Examining Selective Migration as Attitudinal Fit versus Gay Migration

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Abstract

Gay migration is a popular culture notion that lesbian, gay, and bisexual (LGB) people move from places that are not gay-friendly to places that are gay-friendly. Such migration may reflect *person-environment fit*, and it may be comparable to other types of person-environment fit that may rely on attitudes. The present research examines psychological mechanisms underlying LGB and straight people's migration in search of fit, based on sexual orientation, sexuality attitudes, and contextual cues to gay friendliness. In Study 1, we leveraged a very large, ecologically valid internet sample to examine real-world migration, and in Study 2, we experimentally manipulated gay culture to examine desire to migrate. Both studies provide evidence for person-environment fit moderated by sexual orientation: LGB people largely migrated to gay-friendly places regardless of their own sexuality attitudes, whereas straight people migrated to places that matched their sexuality attitudes. We discuss the implications of these findings for LGB people's health and well-being, demonstrating the importance of fostering gay culture as it relates to fit and belonging among LGB people.

Key Words: Sexual orientation; attitudes; person-environment fit; selective migration; regional psychology

"Note to self: Don't be gay in Indiana…there are places where it's in to be out, maybe San

Francisco or thereabout." -The Prom, 2018

Person-environment fit—the idea that characteristics of both the person and the situation

jointly affect a person's outcomes (Caplan & Harrison, 1993)—is a cornerstone of psychology.

People tend to live in environments that fit them to promote better outcomes. One way in which

people can increase fit with their environments is by moving from places that are not congruent

with their goals, interests, and attributes to other places that are better fits for them (e.g., Motyl et

al., 2014; Rentfrow et al., 2008) – a process called *selective migration*. The pursuit of person-

environment fit through selective migration may be especially relevant in the context of sexual

orientation. Lesbian, gay, and bisexual (LGB) people are often portrayed in popular culture –

such as in the Broadway production *The Prom* – as selectively migrating away from gay-

unfriendly places to gay-friendly places to find community and acceptance. In this process of *gay*

migration, LGB people often migrate to cities that are viewed as safe places for LGB people to

live and develop their identities (Weston, 1995). The present research quantitatively examines

gay migration from the perspective of person-environment fit, and considers it against other

operationalizations of fit that might influence the migration of straight people.

Selective Migration and Person-Environment Fit

Many different motivations guide migration, and people may migrate based on features

of environments or of themselves. People report environmental factors related to housing,

family, and employment as reasons for migration (Jokela, 2021; Sánchez & Andrews, 2011;

Wimark, 2016). Similarly, public policy related to housing (e.g., rent control, tenant protection)

affects migration (Sánchez & Andrews, 2011), as does regional culture, in that residential

mobility is more common in some places than others (Oishi et al., 2015a; Sánchez & Andrews, 2011). Individual factors also affect migration: personality traits like extraversion and openness are related to higher rates of residential mobility (Campbell, 2019; Jokela, 2009), and personality can interact with environmental factors like employment opportunities or family constraints to influence migration. Taken together, environmental features and individual differences each influence migration, and can also work together to jointly influence migration through the process of maximizing person-environment fit.

Person-environment fit can be maximized through selective migration, in which people move away from geographic locations that do not fit them in search of places that do. People who fit their environment experience positive psychological outcomes: greater fit (versus misfit) correlates positively with subjective well-being and self-esteem (Götz et al., 2018; Du et al., 2021), longevity (Ebert et al., 2020), self-esteem (Bleidorn et al., 2016), and life satisfaction (Jokela et al., 2015). Similarly, exposure to religious cues that signal fit improves people's self-esteem, mood, and feelings of inclusion (Schmitt et al., 2010). Moreover, the relationship between people and their environments is a two-way street: when like-minded people cluster in an environment, they can influence physical structures in that environment. For example, conservative (versus liberal) people prefer communities with Protestant churches, Walmarts, and sport-utility vehicles (Motyl et al., 2020). Physical markers such as these may encourage people to migrate to a place because they suggest to people that they will be able to find like-minded others and the kinds of amenities that are important to them – in other words, they signal fit.

Person-Level Factors Related to Fit

In addition to migration based on personality and political markers, people also selectively migrate to places that signal fit in terms of their sexual orientation. In the context of

gay migration, LGB people migrate to gay-friendly places to find community and develop their identities (Weston, 1995; Annes & Redlin, 2012). Most research on gay migration focuses on LGB migration to cities (Weston, 1995; Annes & Redlin, 2012; Wimark, 2015; Wimark & Östh, 2014). That said, the apparent desirability of cities to LGB people may vary as a function of gender: whereas gay men tend to migrate to cities, regardless of the concentration of gay men, lesbian women migrate to less populous places with strong lesbian community (Cooke & Rapino, 2007). Moreover, LGB people do not only live in or migrate to cities. Instead, there is evidence that partnered homosexual couples, as well as gay men who are originally from rural areas, leave cities after some time there (Annes & Redlin, 2012; Cooke & Rapino, 2007). Taken together, previous research demonstrates gay migration in both urban and rural contexts, but this body of work is limited both in its methodological approach and also in the scope of sexual identities examined.

Existing gay migration research has primarily focused on gay men (Annes & Redlin, 2012; Wimark, 2015; Wimark & Östh, 2014) and couples (Cooke & Rapino, 2007; Wimark & Östh, 2014). Additionally, existing gay migration research is largely qualitative (Annes & Redlin, 2012; Weston, 1995; Wimark, 2015; Wimark, 2016) or non-experimental (Cooke & Rapino, 2007; Wimark & Östh, 2014). Therefore, we aim to fill these gaps in the literature with quantitative work that includes not only gay men, but also lesbian women and bisexual people. Moreover, migration may also vary for different LGB people, not based solely on their sexual orientation. Though gay migration focuses on sexual orientation's effect on migration, *sexuality attitudes,* or one's affective evaluations of straight, gay, and lesbian people, may also influence migration.

Sexuality attitudes affect how LGB people view and behave towards themselves (Hatzenbuehler et al., 2009), as well as how straight people behave towards LGB people (Lazarević et al., 2015; Gabriel et al., 2007). Building on previous work, the present research examines the extent to which migration is related to sexuality attitudes. Importantly, sexuality attitudes are sometimes incongruent with sexual orientation, and some LGB people have negative attitudes towards other LGB people (e.g., internalized homophobia). Whereas gay migration is typically characterized by LGB people migrating to gay-friendly places, gay migration might not result in fit for LGB people who internalize homophobia. Instead, LGB people who internalize homophobia may have to choose between gay-unfriendly places that align with their attitudes versus gay-friendly places that align with their sexual orientation. Thus, by investigating the role of sexual orientation together with sexuality attitudes, we are positioned to examine fit in terms of these two person-level dimensions – dimensions that can theoretically complement or conflict with one another.

The present research is also positioned to examine factors that contribute to straight people's migration. In contrast to gay migration, straight migration may reflect a different combination of motivations because, for example, straight people are higher status and more populous than gay people (Conron & Goldberg, 2020). Consequently, straight people's sexual orientation may not be a salient social identity (Leonardelli et al., 2010), and their sexual orientation may not strongly influence their decision to migrate. From this perspective, straight people's migration should be primarily guided by their sexuality attitudes. Moreover, though gay migration is the established term to explain migration based on sexual orientation (Weston, 1995), the extent to which gay migration differs from other forms of person-environment fit remains an empirical question. Consequently, the present research will include both straight and

LGB people to determine the degree to which sexual identity and sexuality attitudes contribute to migration for both groups.

Place-Level Factors Related to Fit

The present research investigates relationships among sexual orientation, sexuality attitudes, and gay friendliness and gay culture in places. Sexual orientation and sexuality attitudes are person-level factors, whereas gay friendliness and gay culture are place-related factors. Before we can study the influence of place-level factors on migration, we must first define what a place is. On a basic level, a place is defined as a location for events (Paasi, 1991), or, more specifically, a location for social events and interactions (Fullilove, 1996). Building on these descriptive definitions of places, theorists often operationalize places in terms of their psychological meaning. Rather than simple physical settings, places also include the social and psychological processes that occur in the setting (Stedman, 2002), and the social and cultural contexts that add value to a location that make it a place (Brandenburg & Carroll, 1995; Tuan, 1977). Therefore, physical structures as well as the meaning ascribed to them are features of places (Cresswell, 2015). Synthesizing these perspectives, we operationalize places in two ways in the present research: as regional norms about gay-related issues, and as physical structures in communities. Norms can serve as proxies for friendliness towards and acceptance of LGB people, and physical structures can signal the presence of gay culture and institutions. Both operationalizations offer complementary insight into place-level factors as they may relate to gay migration.

Overview of Studies

In two studies, the present research investigates the contributions of person- and place-level factors to the migration of LGB and straight people. We consider two dimensions of the

person that may guide people's decisions to leave one place and move to a new place: their

sexual orientation and their sexuality attitudes. We operationalized sexual orientation in both

studies in terms of participants' self-reported sexual identity. In both studies, we operationalized

sexuality attitudes in two main ways: implicitly and explicitly. Explicit measures rely on self-

report and are assumed to reflect the influence of relatively deliberate cognitive processes. In

contrast, implicit measures generally infer biases through the speed or accuracy of responses,

rather than from the contents of responses, per se. As such, implicit measures are assumed to

reflect the influence of relatively unintentional cognitive processes (Gawronski & Bodenhausen,

2006). To the extent that migration is a deliberate choice, then we should expect for explicitly

measured sexuality attitudes to correspond most closely with LGB and straight people's

migration. However, people do not always have conscious access to the cognitive processes that

influence their judgments and behaviors – even ones that are made deliberately (e.g., Nisbett &

Wilson, 1977). Consequently, the extent to which implicitly-measured sexuality attitudes

correspond with migration remains an open question.

     In the present research, we also consider two different dimensions of the environment

that may signal acceptance to LGB people in particular. In Study 1, we operationalize gay

friendliness in terms of public opinion about support for LGB-related rights, and in Study 2 we

operationalize gay friendliness in terms of visual environmental cues related to gay culture.

Study 1 relies on large national data sources to examine the actual migration patterns of Internet

participants, and pre-registered Study 2 experimentally manipulates gay friendliness and

measures participants' desire to migrate. By combining the strengths of an ecologically-valid,

high-powered design with an experimental, internally-valid design, the present research is well-

positioned to provide insight into the processes related to gay migration. We report all measures, manipulations, and exclusions in both studies.

Study 1

Methods

Participants

Participants were 1,360,671 U.S. residents who visited Project Implicit (implicit.harvard.edu) and completed at least one of the following sexuality attitude measures between April 30, 2004 and December 31, 2019: the implicit association test (IAT: Greenwald et al., 1998), relative preference measure, feeling thermometers. Participants were included in analyses if they reported their sexual orientation and the postal codes of both the place that they have lived the longest and the place that they currently live. Other demographic information, including age, sex, political ideology, race/ethnicity, and education level were included in analyses, but were not inclusion criteria. Multiple Imputation by Chained Equations (MICE) was performed to impute missing demographic information (van Buuren & Groothuis-Oudshoorn, 2011).

Participants were predominately women (65.7%) and White (68.8%). Participants tended to be more liberal; on a 7-point scale ranging from 1 ("Strongly Conservative) to 7 ("Strongly Liberal"), participants on average fell between Neutral and Slightly Liberal ($M = 4.74$, SD = 1.63). Most participants completed at least high school (83.7%) and 40.9% had some sort of college degree, with an additional third having completed some college. Roughly three-quarters (74.8%) of participants were straight, 10.3% were gay/lesbian, and 11.8% were bisexual. The remaining participants fell into an "Other" category (3.1%) that included Other, Queer, Asexual, or Questioning. Demographic data broken down by sexual orientation is listed in Table 1.

Table 1

Descriptive Statistics of Unstandardized Scale Variables by Sexual Orientation.

Variable	Straight		Gay/Lesbian		Bisexual		Other	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Age	27.00	11.06	28.71	11.57	24.49	8.71	24.94	9.22
Political Ideology	4.46	1.62	5.68	1.33	5.46	1.39	5.70	1.39
Regional Gay Friendliness of Longest-Lived DMA	2.90	0.22	2.90	0.22	2.90	0.22	2.90	0.22
Regional Gay Friendliness of Current DMA	2.90	0.22	2.92	0.22	2.91	0.22	2.92	0.22
Sexuality IAT D-Score	0.35	0.45	-0.17	0.45	-0.03	0.47	-0.13	0.48
Attitude Preference Measure	0.26	0.90	-0.95	0.95	-0.57	0.72	-0.82	1.00
Feeling Thermometer – Straight Men	7.79	2.14	5.65	2.44	6.65	2.42	5.68	2.65
Feeling Thermometer – Straight Women	8.11	2.04	7.45	2.03	7.40	2.08	7.19	2.10
Feeling Thermometer – Gay Men	6.61	2.61	7.79	1.98	7.62	2.01	7.44	2.14
Feeling Thermometer – Lesbian Women	6.46	2.45	7.81	2.21	7.93	1.98	7.90	2.13
Feeling Thermometer Difference – Men Only	1.18	2.70	-2.13	2.62	-0.97	2.36	-1.76	2.90
Feeling Thermometer Difference – Women Only	1.66	2.59	-0.35	2.51	-0.51	1.97	-0.69	2.23
Feeling Thermometer Difference – Average Across Gender	1.43	2.36	-1.24	2.02	-0.73	1.73	-1.23	2.25

Materials and Measures

In addition to reporting demographic and location information, participants completed implicit and explicit sexuality attitude measures. Materials, measures, and data are available at https://osf.io/ctqxo/ (Xu et al., 2021).

Implicit Attitude Measure. Participants completed the Sexuality IAT, which is a dual-categorization task in which participants respond to stimuli reflecting sexual orientations (i.e., gay people, straight people) and attributes (e.g., good, bad) with a computer-key press. In some blocks of trials, participants respond to gay and good stimuli with one key, and to straight and bad stimuli with another key. In other blocks of trials, the key assignments are switched and participants respond to gay and bad stimuli with one key, and to straight and good stimuli with another key. The speed with which participants respond to one set of pairings (e.g., gay-good)

relative to another set of pairings (e.g., straight-good) is assumed to reflect the relative strength with which they associate each sexual orientation with positive versus negative attributes. The Sexuality IAT was scored according to the D-scoring algorithm recommended by Greenwald and colleagues (2003), with positive D-scores interpreted to reflect evaluative preferences for straight people over gay people.

Explicit Attitude Measures. Participants completed two types of measures of explicit sexuality attitudes: attitude preference and feeling thermometers. On the attitude preference measure, participants indicate their attitudes towards straight people compared to gay people. Early visitors to Project Implicit completed the attitude preference measure on a 5-point scale, but in more recent years visitors completed it on a 7-point scale. Consequently, we standardized responses on each version of the measure, then combined them to create one attitude preference measure.

Feeling thermometers asked participants to rate the warmth they feel towards a social group, with 0 reflecting "Coldest" and 10 reflecting "Warmest" feelings. Four separate feeling thermometers measured feelings towards gay men, lesbian women, straight men, and straight women. We used the four feeling thermometers to calculate three indices of relative preference for straight people versus gay people. We subtracted the gay men feeling thermometer from the straight men feeling thermometer to create a relative preference index for straight versus gay men. Similarly, we subtracted the lesbian women feeling thermometer from the straight women feeling thermometer to create a relative preference index for straight versus lesbian women. Finally, we averaged these two indices together to create relative preference index for straight versus gay people.

Regional Gay Friendliness. The Public Religion Research Institute (PRRI) surveys representative samples of Americans to gather public opinion data regarding a wide variety of topics related to religion, including gay-related issues. Between 2017-2019, PRRI asked American respondents three questions about their support of gay marriage, LGBT anti-discrimination laws, and refusing business services to LGBT patrons (Appendix A). PRRI also collected respondents' location in the form of Designated Market Area (DMA). DMAs are defined as geographic regions in which the population shares access to the same (or similar) media, such as television, radio, newspaper, and Internet content (Nielsen, n.d.). There are 210 DMAs that cover the entire US, except for a few regions in Alaska, which, for the purposes of this study, were grouped together as a 211th DMA.

Based on data from 6,715 respondents[1] who answered at least one of the gay-friendliness items, we aggregated all responses into DMA-level estimates of gay friendliness. To operationalize regional gay friendliness, we aggregated participants' responses to the three gay-related questions for each DMA ($\alpha = 0.62$). Despite the alpha for the regional gay friendliness index not reaching the conventional threshold of 0.70, internal reliability does not improve if any items are removed from the scale. We reverse-coded responses to the question about refusing business services, such that higher scores on all three items reflected greater gay friendliness. Because DMA is the unit of analysis, we included in the regional gay friendliness index the responses of any respondent in the DMA who answered at least one of the three questions.

Participant Location and Migration Status. We used postal code to assign each Project Implicit participant to a corresponding DMA, both for their current and longest-lived postal

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[1] PRRI uses telephone area code (for landlines), and billing zip code (for cell phones) to infer respondents' DMA and county and asks respondents to self-report their state of residence. In some cases, respondents' inferred DMA and/or county did not correspond to their self-reported state of residence, so we removed these responses from our sample. Of the original 7,163 respondents, we removed 448 (6.3%).

code. Participants whose longest-lived DMA differed from their current DMA were

operationalized as having migrated, whereas participants whose longest-lived DMA matched

their current DMA were operationalized as having not migrated. Almost all Project Implicit

participants (98.1%) reported moving from their longest-lived DMA.

Results

Based on regional gay friendliness and participants' self-reported sexual orientation,

current and longest-lived location, and sexuality attitudes, we examined the extent to which

participants' migration reflected person-environment fit in two ways. First, we tested whether

(mis)fit with longest-lived location predicts migrating away from that location. Second, we tested

the extent to which participants fit their current location.

Data Preparation

Prior to analyses, we standardized the scale values for age, political ideology, IAT D-

score, the four explicit measures, and regional gay friendliness.

Predicting Likelihood of Migration from Longest-Lived DMA

In a series of logistic regression models[2], we sought to predict whether Project Implicit

participants migrated (yes/no) based on their implicit and explicit attitudes, their sexual

orientation, and the gay friendliness of their longest-lived region. We ran four regression models,

one for each of the explicit measures of sexuality attitude: the attitude preference measure and

the three feeling thermometer difference measures. All four models included the IAT D-score as

a measure of implicit sexuality attitude. We included implicit along with explicit measures of

sexuality attitude in each of our models because these are distinct constructs with low correlation

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[2] We used logistic regression models instead of multilevel models due to the low intraclass correlation based on the
longest-lived DMA (ICC = 0.004).

at the individual level ($r = 0.350 – 0.424$, depending on the explicit measure), with no evidence

of multicollinearity in the model used (Explicit, $VIF = 2.15$; Implicit, $VIF = 2.23$). We examined

the main effects of sexual orientation, implicit and explicit sexuality attitude, and the gay

friendliness of the participant's longest-lived DMA. We compared each sexual orientation group

to straight. We included age, education level, race/ethnicity, sex, and political ideology as

covariates in the models, comparing education level to the group that completed only elementary

school, and comparing race/ethnicity to those who are White. As regional economic covariates,

we also included median household income and regional gross domestic product (GDP) in the

models, aggregated to the DMA level (Bureau of Economic Analysis, 2021).

　　　　We also included interactions in the model to examine our central research questions. We

included two two-way interactions that examined person-environment fit in the context of

sexuality attitudes: The first examined explicit person-environment fit (explicit sexuality attitude

× regional gay friendliness of longest-lived DMA) and the second examined implicit person-

environment fit (sexuality IAT D-score × regional gay friendliness of longest-lived DMA). To

examine our gay migration hypothesis, we examined the interaction between sexual orientation

and regional gay friendliness. We also included sexuality attitudes into these interactions to

examine how internalized homophobia may affect migration, resulting in two three-way

interactions that examined the effects of sexual orientation on explicit and implicit person-

environment fit (explicit sexuality attitude × regional gay friendliness of longest-lived DMA ×

sexual orientation; sexuality IAT D-score × regional gay friendliness of longest-lived DMA ×

sexual orientation).

　　　　All four models produced the same patterns of results, regardless of which specific

operationalization of explicit attitudes was included. Table 2 shows the R^2 values for all four

models tested. The model with the explicit attitude measure that reflects the composite based on all four feeling thermometers explained the most variance, $R^2 = 0.308$. Consequently, we focus on this model throughout the rest of the manuscript and report the results of the other models in the supplement.

Table 2

Model Comparison for Logistic Regression Models Predicting Migration.

Explicit Measure Used	R^2
Attitude Preference Measure	0.303
Feeling Thermometer Difference – Men Only	0.280
Feeling Thermometer Difference – Women Only	0.318
Feeling Thermometer Difference – Average Across All	0.319

We also ran a sensitivity power analysis for our model. The analysis had 80% power to detect an effect size of $f^2 = 1.28 \times 10^{-5}$. Our model had an effect size of $f^2 = 0.469$, so we were very well-powered to detect our effect of interest.

We summarize in Table 3 the reliable effects of theoretical interest in this regression model. We report the full model in the Supplement.

Table 3

Logistic Regression Model Predicting Migration.

Variable	β estimate	Lower CI	Upper CI	Std. Error	z-statistic	p-value
Sexual Orientation: Gay/Lesbian	-0.004	-0.077	0.069	0.04	-0.11	0.916
Sexual Orientation: Bisexual	0.012	-0.050	0.073	0.03	0.37	0.714
Sexual Orientation: "Other"	0.065	-0.058	0.188	0.06	1.04	0.299
Longest-lived Regional Gay Friendliness	-0.022	-0.044	0.000	0.01	-1.92	0.055
Explicit Sexuality Attitude	-0.005	-0.025	0.015	0.01	-0.49	0.626
Implicit Sexuality Attitude	0.009	-0.010	0.029	0.01	0.92	0.360

Explicit Sexuality Attitude × Longest-lived Regional Gay Friendliness	0.070	0.053	0.088	0.01	7.71	< 0.001 ***
Implicit Sexuality Attitude × Longest-lived Regional Gay Friendliness	0.025	0.007	0.043	0.01	2.73	0.006 ***
Gay/Lesbian × Longest-lived Regional Gay Friendliness	-0.088	-0.154	-0.022	0.03	-2.62	0.009 ***
Bisexual × Longest-lived Regional Gay Friendliness	-0.003	-0.060	0.054	0.03	-0.11	0.916
"Other" × Longest-lived Regional Gay Friendliness	-0.054	-0.166	0.058	0.06	-0.95	0.344
Gay/Lesbian × Explicit Sexuality Attitude × Longest-lived Regional Gay Friendliness	-0.080	-0.135	-0.025	0.03	-2.84	0.005 ***
Bisexual × Explicit Sexuality Attitude × Longest-lived Regional Gay Friendliness	-0.084	-0.146	-0.023	0.03	-2.68	0.007 ***
"Other" × Explicit Sexuality Attitude × Longest-lived Regional Gay Friendliness	-0.048	-0.141	0.046	0.05	-1.00	0.317
Gay/Lesbian × Implicit Sexuality Attitude × Longest-lived Regional Gay Friendliness	-0.021	-0.069	0.028	0.02	-0.84	0.399
Bisexual × Implicit Sexuality Attitude × Longest-lived Regional Gay Friendliness	0.027	-0.020	0.073	0.02	1.12	0.261
"Other" × Implicit Sexuality Attitude × Longest-lived Regional Gay Friendliness	-0.019	-0.106	0.067	0.04	-0.44	0.660

Note. 95% Confidence Intervals. Full regression model is reported in the supplement, only variables and

interactions of theoretical interest reported here. Sexual orientation variables are compared against

straight participants.

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Interaction between Explicit Attitudes, Sexual Orientation, and Regional Gay

Friendliness. The model revealed an interaction between explicit sexuality attitudes and regional

gay friendliness in participants' longest-lived DMA, $\beta = 0.070$, 95% CI [0.053, 0.088], $p <$

0.001, which was qualified by a three-way interaction between sexual orientation, explicit

attitude, and regional gay friendliness for gay/lesbian participants, β = -0.080, 95% CI [-0.135, -

0.025], p = 0.005, and for bisexual participants, β = -0.084, 95% CI [-0.146, -0.023], p = 0.007

(Figure 1).

Figure 1

Predicted Migration Likelihood Based on Sexual Orientation, Explicit Attitudes, and Longest-

lived Regional Gay Friendliness.
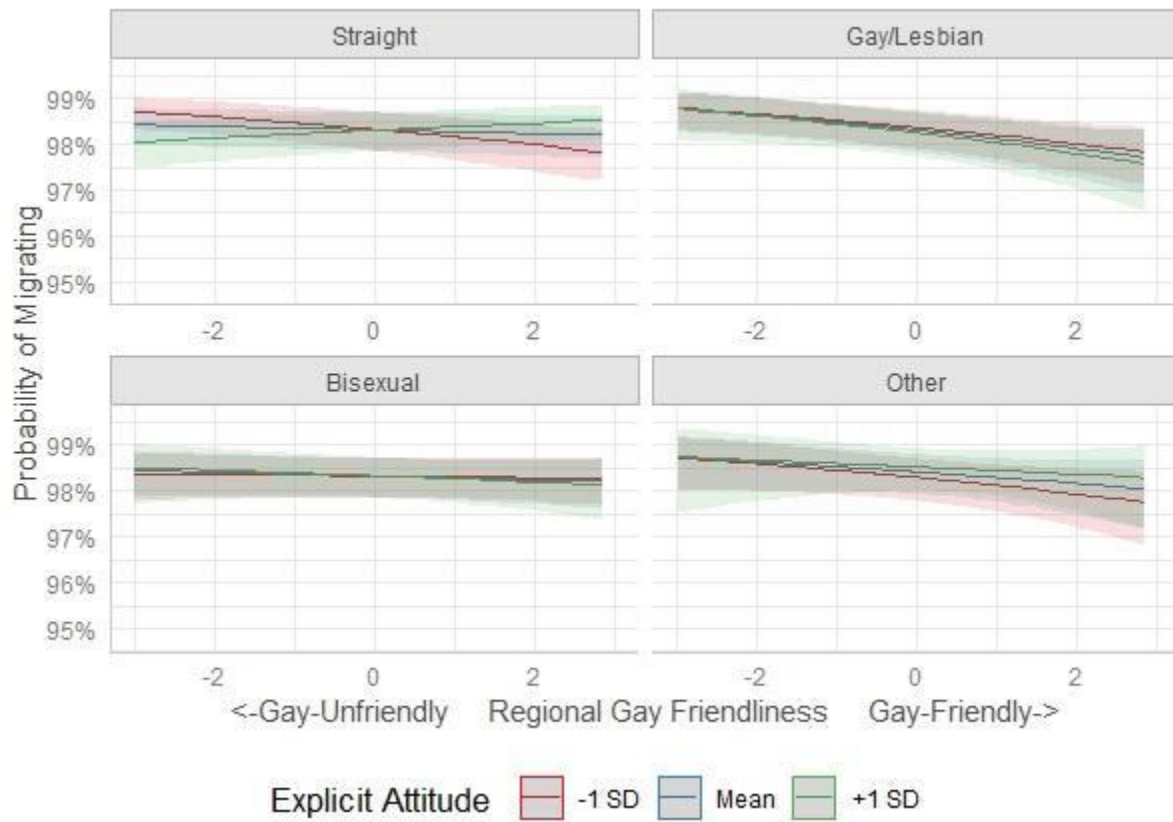
Simple slopes analysis revealed that straight participants' likelihood of migration was

related to both their explicit attitudes and the gay friendliness of their location, in accordance

with our person-environment fit hypothesis. Straight participants whose explicit sexuality

attitudes are pro-gay or neutral (i.e., at the sample mean) become less likely to migrate as their

longest-lived region becomes more gay-friendly, β = -0.092, 95% CI [-0.122, -0.062], $p < 0.001$

for pro-gay and β = -0.022, 95% CI [-0.045, -0.0002], $p = 0.048$ for neutral. In contrast, straight

participants with pro-straight explicit sexuality attitude becomes more likely to migrate as their

longest-lived region becomes more gay-friendly, β = 0.048, 95% CI [0.021, 0.074], $p < 0.001$.

This pattern of results does not persist for gay and lesbian participants; instead, we

observed only a main effect of regional gay friendliness: gay and lesbian participants were

always more likely to migrate from places that are lower versus higher in gay friendliness,

regardless of their explicit sexuality attitude (βs < -0.101, ps < 0.022), whereas bisexual

participants' migration was unrelated to either their explicit attitudes or the regional gay

friendliness (βs > -0.038, ps > 0.393).

Interaction between Implicit Attitudes and Regional Gay Friendliness. As reported in

Table 3, a reliable interaction emerged between implicit sexuality attitudes and the gay

friendliness of participants' longest-lived region. However, as a robustness check, we re-ran all

analyses including only participants who had complete data (i.e., without imputation). The

interaction between implicit attitudes and regional gay friendliness did not replicate in this re-

analysis. Consequently, we hesitate to interpret this finding, but report the analyses in full in the

Supplement. All of the findings related to explicit attitudes replicate in the full-data re-analysis.

Predicting Migration to Current DMA, based on Gay Friendliness

Complementing the analyses that predicted whether participants migrated away from

regions, we next fit a set of linear regression models to predict the gay friendliness of the region

in which each participant who migrated resides currently. Each model included sexual

orientation, regional gay friendliness of the longest-lived DMA, and both an implicit and explicit

sexuality attitude measure. We included age, education level, race/ethnicity, sex, and political ideology as demographic covariates. We also included median household income and regional GDP as regional economic covariates (Bureau of Economic Analysis, 2021). These analyses were limited to Project Implicit participants who reported having migrated, i.e., whose longest-lived DMA differed from their current DMA, $N = 1,334,224$. In line with the previous analysis, participants were predominantly women (64.4%) and White (67.6%). Most participants completed at least high school (84.0%) and 40.1% had some sort of college degree, with an additional third having completed some college. Roughly three-quarters (73.3%) of participants were straight, 10.1% were gay/lesbian, and 11.6% were bisexual. The remaining participants fell into an "Other" category (3.0%) that included Other, Queer, Asexual, or Questioning. Unstandardized means and standard deviations for the demographics of the migrated participant are reported in Table 4.

Table 4

Descriptive Statistics of Unstandardized Scale Variables by Sexual Orientation.

Variable	Straight		Gay/Lesbian		Bisexual		Other	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Age	27.00	11.06	28.69	11.56	24.48	8.71	24.94	9.24
Political Ideology	4.46	1.62	5.68	1.33	5.45	1.39	5.70	1.39
Regional Gay Friendliness of Longest-Lived DMA	2.90	0.22	2.90	0.22	2.90	0.22	2.90	0.22
Regional Gay Friendliness of Current DMA	2.89	0.22	2.92	0.22	2.91	0.22	2.92	0.22
Sexuality IAT D-Score	0.35	0.45	-0.17	0.45	-0.03	0.47	-0.13	0.48
Attitude Preference Measure	0.26	0.90	-0.95	0.95	-0.57	0.72	-0.82	0.99
Feeling Thermometer – Straight Men	7.79	2.14	5.65	2.44	6.65	2.42	5.68	2.65
Feeling Thermometer – Straight Women	8.11	2.04	7.45	2.03	7.40	2.08	7.19	2.10
Feeling Thermometer – Gay Men	6.61	2.61	7.79	1.98	7.62	2.01	7.44	2.14
Feeling Thermometer – Lesbian Women	6.45	2.45	7.82	2.21	7.93	1.98	7.90	2.13
Feeling Thermometer Difference – Men Only	1.19	2.70	-2.14	2.62	-0.97	2.36	-1.76	2.91
Feeling Thermometer Difference – Women Only	1.67	2.59	-0.35	2.51	-0.51	1.97	-0.69	2.22

Feeling Thermometer Difference – Average Across Gender	1.43	2.36	-1.24	2.02	-0.73	1.73	-1.23	2.25

We included main effects and interactions in the model that correspond to our central research questions related to gay migration and attitudinal person-environment fit. We examined the main effects of sexuality attitudes (both implicit and explicit) on current regional gay friendliness, to determine whether people migrate to places that fit their attitudes. We also examined the main effect of sexual orientation on current regional gay friendliness to test our gay migration hypothesis. We also included two two-way interactions (one for implicit attitudes, another for explicit attitudes) to examine whether sexual orientation and sexuality attitudes jointly predict gay friendliness of the current region (sexual orientation × explicit sexuality attitude; sexual orientation × IAT D-score); these interactions are also positioned to provide insight into the role of internalized homophobia (i.e., LGB people with pro-straight attitudes) on migration. Finally, we sought to control for the gay friendliness of where each participant was migrating from by adding gay friendliness of longest-lived region into the two-way interactions, resulting in two three-way interactions (explicit sexuality attitude × regional gay friendliness of longest-lived DMA × sexual orientation; sexuality IAT D-score × regional gay friendliness of longest-lived DMA × sexual orientation).

We tested four models that predicted the gay friendliness of the DMA in which our participants currently live. As in the previous analyses, each model included a different explicit measure of sexuality attitude. Table 5 shows the R^2 values for all four models tested. Replicating our previous set of analyses, the model that included the composite based on all four feeling thermometers explained the most variance, $R^2 = 0.519$. Therefore, we focus on this model

throughout the rest of the manuscript and report the results of the other models in the

supplement.

Table 5

Model Comparison for Linear Regression Models Predicting Regional Gay Friendliness.

Explicit Measure Used	R^2
Attitude Preference Measure	0.5123
Feeling Thermometer Difference – Men Only	0.5031
Feeling Thermometer Difference – Women Only	0.5189
Feeling Thermometer Difference – Average Across All	0.5192

We also ran a sensitivity power analysis for our model. The analysis had 80% power to

detect an effect size of $f^2 = 1.34 \times 10^{-5}$. Our model had an effect size of $f^2 = 1.08$, so we were

very well-powered to detect our effect of interest.

We summarize in Table 6 the reliable effects of theoretical interest in this regression

model. We report the full model in the Supplement.

Table 6

Linear Regression Model Predicting Regional Gay Friendliness.

Variable	β Estimate	Lower CI	Upper CI	Std. Error	t-value	p-value
Sexual Orientation: Gay/Lesbian	-0.023	-0.030	-0.016	0.004	-6.39	< 0.001 ***
Sexual Orientation: Bisexual	0.002	-0.004	0.008	0.003	0.67	0.500
Sexual Orientation: "Other"	0.009	-0.002	0.020	0.006	1.52	0.127
Regional gay friendliness of longest-lived DMA	-0.010	-0.012	-0.008	0.001	-9.91	< 0.001 ***
Explicit sexuality attitude	-0.023	-0.025	-0.021	0.001	-24.39	< 0.001 ***
Implicit sexuality attitude	-0.006	-0.008	-0.005	0.001	-6.89	< 0.001 ***
Gay/Lesbian × Implicit sexuality attitude	0.000	-0.005	0.005	0.003	-0.10	0.923
Bisexual × Implicit sexuality attitude	0.006	0.002	0.011	0.002	2.60	0.009 ***
"Other" × Implicit sexuality attitude	0.000	-0.008	0.009	0.004	0.07	0.940

|						
Gay/Lesbian × Explicit sexuality attitude	0.023	0.017	0.028	0.003	7.87	< 0.001 ***
Bisexual × Explicit sexuality attitude	0.026	0.020	0.033	0.003	8.33	< 0.001 ***
"Other" × Explicit sexuality attitude	0.020	0.010	0.029	0.005	4.10	< 0.001 ***
Gay/Lesbian × Regional gay friendliness	-0.004	-0.011	0.003	0.004	-1.08	0.280
Bisexual × Regional gay friendliness	-0.002	-0.007	0.004	0.003	-0.53	0.599
"Other" × Regional gay friendliness	-0.003	-0.014	0.008	0.006	-0.51	0.611
Implicit sexuality attitude × Regional gay friendliness	-0.001	-0.002	0.001	0.001	-0.64	0.523
Explicit sexuality attitude × Regional gay friendliness	0.000	-0.002	0.002	0.001	-0.17	0.864
Gay/Lesbian × Implicit sexuality attitude × Regional gay friendliness	-0.003	-0.008	0.002	0.003	-1.13	0.257
Bisexual × Implicit sexuality attitude × Regional gay friendliness	0.000	-0.005	0.005	0.002	0.01	0.989
"Other" × Implicit sexuality attitude × Regional gay friendliness	0.001	-0.008	0.010	0.004	0.21	0.833
Gay/Lesbian × Explicit sexuality attitude × Regional gay friendliness	0.001	-0.005	0.007	0.003	0.37	0.711
Bisexual × Explicit sexuality attitude × Regional gay friendliness	0.004	-0.002	0.010	0.003	1.26	0.207
"Other" × Explicit sexuality attitude × Regional gay friendliness	-0.001	-0.010	0.009	0.005	-0.13	0.897

Note. 95% Confidence Intervals. Full regression model reported in the supplement, only variables and

interactions of interest reported here. Sexual orientation variables are compared against straight

participants.

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Interaction between Explicit Attitudes and Sexual Orientation. The model revealed an effect of explicit sexuality attitudes on the gay friendliness of the participants' current region, $\beta = -0.023$, 95% CI [-0.025, -0.021], $p < 0.001$, which was qualified by a two-way interaction between sexual orientation and explicit sexuality attitude for gay/lesbian participants, $\beta = 0.023$, 95% CI [0.017, 0.028], $p < 0.001$, bisexual participants, $\beta = 0.026$, 95% CI [0.020, 0.033], $p < 0.001$, and "Other" participants, $\beta = 0.020$, 95% CI [0.010, 0.029], $p < 0.001$ (Figure 2).

Figure 2

Predicted Gay Friendliness of Current Region Based on Sexual Orientation and Explicit Sexuality Attitude.
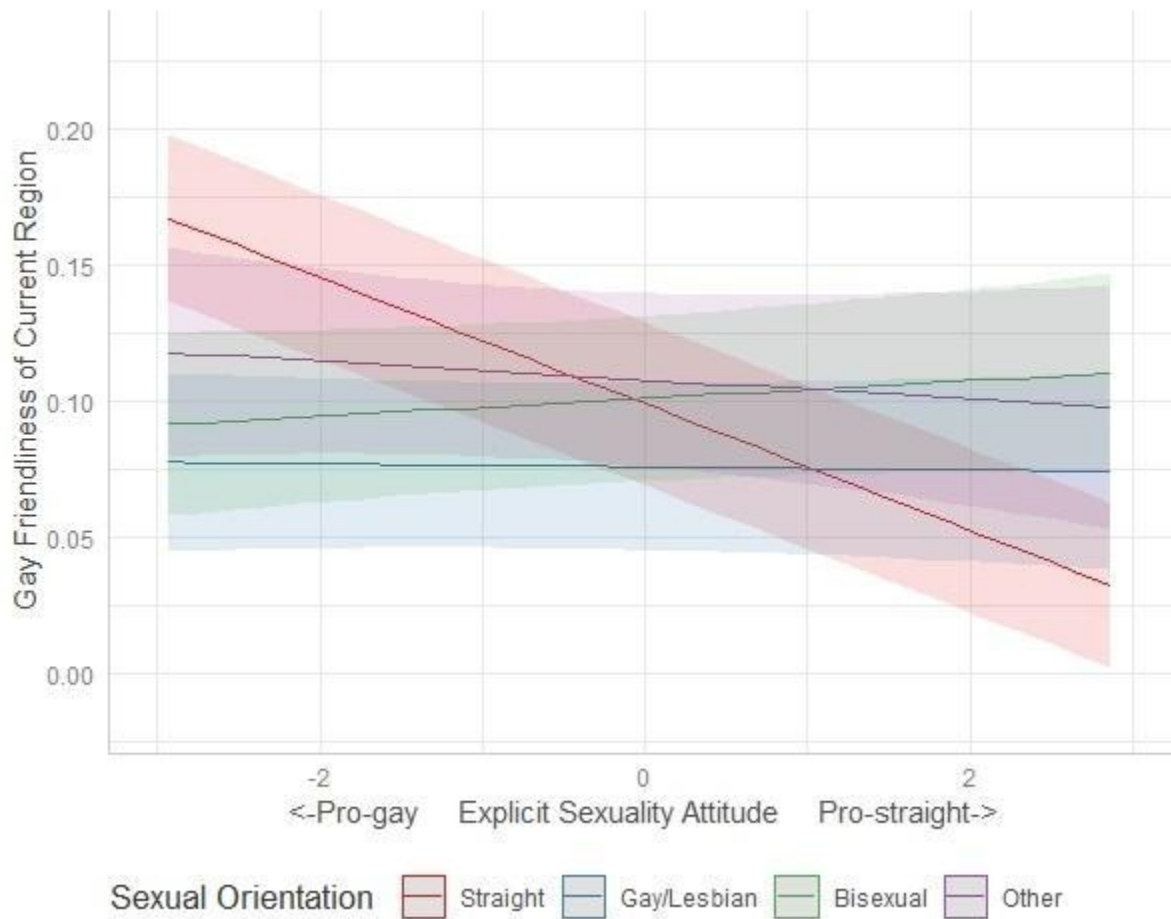
Simple slopes analysis showed that straight participants with pro-gay explicit attitudes migrated to places that were higher in gay friendliness, β = -0.023, 95% CI [-0.025, -0.021], p < 0.001. This was not true for people of any other sexual orientation (βs < |0.003|, ps > 0.05).

Implicit Attitudes and Migration to Current DMA. As reported in Table 6, a reliable interaction emerged between implicit sexuality attitudes and sexual orientation (i.e., bisexuality). However, mirroring our approach to the analyses predicting gay friendliness of participants' current region, we re-ran these analyses including only participants who had complete data (i.e., without imputation) as a robustness check. The interaction between implicit attitudes and sexual orientation did not replicate in this re-analysis. Consequently, we hesitate to interpret this finding, but report the analyses in full in the Supplement. All of the findings related to explicit attitudes replicate in the full-data re-analysis.

Study 1 Discussion

In Study 1, we found that lesbian women and gay men were more likely to leave places that were not gay friendly compared to places that were gay-friendly, independent of their sexuality attitudes. This pattern of results maps onto our conceptualization of gay migration reflecting fit in terms of identity but not attitudes, in contrast to our prediction that internalized homophobia could keep LGB people in gay-unfriendly places. That said, lesbian and gay people left gay-unfriendly places, but they did not consistently migrate to gay-friendly regions. Instead, LGB people's attitudes were unrelated to the gay-friendliness of their current region. Straight people demonstrated a different pattern of results, and migrated in accordance with their sexuality attitudes: they were more likely to leave places that did not match their attitudes and migrate to places that do, which maps onto our conceptualization of attitudinal person-

environment fit. Building on the statistically-powerful but correlational findings of Study 1,

Study 2 further investigates the mechanisms underlying migration in an experimental design.

Study 2

Methods

Participants

We used Amazon's Mechanical Turk (mTurk) platform through CloudResearch (Litman

et al., 2017) to recruit U.S.-based participants who self-reported as either straight or LGB. Study

2 relied on an experimental paradigm very similar to the one used by Motyl et al. (2014, Study

3). Based on the effect sizes reported by Motyl et al. (2014) that most closely correspond to the

present research, a priori power analysis using G*Power (Faul et al., 2007) indicated that we

would need a sample of 60 participants per group to detect the same sized effects with an alpha

of 0.05 and power of 0.80. To be conservative, we doubled that number and aimed to recruit 120

straight participants and 120 LGB participants. Sample size was determined before any data

analysis. After excluding participants who failed attention checks or did not have complete

demographic data, our final sample consisted of 214 participants: 116 straight, 91 LGB, and

seven "Other."

Half of participants were women (50.0%) and participants were predominately White

(77.6%). About a quarter (27.6%) of participants reported an annual income of below $25,000,

while 36.9% reported an annual income between $25,000 and $49,999, 21.0% reported between

$50,000 and $74,999, 7.0% between $75,000 and $99,999 and 7.5% reported an annual income

of above $100,000. In line with our targeted recruitment, about half of our participants identified

as straight (54.2%) while the rest were either gay (10.3%), lesbian (6.1%), bisexual (26.2%),

queer (0.9%), asexual (0.9%) or other (1.4%). We combined participants who self-reported as

gay, lesbian, bisexual, queer, asexual, and other into one LGB category. Consistent with Study 1, we also ran analyses separating out each sexual orientation (straight, gay/lesbian, bisexual, and "Other"). Both approaches produced the same pattern of results, so we report here the analyses using two sexual orientation groups (straight, LGB), in accordance with our power analysis. Analyses using four sexual orientation groups are included in the supplement, https://osf.io/n2cea/?view_only=c21642735df2425181ee7d6fd14d9e3d.

Materials and Measures

Participants viewed a series of images of places taken from Google Street View. For each image, they reported their desire to migrate to that place, their sense of belonging in that place, and their perceptions of that place's (gay versus straight) culture. After viewing all images, participants reported their attitudes towards different social groups and demographic information.

Place Images. Participants viewed a total of 45 place images. We used Google Street View to gather place stimuli that came from 15 major cities across different US geographical regions. For each city, we selected images of places that we considered to reflect gay culture (e.g., gay bars, gay bookstores).

We found LGB places by using Google Maps' built-in search function or by finding gay attractions on cities' tourist websites. After finding a place reflecting gay culture in each city, we found a nearby matched place (e.g., bar, bookstore) that did not reflect gay culture. Without clear cues that a place is designed for LGB people, we expected participants to perceive these places as reflecting straight culture (i.e., because straight people are higher status and the numerical majority and, therefore, the default). For each city, we also included a nearby non-social neutral place, such as a bank or storefront, that we expected to be frequented equally by LGB and

straight people. We took screenshots of the places from Google Street View and removed any

location identifying information, including city names. Examples of gay, straight, and neutral

spaces are shown in Figure 3.

Figure 3

Examples of Place Stimuli.

5a.

5b.

5c.
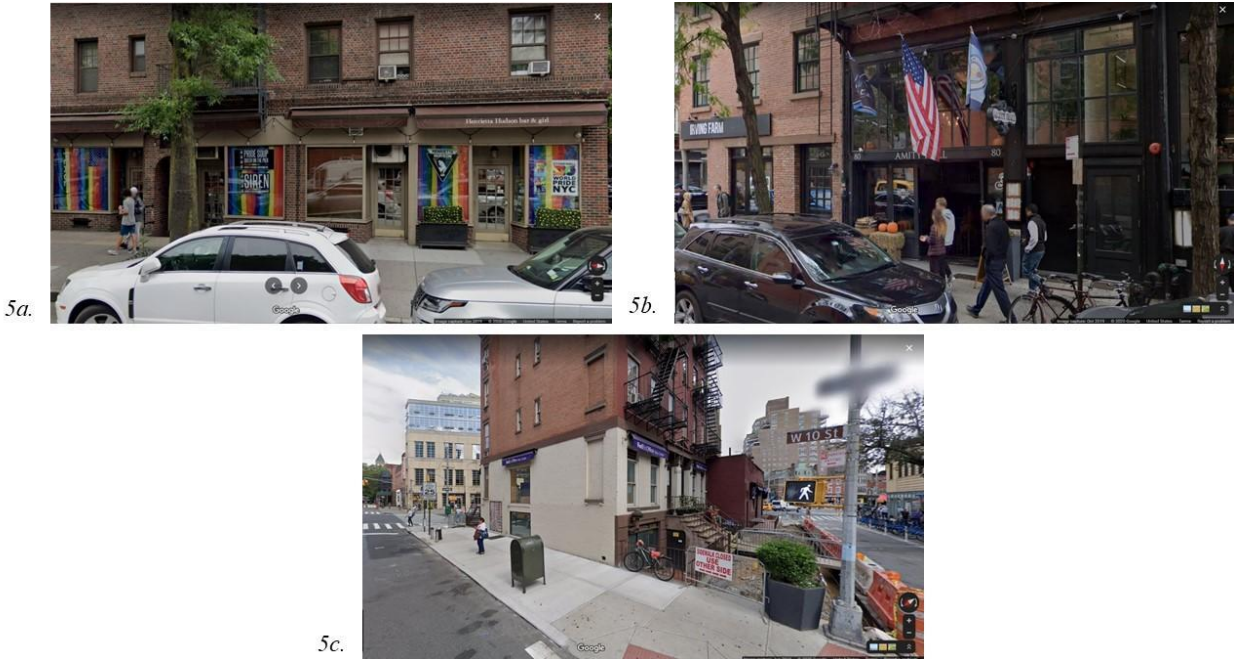
Note. Figure 3a reflects gay culture, Figure 3b reflects straight culture, and Figure 3c reflects

neutral culture.

Desire to Migrate. We adapted two items from Motyl et al. (2014) ("I would consider

moving here" and "I would like to live here"). Additionally, we included a third item ("I would

prefer to live somewhere else") to measure participants' desire to migrate to each place. Each

participant responded on a scale of 1 ("Strongly Disagree") to 7 ("Strongly Agree"). We reverse

coded the third item ("I would prefer to live somewhere else") and summed the values to create a

scale ranging from 3 to 21, α = 0.95.

Sense of Belonging. We adapted three items ("I would have a sense of belonging here," "I would feel accepted by others here," and "I would feel like an outsider here") from the General Belongingness Scale (Malone et al., 2012) to measure participants' sense of belonging in each place. Each participant responded on a scale of 1 ("Strongly Disagree") to 7 ("Strongly Agree"). We reverse coded the third item ("I would feel like an outsider here") and summed the values to create a scale ranging from 3 to 21, $\alpha = 0.92$.

Perceived Culture. Our image selection criteria were relatively subjective, reflecting our own assumptions about places that reflect gay versus straight culture, and the goodness with which each place reflects either gay or straight culture. Consequently, we also measured participants' subjective evaluations of the culture of each place they viewed. Participants were asked "How likely would it be for the following people to frequent this place?" and responded both for gay people and for straight people on a slider from 0 ("Extremely unlikely") to 100 ("Extremely likely"). We then operationalized the perceived culture of each place by subtracting each participant's rating of the likelihood of gay people frequenting a place from the likelihood of a straight person frequenting that place. This scale has potential values from -100 to 100, with more negative values reflecting stronger gay culture and more positive values reflecting stronger straight culture.

Attitude Measures. Participants were instructed to rate different social groups on a feeling thermometer with a slider that ranged from 0 ("Coldest feelings") to 100 ("Warmest feelings"), with "Neutral" in the middle. We included a variety of social groups to mask the groups of interest: gay or lesbian people and straight people. We subtracted participants' response to the feeling thermometer for gay or lesbian people from their response to the feeling

thermometer for straight people to create a relative preference index, such that positive values correspond to a relative preference for straight versus gay or lesbian people.

Participants responded twice to the full set of feeling thermometers, once reporting their "gut responses," and again reporting their "fully considered" attitudes (see Appendix B for full instructions). We expected that participants' gut responses versus fully considered attitudes would map onto relatively automatic versus controlled responses, as proxies for implicit and explicit attitude measures (Ranganath et al., 2008). We calculated separate relative preference indices for each type of response with more positive values reflecting greater straight over gay preference.

Due to high multicollinearity between the gut-response and fully-considered attitude measures (Fully Considered, $VIF = 16.10$; Gut Response, $VIF = 12.41$), we could not include both measures in the same models. Instead, we made two sets of models, one that used fully considered opinions for sexuality attitudes and one that used gut responses for sexuality attitudes. Both sets of models produced the same pattern of results. Therefore, we report only the results using the fully considered attitudes here (hereafter referred to as "explicit attitudes") and include results using the gut response attitudes in the supplement, https://osf.io/n2cea/?view_only=c21642735df2425181ee7d6fd14d9e3d.[3]

Procedure

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[3] We preregistered different predictions for the two types of sexuality attitude measures. Specifically, we expected explicit (i.e., "fully considered") attitudes to influence migration for straight participants but not for LGB participants, but implicit (i.e., "gut feeling") attitudes to influence migration for all participants. These predictions were based on initial results from Study 1 that suggested an effect of explicit attitudes for only straight participants but an effect of implicit attitudes for all participants. In contrast to this prediction, in Study 2 we found that both types of attitudes produced the same patterns of results. However, the two attitude measures were also highly correlated with one another. Given this multicollinearity and given that the results for implicit measures in Study 1 did not survive robustness checks, we focus on explicit attitudes in the main manuscript, and report implicit attitudes in the Supplement.

After providing consent and passing bot-screening questions, participants read instructions outlining the study, in which we instructed them to look at the street-view pictures and to answer questions about each place. Participants then viewed the Google Street View images, one at a time. On each page, they were given the following prompt: "Look at the picture and rate how you feel about it on the following rating scales. Go with your gut and answer based on your first impression" and they responded to the measures assessing desire to migrate and belonging. The order of images and items were randomized for each participant. Next, participants were instructed that they would be rating the warmth they feel towards different social groups. After completing these feeling thermometers, participants viewed each of the 45 Street View images again, this time rating the extent to which they perceived each to be places straight and gay people would frequent. We gave participants instructions to carefully consider each item and to answer truthfully. Full instructions and stimuli are included in the supplement, https://osf.io/n2cea/?view_only=c21642735df2425181ee7d6fd14d9e3d.

Results

We used a multilevel model[4] to examine the extent to which a place's perceived culture, participants' sexual orientation, and their explicit attitude relate to participants' sense of belonging and desire to migrate to each place. We also examined whether sense of belonging mediated the relationship between person-environment fit and desire to migrate. We preregistered our hypotheses and analyses at:

https://osf.io/n2cea/?view_only=c21642735df2425181ee7d6fd14d9e3d.

Testing Assumptions about Place's Culture

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[4] We used a multilevel model for stimuli nested within participants, with an ICC of 0.3227.

First, we examined whether participants perceived the images to reflect gay versus straight culture in the way we intended. A one-way ANOVA revealed that participants rated places differently, according to our a priori assumptions about each type of place ($F = 193.51$, $p < 0.001$). A post-hoc test revealed that participants rated the places we assumed to reflect gay culture as reflecting gay culture ($M = 38.86$, $SD = 7.11$) to a greater extent than did the places we assumed to reflect either straight culture ($M = 25.22$, $SD = 14.13$; $p < 0.001$) or no culture ($M = 20.81$, $SD = 6.90$; $p < 0.001$). Additionally, and perhaps interestingly, participants did not rate the places assumed to reflect straight versus no culture as different from one another ($p = 0.453$). Consequently, in all subsequent analyses we did not rely on our a priori categorization of each place but, instead, used each person's rating of each place as an index of the culture reflected by each place.

Data Preparation

Prior to analyses, we standardized the scale values for age, political ideology, desire to migrate, sense of belonging, place's perceived culture, and explicit attitude about the grand mean. Unstandardized means and standard deviations for the scales are included in Table 7.

Table 7

Descriptive Statistics of Unstandardized Scale Variables.

Variable	Straight		LGB	
	Mean	*SD*	*Mean*	*SD*
Age	39.90	11.43	36.03	11.11
Political Ideology (Liberalism)	4.51	1.88	5.57	1.63
Desire to Migrate	11.22	5.30	11.17	5.59
Sense of Belonging	12.70	4.82	13.06	4.97
Perceived Culture of the Place	1.07	43.40	3.88	44.95
Explicit Attitudes – Straight People	68.01	27.34	84.27	19.39
Explicit Attitudes – Gay or Lesbian People	80.60	19.01	65.68	23.94
Explicit Attitudes – Difference	12.59	26.29	-18.59	28.51

Predicting Desire to Migrate

In a series of multilevel models, we sought to predict participants' desire to migrate based on their explicit attitudes, sexual orientation, sex, and perceived culture of the place. We took a model comparison approach to our multilevel model, starting with an intercept only model, reflected in Eq. (1).

$$Y_{ij} = \gamma_{00} + u_{0j} + r_{ij} \qquad (1)$$

In Eq. (1), the desire to migrate to location stimuli trial i in participant j (Y_{ij}) is modeled as the function of the grand-mean desire to migrate (γ_{00}) plus a participant-specific deviation from the grand mean (u_{0j}) and a residual term for individual stimuli differences around the mean of participant j (r_{ij}).

We then included predictors in a stepwise fashion, starting with our Level 1 predictor, perceived culture of the place, as a random effect (Eq. (2)).

$$Y_{ij} = \gamma_{00} + \gamma_{10}\left(\text{Culture}_{ij} - \overline{\text{Culture}_j}\right) + u_{0j} + u_{1j}\left(\text{Culture}_{ij} - \overline{\text{Culture}_j}\right) + r_{ij} \quad (2)$$

Next, we included our Level 2 predictors, sexual orientation, sex, and explicit attitudes as fixed effects in Eq. (3).

$$Y_{ij} = \gamma_{00} + \gamma_{01}\left(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}}\right) + \gamma_{02}\left(\text{Sex}_j - \overline{\text{Sex}}\right) \qquad (3)$$
$$+ \gamma_{03}\left(\text{Exp. Att.}_j - \overline{\text{Exp. Att.}}\right) + \gamma_{10}\left(\text{Culture}_{ij} - \overline{\text{Culture}_j}\right) + u_{0j}$$
$$+ u_{1j}\left(\text{Culture}_{ij} - \overline{\text{Culture}_j}\right) + r_{ij}$$

We compared LGB to straight and compared women to men. The next model, Eq. (4), included cross-level interactions in the model to examine our central research questions. We included a two-way interaction between explicit attitudes and perceived culture to examine person-environment fit. To examine our gay migration hypothesis, we examined the interaction between sexual orientation and perceived culture. Additionally, we included explicit attitudes in the interaction between sexual orientation and perceived culture to examine our internalized

homophobia hypothesis, as well as sex to examine potential gender differences, resulting in a

four-way interaction reflecting the effects of sexual orientation and sex on person-environment

fit (explicit attitudes $\times$ perceived culture of place $\times$ sexual orientation $\times$ sex).

$$Y_{ij} = \gamma_{00} + \gamma_{01}\left(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}}\right) + \gamma_{02}\left(\text{Sex}_j - \overline{\text{Sex}}\right) \tag{4}$$

$$+ \gamma_{03}\left(\text{Exp. Att.}_j - \overline{\text{Exp. Att.}}\right)$$

$$+ \gamma_{04}\left(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}}\right)\left(\text{Sex}_j - \overline{\text{Sex}}\right)\left(\text{Exp. Att.}_j - \overline{\text{Exp. Att.}}\right) + \left(\gamma_{10}\right.$$

$$+ \gamma_{11}\left(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}}\right) + \gamma_{12}\left(\text{Sex}_j - \overline{\text{Sex}}\right)$$

$$+ \gamma_{13}\left(\text{Exp. Att.}_j - \overline{\text{Exp. Att.}}\right)$$

$$+ \gamma_{14}\left(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}}\right)\left(\text{Sex}_j - \overline{\text{Sex}}\right)\left(\text{Exp. Att.}_j\right.$$

$$\left.\left. - \overline{\text{Exp. Att.}}\right)\right)\left(\text{Culture}_{ij} - \overline{\text{Culture}_j}\right) + u_{0j} + u_{1j}\left(\text{Culture}_{ij} - \overline{\text{Culture}_j}\right) + r_{ij}$$

Our fifth and final model (Eq. (5)) built upon Eq. (4) and included covariates age, race,

ethnicity, political ideology, and income level as fixed effects.

$$Y_{ij} = \gamma_{00} + \gamma_{01}\left(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}}\right) + \gamma_{02}\left(\text{Sex}_j - \overline{\text{Sex}}\right) \tag{5}$$

$$+ \gamma_{03}\left(\text{Exp. Att.}_j - \overline{\text{Exp. Att.}}\right)$$

$$+ \gamma_{04}\left(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}}\right)\left(\text{Sex}_j - \overline{\text{Sex}}\right)\left(\text{Exp. Att.}_j - \overline{\text{Exp. Att.}}\right)$$

$$+ \left(\gamma_{10} + \gamma_{11}\left(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}}\right) + \gamma_{12}\left(\text{Sex}_j - \overline{\text{Sex}}\right)\right.$$

$$+ \gamma_{13}\left(\text{Exp. Att.}_j - \overline{\text{Exp. Att.}}\right)$$

$$+ \gamma_{14}\left(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}}\right)\left(\text{Sex}_j - \overline{\text{Sex}}\right)\left(\text{Exp. Att.}_j\right.$$

$$\left.\left. - \overline{\text{Exp. Att.}}\right)\right)\left(\text{Culture}_{ij} - \overline{\text{Culture}_j}\right) + \gamma_{05}\left(\text{Political}_j - \overline{\text{Political}}\right)$$

$$+ \gamma_{06}\left(\text{Ethnicity}_j - \overline{\text{Ethnicity}}\right) + \gamma_{07}\left(\text{Race}_j - \overline{\text{Race}}\right) + \gamma_{08}\left(\text{Income}_j - \overline{\text{Income}}\right)$$

$$+ u_{0j} + u_{1j}\left(\text{Culture}_{ij} - \overline{\text{Culture}_j}\right) + r_{ij}$$

We compared race to White, Hispanic/Latinx to not Hispanic/Latinx for ethnicity, and income levels to less than $25,000 annual income. We did not preregister the model comparison approach to multilevel model building. However, we used model comparison because it is a common approach to multilevel model analysis and analyzed the factors of interest and covariates that we preregistered on OSF, https://osf.io/n2cea/?view_only=c21642735df2425181ee7d6fd14d9e3d.

Fit indices for all five models are summarized in Table 8. Models 4 and 5 produced the same pattern of results; however, fit was better for Model 5 in terms of AIC and explained the most variance, $R^2 = 0.438$. Consequently, we focus on Model 5 throughout the rest of the manuscript and report the results of the other models in the supplement.

Table 8

Model Comparison for Multilevel Models Predicting Desire to Migrate.

Model	AIC	R^2	df
1 – Intercept Only	24248	0.322	
2 – Level 1 Predictors	23060	0.429	3
3 – Level 2 Predictors	23061	0.430	3
4 – Cross-Level Four-Way Interaction	22962	0.431	11
5 – Covariate Model	22952	0.438	12

The variance components of the random effects are reported in Table 9 and the fixed effects model is reported in Table 10, where we summarize the reliable effects of theoretical interest. We report the full model in the Supplement.

Table 9

Variance Components of the Multilevel Model Predicting Desire to Migrate.

Variable	Std. Dev.	Correlation
Intercept	0.54	
Culture	0.24	-0.137

Residual	0.76

Table 10

Multilevel Model Predicting Desire to Migrate.

Variable	β estimate	Lower CI	Upper CI	Std. Error	t-value	p-value
Sexual Orientation: LGB	-0.088	-0.338	0.164	0.13	-0.65	0.514
Explicit Attitudes × Culture	0.134	0.060	0.207	0.04	3.52	< 0.001 ***
LGB × Culture	-0.216	-0.348	-0.085	0.07	-3.16	0.002 **
LGB × Explicit Attitudes × Culture	0.075	-0.059	0.208	0.07	1.08	0.284
LGB × Woman × Culture	-0.046	-0.228	0.136	0.09	-0.49	0.628
LGB × Woman × Explicit Attitudes × Culture	-0.174	-0.353	0.008	0.09	-1.85	0.067

Note. 95% confidence intervals. Full model is reported in the supplement, only variables and interactions of interest reported here. Sexual orientation variables compared against straight. Sex variables compared against men.
*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

The model revealed an interaction between perceived culture of the place and sexual orientation, β = -0.216, 95% CI [-0.348, -0.085], p = 0.002, and an interaction between explicit attitudes and perceived culture of the place, β = 0.134, 95% CI [0.060, 0.207], $p < 0.001$. These were qualified by a four-way interaction between explicit attitudes, perceived culture of the place, sexual orientation, and sex, β = -0.174, 95% CI [-0.353, 0.008], p = 0.067 (Figure 4).

Figure 4

Predicted Desire to Migrate Based on Sexual Orientation, Sex, Explicit Sexuality Attitude, and
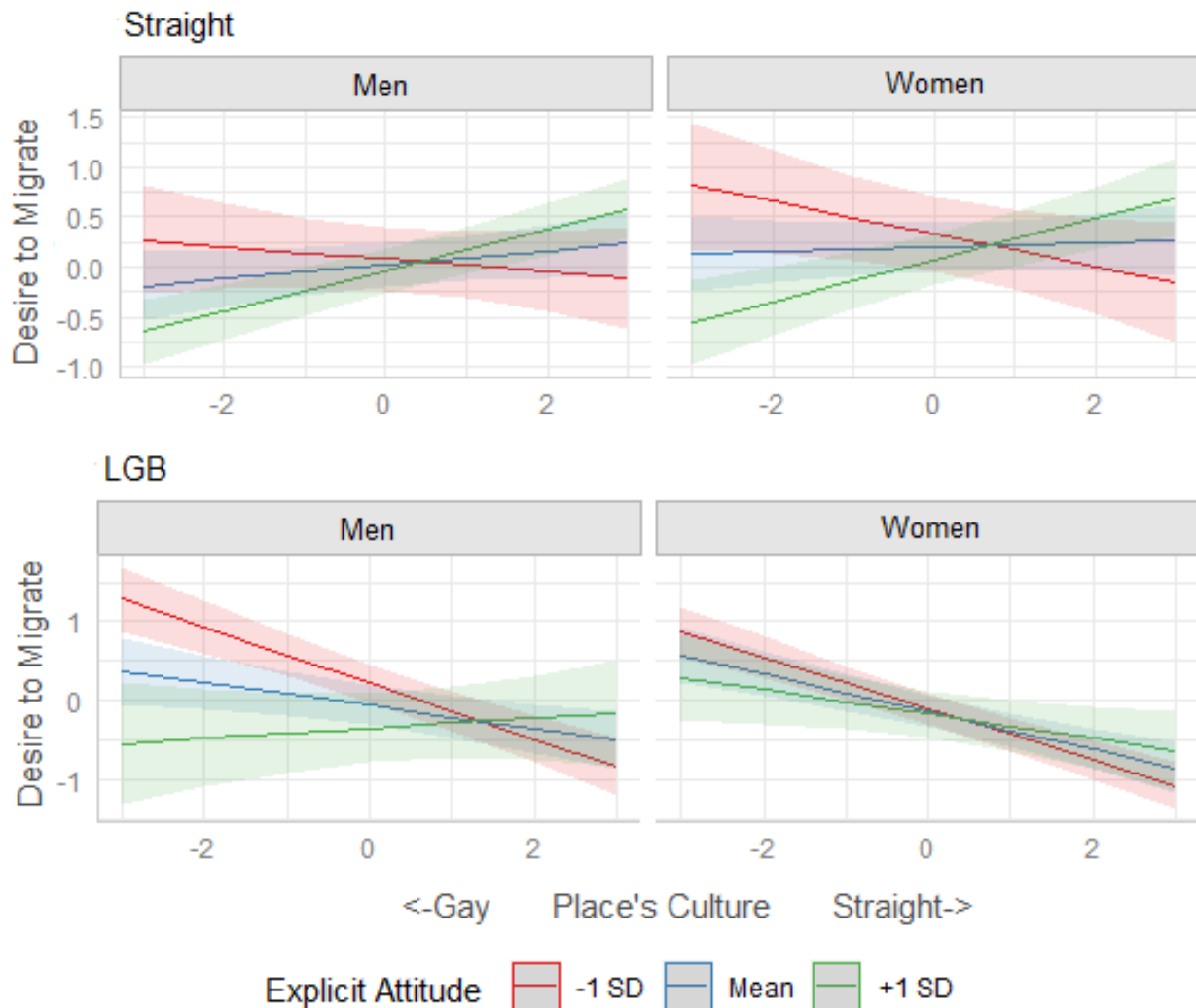
Place's Perceived Culture.

We also ran a sensitivity power analysis for our model, using the SIMR R package (Green & MacLeod, 2016). The analysis had 80% power to detect an effect size of $\beta = -0.067$ for this four-way interaction, with our sample size of $N = 214$. Thus, our analysis is sufficiently powered because the four-way interaction that emerged in our analysis ($\beta = -0.174$) is larger than this threshold.

Simple slopes analysis revealed that both straight men and women with pro-straight explicit attitudes reported a greater desire to migrate to places with greater perceived straight

culture, $\beta = 0.206$, 95% CI [0.131, 0.280], $p < 0.001$ for men, and $\beta = 0.208$, 95% CI [0.102,

0.313], $p < 0.001$ for women. Additionally, straight women with a pro-gay explicit attitudes

reported a greater desire to migrate to places with greater perceived gay culture, $\beta = -0.162$, 95%

CI [-0.323, -0.001], $p = 0.050$, though this trend did not persist for straight men with pro-gay

explicit attitudes, $\beta = -0.064$, 95% CI [-0.205, 0.078], $p = 0.377$.

In contrast, gay and bisexual men whose attitudes reflected either pro-gay or neutral

explicit attitudes (i.e., at the sample mean) report a greater desire to migrate to places with

greater perceived gay culture, $\beta = -0.355$, 95% CI [-0.456, -0.255], $p < 0.001$ and $\beta = -0.146$,

95% CI [-0.250, -0.041], $p = 0.007$, respectively. The desire to migrate of gay and bisexual men

who had pro-straight attitudes did not differ as a function of perceived culture of the place, $\beta =$

0.064, 95% CI [-0.130, 0.258], $p = 0.517$. Lesbian and bisexual women reported greater desire to

migrate to places with greater perceived gay culture, regardless of whether they had pro-straight

($\beta = -0.154$, 95% CI [-0.297, -0.011], $p = 0.036$), neutral ($\beta = -0.239$, 95% CI [-0.329, -0.149], p

< 0.001), or pro-gay ($\beta = -0.324$, 95% CI [-0.405, -0.243], $p < 0.001$) explicit attitudes.

Predicting Sense of Belonging

Complementing the above analyses in which we predicted participants' desire to migrate,

we next ran a series of multilevel models to predict participants' sense of belonging based on

their explicit sexuality attitudes, their sexual orientation, sex, and the participant perceived

culture of the place. Here, the sense of belonging toward location stimuli trial i for participant j

(Y_{ij}) is modeled as the function of the grand-mean sense of belonging (γ_{00}) plus a participant-

specific deviation from the grand mean (u_{0j}) and a residual term for individual stimuli differences

around the mean of participant j (r_{ij}). We otherwise took the same model comparison approach as

with our previous models, which are summarized below.

$$Y_{ij} = \gamma_{00} + u_{0j} + r_{ij} \tag{1}$$

$$Y_{ij} = \gamma_{00} + \gamma_{10}(\text{Culture}_{ij} - \overline{\text{Culture}_j}) + u_{0j} + u_{1j}(\text{Culture}_{ij} - \overline{\text{Culture}_j}) + r_{ij} \tag{2}$$

$$Y_{ij} = \gamma_{00} + \gamma_{01}(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}}) + \gamma_{02}(\text{Sex}_j - \overline{\text{Sex}}) \tag{3}$$

$$+ \gamma_{03}(\text{Exp. Att.}_j - \overline{\text{Exp. Att.}}) + \gamma_{10}(\text{Culture}_{ij} - \overline{\text{Culture}_j}) + u_{0j}$$

$$+ u_{1j}(\text{Culture}_{ij} - \overline{\text{Culture}_j}) + r_{ij}$$

$$Y_{ij} = \gamma_{00} + \gamma_{01}(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}}) + \gamma_{02}(\text{Sex}_j - \overline{\text{Sex}}) \tag{4}$$

$$+ \gamma_{03}(\text{Exp. Att.}_j - \overline{\text{Exp. Att.}})$$

$$+ \gamma_{04}(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}})(\text{Sex}_j - \overline{\text{Sex}})(\text{Exp. Att.}_j - \overline{\text{Exp. Att.}}) + (\gamma_{10}$$

$$+ \gamma_{11}(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}}) + \gamma_{12}(\text{Sex}_j - \overline{\text{Sex}})$$

$$+ \gamma_{13}(\text{Exp. Att.}_j - \overline{\text{Exp. Att.}})$$

$$+ \gamma_{14}(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}})(\text{Sex}_j - \overline{\text{Sex}})(\text{Exp. Att.}_j$$

$$- \overline{\text{Exp. Att.}}))(\text{Culture}_{ij} - \overline{\text{Culture}_j}) + u_{0j} + u_{1j}(\text{Culture}_{ij} - \overline{\text{Culture}_j}) + r_{ij}$$

$$Y_{ij} = \gamma_{00} + \gamma_{01}(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}}) + \gamma_{02}(\text{Sex}_j - \overline{\text{Sex}}) \tag{5}$$

$$+ \gamma_{03}(\text{Exp. Att.}_j - \overline{\text{Exp. Att.}})$$

$$+ \gamma_{04}(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}})(\text{Sex}_j - \overline{\text{Sex}})(\text{Exp. Att.}_j - \overline{\text{Exp. Att.}})$$

$$+ \left(\gamma_{10} + \gamma_{11}(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}}) + \gamma_{12}(\text{Sex}_j - \overline{\text{Sex}})\right.$$

$$+ \gamma_{13}(\text{Exp. Att.}_j - \overline{\text{Exp. Att.}})$$

$$+ \gamma_{14}(\text{Sex Orient.}_j - \overline{\text{Sex Orient.}})(\text{Sex}_j - \overline{\text{Sex}})(\text{Exp. Att.}_j$$

$$\left. - \overline{\text{Exp. Att.}})\right)(\text{Culture}_{ij} - \overline{\text{Culture}_j}) + \gamma_{05}(\text{Political}_j - \overline{\text{Political}})$$

$$+ \gamma_{06}(\text{Ethnicity}_j - \overline{\text{Ethnicity}}) + \gamma_{07}(\text{Race}_j - \overline{\text{Race}}) + \gamma_{08}(\text{Income}_j - \overline{\text{Income}})$$

$$+ u_{0j} + u_{1j}(\text{Culture}_{ij} - \overline{\text{Culture}_j}) + r_{ij}$$

We compared race to White, Hispanic/Latinx to not Hispanic/Latinx for ethnicity, and income levels to less than $25,000 annual income. As in the previous models, we did not preregister the model comparison approach to multilevel model building. However, we used model comparison because it is a common approach to multilevel model analysis and analyzed the factors of interest and covariates that we preregistered on OSF.

Fit indices for all five models are summarized in Table 11. Models 4 and 5 produced the same pattern of results; however, fit was better for Model 5 in terms of AIC and explained the most variance, $R^2 = 0.482$. Consequently, we focus on Model 5 throughout the rest of the manuscript and report the results of the other models in the supplement.

Table 11

Model Comparison for Multilevel Models Predicting Sense of Belonging.

Model	AIC	R^2	df
1 – Intercept Only	24626	0.293	
2 – Level 1 Predictors	22455	0.477	3
3 – Level 2 Predictors	22457	0.477	3
4 – Cross-Level Four-Way Interaction	22327	0.477	11
5 – Covariate Model	22326	0.482	12

The variance components of the random effects are reported in Table 12 and the fixed effects model is reported in Table 13, where we summarize the reliable effects of theoretical interest. We report the full model in the Supplement.

Table 12

Variance Components of the Multilevel Model Predicting Sense of Belonging.

Variable	Std. Dev.	Correlation
Intercept	0.53	
Culture	0.29	-0.096
Residual	0.73	

Table 13

Multilevel Model Predicting Sense of Belonging.

Variable	β estimate	Lower CI	Upper CI	Std. Error	t-value	p-value
Sexual Orientation: LGB	-0.126	-0.372	0.122	0.13	-0.96	0.339
Explicit Attitudes × Culture	0.169	0.083	0.254	0.04	3.78	< 0.001 ***
LGB × Culture	-0.322	-0.475	-0.170	0.08	-4.05	< 0.001 ***
LGB × Explicit Attitudes × Culture	0.049	-0.107	0.205	0.08	0.60	0.550
LGB × Woman × Culture	-0.054	-0.262	0.157	0.11	-0.49	0.624
LGB × Woman × Explicit Attitudes × Culture	-0.137	-0.347	0.075	0.11	-1.25	0.214

Note. 95% confidence intervals. Full model is reported in the supplement, only variables and interactions of interest reported here. Sexual orientation variables compared against straight. Sex variables compared against men.
*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Replicating the pattern of results in the model predicting desire to migrate, the models predicting belonging revealed an interaction between explicit attitudes and perceived culture of the place, $\beta = 0.169$, 95% CI [0.083, 0.254], $p < 0.001$, and an interaction between perceived culture of the place and sexual orientation, $\beta = -0.322$, 95% CI [-0.475, -0.170], $p < 0.001$. Unlike the models predicting desire to migrate, these interactions were not qualified by higher order interactions. We also ran a sensitivity power analysis for our model, using the SIMR R package (Green & MacLeod, 2016). The analysis had 80% power to detect an effect size of $\beta = 0.080$ for a two-way interaction, with our sample size of $N = 214$. Thus, our analysis is sufficiently powered because the four-way interaction that emerged in our analysis ($\beta = -0.137$) is larger than this threshold.

Simple slopes analysis of the explicit sexuality attitudes and perceived culture interaction showed that participants with pro-straight attitudes report a greater sense of belonging to places that they perceive to reflect straight culture, $\beta = 0.224$, 95% CI [0.137, 0.311], $p < 0.001$ (Figure

5). When participants had pro-gay or neutral attitudes, no such effect occurred and participants felt an equal sense of belonging across places, $\beta = -0.116$, 95% CI [-0.280, 0.048], $p = 0.167$ and $\beta = 0.054$, 95% CI [-0.044, 0.151], $p = 0.281$, respectively.

Figure 5

Sense of Belonging Based on Explicit Sexuality Attitude and Place's Perceived Culture.
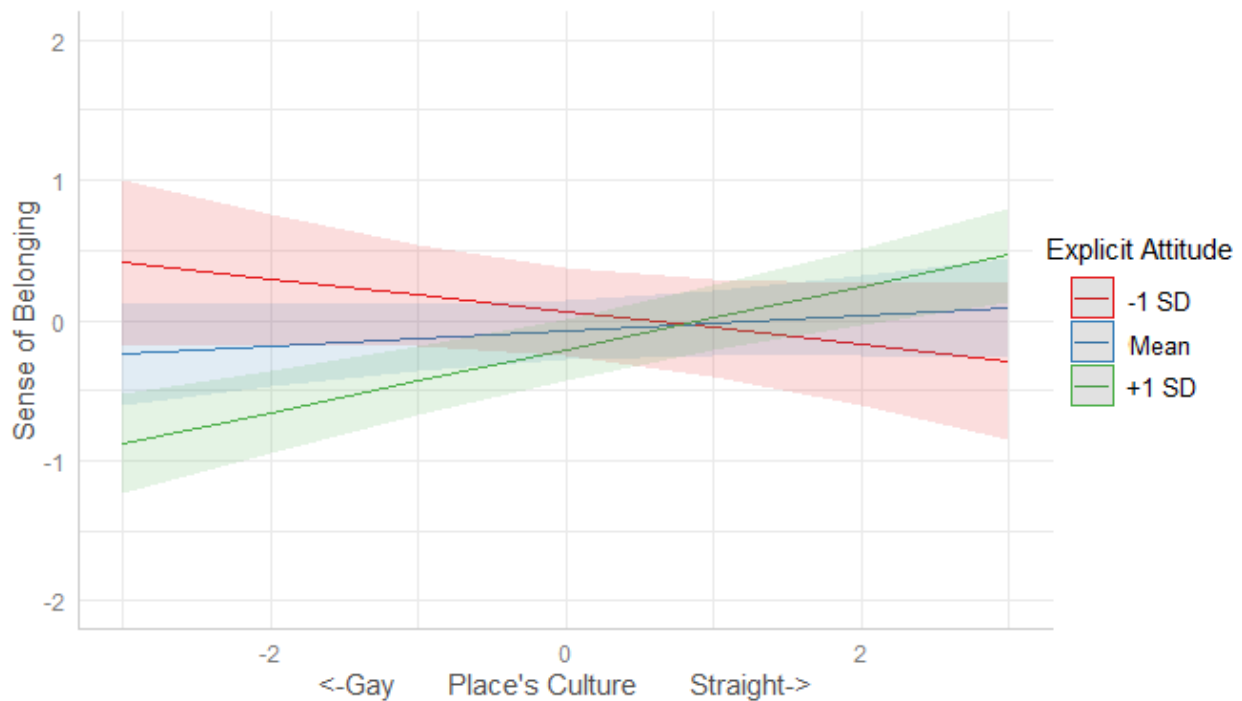
Simple slopes analysis of the interaction between sexual orientation and culture also showed that as places had greater perceived gay culture, LGB participants reported a higher sense of belonging, $\beta = -0.268$, 95% CI [-0.389, -0.146], $p < 0.001$. However, straight participants' sense of belonging did not vary as a function of perceived culture, $\beta = 0.054$, 95% CI [-0.043, 0.151], $p = 0.279$, as shown in Figure 6.

Figure 6

*Sense of Belonging Based on Sexual Orientation and Place's Perceived Culture.*
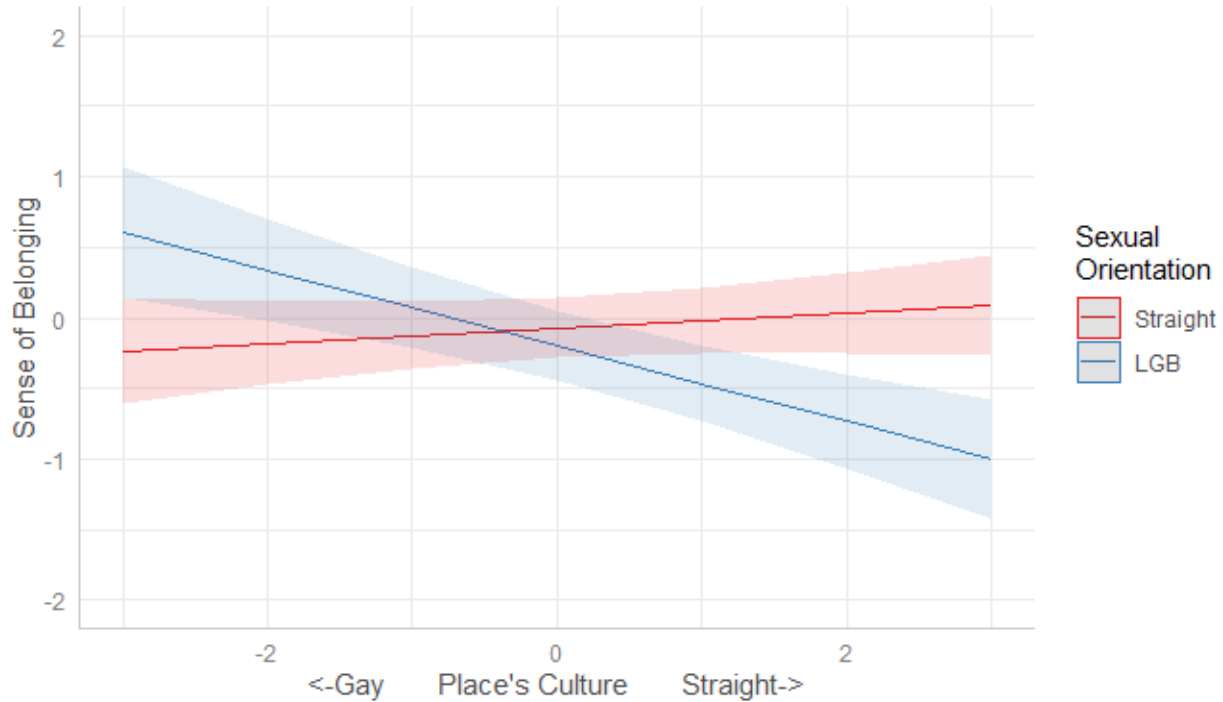
Sense of Belonging Mediating Desire to Migrate

To better understand the factors related to desire to migrate, we examined sense of belonging as a potential mediator on a pathway between our operationalizations of person-environment fit and desire to migrate. We operationalized attitudinal person-environment fit in terms of the interaction between place's perceived culture and explicit attitudes, and gay migration fit in terms of the interaction between place's perceived culture and sexual orientation. The mediation pathway is shown in Figure 7 and the standardized regression coefficients are summarized in Table 14.

Figure 7

Diagram of the Mediated Pathway from Person-Environment Fit to Desire to Migrate.
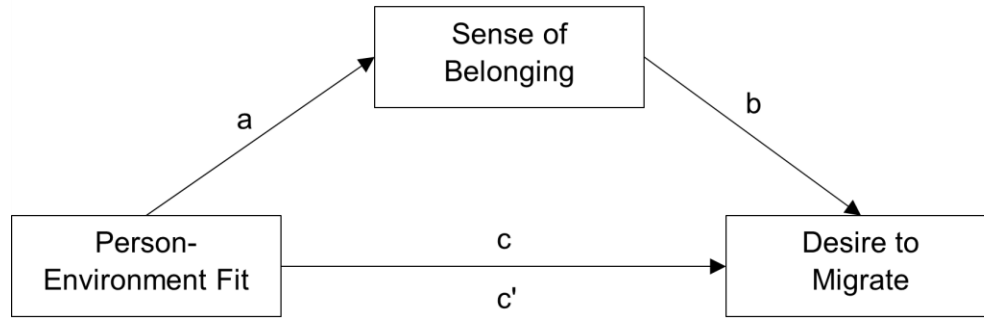
Table 14

Summary of Mediation Pathway.

Interaction	β Estimate for c	β Estimate for a	β Estimate for c'
Attitude × Place's Culture	0.1339 ***	0.1687 ***	0.0006
LGB × Place's Culture	-0.2163 **	-0.3218 ***	0.0422

$* \, p < 0.05; \, ** \, p < 0.01; \, *** \, p < 0.001$

As shown in Table 14, there is an unmediated relationship between our two operationalizations of person-environment fit (attitudinal fit and gay migration fit) and the desire to migrate, along the c pathway. Sexuality attitudes and place's perceived culture interact to predict the desire to migrate, $\beta = 0.134$, 95% CI [0.060, 0.207], $p < 0.001$, in line with attitudinal person-environment fit. Additionally, sexual orientation and place's perceived culture interact to predict the desire to migrate, $\beta = -0.216$, 95% CI [-0.348, -0.085], $p = 0.002$, in line with gay migration fit. Then, we showed a relationship between both attitudinal person-environment fit ($\beta = 0.169$, 95% CI [0.083, 0.254], $p < 0.001$) and gay migration fit ($\beta = -0.322$, 95% CI [-0.475, -0.170], $p < 0.001$) and sense of belonging for explicit sexuality attitudes (Pathway a). Sense of belonging predicted the desire to migrate, along Pathway b, $\beta = 0.784$, 95% CI [0.772, 0.795], $p < 0.001$. Finally, when we include sense of belonging in the model to predict desire to migrate, c', sense of belonging predicts the desire to migrate, $\beta = 0.803$, 95% CI [0.790, 0.816], $p <$

0.001. Thus, sense of belonging accounts for the relationship between person-environment fit and desire to migrate across two conceptualizations of fit: attitudinal person-environment fit and gay migration fit.

Study 2 Discussion

Study 2 provides experimental evidence for gay migration and attitudinal person-environment fit. LGB participants showed evidence for gay migration, generally migrating to places with greater perceived gay culture. In contrast, straight participants showed a greater desire to migrate to places with greater perceived straight culture, but only when they preferred straight people over gay people. Sense of belonging mediated the relationship between fit and desire to migrate.

<div align="center">

General Discussion

</div>

Across two studies, we found that people migrate to maximize fit with their environment, in terms of either their sexual orientation or sexuality attitudes. LGB people's migration primarily reflected gay migration: LGB people generally migrated from places low in gay friendliness to places that were more gay-friendly, and their own sexuality attitudes played little role in this pattern of results. In contrast, straight people's migration primarily reflected attitudinal person-environment fit: straight people with relatively stronger pro-straight attitudes consistently migrated from places that were gay-friendly to places that were less gay-friendly.

Gay Migration and Person-Environment Fit

In accordance with our perspective on attitudinal person-environment fit, straight people in both studies migrated based on their sexuality attitudes. In Study 1, only straight people migrated away from regions that did not fit their attitudes (e.g., pro-gay attitudes in a gay unfriendly region), and migrated to regions that fit their attitudes. Straight participants in Study 2

also showed a desire to migrate based on sexuality attitudes, in line with attitudinal person-

environment fit. Straight participants who had pro-straight attitudes wanted to migrate to places

with straight (versus gay) culture. Similarly, the migration preferences of straight women with

pro-gay attitudes were also guided by fit with their attitudes, such that they wanted to migrate to

places with gay (versus straight) culture. This pattern of results suggests that sexual orientation is

not particularly relevant to straight people's migration decisions, but their sexuality attitudes are.

LGB participants largely migrated according to our gay migration hypothesis, though

their patterns of results were relatively more mixed compared to straight participants. In Study 1,

LGB participants were more likely to leave regions low (versus high) in gay friendliness.

Importantly, LGB participants' explicit sexuality attitudes were unrelated to the gay friendliness

of their current region, as the attitudinal person-environment fit mechanism we observed among

straight participants would predict. This pattern of results suggests that different mechanisms

contribute to migration decisions for LGB and straight people: whereas LGB people largely

migrate based on fit with their identity (i.e., gay migration), straight people largely migrate based

on fit with their attitudes (i.e., attitudinal person-environment fit). That said, and contrary to the

gay migration perspective, LGB participants who migrated in Study 1 did not consistently

migrate to gay-friendly places – though this pattern of results did not persist in Study 2. Instead,

LGB participants in Study 2 generally reported a higher desire to migrate to places with greater

perceived gay culture. One possible interpretation of these seemingly disparate findings is that it

is easier to leave a bad place than it is to end up in a good place. Under hypothetical

circumstances (i.e., Study 2), LGB people may prefer to live in gay-friendly places, but in the

real world (i.e., Study 1) the choice of destinations is constrained by other priorities (e.g.,

employment options) and pressures (e.g., affordable housing). Future research is necessary to

better understand these nuances in the relationships between sexual orientation and migration as a function of attitudes.

In addition to the differences between hypothetical and actual migration, other seeming inconsistencies emerged among the migration patterns of LGB participants in the present research. For example, in Study 2, lesbian and bisexual women always reported a stronger desire to migrate to places with gay culture compared to places with straight culture. This pattern of migration also persisted for gay and bisexual men, who also reported a stronger desire to migrate to places with perceived gay culture – but only when their sexuality attitudes reflected either pro-gay or no preference. Gay and bisexual men with pro-straight attitudes were the exception to this pattern of migration: their desire to migrate was unrelated to their perceptions of gay (versus) straight culture. Gay and bisexual men with pro-straight attitudes may reflect a special case – internalized homophobia – that may, in turn, may affect migration. Due to their negative attitudes towards LGB people, gay and bisexual men may have no desire to be around other LGB people, even if their identities would otherwise fit in places with strong gay culture. At the same time, they might recognize that, because of their sexual identities, they would not be welcomed into places with strong straight culture. Seemingly caught between a rock and a hard place, pro-straight gay and bisexual men's migration decisions may be unaffected by perceptions of gay (versus straight) culture because neither option provides optimal fit for them. Future research should continue to investigate cases like this, in which apparent conflicts between attitudes and identity influence the judgments and behaviors of LGB people.

Though internalized homophobia may explain the divergent migration preferences pro-straight gay and bisexual men, the migration preferences of pro-straight lesbian and bisexual women did not diverge from their counterparts with pro-gay attitudes. Specifically, lesbian and

bisexual women who internalize homophobia nevertheless preferred to migrate to places with strong pro-gay culture. This pattern of results may reflect a difference in how women and men migrate, such that lesbian and bisexual women seek fit by moving to places that have stronger gay culture. Lesbian culture is relatively invisible compared to gay male culture (Wolfe, 1992), and by extension, lesbian cultural spaces, such as lesbian bars, are more hidden and less common, than gay male spaces (Chamberland, 1993; Jennings, 2012). Therefore, lesbian and bisexual women may express stronger desires to be part of communities that are hidden, dwindling, and in need of support and preservation. In contrast, male privilege may shield gay and bisexual men against the pressures and stressors that gay spaces otherwise provide refuge against. Consequently, gay and bisexual men may have the option to avoid gay spaces when other pressures (e.g., pro-straight attitudes) would make those spaces less inviting to them. Furthermore, to the extent that spaces for gay and bisexual men are more common and visible than are spaces for lesbian and bisexual women, gay and bisexual men may not actively seek to migrate to places with clear gay culture under the assumption that gay spaces will be relatively easy for them to find in any context. Future research should explore possible gender differences like these in the mechanisms underlying gay migration.

Implications

Environmental fit is related to positive mental health outcomes (Bleidorn et al., 2016; Götz et al., 2018), and LGB people – who are at a heightened risk of poor mental and physical health outcomes (King et al., 2008; Ryan et al., 2017) – may especially benefit from migrating to maximize fit. Our findings provide insight into how person-environment fit affects migration, as well as the relationship between culture and fit, which in turn demonstrates the importance of gay culture to foster belonging among LGB people. Our research also investigates new

conceptualizations of fit, testing how identity and attitudes interact with places – both real and hypothetical – to produce fit. Previous research largely does not incorporate identity or attitudes into conceptualizations of regional fit; instead, person-environment fit in previous research has been examined in the context of personality (Götz et al., 2018; Bleidorn et al., 2016; Jokela et al., 2015), values (Du et al., 2021), political affiliation (Motyl et al., 2014), and religiosity (Ebert et al., 2020; Schmitt et al., 2010). Even among studies that have focused gay migration specifically (Cooke & Rapino, 2007; Wimark & Osth, 2014), none have considered sexuality attitudes or internalized homophobia, nor have they experimentally manipulated gay culture. Thus, the present research reflects novel contributions to the literatures on regional person-environment fit and gay migration.

This research also contributes to our theoretical understanding of how people migrate, and the relationships between people and places. Geographical psychology theorists posit that selective migration is one mechanism underlying geographic clustering of similar individuals (Rentfrow et al., 2008; Motyl et al., 2014), and our work provides insight into selective migration in the context of sexual identity and sexuality attitudes. Similarly, a large body of research investigates how people perceive and make meaning of places, how physical structures affect perceptions and sense of belonging, and how places may have identities (Di Masso et al., 2011; Wnuk et al., 2021; Dixon & Durrheim, 2010). In Study 2 of the present research, participants indicated their desire to migrate to places as a function of physical environmental cues, and future research can build upon these findings to examine which cues specifically signal gay culture, gay friendliness, or fit.

Limitations

Despite the strengths of this research, there were also some limitations. Participants came from Project Implicit and mTurk, which do not reflect representative samples of any population. Moreover, LGB people were overrepresented in Study 1 (21.6% compared to the national average, 4.1%; Conron & Goldberg, 2020). This large percentage of LGB participants likely reflects self-selection, wherein LGB Project Implicit visitors disproportionally choose the Sexuality IAT. Additionally, Study 1 relied on data from PRRI that were collected from 2017-2019 but Project Implicit Data that were collected from 2002-2019. Consequently, the data reflecting participants' sexuality attitudes overlaps with – but does not perfectly align with – the data reflecting regional gay friendliness. Additionally, our index of regional gay friendliness in Study 1 did not reach conventionally-accepted levels of internal reliability, which threatens the construct validity of that index. However, all three items in the index assess attitudes related to policies that affect LGB people and, thus, would seem to be face valid indices of regional gay friendliness. That said, we conceptually replicated the key findings of Study 1 with a different operationalization of gay friendliness in Study 2 (i.e., environmental cues). Future research should nevertheless continue to explore different ways in which a region's or place's friendliness to gay people can be signaled or operationalized.

In Study 1, we operationalized participants as having migrated if they reported a current DMA that differed from their longest-lived DMAs – an approach we adopted from Motyl et al.'s (2014) investigation into migration in search of political fit. However, this conceptualization of migration may not account for people who have migrated multiple times, or who have migrated within a DMA. We also found that the vast majority of participants in Study 1 (roughly 98%) migrated according to this operationalization, which may have led to ceiling effects as well as a

lack of insight into the participants who did not migrate. That said, our very large sample

provides both range and statistical power that helps to minimize concerns about ceiling effects.

We operationalized person-environment fit in terms of cross-level interactions between

individual-level traits and region-level characteristics, an approach that has been used in previous

research on person-environment fit (Fulmer et al., 2010; Gebauer et al., 2020). However,

researchers have investigated person-environment fit using other approaches, such as response

surface analysis (Humberg et al., 2018; Humberg et al., 2020; Nestler, et al., 2019) and elevation,

scatter, and shape analysis (Furr, 2008; Furr, 2010). Each of these techniques provides

complementary insight into person-environment fit: response surface analysis can examine

asymmetric and level-dependent congruence effects (Humberg et al., 2020), whereas elevation,

scatter, and shape analysis can give insight into contexts where normativeness or distinctiveness

matter in fit (Furr, 2008). That said, cross-level interactions remain a valid way to operationalize

and examine person-environment fit (Aguinis et al., 2013) and future work should examine

whether the patterns of results that emerged in the present research generalize across other

operationalizations of fit.

In Study 2, we relied on stimuli selected from major U.S. cities, focusing on social

spaces, to operationalize gay and straight culture. Though urban centers are often the focus of

gay migration research (Weston, 1995; Annes & Redlin, 2012), not all people – gay or straight –

prefer urban or social spaces, so they might not be interested in migrating to these places

regardless of cultural fit. That said, Study 2's within-participants design accounts for these

individual differences, rather than assuming a priori that all participants will view each class of

stimuli in the same way. Further, gay bars are perceived as safe spaces by members of the LGB

community (Croff et al., 2017), and spaces that are dedicated to underrepresented minority

communities increase a sense of belonging even for group members who do not frequent the spaces themselves (Kirby et al., 2020). Consequently, a sober LGB person may feel welcome in a neighborhood with a gay bar, even if she never visits the bar herself. Nevertheless, future research should continue to examine the breadth of what gay spaces can look like, and how they affect LGB people's sense of belonging.

In both studies, we examined the influence of implicit and explicit sexuality attitudes on migration. Whereas we found a relatively consistent pattern of results for explicit sexuality attitudes across studies, the pattern of results was less clear for implicit sexuality attitudes. In Study 1, the effects of implicit attitudes on migration did not survive robustness checks, such that the pattern of results depended on analytic decisions regarding missing data. In Study 2, we did not rely on a traditional implicit measure like the IAT, but instead manipulated the task instructions of our explicit measure in an effort to constrain the influence of deliberate processes in the same way that implicit measures are assumed to operate. We adopted this approach based on the work of Ranganath and colleagues (2008), who showed that "fully-considered" responses correspond with traditional explicit measures, whereas "gut" responses correspond with traditional implicit measures – and that "fully-considered" and "gut" responses do not correspond with one another. In contrast, in Study 2 of the present research the two measures corresponded very closely. In light of these challenges, we report analyses of implicit sexuality attitudes in the Supplement rather than in the main text, and refrain from making strong claims about the effects of implicit attitudes on migration. Nevertheless, we believe that further research should continue to examine the influence of implicit sexuality attitudes on migration.

Though the present research focused on sexual orientation and sexuality attitudes as they related to migration, other factors certainly also influence migration. Differences in mobility

(Oishi et al., 2015b), family ties (Wimark, 2016), and political ideology (Motyl et al., 2014) all influence migration as well. Though we controlled for a variety of demographic and environmental factors, we make no strong claims that our statistical models reflect comprehensive investigations into every factor – or even the most important factors – that influence migration. Moreover, we found that belonging mediated the relationship between person-environment fit and desire to migrate, but refrain from making a strong causal claim that people migrate because of feelings of belonging. That said, to the extent that people have some flexibility in where they search for jobs or homes, our findings suggest that people's sexual orientation and sexuality attitudes affect where they chose to live and work.

Conclusion

The present research examined selective migration in the context of sexual orientation and sexuality attitudes, and found evidence of both gay migration and attitudinal person-environment fit. Straight people migrate based on their sexuality attitudes, tending to leave places that do not match their attitudes and migrating to places that do. In contrast, LGB people largely migrate based on the regional gay friendliness or perceived gay culture of the place, with limited influence from their attitudes. The present research highlights characteristics of both people and places that influence migration, and provides insight into how gay culture affects belongingness and fit among LGB people. In conclusion, we hope that this work helps LGB people find places where they can be happy and healthy.

Open Practices

The studies in this article earned Open Data and Open Materials badges for transparent practices. Materials for Study 1 are available at https://osf.io/xpnjk/?view_only=2b307a2013764fa5bedaf6e7be9c14e3. Materials, data, and

preregistration for Study 2 are available at

https://osf.io/n2cea/?view_only=c21642735df2425181ee7d6fd14d9e3d.

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Appendix A

PRRI Questionnaire for Regional Climate

Respondents were asked to answer the following questions according to the following wording. The order was randomized for different participants.

Now, we would like to get your views on some issues that are being discussed in the country today. Do you strongly favor, favor, oppose or strongly oppose:

- Laws that would protect gay, lesbian, bisexual, and transgender people against discrimination in jobs, public accommodations, and housing

- Allowing a small business owner in your state to refuse to provide products or services to gay or lesbian people, if doing so violates their religious beliefs

- Allowing gay and lesbian couples to marry legally

Appendix B

Instructions for Feeling Thermometers

When reporting their gut responses, participants were instructed to "Answer based on your <u>initial feelings</u> and respond with your <u>"gut response"</u> towards these groups." When reporting their fully considered attitudes, they were told to "Take a moment to <u>fully consider</u> your <u>actual feelings</u> towards these groups and respond with your <u>fully considered opinion.</u>" The order of feeling thermometer instructions was randomized between participants, and participants had to complete an attention check (e.g., "On the following screen, I will respond based on: my fully considered opinion or my gut response") before responding to each set of feeling thermometers.