

Hostile and Harmful: Structural Stigma and Minority Stress Explain Increased Anxiety Among
Migrants Living in the UK After the Brexit Referendum

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Abstract

Objective: The extent to which the outcome of the EU referendum (“Brexit”) has affected the mental health of migrants living in the UK has been the subject of much speculation. However, no empirical attempts have been made to examine the mental health impact of the Brexit vote. Through the combination of structural stigma and minority stress theories, this study examined the extent to which the outcome of the Brexit referendum was associated with the mental health of migrants in the UK as a result of increased discrimination. **Method:** Adult migrants living in the UK ($N = 311$) participated in a longitudinal survey containing measures of discrimination and symptoms of generalized anxiety disorder (GAD) at baseline, one-month and six-month follow-ups. Participant data were matched to official voting records at the electorate level. **Results:** The percentage of “Leave” voters where participants lived was associated with increased discrimination, which was in turn associated with increased GAD symptoms, including the likelihood of experiencing clinically significant GAD symptoms over the course of the study ($OR = 3.01, 95\% CI = 1.25, 7.33$). The percentage of leave voters where participants lived was associated with increased GAD symptoms indirectly via increased discrimination (Standardized Indirect Effect = 0.12, 95% BC CI = 0.07, 0.19). **Conclusions:** This study demonstrates that voter referenda can have a detrimental impact on migrants’ mental health. Findings illustrate how aspects of structural stigma can produce experiences of minority stress, which can lead to negative mental health outcomes for members of marginalized populations.

Keywords: Mental Health; Generalized Anxiety Disorder; Migrants; Brexit; European Union Referendum

Public Health Significance

The present findings provide evidence for the widely theorized negative effects of the Brexit referendum on the social climate and mental health of migrants living in the UK. Clinicians may have to contend with higher levels of mental health problems in the UK's migrant population and may benefit from an awareness of how various aspects of the post-Brexit social climate can contribute to heightened anxiety and other forms of psychological distress. Further, the present study adds to a small but growing international body of evidence indicating that the social climate emerging from voter referenda on the rights of minority groups can be damaging for the mental health of minority groups by increasing exposure to social stress in the form of discrimination.

Hostile and Harmful: Structural Stigma and Minority Stress Explain Increased Anxiety Among Migrants Living in the UK After the Brexit Referendum

In 2016, the United Kingdom (UK) voted to leave the European Union (EU)—a decision popularly known as “Brexit”—via a public voter referendum (Electoral Commission, 2016). Research has demonstrated that voting to leave the EU was driven by anti-immigration sentiment (Goodwin & Milazzo, 2017; Hobolt, 2016) above and beyond the influence of other demographic and economic factors (Matti & Zhou, 2017). Anti-immigration sentiment in the UK has manifested in an increase in hate crimes against migrants following the Brexit vote (Home Office, 2018). UK policy has also focused on limiting migration by creating a “hostile environment” for migrants, aimed at decreasing net migration, limiting transition to citizenship, and removing migrants without documentation (Hiam, Steele, & McKee, 2018). These aspects of the post-Brexit referendum social climate have led to concerns over the degree to which Brexit will increase discrimination and mental health problems for minority ethnic communities in the UK (Heald, Vida, & Bhugra, 2018).

Theories of structural stigma (Hatzenbuehler, 2016) and minority stress (Meyer, 2003) offer potential explanations for whether and how the post-Brexit UK climate may be damaging for the mental health of migrants living in the UK. Structural stigma refers to societal- and cultural-level norms, conditions, and policies that restrict or prevent opportunities for equal participation in society for stigmatized groups (Hatzenbuehler, 2016). Community-level support for leaving the EU can be considered an indicator of structural stigma towards migrants living in the UK given negative attitudes toward migrants and restriction of migration were key factors in the “Leave” vote (Goodwin & Milazzo, 2017; Hatzenbuehler, 2016; Matti & Zhou, 2017). Minority stress refers to the social stress resulting from a stigmatized social status, of which

experiences of discrimination represent one form (Meyer, 2003). Excess exposure to social stress therefore places minority group members at heightened risk for negative mental health outcomes relative to their majority group peers (Meyer, 2003). When combined, the two theories have the potential to account for the cascading social psychological processes that link negative aspects of the social climate to negative mental health outcomes for minority group members (Pachankis & Bränström, 2018; Richman & Hatzenbuehler, 2014).

No attempts have been made to empirically examine the degree to which the social climate surrounding Brexit may be detrimental to the health of migrants in the UK via structural stigma and minority stress. However, studies on the impact of voter referenda and structural stigma in other contexts suggest this link. For example, studies of same-sex marriage referenda have shown that negative aspects of the social climate surrounding voter initiatives (e.g., exposure to negative campaign messages, living in areas with higher percentages of people voting against same-sex marriage) are associated with negative mental health outcomes (Flores, Hatzenbuehler, & Gates, 2018; Frost & Fingerhut, 2016; Perales & Todd, 2018). Additionally, structural stigma towards migrants in the form of United States (US) state-level restrictions on migration was found to be detrimental to the mental health of Latino migrants (Hatzenbuehler et al., 2017).

The current study examined the extent to which the social climate surrounding the Brexit referendum negatively affected the mental health of migrants living in the UK (hypotheses depicted in Figure 1). The study focused specifically on anxiety as a mental health outcome, given emerging qualitative and ethnographic research has highlighted how migrants living in the UK have attributed feelings of anxiety, fear, and uncertainty about the future to the result of the Brexit referendum (Browning, 2018; Guma & Dafydd Jones, 2019). Further, research in other

policy contexts has shown that generalized anxiety disorder (GAD) has been shown to be particularly sensitive to structural stigma, relative to other mental health outcomes (Hatzenbuehler, McLaughlin, Keyes, & Hasin, 2010). Discrimination was determined to be the minority stressor with the highest potential to result from structural stigma in the form of the Brexit vote given its theorized role as a distal minority stressor emanating directly from the social environment (Meyer, 2003). Observed increases in hate crimes, victimization, and unfair treatment based on race and religion in the UK following the Brexit vote (Home Office, 2018) further suggest a focus on discrimination as a relevant minority stress mechanism linking structural stigma to mental health. It was hypothesized that living in areas with a higher percentage of “Leave” voters (i.e., higher structural stigma) would be associated with increased experiences of discrimination (i.e., minority stress) following the referendum (H₁). It was also hypothesized that increases in experiences of discrimination would result in concomitant increases in GAD symptoms (H₂). Finally, it was hypothesized that Brexit referendum voting patterns would have a detrimental impact on anxiety indirectly by operating through increased experiences of discrimination (H₃).

Method

Participants

To be eligible, individuals had to be adult migrants presently living in the UK. Migrant status was defined based on country of birth, as anyone currently living in the UK that was born outside of the UK (Anderson & Blinder, 2017). Migrants from the US, Canada, Australia, and New Zealand were excluded because they experience privileged status in the UK due to shared language, culture, and positive portrayal in the EU referendum (Wellings, 2017). Participants were recruited through a pre-screened panel of online research volunteers constituted by Prolific,

chosen because of the need to collect data in immediate response to the referendum and because the high level of data quality and diversity of the Prolific panel (Peer, Brandimarte, Samat, & Acquisti, 2017). Only panel members who met the eligibility criteria were invited to participate. Participants were surveyed three times between February and October 2017, with the first survey occurring approximately seven months after the Brexit referendum on June 23, 2016. The average time between follow-up surveys was 6.35 weeks ($SD = 2.42$) at time two and 22.05 weeks ($SD = 2.74$) at time three. Attrition rates at times two and three were 15.11% and 32.24%, respectively. There were no differences in study measures between those who were lost to follow-up and those who completed all timepoints ($t_s = .28$ to $.49$, $p_s = .62$ to $.78$). Demographic information for the sample ($N = 311$) at time one is presented in Table 1. Ethical approval was provided by the University of Surrey and University College London.

Measures

Demographic information. Surveys included items to assess participants' ethnicity, gender, citizenship status, time living in the UK, age, education level, employment status, and the number of physical health problems participants had been diagnosed with prior to the study.

Discrimination. The nine-item Everyday Discrimination (Williams, Yu, Jackson, & Anderson, 1997) measure was included. Items from the first stage of the measure required participants to report on the following experiences of unfair treatment: being treated with less courtesy, less respect, receiving poorer services, being treated as not smart, people acting like they are afraid of you, people acting like you are dishonest, people acting like they are better than you, being threatened or harassed, and being called names or insulted. Participants indicated how often they experienced these forms of discrimination on a four-point scale ranging from 0 – “never” through 3 – “often”). The second stage of the measure requiring participants to attribute

the reasons for unfair treatment was not included for sake of brevity and avoiding the challenging and potentially inaccurate cognitive task of attribution (Lewis, Cogburn, & Williams, 2015). Summary scores were computed for each participant reflecting their average response (ranging from 0 to 3) across the nine items. Responses to the Everyday Discrimination measure in the current study were reliable at the levels of $\alpha_{\text{time1}} = 0.89$, $\alpha_{\text{time2}} = 0.89$, and $\alpha_{\text{time3}} = 0.90$.

Anxiety. The Generalized Anxiety Disorder 7 (GAD7) measure was used because it is a brief, previously validated, self-report measure to assess both symptoms of anxiety and identify probable cases of GAD in the general population (Löwe et al., 2008; Spitzer, Kroenke, Williams, & Löwe, 2006). Participants were asked to report how often they experienced symptoms of GAD over the previous two weeks on a 4-point scale ranging from 0 – “not at all” through 3 – “nearly every day”. Responses to the GAD7 in the current study were reliable at the levels of $\alpha_{\text{time1}} = 0.92$, $\alpha_{\text{time2}} = 0.92$, and $\alpha_{\text{time3}} = 0.93$. This measure was scored in two ways. First, a total score reflecting *GAD symptoms* was created for each participant, which ranged from 0 to 21. Second, following Spitzer and colleagues (2006) scores of 10 or greater on the GAD7 were taken to indicate moderate to severe symptoms of GAD that are likely indicative of clinically significant forms of GAD (i.e., scores of 10 or greater have a sensitivity of 89% and a specificity of 82%). Thus, an additional dichotomous outcome variable was computed to indicate whether or not each participant experienced *clinically significant GAD symptoms* ($\geq 10 = \text{yes} = 1$; $< 10 = \text{no} = 0$).

Results of the EU referendum. Data were obtained in the form of official vote counts (i.e., percentage of “Leave” voters) from the UK Electoral Commission (Electoral Commission, 2016), and electorate-level data were linked to participants’ current town/city of residence. For participants living in London who did not provide their exact borough of residence, the London

aggregate percentage of “Leave” voters was used.

Statistical Analysis

Hypotheses were tested within a structural equation modeling (SEM) context in order to simultaneously test the study’s hypotheses involving direct and indirect longitudinal effects (Cole & Maxwell, 2003) using IBM SPSS AMOS 25. Analyses involved simultaneous tests of both contemporaneous (i.e., change in predictors from one timepoint to the next predicting change in outcomes during the same timepoints) and lagged effects (i.e., change in predictors at one timepoint predicting change in outcomes at a later timepoint). Linear change in discrimination and GAD symptoms (0 – 21) were modeled by estimating effects of exogenous predictor variables controlling for the same endogenous outcome variable at an earlier timepoint, leaving only variance associated with change in an outcome to be explained by a hypothesized predictor (Cole & Maxwell, 2003). Binary logistic regression was used to test the extent to which changes in discrimination over the course of the study (i.e., discrimination at time three minus discrimination at time 1) were associated with the experience (yes or no) of clinically significant GAD symptoms (≥ 10) during the study controlling for the experience of clinically significant GAD symptoms at baseline. Missing data were minimal (ranging from 0 to 2.65% across assessments). The Multiple Imputation package within IBM SPSS 25 was used to examine patterns of missing data and impute missing values using fully conditional specification (based on all study variables reported in Table 2). No data were imputed for cases lost-to-follow-up.

Results

Table 2 reports descriptive statistics and bivariate associations between all study variables. Being white and an EU national were associated with lower levels of discrimination and were controlled for in subsequent analyses predicting changes in discrimination. Age and

prior health problems were associated with GAD symptoms and were controlled for in subsequent analyses predicting changes in GAD symptoms over the course of the study.

The results of longitudinal path analyses are presented in Table 3 and summarized in Figure 2. Regarding H₁, participants who lived in areas with higher percentages of “Leave” voters reported significantly more experiences of discrimination than those who lived in areas with fewer “Leave” voters. Furthermore, the percentage of “Leave” voters where participants lived was associated with increases in experiences of discrimination from time one to time two, as well as increases in discrimination from time two to time three. Regarding H₂, experiences of discrimination at time one were associated with significantly higher GAD symptoms. Further, increases in GAD symptoms from time one to time two were associated with increased levels of reported discrimination over the same period. Similarly, increases in GAD symptoms from time two to time three were associated with increased levels of reported discrimination over the same period. The lagged paths linking GAD symptoms at times two and three to discrimination at prior timepoints were negative, but were not statistically significant with 95% bias-corrected confidence intervals (BC CI) spanning zero. These models demonstrated adequate fit to the data, $\chi^2(25) = 56.26$, $\chi^2/df = 2.25$, CFI = 0.96, RMSEA = 0.08. H₃ was tested by calculating the BC CI around the indirect effect of the percentage of “Leave” voters on changes in GAD symptoms via changes in discrimination using maximum likelihood bootstrapping procedures with 10,000 samples (MacKinnon, Lockwood, & Williams, 2004). Indirect effects with confidence intervals that did not include zero were considered statistically significant (MacKinnon et al., 2004). Significant indirect effects of the percentage of “Leave” voters where participants lived was observed to produce, via increases in discrimination, concomitant increases in GAD symptoms over the course of the study (Standardized Indirect Effect = 0.12, 95% BC CI = 0.07, 0.19).

Finally, increases in discrimination over the course of the study were shown to increase the likelihood of clinically significant GAD symptoms ($\geq 10 = 1$ vs. $< 10 = 0$). As shown in Table 4, a one unit increase in discrimination from time one to time three was associated with a three-fold increase in the likelihood of experiencing clinically significant GAD symptoms, controlling clinically significant GAD symptoms at time one along with ethnicity, age, EU nationality, and other health conditions at the start of the study. All tests of study hypotheses were rerun using only complete cases, which did not produce any meaningful differences.

Discussion

The present study demonstrates a link between aspects of the post-Brexit social climate and the mental health of migrants living in the UK. Migrants in areas of the UK that had higher percentages of “Leave” supporters were more likely to experience increased discrimination over time after the referendum. In turn, increases in discrimination over time were associated with contemporaneous increases in GAD symptoms. The findings demonstrate an indirect pathway whereby living in areas with high percentages of “Leave” supporters was associated with increases in GAD symptoms as a result of increased discrimination. Indeed, experiencing increased discrimination after the Brexit vote was indicative of a significantly greater likelihood of experiencing clinically significant GAD symptoms over the course of the study. These findings held after controlling for factors known to be associated with discrimination and mental health (i.e., ethnicity, age, and previously diagnosed health problems).

There was no directly observed association between “Leave” voting and symptoms of generalized anxiety disorder. However, the observed indirect effect of “Leave” support on symptoms of generalized anxiety disorder via increased discrimination held and did not require a direct effect in order to demonstrate a mediated pathway (MacKinnon et al., 2004). Indeed, it

may be the case that the mental health impact of the percentage of “Leave” voters in one’s community may not be perceived or felt directly, but is more likely to manifest in negative interpersonal interactions, such as discrimination, as the present findings indicate. These findings suggest the need to utilize a combination of structural stigma and minority stress perspectives in research on stigma and minority group health, given a focus on one or the other limits researchers’ abilities to detect deleterious effects of the social climate on individual-level outcomes. Specifically, it shows that discrimination functions as a minority stress process that connects structural stigma at the macro-level to changes in individual-level mental health outcomes. In this regard, this study adds to the small but growing number of studies that have begun to identify the mechanisms linking structural stigma to health in stigmatized populations (e.g., Evans-Lacko, Brohan, Mojtabai, & Thornicroft, 2012; Pachankis & Bränström, 2018). The use of a longitudinal design further bolsters the current study’s contribution to broader efforts to understand the causal pathways through which structural stigma can damage health (Hatzenbuehler, 2016).

Policy makers interested in protecting and improving the mental health of migrants need to be aware of how the pursuit of referenda aimed at reducing and controlling migration create a social climate that can be detrimental to the mental health of migrants. Conversely, it should also be noted that the present findings illustrate what may be the intended consequences of policies aimed at creating a “hostile environment” (Hiam et al., 2018) for migrants, thereby using structural stigma to keep migrants “down” (e.g., damaging their mental health) and “away” (e.g., making migrants want to leave, discouraging future migration) (Link & Phelan, 2014). Clinicians may have to contend with higher levels of mental health problems among migrants in such contexts and may benefit from an awareness of how forms of structural stigma and minority

stress can contribute to heightened anxiety and other forms of psychological distress, particularly in areas with high levels of support for anti-migrant policies. This added stress burden is of particular concern given migrants already represent an at-risk population for mental health problems given the stress associated with migration itself (Lindert, Ehrenstein, Priebe, Mielck, & Brähler, 2009).

The findings are limited to GAD as assessed through a validated self-report measure. Future research is needed to replicate and extend the present explanatory models given a range of mental and physical health outcomes have been established as consequences of both structural stigma and minority stress. Further, the current study was limited in its focus on discrimination as a distal form of minority stress. There may be additional proximal minority stress processes that connect structural stigma to mental health in the post-Brexit UK context. For example, identity concealment has been shown to mediate the relationship between structural stigma and life satisfaction for sexual minorities in 28 European countries (Pachankis & Bränström, 2018), and migrant's concealment of their status may play a role in their negotiation of the complexities of the stigmatizing social climate after the Brexit referendum. Additionally, due to the time-sensitive nature of the study, it was not possible to obtain a nationally representative sample. The current study also lacks a comparison group of non-migrants, and thus additional research is needed to examine whether the aspects of the social climate assessed represent a unique and additive risk for increased symptoms of generalized anxiety disorder for migrants relative to the general population.

Despite these limitations, the current study provides the first evidence that aspects of the post-Brexit social climate in the UK can have a detrimental impact on migrants' mental health. The degree to which the post-Brexit social climate may be emerging as not only hostile but also

harmful for migrants living in the UK is in need of additional attention by researchers, policy makers, and clinicians. The present findings provide a useful starting place for future efforts to understand, prevent, and treat mental health problems stemming from the negative social climates that emerge from popular voter referenda concerning the rights of marginalized groups.

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Table 1. Sample Demographic Characteristics.

| | Mean | Standard Deviation |
|--------------------------------------|------------------|---------------------------|
| Age | 30.64 | 9.09 |
| Time living in United Kingdom | 9.67 | 9.11 |
| | Frequency | Percentage |
| Region | | |
| North | 9 | 2.9 |
| Yorks and Humberside | 22 | 7.1 |
| East Midlands | 19 | 6.1 |
| East Anglia | 16 | 5.1 |
| South West | 14 | 4.5 |
| West Midlands | 20 | 6.4 |
| North West | 18 | 5.8 |
| Wales | 13 | 4.2 |
| Scotland | 33 | 10.6 |
| London | 105 | 33.8 |
| Northern Ireland | 3 | 1.0 |
| South East | 38 | 12.2 |
| Employment Status | | |
| Employed full time | 106 | 34.1 |
| Employed part time | 41 | 13.2 |
| Self-employed | 39 | 12.5 |
| In full time education | 84 | 27.0 |
| Unemployed | 35 | 11.3 |
| Retired | 6 | 1.9 |
| Income Below £30,000 | 137 | 44.1 |
| Citizen of the United Kingdom | 65 | 20.9 |
| Country of Origin | | |
| European Union national | 197 | 63.3 |
| Outside the European Union | 114 | 36.7 |
| Gender | | |
| Male | 108 | 34.7 |
| Female | 201 | 64.6 |
| Something else | 2 | 0.6 |
| Ethnicity | | |

| | | |
|-------------------------------|-----|------|
| White | 213 | 68.5 |
| Black/Black British | 15 | 4.8 |
| Asian/Asian British | 56 | 18.0 |
| Arab | 2 | 0.6 |
| Mixed/ Multiple Ethnic Groups | 10 | 3.2 |
| Something else | 15 | 4.8 |

Sexual Orientation

| | | |
|--------------------------|-----|------|
| Gay or Lesbian | 9 | 2.9 |
| Bisexual | 19 | 6.1 |
| Heterosexual or Straight | 278 | 89.4 |
| Something else | 5 | 1.6 |

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Table 2. Bivariate correlations and descriptive statistics for independent, control, and outcome variables

| Independent and Control Variables | Generalized Anxiety Disorder Symptoms (GAD7) ¹ | | | M/% | SD |
|--|---|--------------|--------------|--------|-------|
| | GAD7 @Time 1 | GAD7 @Time 2 | GAD7 @Time 3 | | |
| <i>Continuous Variables</i> | | | | | |
| Discrimination @Time 1 | 0.36*** | 0.24*** | 0.28*** | 0.77 | 0.62 |
| Discrimination @Time 2 | 0.32*** | 0.29*** | 0.28*** | 0.77 | 0.60 |
| Discrimination @Time 3 | 0.38*** | 0.38*** | 0.41*** | 0.75 | 0.62 |
| Percentage "Leave" Voters in locality | 0.03 | 0.07 | 0.10 | 45.89 | 11.09 |
| Number of Previously Diagnosed Health Problems | 0.17** | 0.12 | 0.12 | 0.50 | 1.09 |
| Number of Years Living in the UK | 0.07 | 0.08 | 0.11 | 9.67 | 9.11 |
| Age (in Years) | 0.05 | 0.13* | 0.14 | 30.64 | 9.09 |
| <i>Dichotomous Variables</i> | | | | | |
| Male (= 1, Female = 0) | -0.04 | -0.04 | -0.09 | 34.73% | |
| UK Citizen (=1, non-citizen = 0) | 0.03 | -0.06 | -0.02 | 20.90% | |
| White (=1, other ethnicity = 0) | -0.07 | 0.03 | -0.07 | 68.49% | |
| EU National (=1, non-EU national = 0) | -0.04 | 0.05 | -0.04 | 63.34% | |
| Income above £30,000 ² (=1, < 30,000 = 0) | -0.04 | 0.01 | -0.05 | 47.31% | |
| Unemployed (=1, other employment = 0) | 0.02 | 0.02 | 0.05 | 11.25% | |
| <i>M</i> | 6.67 | 6.45 | 5.94 | | |
| <i>SD</i> | 5.37 | 5.16 | 5.10 | | |
| <i>N</i> | 308 | 257 | 184 | | |

*** $p < .001$, ** $p < 0.01$, * $p < 0.05$.

¹ Generalized Anxiety Disorder symptoms reflect GAD7 total scores ranging from 0 to 21.

² Equivalent to approximately \$44,394 (US) at the time of the United Kingdom European Union membership (Brexit) referendum.

Table 3. Associations between EU referendum voting, experiences of discrimination, and symptoms of generalized anxiety disorder (GAD) among migrants in the UK

| Paths from: | Standardized Coefficients (95% Bias Corrected Confidence Intervals) | | | | | |
|---------------------------------|---|----------------------------|----------------------------|--------------------------|--------------------------|--------------------------|
| | To Discrimination @ Time 1 | To Discrimination @ Time 2 | To Discrimination @ Time 3 | To GAD Symptoms @ Time 1 | To GAD Symptoms @ Time 2 | To GAD Symptoms @ Time 3 |
| % Leave Voters | 0.38** (0.30 to 0.47) | 0.08* (0.01 to 0.16) | 0.19** (0.13 to 0.26) | | | |
| Discrimination @ Time 1 | | 0.71** (0.58 to 0.81) | | 0.37** (0.21 to 0.50) | -0.08 (-0.2 to 0.10) | |
| Discrimination @ Time 2 | | | 0.44** (0.29 to 0.60) | | 0.20* (0.02 to 0.35) | -0.14 (-0.31 to 0.04) |
| Discrimination @ Time 3 | | | | | | 0.30* (0.10 to 0.46) |
| Symptoms of GAD @ Time 1 | | | | | 0.62** (0.48 to 0.73) | |
| Symptoms of GAD @ Time 2 | | | | | | 0.54** (0.37 to 0.70) |
| Ethnicity (white = 1) | -0.36** (-0.56 to -0.14) | 0.03 (-0.13 to 0.22) | -0.09 (-0.24 to 0.08) | | | |
| EU National | 0.08 (-0.14 to 0.27) | -0.03 (-0.20 to 0.11) | -0.06 (-0.24 to 0.08) | | | |
| Number of Prior Health Problems | | | | 0.10 (-0.01 to 0.29) | -0.01 (-0.14 to 0.07) | 0.05 (-0.04 to 0.19) |
| Age (in years) | | | | 0.03 (-0.11 to 0.18) | 0.04 (-0.06 to 0.15) | 0.03 (-0.08 to 0.13) |
| R-Squared | 0.18* (0.05 to 0.27) | 0.55** (0.40 to 0.65) | 0.54** (0.41 to 0.65) | 0.15* (0.05 to 0.26) | 0.45* (0.30 to 0.57) | 0.53** (0.41 to 0.64) |

Note: Values reflect standardized path coefficients (and 95% bias corrected confidence intervals) from path models using 10,000 bootstrapped samples. GAD symptoms total scores ranged from 0 to 21. ** $p < 0.01$, * $p < 0.05$.

Table 4. Tests of the effect of changes in discrimination on whether or not participants experienced clinically significant generalized anxiety disorder symptoms over the course of the study.

| Variables in Equation | <i>b</i> | <i>p</i> | OR | 95% CI for OR | |
|----------------------------------|----------|----------|-------|---------------|-------|
| | | | | Lower | Upper |
| Constant | -3.00 | <0.001 | 0.05 | | |
| Change in Discrimination | 1.11 | 0.01 | 3.02 | 1.25 | 7.33 |
| GAD7 \geq 10 at Start of Study | 2.48 | <0.001 | 11.95 | 5.12 | 27.88 |
| Ethnicity (white = 1) | -0.77 | 0.36 | 0.46 | 0.09 | 2.43 |
| European Union National | 0.57 | 0.49 | 1.77 | 0.35 | 8.98 |
| Number of Prior Health Problems | 0.08 | 0.63 | 1.08 | 0.79 | 1.47 |
| Age (in years) | 0.03 | 0.17 | 1.03 | 0.99 | 1.08 |

Note: Results were obtained from binary logistic regression predicting experiences of clinically significant generalized anxiety disorder symptoms (GAD7 total scores \geq 10 = 1, $<$ 10 = 0) at either time 1 or time 2.

Figure 1. Hypothesized effects of EU referendum voting patterns on exposure to discrimination and mental health among migrants living in the UK

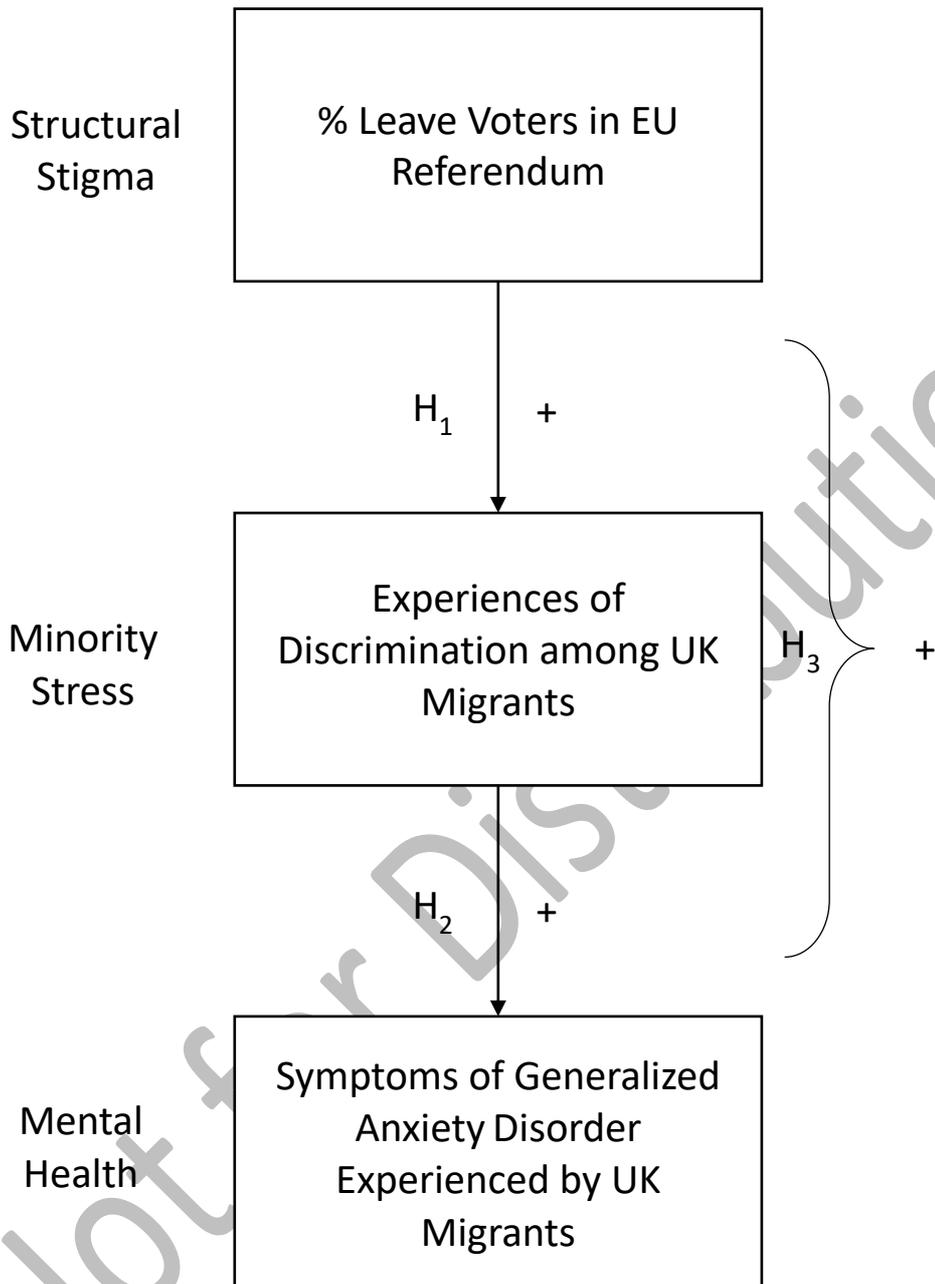
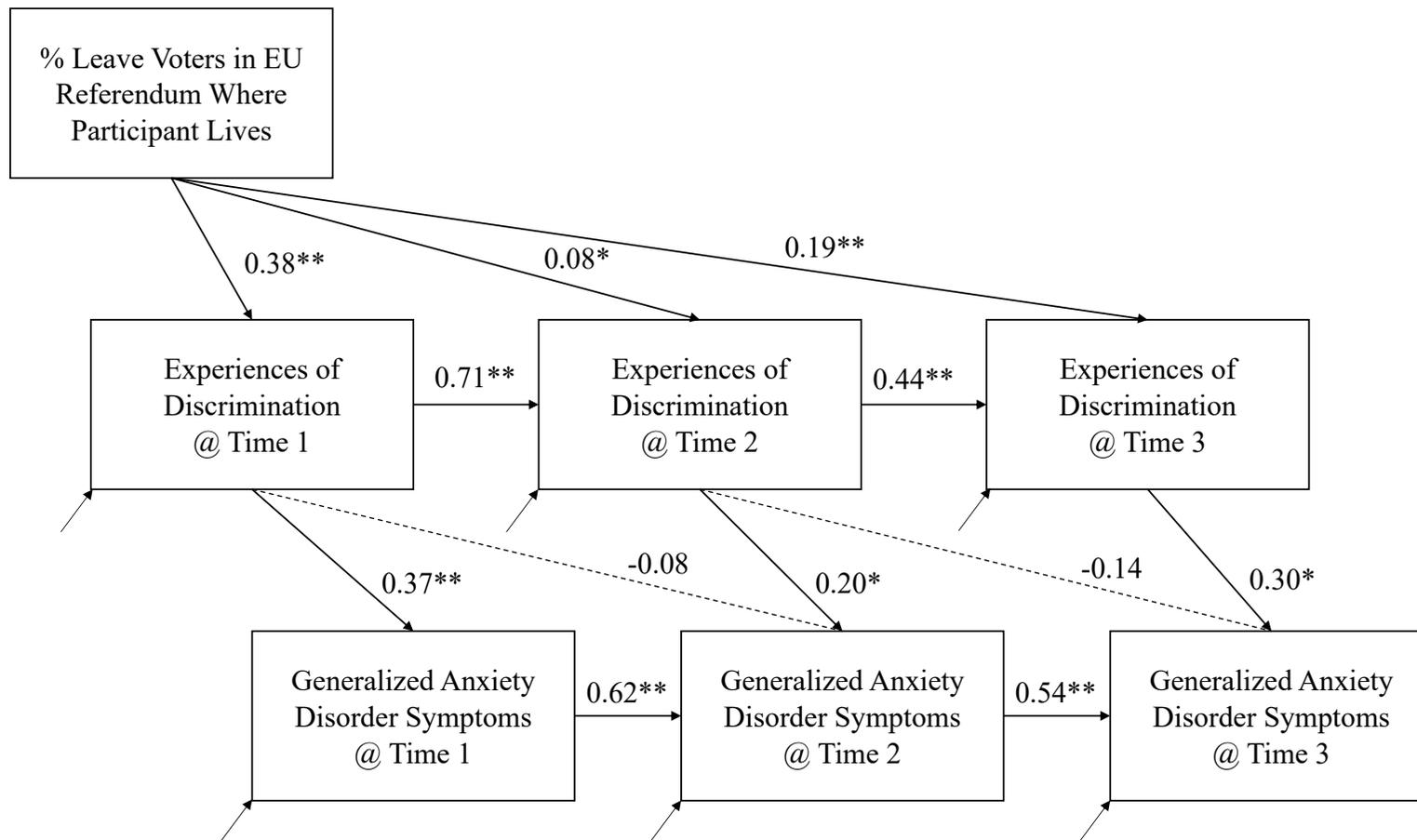


Figure 2. Longitudinal path model predicting changes in symptoms of generalized anxiety disorder based on local EU referendum voting patterns and reported experiences of discrimination



Note: Values represent standardized path coefficients. Generalized Anxiety Disorder Symptoms were scored on a scale from 0 to 21. Experiences of discrimination were scored on a scale of 0 to 3. ** p < .01 * p < .05