**ARTICLE**

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# Stigma salience increases loneliness among ethnic minorities

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**Abstract**

Research shows that ethnic minorities are at increased risk of loneliness compared to the general population of the United Kingdom. We hypothesized that stigma salience increases loneliness among ethnic minorities, conducting two experimental studies with ethnic minorities (Study 1: $N = 134$, Study 2: $N = 267$) in which participants were randomly assigned to a stigma salience (recalling a personal experience of discrimination based on ethnicity) or control condition (recalling a past meal in Study 1 and the experience of reading a book in Study 2). Across these two studies, we demonstrated that stigma salience consistently increased self-reported loneliness relative to the control conditions. Study 1 additionally showed evidence for an indirect effect of stigma salience on loneliness through feelings of anxiety. Study 2 replicated the effect of self-relevant (but not non-self-relevant) stigma salience on loneliness and provided suggestive evidence for a more specific indirect effect through identity-related social anxiety.

**KEYWORDS**
discrimination, ethnic minorities, loneliness, social stigma

Loneliness, or the perception that one's social needs are not being adequately met (Hawkley & Cacioppo, 2010), is an aversive psychological state tied to impairments in physical and mental health (Hawkley & Cacioppo, 2010; Heinrich & Gullone, 2006; Wang et al., 2023). Loneliness is a common human experience that affects most people at some point throughout their lives (Heinrich & Gullone, 2006). However, the experience of loneliness may be more frequent and pernicious for social groups that are stigmatized or devalued in society (Doyle & Molix, 2016; Elmer et al., 2022; Victor et al., 2012; Visser & El Fakiri, 2016; see Barreto et al., 2023 for a review). For example, past research in the United Kingdom has documented greater levels of loneliness among ethnic minorities compared to

the general population (Victor et al., 2012). Given this inequitable burden of loneliness, further research is needed to uncover causal factors that place devalued social groups at heightened risk for loneliness. Here we suggest that exposure to social stigma is such a risk factor that increases loneliness among ethnic minorities.

Those who are socially stigmatized, including ethnic minorities, regularly contend with prejudice and discrimination (Hoggard et al., 2012; Swim et al., 2003). Research on social stigma has predominantly focused on deleterious consequences of such exposures for health and well-being (Paradies, 2006; Pascoe & Richman, 2009; Schmitt et al., 2014), but largely overlooked consequences for social relationships and overall social health (Doyle & Molix, 2016). While any form of rejection can be damaging to social health, discrimination driven by social stigma is particularly insidious in that it conveys devaluation of an aspect of one's identity. Members of socially stigmatized groups who experience chronic prejudice and discrimination may come to expect rejection in future interactions, reducing feelings of belonging and acceptance in their social environments (Mendoza-Denton et al., 2002).

There is some evidence that social stigma is causally related to negative or defensive social behaviours and cognitions. For example, a recent set of experiments (Zhang et al., 2020) demonstrated decreased interpersonal trust in a behavioural trust paradigm (a coin toss game) for those randomly assigned to recall an experience of stigma-based rejection compared to recalling an experience of non-stigma-based rejection (Study 1), as well as for those randomly assigned to be rejected by an interviewer for stigma-based compared to non-stigma-based reasons (Study 2). In a similar vein, another set of experiments (Richman et al., 2016) showed that recalling an experience of stigma-based rejection compared to a neutral writing task led to slower recognition of smiling faces in an emotion recognition task (Study 1) and impaired recognition of affiliation-related words in a word completion task (Study 2). Experimental manipulations of stigma salience (involving reading a newspaper article about the prevalence of discrimination against the in-group or a neutral topic) have also been shown to decrease self-reported romantic relationship quality (Doyle & Molix, 2014). Collectively, these experiments provide evidence that manipulations of stigma salience can causally alter or impair social behaviours and cognitions. However, none of these experiments have focused specifically on the experience of loneliness following social stigma salience.

Related cross-sectional work has found evidence that perceived discrimination is associated with loneliness among ethnic minorities across a number of different studies (e.g., Juang & Alvarez, 2010; Lee & Turney, 2012; Sutin et al., 2015; Visser & El Fakiri, 2016). There have also been longitudinal examinations of this association, with one study (Priest et al., 2017) of Australian primary and secondary students from diverse ethnic backgrounds finding that perceived ethnic discrimination at baseline was associated with increased loneliness at a nine-month follow-up, even after adjusting for loneliness at baseline. While this research suggests a causal role of stigma in shaping experiences of loneliness, experimental work investigating the effect of stigma salience on loneliness among ethnic minorities would provide further confirmation of this potentially causal effect.

## Present research

Given past experimental evidence that stigma salience impairs social behaviours and cognitions (Doyle & Molix, 2014; Zhang et al., 2020) as well as cross-sectional and longitudinal evidence that perceived discrimination (a product of social stigma) is associated with loneliness (e.g., Lee & Turney, 2012; Priest et al., 2017), we sought to examine the potential causal role of stigma salience in shaping loneliness among ethnic minorities. Therefore, the present studies were designed to test the hypothesis that stigma salience, operationalized as recalling a past experience of discrimination based on one's ethnicity, would increase self-reported levels of loneliness among ethnic minorities. We conducted two related studies to test this hypothesis, altering some features of the experimental design, but maintaining the same key dependent variable and the same experimental stigma salience condition across studies.

# STUDY 1

The focal hypothesis of Study 1 was that an experimental manipulation of stigma salience would increase self-reported loneliness among ethnic minorities in the United Kingdom. A secondary hypothesis of Study 1 was that an experimental manipulation of social support salience would decrease loneliness and potentially buffer the deleterious effects of priming social stigma on loneliness. Additionally, as an exploratory aim, state levels of depressive symptoms, anxiety, and self-esteem were measured in order to test for possible indirect effects of stigma salience on loneliness. These candidate mechanisms were chosen as previous meta-analyses have confirmed that they are associated with both perceived discrimination (Schmitt et al., 2014) and loneliness (Mahon et al., 2006). However, although we proposed these variables as candidate mechanisms in the current study, it is important to note that our experimental design does not allow us to make strong causal claims of mediation as each of these variables likely have bidirectional associations with our key outcome, loneliness.

## Method

### Design

Study 1 utilized a 2 (stigma salience: stigma, control) × 3 (social support salience: high support salience, low support salience, control) between-participants experimental design. The first factor, stigma salience, was manipulated by randomly assigning participants to write about either an experience in which they were treated unfairly because of their ethnicity (stigma salience condition) or their last meal (control condition; adapted from Richman et al., 2016). In both conditions, participants were required to write for at least 2 min. The instructions were parallel but differed in key ways by condition: "We would like you to think about *the racial ethnic group to which you belong* (*your last meal*). Please think back to *an experience when you felt that you were treated unfairly because of being this race/ethnicity* (*this experience*). Try to go back to this event in your mind and recall it as vividly as possible, providing a brief description of this experience in the section below. Please write for at least 2 min." The second factor, social support salience, was manipulated by randomly assigning participants to list the initials of three close friends they could go to for support (high social support salience condition), the initials of ten close friends they could go to for support (low social support salience condition), or five colours (control condition). This manipulation was created for the current study drawing upon past research on the ease-of-retrieval effect (Schwarz et al., 1991), as well as traditional measures of social support (Sarason et al., 1987). In pilot testing with a group of 18 volunteers, the majority of people found it relatively easy to list the initials of three close friends that they could go to for support, but relatively difficult to list the initials of 10 close friends that they could go to for support. Based on the ease-of-retrieval effect, participants were expected to view themselves as less able to access social support when confronted with the relatively difficult task of listing their 10 close friends as opposed to listing three close friends (or five colours).

### Participants

Study 1 was powered with regard to the focal hypothesis (i.e., that stigma salience would increase loneliness relative to the control condition). The estimated effect size ($d = .59$) was drawn from Study 1 by Richman et al. (2016) due to the similar manipulation and related dependent variable in that experiment. Given this effect size of interest and alpha = .05, analyses in G*Power Version 3.1 (Erdfelder et al., 1996) indicated a necessary sample size of 94 to achieve 80% power in the current study.

Community groups and university societies focused on ethnic minority issues were targeted for recruitment. However, in order to disguise the aims of the study, respondents were not presented with any eligibility criteria other than being over 18 years of age. In total, 355 people accessed the first page

of the study. Of these, 221 were not presented with the rest of the experiment because they did not self-identify as an ethnic minority ($n = 150$), or they identified as an ethnic minority but did not reside in the United Kingdom ($n = 27$), or they did not complete relevant demographic information ($n = 44$), resulting in a total analytic sample of 134 participants.

Participants self-identified with a variety of minority ethnic groups: 60 Asian (45%), 10 African British (8%), 8 British Chinese (6%), 7 Arabic (5%), 6 British Indian (5%), 5 White and Black African (4%), 5 White and Asian (4%), 5 Black British (4%), 3 Middle Eastern (2%), 1 White and Black Caribbean (1%), 1 British Bangladeshi (1%), 1 Caribbean British (1%), and 20 identified as another minority ethnic group not specified (20%). All participants currently resided in the United Kingdom, but 94 (70%) were born in another country. Participants ranged in age from 18 to 35 years old ($M = 21.41$, $SD = 2.81$) and there were 86 women (64%) and 48 men (36%) in the sample.

## Materials and procedure

This study was approved by the Department of Psychology Ethics Committee at the University of Exeter and was conducted online using Qualtrics. All measures, manipulations, and exclusions in the study are reported here. Participants completed demographic questions, including ethnicity, sex, country of residence, and age, before being randomly assigned to stigma salience and social support salience conditions as described previously. After the experimental manipulations, participants completed a measure of the key dependent variable, loneliness, followed by measures of state depressive symptoms, anxiety, and self-esteem as exploratory mechanisms.

### Loneliness

Loneliness was assessed with the UCLA Loneliness Scale Version 3 (Russell, 1996). This widely used measure is a revised version of the original UCLA Loneliness Scale (Russell et al., 1978) and is among the most psychometrically sound for assessing loneliness. Participants are asked to rate the frequency with which they experience 20 feelings related to loneliness on a scale ranging from 1 (*Never*) to 4 (*Often*). Example items include "How often do you feel that you lack companionship" and "How often do you feel isolated from others." This measure showed good internal consistency in the current sample, Cronbach's alpha ($\alpha$) = .90, McDonald's omega ($\omega$) = .90. Although we are not aware of any work examining measurement invariance among ethnic minorities for the full 20-item UCLA Loneliness Scale, the shortened 7-item version of the measure has been examined between African Americans and whites in the US, showing differences in mean levels but equivalence in functioning (Allen & Oshagan, 1995).

### Depressive symptoms

Depressive symptoms were assessed with the state subscale of the Maryland Trait and State Depression Scale (Chiappelli et al., 2014). This 18-item measure asks participants to indicate how often within the past week they experienced depressive symptoms on a 5-point scale with the following response options: *Not at all, <1, 1–2, 3–4, 5–7 days*. Example items from this measure include "I feel sad" and "I feel sluggish and slow." One item was excluded from the measure in this study for ethical reasons: "I feel that I want to die." The 17 remaining items on this measure showed good internal consistency in the current sample, $\alpha$ = .92, $\omega$ = .92.

### Anxiety

Anxiety was assessed using the state subscale of the State–Trait Anxiety Inventory for Adults (Spielberger, 1983). For this measure, participants are asked to rate their agreement to a variety of items on a 4-point scale ranging from 1 (*Not at all*) to 4 (*Very much so*). This measure consists of 20 items, including, "I feel worried" and "I feel secure" (reverse coded). This measure showed good internal consistency in the current sample, $\alpha$ = .93, $\omega$ = .93.

*Personal self-esteem*

The 20-item State Self-Esteem Scale (Heatherton & Polivy, 1991) was included in the current study to assess self-esteem. This 20-item measure consists of 3 subcomponents: Performance, social, and appearance state self-esteem. In this study, the total score was computed and analysed rather than the subcomponents. Participants respond to the 20 items on a 5-point scale ranging from 1 (*Not at all*) to 5 (*Extremely*). Example items include, "I feel that others respect and admire me" and "I feel confident about my abilities." This measure showed good internal consistency in the current sample, $\alpha = .90$, $\omega = .90$.

## Results and discussion

Analyses were conducted using SPSS Version 25. Missing data were handled with pairwise deletion, with overall missing data minimal in the current study (<4% for any measure). A two-way ANOVA revealed a main effect of stigma salience on loneliness, $F(1, 119) = 7.06$, $p = .009$, $\eta_p^2 = .056$, with those in the stigma salience condition ($M = 2.27$, $SD = 0.48$) reporting significantly increased loneliness relative to the control condition ($M = 2.08$, $SD = 0.44$). There was no statistically significant effect of the manipulation of social support salience on loneliness, $F(2, 119) = 2.05$, $p = .133$, $\eta_p^2 = .033$. That is, participants did not significantly differ in loneliness whether they were randomly assigned to the control ($M = 2.13$, $SD = 0.52$), low social support salience ($M = 2.28$, $SD = 0.48$), or high social support salience conditions ($M = 2.12$, $SD = 0.38$). There was also no statistically significant evidence for an overall interaction between the stigma salience and social support salience manipulations on loneliness, $F(5, 119) = .63$, $p = .532$, $\eta_p^2 = .011$ (see Figure 1).

Regarding potential mechanisms, those in the stigma salience condition ($M = 2.23$, $SD = 0.86$) did not report significantly greater state depressive symptoms relative to the control condition ($M = 2.01$, $SD = 0.74$), $t(127) = -1.50$, $p = .137$, $d = .266$, nor did those in the stigma salience condition ($M = 3.19$, $SD = 0.63$) report significantly lower state self-esteem relative to the control condition ($M = 3.32$,
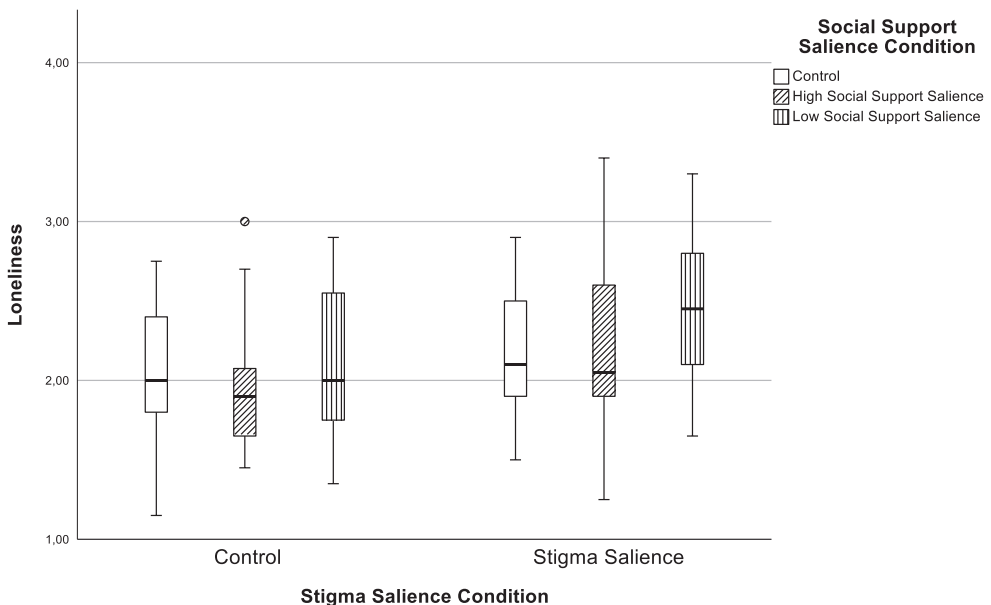


**FIGURE 1** Box plots (with median and interquartile range) showing loneliness as a function of stigma salience and social support salience (Study 1).

$SD = 0.59$), $t(126) = 1.164$, $p = .246$, $d = .207$. Therefore, we did not find evidence to suggest an indirect effect of stigma salience on loneliness through either of these potential mechanisms.

However, those in the stigma salience condition ($M = 2.20$, $SD = 0.57$) did report significantly higher levels of state anxiety relative to those in the control condition ($M = 1.95$, $SD = 0.56$), suggesting evidence for a potential indirect effect, $t(125) = -2.418$, $p = .017$, $d = .430$. Further analysis using PROCESS Version 3.1 (Hayes, 2018), set at 5000 bootstrap samples, confirmed a statistically significant indirect effect of stigma salience on loneliness via state anxiety, $\beta = .30$, $SE = 0.11$, 95% CI: 0.08, 0.53 (y-standardized). After accounting for this indirect effect, the direct effect of stigma salience on loneliness was reduced in magnitude and no longer statistically significant (see Figure 2). In total, this model accounted for over a third of the variance in loneliness in this sample, $F(2, 120) = 36.85$, $p < .001$, $R^2 = .381$.

In summary, the results from Study 1 confirmed the hypothesized increase in loneliness among ethnic minorities in the United Kingdom after stigma salience. However, the manipulation of social support salience employed in this study did not appear to significantly buffer this effect. This may be due to relatively low power to detect an interaction in this study (as the study was powered to detect the focal main effect of stigma salience on loneliness rather than the interaction), but also may be attributable to the distinction between loneliness and social isolation (Newall & Menec, 2019). Loneliness is a subjective experience relating to both the quantity and (perhaps more importantly) quality of social relationships. Because this study employed a relatively objective manipulation of the number of social relationships available, it may not have been adequate to suppress the emotional, subjective consequences of stigma salience. That is, participants may have perceived that they had access to more social support in the high social support salience condition, but (at least some) might have still felt that these relationships were inadequate in some way, thus failing to block perceptions of loneliness.

While the effect of stigma salience on loneliness revealed in this study was in line with past theory and research on how stigma might increase loneliness, closer inspection of the control condition led to some potential ambiguity regarding which condition may have driven observed differences. Specifically, when reading passages written by participants in the control condition, it became clear that there were occasional references to the presence of others (e.g., family, friends) when participants described their last meals. Therefore, it is possible that any difference in loneliness between the stigma salience and control conditions could have been driven by a boost in social inclusion when recalling a meal shared with others rather than an increase in loneliness when recalling an experience of unfair treatment based on ethnicity, a limitation that we sought to address in Study 2.

Finally, in Study 1 we also found evidence for a potential indirect effect of stigma salience on loneliness through state anxiety (but not state depressive symptoms or self-esteem). This suggests that stigma
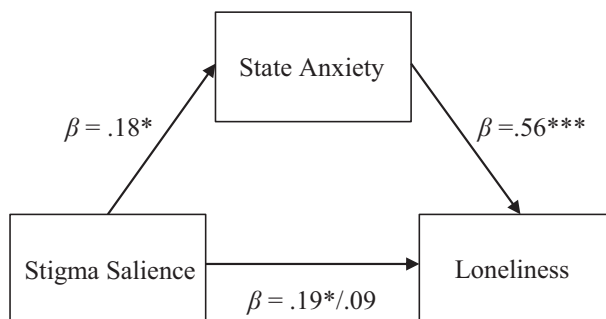


**FIGURE 2** Indirect effect model with exposure to stigma salience (relative to control condition) predicting loneliness via state anxiety in Study 1. All values presented are standardized regression coefficients. In the path from social stigma to loneliness, the first value indicates the total effect of stigma salience and the second value indicates the direct effect. *$p < .05$, *** $p < .001$.

salience may be capable of instigating a process of anxious cognitions that may interfere with social health. Importantly, anxiety is an emotion associated with expectations of potential future negative events (Craske et al., 2009). Therefore, it is consistent with the notion that exposure to social stigma leads to expectations that one will be rejected or discriminated against in the future, limiting the possibility of potential social connections and increasing feelings of loneliness. However, confirmation of such a pathway would be strengthened with evidence for effects on anxiety specific to the social domain, which we also sought to examine in Study 2.

# STUDY 2

The main aim of Study 2 was to replicate the findings of Study 1 regarding the effect of stigma salience on loneliness, thus the primary hypothesis was once again that an experimental manipulation of stigma salience would increase self-reported loneliness among ethnic minorities in the United Kingdom. Furthermore, in Study 2 we sought to address some of the limitations of Study 1 as described previously, as well as extend our preliminary findings. First, because in Study 1 we found that participants in the control condition occasionally wrote about social experiences, we sought to create a control condition that would exclude any possibility of a social element as far as possible. Furthermore, based on similar past research utilizing another type of control condition (Doyle & Molix, 2014), we aimed to compare self-relevant stigma (i.e., stigma due to ethnicity) to non-self-relevant stigma (i.e., stigma due to an identity that our participants did not possess). The addition of this third condition would allow us to even more robustly test the effects of stigma salience on loneliness in ethnic minorities.

Additionally, we sought to build on our initial evidence for changes in anxiety as a potential mechanism linking stigma salience and loneliness by focusing on forms of anxiety related to the social domain: social anxiety and race-based rejection sensitivity. Social anxiety refers to distress experienced when meeting or interacting with other people (Mattick & Clarke, 1998) while race-based rejection sensitivity refers to the tendency to anxiously expect, readily perceive, and intensely react to rejection because of race or ethnicity (Mendoza-Denton et al., 2002). While both of these are more social forms of anxiety, race-based rejection sensitivity explicitly acknowledges the role of one's stigmatized identity in creating these anxious expectations during social interactions.

Finally, although we did not observe an effect of our stigma salience manipulation on state self-esteem in Study 1, we decided to include a measure of trait self-esteem in Study 2 (specifically, the widely used and well validated Rosenberg Self-Esteem Scale; Rosenberg, 1965). State self-esteem should theoretically be more situationally variable and therefore responsive to our experimental manipulation, which is why we chose to include it in Study 1, however some classic work on the situational effects of stigma has also shown effects on trait self-esteem, specifically using the Rosenberg Self-Esteem Scale (e.g., Crocker et al., 1991; Major et al., 2007). Trait self-esteem may also better capture global self-views that pattern people's sense of relational worth and therefore shape appraisals of interpersonal risk and connection (Murray et al., 2006).

## Method

### Design

Study 2 utilized a single factor (stigma salience) between-participants experimental design with 3 levels: Self-relevant stigma salience, non-self-relevant stigma salience, and control. As in Study 1, the key experimental condition involved participants writing about an experience in which they were treated unfairly because of their ethnicity (self-relevant stigma salience condition). In Study 2, the control condition was adjusted to exclude any possibility of a social element as far as possible. We developed this control condition in pilot testing, in which a group of 43 volunteers independent of

the Study 2 sample rated how social, easy to recall, and positive/negative they considered various prompts to be. Based on these scores, those assigned to the control condition were asked to write about the experience of reading a book, which was rated as the least social as well as easy to recall and neutral. Finally, a second stigma condition was added in which we attempted to manipulate non-self-relevant stigma salience as opposed to self-relevant stigma salience. In the non-self-relevant stigma salience condition, participants were asked to write about an experience in which someone else was treated unfairly because they belonged to an age group different from the participant. This prompt was also developed through pilot testing, in which volunteers rated it as the least relevant to their own social identities as well as easy to recall and a topic about which they felt informed. In all three conditions, participants were required to write for at least 2 min. The instructions in the self-relevant stigma condition were identical to those in Study 1 and the instructions for the two additional conditions were parallel but differed in key ways: "We would like you to think about *an age group other than your own* (*the last book you read*). Please think back to *a time when you heard of someone being treated unfairly because of their age* (*this experience and what it was like to read this book*). Try to go back to this event in your mind, try to recall it as vividly as possible and provide a brief description of this experience in the section below. Please write for at least 2 min."

## Participants

Study 2 was once again powered with regard to the focal hypothesis (i.e., that exposure to self-relevant social stigma would increase loneliness relative to the control condition). The estimated effect size comparing the two stigma conditions ($d = .409$) was drawn from Study 1. Given this effect size of interest and alpha = .05, analyses in G*Power Version 3.1 (Erdfelder et al., 1996) indicated a necessary sample size of 190 to achieve 80% power.

Community groups and university societies focused on ethnic minority issues were again targeted for recruitment. In order to disguise the aims of the study, respondents were once more not presented with any eligibility criteria other than being over 18 years of age. In total, 718 people accessed the first page of the study. Of these, 451 were not presented with the rest of the experiment because they did not self-identify as an ethnic minority ($n = 154$), or they identified as an ethnic minority but did not reside in the United Kingdom ($n = 73$), or they did not complete relevant demographic information ($n = 224$), resulting in a total analytic sample of 267 participants.

Participants self-identified with a variety of minority ethnic groups: 99 Asian (37%), 27 British Indian (10%), 19 British Pakistani (7%), 12 White and Asian (5%), 11 British Chinese (4%), 9 White and Black Caribbean (3%), 9 African British (3%), 9 Arabic (3%), 8 White and Black African (3%), 8 Black British (3%), 7 Caribbean British (3%), 5 British Bangladeshi (2%), 5 Middle Eastern (2%), and 39 identified as another minority ethnic group not specified (15%). All participants currently resided in the United Kingdom, but 172 (64%) were born in another country. Participants ranged in age from 18 to 64 years old ($M = 24.33$, $SD = 8.78$) and there were 189 women (71%), 73 men (27%), and 4 non-binary people (2%) in the sample.

## Materials and procedure

This study was approved by the Department of Psychology Ethics Committee at the University of Exeter and was conducted online using Qualtrics. All measures, manipulations, and exclusions in the study are reported here. Participants completed demographic questions, including ethnicity, sex, country of residence, and age, before being randomly assigned to social stigma conditions. Participants then completed measures of the dependent variable, loneliness, as well as potential mechanisms: Social anxiety, race-based rejection sensitivity, and trait-level self-esteem.

*Loneliness*

Loneliness was again assessed with the UCLA Loneliness Scale Version 3 (Russell, 1996) as described in Study 1. This measure showed good internal consistency in the current sample, $\alpha = .93$, $\omega = .93$.

*Social anxiety*

Social anxiety was measured using a short form of the Social Interaction Anxiety Scale (Fergus et al., 2012). This 6-item scale assesses fears related to general social interactions. Respondents rate the extent to which each statement characterizes them on a 5-point scale ranging from 0 (*Not at all*) to 4 (*Extremely*). Example items include "I tense up if I meet an acquittance in the street" and "I am nervous mixing with people I don't know very well." This measure showed good internal consistency in the current sample, $\alpha = .91$, $\omega = .91$.

*Race-based rejection sensitivity*

The Rejection Sensitivity Race Questionnaire (Mendoza-Denton et al., 2002) is a 12-item measure that assesses anxious expectations of race-based rejection. Items are short vignettes describing situations where participants might feel the threat of being discriminated against, such as "Imagine that you are in a pharmacy, trying to pick out a few items. While you're looking at different brands, you notice one of the store clerks glancing your way." Respondents are asked to indicate how concerned they would be about a negative outcome occurring because of their race, using a 6-point scale ranging from 1 (*Very unconcerned*) to 6 (*Very concerned*). They are also asked to indicate the degree to which they would expect to be rejected in this situation, using a similar scale ranging from 1 (*Very unlikely*) to 6 (*Very likely*). Each item is scored by multiplying the two responses. This measure showed good internal consistency in the current sample, $\alpha = .94$, $\omega = .94$.

*Personal self-esteem*

Trait self-esteem was assessed using the Rosenberg Self-Esteem Scale (Rosenberg, 1965), a widely used measure of global self-esteem. This measure consists of 10 items that are rated on a 4-point scale ranging from 1 (*Strongly disagree*) to 4 (*Strongly agree*). Example items include "I take a positive attitude toward myself" and "I feel that I have a number of good qualities." This measure showed good internal consistency in the current sample, $\alpha = .87$, $\omega = .87$.

## Results and discussion

Analyses were conducted using SPSS Version 25. Missing data were handled with pairwise deletion, with overall missing data minimal in the current study (<1% for any measure). Results from an ANOVA on feelings of loneliness revealed that overall condition failed to attain statistical significance when comparing all three groups, $F(2, 264) = 2.45$, $p = .089$, $\eta_p^2 = .018$. However, replicating key results from Study 1, those in the self-relevant stigma salience condition ($M = 2.22$, $SD = 0.56$) did report significantly increased loneliness relative to those in the control condition ($M = 2.06$, $SD = 0.48$), $t(177) = -2.00$, $p = .047$, $d = .301$, consistent with hypotheses (see Figure 3). Contrary to hypotheses, self-relevant stigma salience did not increase loneliness relative to non-self-relevant stigma salience ($M = 2.21$, $SD = 0.53$), $t(180) = -.12$, $p = .902$, $d = .018$. There was also not a statistically significant difference in loneliness between the non-self-relevant stigma salience and control conditions, $t(171) = -1.92$, $p = .057$, $d = .292$, although the pattern of means suggested higher levels of loneliness in the non-self-relevant stigma condition relative to the control condition.

Regarding potential mechanisms driving the effects of self-relevant stigma salience on loneliness, self-relevant stigma salience did not significantly affect social anxiety, $t(176) = -.85$, $p = .399$, $d = .127$, or trait self-esteem, $t(176) = -.24$, $p = .814$, $d = .035$, relative to the control condition. Therefore, we did not find evidence to suggest an indirect effect of self-relevant stigma salience on loneliness through either of these potential mechanisms.
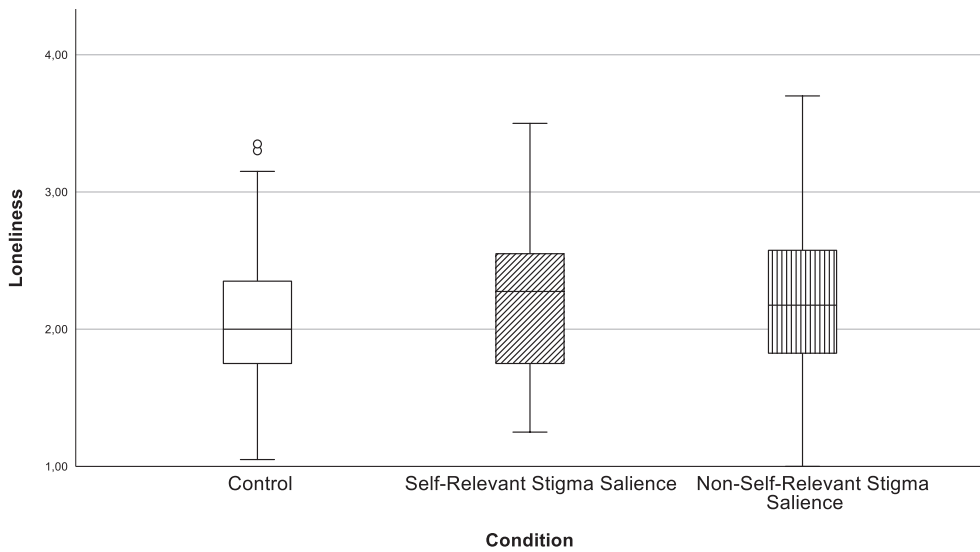
**FIGURE 3** Box plots (with median and interquartile range) showing loneliness as a function of stigma salience (Study 2).
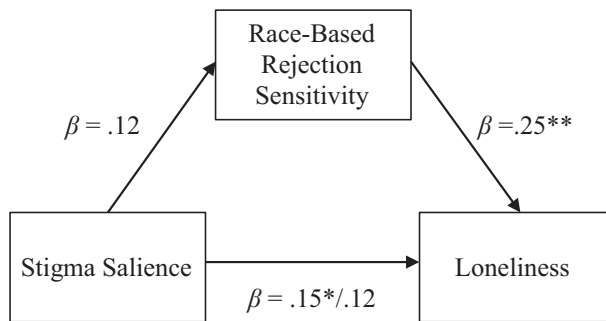


**FIGURE 4** Indirect effect model with exposure to social stigma (relative to control condition) predicting loneliness via race-based rejection sensitivity in Study 2. All values presented are standardized regression coefficients. In the path from social stigma to loneliness, the first value indicates the total effect of social stigma and the second value indicates the direct effect. *$p < .05$, ** $p < .01$.

Although not statistically significant, the pattern of means suggested higher race-based rejection sensitivity for those in the self-relevant stigma salience condition ($M = 8.58$, $SD = 7.66$) relative to the control condition ($M = 6.81$, $SD = 6.49$), $t(177) = -1.66$, $p = .098$, $d = .250$. Further analysis using PROCESS Version 3.1 (Hayes, 2018), set at 5000 bootstrap samples, revealed a non-significant indirect effect of self-relevant stigma salience on loneliness via race-based rejection sensitivity, $\beta = .06$, $SE = 0.04$, 95% CI: $-0.01$, $0.15$ (y-standardized). After accounting for this indirect effect, the direct effect of self-relevant stigma salience on loneliness was somewhat reduced in magnitude and now not statistically significant (see Figure 4). In total, this model accounted for under a tenth of the variance in loneliness in this sample, $F(2, 176) = 8.08$, $p < .001$, $R^2 = .084$.

In summary, Study 2 replicated the focal hypothesized effect of self-relevant stigma salience on loneliness among ethnic minorities in the United Kingdom. This effect was robust to the addition of a more clearly non-social control condition (which was confirmed by the fact that very few participants mentioned other people when describing the experience of reading a book), although it was not evident when contrasting exposure to self-relevant and non-self-relevant stigma. One reason why the salience of this ostensibly irrelevant stigma may have resulted in levels of loneliness

inconsistent with our hypotheses is that we chose a social group to which our participants did not currently belong, but either had belonged in the past or would belong in the future. Therefore, participants may have imagined the social stigma in this condition affecting themselves in the past or future, and this may have diluted the contrast we had hypothesized. Also, in past research including a similar non-self-relevant stigma salience condition (e.g., Doyle & Molix, 2014; McCoy & Major, 2003), participants were exposed to stigma against the Inuit in Canada, a largely unfamiliar social group outside of the society in which they lived. Because our manipulation required participants to recall and write about a specific instance of discrimination, we were not able to use a similar unfamiliar group, but rather chose a social group that included people who were close to the participants. In fact, most passages written by participants in this condition indeed described their own experiences in the past or experiences of close friends and family members, which may have led to courtesy stigma (Corrigan & Miller, 2004; Goffman, 1963).

Following up on the indirect effect of anxiety in Study 1, in Study 2 there was some indication that race-based rejection sensitivity might potentially act as a more specific mechanism linking self-relevant stigma salience and loneliness. While this evidence was not statistically significant and therefore somewhat unclear (and certainly only suggestive at this point), we do think that it is interesting in that it might suggest a more specific mechanism related to anxious expectations of identity-based rejection following exposure to social stigma. This is consistent with the theoretical perspective that the reason social stigma is so deleterious for social health (even relative to other forms of non-identity-based rejection) is because it targets what is typically an intrinsic part of the self and therefore leads to anxious expectations of future rejection (Zhang et al., 2020).

While the causal model that we propose here links stigma salience to loneliness via anxiety-related processes, it is again important to note that the current studies are limited in the ability to support strong causal claims regarding mediation due to the fact that the key dependent variable (loneliness) and the proposed mechanisms (identity-based social anxiety) were both measured subsequent to our manipulation of stigma salience. It is entirely plausible that these variables have bidirectional causal effects or that there is confounding by other unmeasured variables that would explain the pattern of effects observed in the current studies. However, past research utilizing longitudinal methods does indicate that social anxiety (Lim et al., 2016) and rejection sensitivity (Gao et al., 2017) are both capable of increasing loneliness. Furthermore, in the initial work on race-based rejection sensitivity (Mendoza-Denton et al., 2002), although loneliness was not the focal outcome, a daily diary study demonstrated that higher levels of race-based rejection sensitivity during university orientation predicted lower well-being (including feeling supported, cared for, accepted, appreciated, and loved) over the following weeks for ethnic minorities. Together, these converging lines of evidence along with results from the current study suggest that identity-based social anxiety may be a plausible mechanism linking stigma salience and loneliness.

## CONCLUSION

Across two experimental studies, we found consistent evidence that social stigma salience increases loneliness among ethnic minorities in the United Kingdom. There is evidence that stigma affects expectations about future interactions with outgroup members (Tropp, 2003) and that expecting to be a target of prejudice decreases ethnic minorities' enjoyment of interracial interactions (Shelton et al., 2005). Past work has even demonstrated deleterious effects of stigma on relationship functioning with close others, including romantic partners who share the same stigmatized identity (Doyle & Molix, 2014). Prior research has also shown the link between stigma salience and other social processes, such as trust (Zhang et al., 2020) and the detection of signs of acceptance (Richman et al., 2016). Our research demonstrates that a possible consequence of these negative impacts of stigma salience on social processes and relationships is that members of stigmatized groups end up feeling lonely.

Turning to potential mechanisms, Study 1 provided some evidence for an indirect path from stigma salience to loneliness through state anxiety, while Study 2 showed less conclusive evidence for a more

specific identity-related mechanism: Race-based rejection sensitivity. This suggests that stigma salience might increase loneliness by raising anxiety linked to how one's identity might shape one's ability to connect with others, generating loneliness. However, as mentioned previously, this potential pathway must be confirmed in future work using experimental methods that allow for stronger causal identification of mediation (Pirlott & MacKinnon, 2016).

Neither study revealed significant effects of stigma salience on personal self-esteem (tapped with two different and widely-used measures), though prior research has shown both how stigma reduces self-esteem (Schmitt et al., 2014) and how low self-esteem can impair social relationships (Murray et al., 2006). It is therefore possible that self-esteem plays a role in this process, but that this is hard to detect in such short-lived experimental paradigms. Future research might examine this with paradigms that allow for longer-lived effects, such as daily diary studies, or longitudinal designs, or examine self-esteem as a potential moderator of the effects of stigma salience on loneliness. It is also possible that self-esteem is more closely related to social behaviour in specific social interactions than to more general feelings about one's connection with others, such as loneliness. Importantly, however, one should not mistake such a general feeling of disconnection as harmless, since it is well documented that loneliness can have severe consequences for physical and mental health (Hawkley & Cacioppo, 2010; Heinrich & Gullone, 2006; Wang et al., 2023), further exacerbating any other health consequences of stigma (Paradies, 2006; Pascoe & Richman, 2009; Schmitt et al., 2014). Future research should therefore examine how loneliness might be mitigated in members of stigmatized groups.

Our results are not necessarily generalizable to the general population of ethnic minorities. Notably, participants were from the United Kingdom and primarily recruited through community groups and university societies focused on issues related to ethnic minorities. In addition, both samples were mostly emerging adults. It would be important to replicate our results in other countries and include a wider age range, including older people who may be especially vulnerable to loneliness and its negative effects (Victor et al., 2012). However, recent evidence from the BBC Loneliness Experiment suggests that young adults and those residing in countries higher in individualism, such as the United Kingdom, report the greatest loneliness (Barreto et al., 2021; see also Office of National Statistics, 2018). Therefore, stigma may in fact have a greater impact on loneliness for these individuals.

While the experiments reported here involved a relatively small manipulation of stigma salience (i.e., recalling and writing about a past experience), it is important to consider the potential real-world implications of this work. In the United Kingdom, where this research took place, the decision to leave the European Union in 2016 (i.e., "Brexit") led to heightened salience of stigma against migrants and ethnic minorities, particularly in districts where a greater proportion of the population voted in favour of the referendum (Frost, 2020). Extrapolating from our results, socio-political shocks such as these may have substantial costs for the social health of stigmatized groups, such as ethnic minorities (Doyle & Link, 2024).

A further implication of our research is that it suggests that members of stigmatized social groups are not only directly disadvantaged through reduced access to material resources and direct effects of prejudice on health and well-being, but also through restricted access to social support—a fundamental resource when coping with life's stressors. Therefore, this work contributes toward an improved understanding of the many ways in which social disadvantage is manifested and how difficult it is to overcome without deliberate and structural solutions. Ultimately, our research suggests that overcoming loneliness is likely to require changes in cultural beliefs regarding the relational value of members of particular social groups.

## AUTHOR CONTRIBUTIONS

## CONFLICT OF INTEREST STATEMENT
The authors declare no competing interests.

## DATA AVAILABILITY STATEMENT
The datasets generated during the current study are available from the corresponding author upon reasonable request.

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