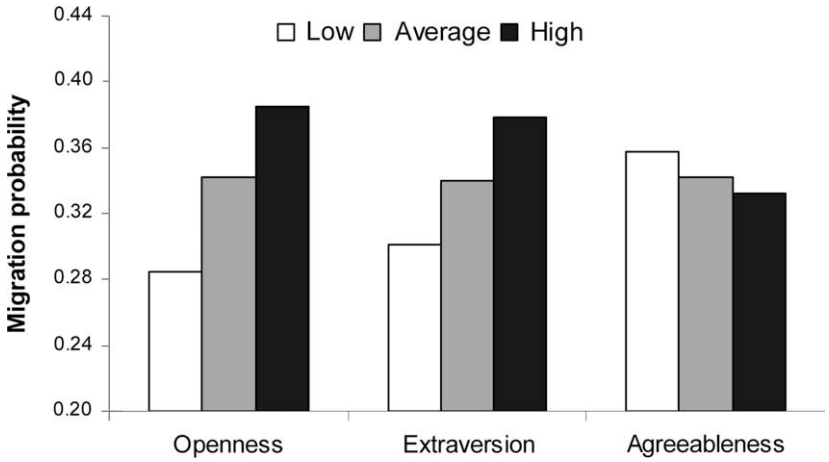

Fig. 1. Predicted probability of within-state migration by personality trait level (low = below 1 SD of mean, average = within 1 SD of mean, high = above 1 SD of mean).

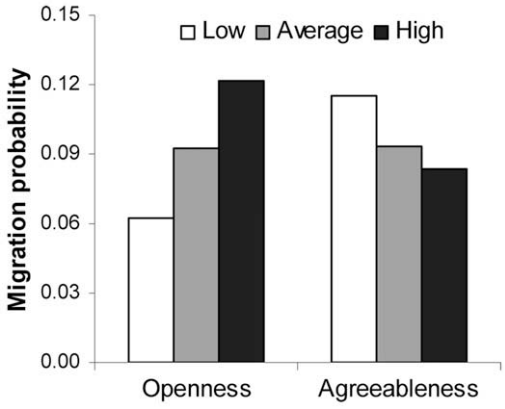

Fig. 2. Predicted probability of between-states migration by personality trait level (low = below 1 SD of mean, average = within 1 SD of mean, high = above 1 SD of mean).

(OR = 1.01, SE = 0.06, $p = 0.82$), agreeableness (OR = 0.95, SE = 0.05, $p = 0.34$), neuroticism (OR = 0.93, SE = 0.06, $p = 0.19$) or conscientiousness (OR = 1.03, SE = 0.06, $p = 0.59$). When openness was controlled for, agreeableness but no other traits predicted migration in a multivariate model (Table 2, model 2, step 1). Fig. 2 shows the predicted probabilities of between-states migration by personality trait groups. Adjusting for sociodemographic factors and neighborhood satisfaction did not alter the associations between personality and migration (step 2), and the regression coefficients remained substantially the same when the more stringent indicator of migration was used (Openness OR = 1.32, SE = 0.12, $p = 0.001$; Agreeableness OR = 0.89, SE = 0.06, $p = 0.10$; $n = 3664$).

4. Discussion

In a prospective longitudinal study of American adults, personality predicted residential mobility within and between U.S. states during a follow-up period of 7–11 years. High openness to experience and low agreeableness predicted increased migration within and between states, while high extraversion increased migration within but not between states. Adjusting for gender, age, education, employment status, marital status, parenthood status, and neighborhood satisfaction, did not substantially alter the associations between personality and migration. Migration was not predicted by neuroticism or conscientiousness.

In line with previous studies (Camperio Ciani et al., 2007; Jokela et al., 2008; Silventoinen et al., 2008), extraversion and openness to experience predicted increased migration propensity. It appears that outgoing and open-minded individuals who prefer novel stimuli are most likely to change their residential locations. However, in the present study extraversion predicted only within-state but not between-states migration whereas openness was particularly strongly associated with between-states migration. These patterns suggest that decisions of within- and between-states migrations may tap on different kinds of psychological dispositions. Together the present and previous findings provide support to the early theories of "mobicentric" personality tendencies that were thought to explain individual differences in migration propensity (Jennings, 1970).

The association between high agreeableness and decreased migration propensity has not been observed previously. Agreeableness reflects trustful, warm, and caring attitudes toward other people. We hypothesize that individuals with high agreeableness tend to form strong bonds to their community, friends, and relatives (e.g., Lounsbury, Loveland, & Gibson, 2003) and they are therefore less willing to change location than people with low agreeableness. Supporting this hypothesis, Boneva et al. (1998) found that high affiliation motive (related to high agreeableness) correlated with low desire to move to another country in a sample of Albanian youth (see also Boneva & Frieze, 2001; Kan, 2007).

In contrast to our hypothesis and findings from two previous studies (Jokela et al., 2008; Silventoinen et al., 2008), we observed no relationship between neuroticism and migration. Although this could reflect cultural differences, as the two studies associating neuroticism with migration were in Finnish samples, it is also possible that the conflicting findings reflect differences in measurement of migration. Further research in different countries and with different measures of migration is needed before these two possibilities can be further evaluated.

The associations between personality and neighborhood satisfaction indicated that extraverted, emotionally stable, and conscientious people considered their neighborhood in a more positive light than introverted, neurotic, and less conscientious individuals did. As data on objectively assessed neighborhood characteristics were not available, it was not possible to evaluate to what extent these associations reflected objective and subjective factors, i.e., whether different personalities actually live in different kinds of neighborhoods or whether personality affects the interpretation of neighborhood qualities independently of objective circumstances. Surprisingly, agreeableness and openness, which were consistently associated with migration, were not associated with

neighborhood satisfaction when other personality traits were taken into account.

The observation that personality plays a role in migration behavior may have wider implications for research in various branches of social sciences. For instance, high agreeableness may be related to accumulation of neighborhood social cohesion—a theme that has received much attention in recent literature of social capital and trust (Putnam, 2007). Insofar as agreeable people are more likely to stay in the same residential location than non-agreeable people, this selection effect may explain part of the observed association between low residential mobility and high social cohesion (Kan, 2007) because individuals staying in the same neighborhood tend to be more trustful, helpful, and caring than those who move. Of course, social selection models such as this are unlikely to explain neighborhood effects completely.

Over time, selective migration may even lead to regional differences in personality. Indeed, Rentfrow, Gosling, and Potter (2008) have recently demonstrated fairly consistent patterns of state-level personality differences in the United States. They also show that these differences correlate with many state-level social indicators. For instance, high openness to experience is associated with high patent production per capita and high proportion of people working in artistic and investigative occupations. These findings of Rentrfow et al. support Richard Florida's (2008) thesis that the clustering of open-to-experience personalities to particular regions is a crucial factor in economic growth. The present study is limited in that it assessed only general migration propensity and could not examine migration patterns in more detail, e.g., selective migration to particular regions. It will be of interest to examine whether personality predicts more specific forms of migration and whether migration flows related to personality differences aggregate to regional differences in social structures, such as neighborhood cohesion or economic development. These issues need to be addressed in future studies of migration psychology.

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