



Fragile Heterosexuality: A Cross-cultural Study Between Germany and Italy

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Accepted: 3 December 2022 / Published online: 29 December 2022
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Abstract

Prior research in the UK and the USA found that heterosexual identity was perceived as more easily compromised than gay identity: a finding dubbed the “Fragile Heterosexuality” effect. However, there is as yet no evidence that this effect occurs outside the USA and UK. With representative samples from Germany ($N=1236$) and Italy ($N=1249$), we investigated the fragile heterosexuality effect using participants’ agreement with gender-neutral statements about the perceived fragility of sexual orientation of others. We found evidence supporting the fragile heterosexuality effect in both countries. We also investigated six possible moderators of the effect. Higher estimates of gay/lesbian population weakened the effect, and higher levels of anti-gay prejudice strengthened the effect. Contact (quantity/quality), right wing authoritarianism, and social dominance orientation did not moderate the effect. These findings contribute to previous literature by highlight that the fragile heterosexuality effect appears across countries of diverse LGBTQ friendliness and languages, and also suggest plausible explanations for the effect.

Keywords Perceived fragile sexual orientation · Heterosexual identity · Homosexual identity · Estimates of gay/lesbian population · Prejudice against gay/lesbian people · Social normativity

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Introduction

People perceived by others as belonging to a sexual minority group (e.g., gay or lesbian) face significant discrimination and even violence throughout their lives (Carnaghi, Maass, and Fasoli 2011; Franklin 2004; Herek, Gillis, and Cogan 1999; Meyer, 2010; Parrott, Peterson, and Bakeman 2011; Powell, Quadlin, and Pizmony-Levy 2015). Unfortunately, sexual orientation-based hate crimes have increased globally (Deck 2018). Indeed, an international meta-analysis revealed that 55% of sexual minorities, including lesbians, gay men, and bisexual people had been harassed, and 28% had been physically attacked (Katz-Wise and Hyde 2012). Prejudice against people who do not conform to various aspects of heteronormativity is linked to a decline in victims' physical and mental health, as well as higher rates of suicide (Hatzenbuehler 2009; Lick, Durso, and Johnson 2013; Meyer 2003). It is thus important to understand the processes underlying sexual orientation categorization (Duran, Renfro, Waller, and Trafimow 2007; Flanders and Hatfield, 2014; Mize and Manago 2018; West et al. 2021). Simply put, how do individuals determine whether a person is "heterosexual" or "gay"?

On the surface, sexual orientation categorization may seem quite simple. That is, one may assume that same-sex attraction or behaviour results in being categorised by others as "gay" or "lesbian", while opposite-sex attraction or behaviour results in being categorised as "heterosexual" or "straight". However, recent research has shown a more complex, less symmetrical picture. Specifically, heterosexual identity is perceived as more fragile (i.e., easily compromised) than gay identity (Duran et al. 2007; Flanders and Hartfield 2014; Mize and Manago 2018; West et al. 2021). For example, West et al., 2021 found that a single same-sex act compromised a person's heterosexual status more than a single opposite-sex act compromised a person's gay status. This effect, dubbed the "Fragile Heterosexuality" effect, was stable for both male and female participants (though it was stronger for men) and was found using a variety of methods including agreement with face-valid statements about heterosexual identity and gay identity, open-ended responses about what would be required to compromise either identity, and people's responses to vignettes about behaviour incongruent with one's professed identity (West et al. 2021).

However, despite its potential importance, evidence for the fragile heterosexual-identity effect is very geographically limited. Evidence for the effect has only been found in the United States of America (Mize and Manago, 2018) and the United Kingdom (West et al. 2021): both English-speaking, Western countries. Nonetheless, there are indications that this effect may also be applicable to other cultural contexts. Worldwide, heterosexual identity is protected from the influence of other sexual orientation categories (Carroll & Itaborahy, 2015). In fact, consensual same-sex acts between adults are still illegal in 75 countries, and are punishable by death in 6 of these countries (Carroll & Itaborahy, 2015). Moreover, 'conversion therapy' also continues to exist in several countries, based on the belief that anyone can become straight with enough help, encouragement, and moral fortitude (Haldeman, 1991, 2002). Both of these facts strongly suggest that heterosexual identity is perceived to be more fragile than gay identity in multiple countries.

Furthermore, given that discrimination against sexual minorities is a world-wide concern, and that it is currently on the rise (Deck 2018), it is imperative to understand if findings from previous research in these limited geographical contexts (e.g., Mize and Manago 2018; West et al. 2021), apply in other contexts. This may help to better understand the processes underlying sexual orientation categorization and its consequences. Thus, one aim of the current research is to replicate the effect in new contexts (differing in language, location and LGBTQ friendliness), to investigate whether the asymmetrical fragility perceptions between heterosexual identity and gay identity of others apply in two non-English-speaking European countries.

Besides replicating the fragile heterosexuality effect in new contexts, another aim of this research was to identify potential moderators of the effect as a means of better understanding when and why it is likely occur. In this research we consider 6 moderators: level of prejudice, estimates of the size of the gay/lesbian population, contact quantity with minority groups, contact quality with minority groups, right-wing authoritarianism and social dominance orientation. Below we discuss each of these moderators, as well as our reasons for including them in our analyses.

Germany and Italy as sampling sites. Taking into account the considerable diverse range of sexual prejudice present in Europe (Wilson and Cariola, 2020), it was imperative to sample countries that presented variability in societal levels of prejudice and that were different from the United Kingdom, which was previously studied (West et al. 2020). Two main criteria were considered: a country's friendliness toward the LGBTQ community and history of legal actions to become more accepting of sexual minorities. When evaluating European countries' friendliness towards sexual minorities, ILGA-Europe (European Region of the International Lesbian, Gay, Bisexual, Trans and Intersex Association) ranked the United Kingdom at 10th place, Germany at 16th and Italy at 35th position in the world. The positioning of each country was based on 6 categories (Equality and non-discrimination, family, hate crime and hate speech, legal gender recognition, civil society space and asylum), which added to 100% friendliness, for which Germany and Italy scored 50.62% and 22.33% respectively. According to this index Germany stands at mid friendliness, whereas Italy is at the low side of the friendliness spectrum (see also Brambilla and Butz 2013 and Soplesa and Silva, 2020).

In terms of legal actions taken by a country, Germany has championed rights in favour of sexual minorities since the fall of the Berlin wall in 1991 (Arestis, 2021). In 2006, it became legal for sexual minorities to openly serve in the army and to change their assigned gender. In the same year, discrimination on the basis of sexual orientation and gender became illegal (Shoshan, 2008). In 2017, Germany joined the UK in legalizing marriage between same sex couples (Henry 2014), and in 2019, a third gender became a legal option in identity cards (Arestis, 2021). In contrast Italy's strong ties with the Catholic church have impeded the country's acceptance of sexual minorities (Horowitz & Bubola, 2021). It was not until 2015 that it became legal to change one's official gender identity, and full discrimination protections against LGBTQ people are still pending within the Italian legal system (Equaldex 2021). These two countries were therefore chosen as study populations to test whether heterosexuality was perceived as more fragile than homosexuality.

Moderators of the Fragile Heterosexuality Effect

Levels of prejudice. Previous research on the effect of prejudice against gay/lesbian people on asymmetrical perceptions of sexual orientation vary depending on the region studied (see Duran et al. 2007 and West et al. 2021). Studies in the United States of America showed that participants reporting higher levels of prejudice against gay people had significantly more biased fragility perceptions between heterosexual and gay identities. This consisted of less sexually incongruent behaviours being required to change sexual orientation expectations of a heterosexual target than those for a gay target, even more so for participants that were highly prejudiced than those that were not (Duran et al. 2007; Rule et al. 2015; West et al. 2021). Accordingly, such asymmetrical fragility perceptions may be more evident in contexts in which prejudice toward sexual minorities are more widespread. Recent research from the European Social Survey show that people in North-Western European nations, including the United Kingdom, made further improvement in reaching equal treatment of sexual minorities than countries in Central (e.g., Germany) and Eastern Europe (e.g., Italy) (Wilson and Cariola 2020). Contrary to findings from the United Kingdom (West et al. 2021), we expect an increase in the fragility perceptual differences between heterosexual and gay identities of others, due to the higher, documented prejudice found in Central Europe (Wilson and Cariola 2020). Put it simply, people with low levels of prejudice would see little difference between categories, and highly prejudiced people would see great difference between categories. We believe that this would be the case because highly prejudiced individuals would find themselves under higher threat from the outgroup and hence would have more restrictive criteria to define group boundaries.

Estimates of the size of the gay/lesbian population. Asymmetrical perceptions of other than sexual orientation constructs have been explained in terms of estimates of the size of minority groups (Chen, Couto, Sacco and Dunham, 2018; Costa-Lopes, Vala and Judd 2012; Hegarty and Bruchmüller 2013; Ho, Sidanius, Cuddy, and Banaji 2013). Zarate and Smith (1990) proposed that differences in the way people assign membership to a group reflect that core norms are changing in a society. Social constructs that were once the most common ones, may no longer be the accepted standard, and those that were once deviant may be the new norm (Miller and Prentice 2021). This may be the case for race where the racial make-up of a region changes racial membership perceptions (Chen, Couto, Sacco and Dunham 2017; Miller and Prentice, 1996). For instance, Brazilian and American participants have different criteria to label someone as Black or White, which may be due to the majority group being Black in Brazil while being White in the USA (Chen et al. 2017). This benchmark information about a group (e.g., population size estimates), is used by individuals to modulate their behaviour and perceptions of others (Dovidio, Gaertner and Lowrance, 1995; Funder and Ozer, 2019; Monteith, Deneen, and Tooman 2021; Tankard and Paluck 2016; Zarate and Smith 1990). In fact, West et al., 2021 found that within a British population, an individual's gay/lesbian population estimates moderated the relationship between sexual orientation and fragility perceptions of others. Lower estimates of the size of the of gay/lesbian population, increased the difference in fragility between heterosexual and the gay identities of others. Germany, Italy and

the UK have all reported similar percentages of gay/lesbian population, ranging from 8 to 12% (Deveaux 2016; EuroClinix 2018; Out Leadership 2017), and since there is evidence that people do not notice small population size differences (Martinez, Wald and Craig 2008), we expected similar moderation effects as those found by West and colleagues (2020) in the UK.

Contact. Asymmetrical perceptions of other social constructs have also been explained in terms of quality and quantity of contact between groups (Wagner, Dick, Pettigrew, and Christ 2003; Wagner, Christ, Pettigrew, Stellmacher, and Wolf, 2006; Pettigrew, Wagner, and Christ, 2010, Schwartz and Simmons, 2001. Several authors have found that when majority group people have positive contact experiences with individuals belonging to a minority group, perceptions of their own group and that of the minority group are less different (Harwood, Hewstone, Paolini, and Voci 2005; Paolini, Hewstone, Cairns, and Voci 2004; Plant and Devine 2003; Pettigrew et al., 2010). When studying out-group/ in-group perceptions in grandparents and grandchildren, Paolini and colleagues (2005) found that contact quality changed group perceptions of the out-group. Similarly, Wright et al. (1997) found that frequency of indirect contact (contact through a relative) with an out-group individual, reduced negative attitudes towards the outgroup. We do not have specific predictions for either contact quantity and contact quality as moderators, however its inclusion was essential to be able rule them out as alternative explanation of our results.

Right-wing authoritarianism. Individuals' ideological attitudes, for instance their level of Right-Wing Authoritarianism, have been linked to perceptual differences of social categories of others (Bret et al., 2017; Dhont and Van Hiel 2011). For instance, when judging the race of a biracial target, people high on right wing authoritarianism (e.g., those who encourage social standards, and are punishing towards those who go against them) showed higher racial bias (Bret et al., 2017; Dhont and Van Hiel 2011). Similarly, the relationship between blame perceptions of a woman victim of harrasment and a victims' sexualized appereance were moderated by levels of Right Wing Authoritarianism (Spaccatini, Pacilli, Giovannelli, Roccato and Penone, 2019). When this personality trait was higher, the difference in blame perceptions between a sexualized and a non-sexualized victims was greater (Spaccatini et al. 2019). It was vital to include this personality characteristic as a possible moderator of the fragile heterosexuality effect due to the mentioned research findings, nonetheless we remain unsure about the direction of its potential moderation effects.

Social Dominance Orientation. This motivational orientation captures an individual's preferences for group-based hierarchies and inequalities. Broadly, individuals high in SDO tend to endorse beliefs, and policy-related actions, that enhance hierarchical differentiation between groups. Abundant research has shown that this personality characteristic influences how different social constructs are perceived. For instance, individuals reporting high levels of SDO have shown more racial asymmetric perceptions between Black and White people (Ho, Sidanius, Cuddy, and Banaji 2013a, Pratto, Cidam, Stewart, Zeineddine, Aranda, Aiello and Henkel, 2013). Furthermore, previous research has shown that Social Dominance Orientation moderates the relationship between colorblindness endorsement and outgroup attitudes of ethnic minorities (Yogeeswaran, Davies, and Sibley 2017). In line with this, when Ho and colleagues (2013) found that White participants high in SDO were especially

likely to designate biracial individuals as “Black” when the status hierarchy that privileged Whites was under threat, they suggested this could be evidence of boundary enforcement by the privileged group. Clearly, SDO is a good candidate to be considered as a moderator of the relationship between sexual orientation and fragility perceptions, however we are uncertain about the direction of effects as the status-quo of heterosexuality was never under attack during our study.

The Current Research

Broadly speaking, our aim was to further understand the reach of the fragile heterosexuality effect in the Western world. The main aim of this study was to corroborate that heterosexual identity is perceived as more fragile (easily compromised) than gay identity in countries other than the USA and the UK (i.e., Germany and Italy), and test its boundary conditions and moderators. Consequently, using the methods found in prior research (i.e., West et al. 2021, Study 4), we investigated this phenomenon with representative samples of participants from Germany and Italy.

We studied the differences in fragility perceptions of sexual orientation between heterosexual and gay identities, while also including possible moderators of this relationship. Participants answered their level of agreement with 14 statements directly related to the fragility of heterosexual or gay identities. These statements were gender neutral. Furthermore, participants answered questions related to six possible moderators for the fragility effect: 1). participants’ estimates of the size of the gay/lesbian population, 2). prejudice against gay/lesbian people, 3). contact quality, 4). contact quantity, 5). social dominance orientation and 6). right wing authoritarianism.

Based on previous findings from the United Kingdom and United States of America, we predicted that, compared to gay identity, there would be significantly higher fragility perceptions for heterosexual identity. As in an earlier study within a British sample, we expected a moderation effect of participants’ estimates of the size of the gay/lesbian population. Higher estimates of the gay/lesbian population would be associated with a smaller fragility difference between heterosexual and gay identity, whereas lower estimates would be associated with a greater difference. Further, we predicted that prejudice against gay/lesbian people would moderate the relationship between fragility perceptions of heterosexual and gay identities. Highly-prejudiced participants would show greater differences in their perceptions of fragility of heterosexual and gay identities, than low-prejudiced individuals, whose differences in fragility perceptions between the two sexual orientations would be smaller or non-existent. In terms of the other four possible moderators, we did not have explicit hypotheses for their effects. Their inclusion as plausible moderators were essential to be able to rule out alternative explanations of the fragile heterosexuality effect. It should be noted that even if country does not drive the fragile heterosexuality effect that we anticipate, we do expect individual differences to moderate the results across our samples.

Methods

We based our effect size estimates on a pilot study with $N=84$, where the effect size found for the difference in fragility perceptions between heterosexual and gay identities was large, $\eta^2=0.089$ (Lakens 2013). Further, in order to establish the most appropriate sample size for the current study we used Ledgerwood's (2019) rule of thumb, which is based on the expected results for the interaction. According to this rule, an n equal to the original study (total $N=2x$ the original), should be used when a reversal is predicted. When the expectation is a 50% attenuation or enhancement for the effect of the new condition, the advice is to use a cell n that is seven times that of the original study ($N=14x$ the original). This meant that to test a moderation in a 2×2 between-subjects factorial design we would need a total of 1176 participants (an $N=84$ to test the fragility difference between heterosexual and gay identities $\times 14$). To further warrant the confirmatory nature of our study, power analyses and statistical parameters were all preregistered at AsPredicted.org (https://aspredicted.org/TNY_FPJ).

Participants and Recruitment

Our total sample consisted of 2485 White, heterosexual participants from Germany ($N=1236$, N men=598 and N women=637) and Italy ($N=1249$; N men=616 and N women=632). All participants were recruited via Qualtrics, an online platform that supplied us with participants from their research panel. It is important to clarify that our survey was answered online. In accordance with data published by the German Federal Statistics office and the Italian National Institute of Statistics for 2019, both samples were representative of each country's population in terms of gender, age and location. Within our German sample, 51% of participants reported being female and 49% of participants reported being male. Additionally, participants age ranged between 18 to 65+, with 9% reporting an age between 18 and 24, 16% between 25 and 34, 24% between 35 and 49, 26% between 50 and 64, and 25% older than 65 years of age. Regarding location, 22% of participants were residents of Nordrhein-Westfalen, followed by 16% living in Bayern, 13% residing in Baden-Württemberg and 10% living in Niedersachsen. The remaining participants were from the federal states of Berlin (4%), Brandenburg (3%), Bremen (1%), Hessen (7%), Mecklenburg-Vorpommern (2%), Rheinland-Pfalz (5%), Saarland (1%), Sachsen (5%), Sachsen-Anhalt, (3%) Schleswig-Holstein (3%), and Thüringen (3%). Within our Italian sample, 51,7% of participants reported being female. Italians' age ranged between 18 to 65+, with 9% reporting an age between 18 and 24, 13% between 25 and 34, 16% between 35 and 44, 18% between 45 and 54, 16% between 55 and 64, and 27% older than 65 years old. In terms of the geographical distribution of our Italian participants, 17% of participants were residents of Lombardy, followed by 10% living in Lazio, 9% residing in Campania, 8% living in Veneto and 8% in Sicily. The remaining participants were from the provinces of Emilia-Romagna (7.4%), Piedmont (7.15%), Apulia (6.5%), Tuscany (6%), Calabria (3%), Sardinia (2.7%), Liguria (2.5%), Marche (2.5%), Abruzzo (2%), Friuli-Venezia Giulia (2%), and the remaining regions (4.8%). All participants were paid for their participation. After

exclusions our total sample was 2483 (men's $N=1214$, M age=50.78, $SD=15.77$; women's $N=1269$, M age=45.01, $SD=15.93$).

Design and Procedure

This study used a between-subjects design. Each person was randomly assigned to one of two conditions (fragile heterosexual identity vs. fragile gay identity). Depending on the condition, participants indicated their level of agreement with gender-neutral statements related to their condition. Additionally, participants' estimates of the gay/lesbian population, prejudice against gay/lesbian people, contact quality, contact quantity, right-wing authoritarianism, and social dominance orientation were measured. Full lists of all items used in this study can be found as an Appendix in the supplementary material.

In terms of the fragile heterosexual identity and the fragile gay identity conditions, participants indicated their level of agreement (7-likert scale) with 14 gender-neutral statements related to each condition (e.g., fragile heterosexual identity: "If a "straight" person has sex with someone of the same sex, they must really be gay"; fragile gay identity: If a "gay" person has sex with someone of the opposite sex, they must really be straight"). The statements used here are the same ones used by West et al. (2021; Study 4). Participants' estimates of gay/lesbian population were assessed with two questions: "1. What percentage of the overall population would you estimate is actually gay or lesbian?", and "2. What percentage of the overall population would you estimate is openly either gay or lesbian?" (Martinez, Wald, and Craig 2008).

In terms of prejudice against gay/lesbian people, participants indicated their level of agreement with five statements related to prejudice against gay/lesbian people (Herek 1988). Contact quantity with the gay/lesbian community was assessed via four questions (Van Dick et al. 2004). When participants had not had any contact with gay/lesbian people they were not asked about contact quality. When they had had contact with gay/lesbian people, they were asked about the quality of those interactions (Schwartz and Simmons 2001). Additionally, participants' right wing authoritarianism was assessed through their level of agreement with 15 statements (Zakrisson 2005). Further, social dominance orientation was measured by asking participants their level of agreement with 10 statements (e.g., "It is OK if some groups have more of a chance in life than others": Pratto, Cidam, Stewart, Zeineddine, Aiello...and Henkel 2013; Pratto, Sidanius, Stallworth and Malle 1994). Once participants had done this section of the survey they were asked 5 demographic questions (gender, age, ethnicity, sexual orientation and religion). It is important to note that overall, all sets of questions showed high internal consistency (estimates of gay/lesbian population $r=.73$; prejudice against gay/lesbian people $\alpha=0.89$, $CI[0.88, 0.89]$; contact quantity $\alpha=0.84$, $CI[0.83, 0.85]$; right wing authoritarianism $\alpha=0.77$, $CI[0.75, 0.78]$; and social dominance orientation $\alpha=0.85$, $CI[0.84, 0.86]$). For the German- and Italian- language measures, all items were translated from British English into the relevant language by a bilingual native speaker of German and Italian respectively. Two other native speakers were then recruited to ensure that the items were easily

understood and retained their original meaning. The complete German and Italian questionnaire is available as an Appendix in the supplementary material.

As a methodological remark, in the case that we do not find a significant interaction between participant's country of residence and condition (fragile heterosexual identity vs. fragile gay identity), our analyses of the fragile heterosexuality effect will be carried out jointly for both countries. Additionally, participant's age was included as a covariate. There is no evidence that indicates that it should have an effect on perceptions of sexual orientation fragility, but we wanted to rule out possible false effects.

The data described in this article is available through the following link: https://osf.io/xq2t5/?view_only=abafe3b83bfb4a38be809db45abbb438.

Results

Differences Between Conditions

Following our pre-registration, we ran two independent sample t-tests, one for each country, with fragility of sexual orientation as the test variable, and condition (heterosexual identity vs. gay identity) as the grouping variable. These tests revealed that within the German population, heterosexual identity ($M=3.23$, $SD=0.78$) was perceived as more fragile than gay identity ($M=3.12$, $SD=0.77$), $t(1, 1233)=2.44$, $p=.015$, $d=0.14$, 95% CI [0.027, 0.250]. It should be noted that the possible range of values of the population mean difference are represented by the confidence interval. Similarly, within our Italian sample, heterosexual identity ($M=3.53$, $SD=0.72$) was perceived as more fragile than gay identity ($M=3.39$, $SD=0.69$), $t(1, 1248)=2.44$, $p=.001$, $d=0.71$, 95% CI [0.079, 0.301]. These results replicate findings from the United Kingdom (West et al., 2021) and the United States of America (Mize and Manago 2018), indicating that the fragile heterosexuality effect is not limited to culturally homogenous, English speaking countries.

Once we established the presence of the fragile heterosexuality effect in both countries, we ran a univariate analysis, that included fragility of sexual orientation as dependent variable, and condition (fragility of heterosexual identity vs. fragility of gay identity) and participants' country of residence (Germany vs. Italy) as fixed factors. Along with age, estimates of gay/lesbian population, prejudice against gay/lesbian people, contact with the gay/lesbian population (quantity and quality), right wing authoritarianism and social dominant orientation) were included as covariates in this model. It should be noted that none of these covariates presented issues of collinearity (all VIF 's < 1.89). Our model was customized to include all possible interactions between condition and each covariate. Residuals for this model were normally distributed (skewness and kurtosis +/- 0.37).

There was a significant main effect of condition, $F(1, 2021)=8.47$, $p=.024$, $\eta^2=0.003$, $b=0.50$, $SE=0.21$, 95% CI(0.078, 0.923). Participants agreed more strongly with statements about the fragility of heterosexual identity ($M=3.33$, $SD=0.74$), than statements about the fragility of gay identity ($M=3.24$, $SD=0.73$). Participants' country of residence had a significant main effect on perceptions of

fragility of sexual orientation, $F(1, 2021)=64.98$, $p<.001$, $\eta^2=0.032$, $b=-0.21$, $SE=0.04$, 95% $CI(-0.293, -0.137)$. German participants showed **lower** perceptions of fragility of sexual orientation ($M=3.15$, $SD=0.75$) compared to Italian participants ($M=3.43$, $SD=0.75$). However, the interaction between country of residence and condition was not significant $F(1, 2023)=0.147$, $p=.702$, $\eta^2<0.001$, $b=-0.02$, $SE=0.06$, 95% $CI(-0.133, 0.090)$, therefore all subsequent analyses are performed jointly for the two European countries.

In terms of the covariates, participants' age had a significant effect on fragility perceptions of sexual orientation, $F(1, 2021)=11.06$, $p=.002$, $\eta^2=0.006$, $b=-0.001$, $SE=0.001$, 95% $CI(-0.003, -0.001)$. Older participants showed lower fragility perceptions of sexual orientation. Further, five out of the six variables had significant main effect on fragility of sexual orientation: estimates of gay/lesbian population ($F(1, 2021)=22.14$, $p<.001$, $\eta^2=0.011$, $b=0.007$, $SE=0.001$, 95% $CI(0.004, 0.009)$), prejudice against gay/lesbian people ($F(1, 2021)=37.81$, $p<.001$, $\eta^2=0.042$, $b=0.059$, $SE=0.017$, 95% $CI(0.026, 0.092)$), contact quality ($F(1, 2021)=17.06$, $p<.001$, $\eta^2=0.009$, $b=-0.064$, $SE=0.018$, 95% $CI(-0.099, -0.029)$), right wing authoritarianism ($F(1, 2021)=70.38$, $p<.001$, $\eta^2=0.034$, $b=0.188$, $SE=0.029$, 95% $CI(0.131, 0.246)$), and social dominance orientation ($F(1, 2021)=68.89$, $p<.001$, $\eta^2=0.034$, $b=0.174$, $SE=0.023$, 95% $CI(0.129, 0.220)$). Participants reporting high estimates of gay/lesbian population, more prejudice against gay/lesbian people, higher right-wing authoritarianism, and higher social dominance orientation showed higher perceptions of sexual orientation fragility. In reference to contact quality, the more pleasant the contact was, the lower perceptions of the fragility of sexual orientation. Furthermore, condition (fragile heterosexual identity vs. fragile gay identity) significantly interacted with estimates of gay/lesbian population, $F(1, 2021)=7.02$, $p=.008$, $\eta^2=0.003$, $b=-0.005$, $SE=0.002$, 95% $CI(-0.008, -0.008)$, with prejudice against gay people, $F(1, 2021)=17.08$, $p<.001$, $\eta^2=0.008$, $b=0.099$, $SE=0.024$, 95% $CI(0.052, 0.146)$, and with social dominance orientation $F(1, 2021)=6.85$, $p=.009$, $\eta^2=0.003$, $b=-0.086$, $SE=0.033$, 95% $CI(-0.152, -0.021)$. None of the other interactions between condition and the other moderators had a significant effect (all p 's >0.198).

To probe the interactions between (1) condition and estimates of gay/lesbian population, (2) condition and prejudice against gay people, and (3) condition and social dominance orientation, we ran three moderation analyses via the PROCESS macro Model 1 with pre-standardized variables, 95% confidence intervals (CIs) and 1,000 bias-corrected bootstrap samples. Mean fragility of sexual orientation was included as the dependent variable and condition was included as the independent variable. Estimates of gay lesbian population, prejudice against gay people, social dominance orientation, were included as moderators in separate analyses. All other possible moderators were included as covariates in each model. This resulted in having different control sets across the three plausible models. This deemed necessary as regression coefficients can be affected by the inclusion of inappropriate and appropriate control variables (Wysocki, Lawson, & Rhemtulla, 2022).

The model involving estimates of gay/lesbian population was significant, $F(9, 2029)=104.63$, $p<.001$, $R^2=0.317$. 31% of the variance in perceived fragility of sexual orientation was explained by condition, estimates of gay/lesbian population

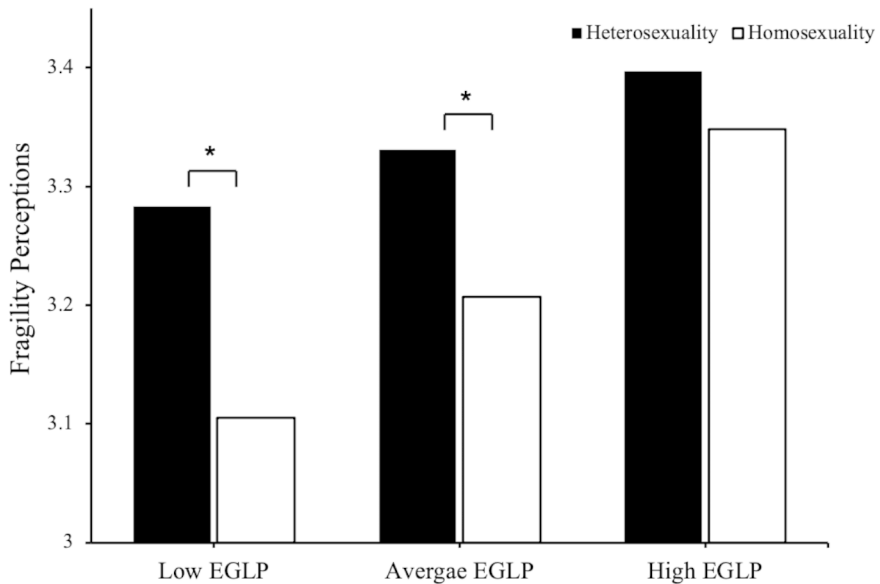


Fig. 1 Moderation effect of estimates of gay/lesbian population on the relationship between condition (heterosexual identity vs. the homosexual identity) and fragility perceptions. * Indicates statistical significance ($p = .05$)

and their interaction. The heterosexual identity condition was perceived as more fragile than gay identity. This is, with the difference between condition (from heterosexual identity to gay identity), there was a 0.222 decrease in fragility perceptions (condition $b = -0.222$, $t(2029) = -4.383$, $p < .001$, $CI[-0.321, -0.123]$). There was no significant main effect of the estimates of gay/lesbian population ($b = -0.0005$, $t(2029) = -0.2009$, $p = .840$, $CI[-0.005, 0.0045]$).

However, the interaction between condition and estimates of gay/lesbian population was significant ($b = 0.042$, $p = .009$, $CI [0.001, 0.007]$). At low levels of population estimates (10.5%), the difference between the heterosexual and gay condition, resulted in a 0.178 average decrease in fragility perceptions ($b = -0.178$, $t(2029) = -4.74$, $p < .001$, $CI[-0.252, -0.104]$). At medium levels of gay/lesbian population estimates (23.5%), the difference between the heterosexual and gay condition, resulted in a 0.124 average decrease in fragility perceptions ($b = -0.124$, $t(2029) = -4.43$, $p < .001$, $CI[-0.179, -0.069]$). At high levels of gay/lesbian population estimates (41.5%), the difference between the heterosexual and gay condition, resulted in a 0.047 average decrease in fragility perceptions. However, this difference was not significant ($b = -0.048$, $t(2029) = -1.32$, $p = .185$). The cut of value for estimates of gay/lesbian population at which the relationship between condition and fragility perceptions became significant was 37.68% ($b = -0.064$, $t(2029) = -1.961$, $p = .05$, $CI[-0.129, 0.000]$). See Fig. 1 for a graphical representation of the results.

The model involving prejudice against gay people was also significant, $F(9, 2029) = 104.55$, $p < .001$. Although there was no main effect of condition in this

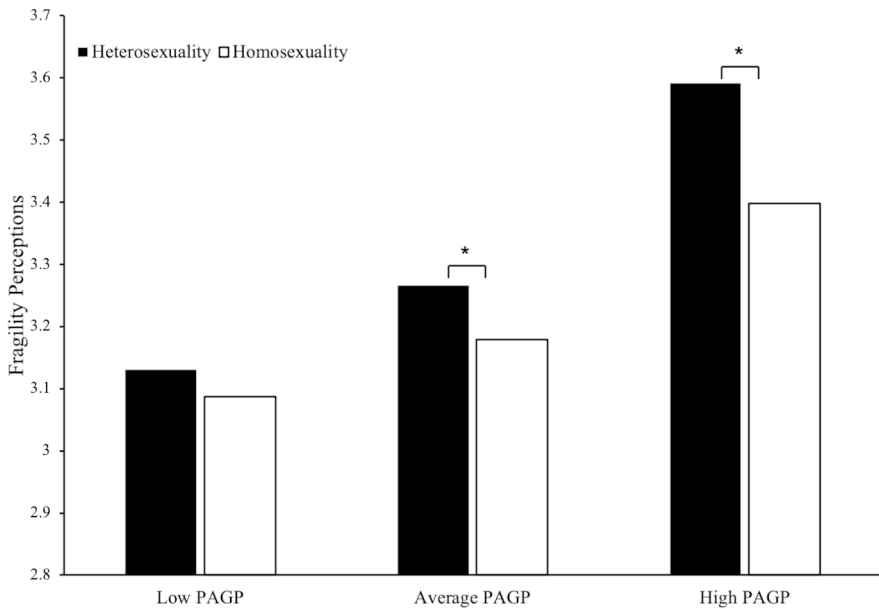


Fig. 2 Moderation effect of prejudice against gay/lesbian people on the relationship between condition (heterosexual identity vs. homosexual identity) and fragility perceptions. * Denotes statistical significance of $p = .05$

model ($b = 0.0018$, $p = .973$, CI $[-0.1023, 0.1058]$), there was a significant main effect of prejudice against gay people ($b = 0.18$, $p < .001$, CI $[0.122, 0.238]$), meaning that regardless of condition, when participants reported higher prejudice against gay/lesbian people, their fragility perceptions were high too.

Prejudice also significantly moderated the effect of condition on fragility perceptions ($b = -0.044$, $p = .012$, CI $[-0.079, -0.009]$). At low levels of prejudice against gay/lesbian people (1.0), the difference between the heterosexual and gay condition, resulted in a 0.043 average decrease in fragility perceptions, however this difference was not significant ($b = -0.043$, $t(2029) = -1.092$, $p = .275$). At median levels of prejudice (2.0) the difference in fragility perceptions between conditions was significantly greater ($b = -0.087$, $t(2029) = -2.97$, $p < .05$, CI $[-0.144, -0.029]$). (3) At high levels of prejudice (4.4), the difference between condition (heterosexual identity and gay identity), became greatest ($b = -0.193$, $t(2029) = -4.53$, $p < .001$, CI $[-0.277, -0.109]$), with heterosexual identity being more fragile than gay identity. The cut of value for prejudice against gay/lesbian population at which the relationship between condition and fragility perceptions became significant was 1.51 ($b = -0.065$, $t(2029) = -1.961$, $p = .05$, CI $[-0.130, -0.000]$). See Fig. 2 for a graphical representation of the results. Although the difference was significant for participants with low prejudice against gay people (1.5), it is important to acknowledge that the magnitude of the effect size became practically significant (Cohen 1988; Borman, Grigg, and Hanselman 2016) only for participants who reported medium to high prejudice (4.8–8.0), with effect

sizes ranging from -0.213 to -0.353 . See Fig. 2 for a graphical representation of these results.

The model involving social dominance orientation was also significant, $F(9, 2029)=103.97$, $p<.001$. There was a main effect of condition in this model ($\beta=-0.237$, $p=.004$, CI $[-0.3974, -0.0767]$), but no significant main effect of social dominance orientation ($\beta=0.047$, $p>.05$, CI $[-0.0419, 0.1359]$) and no significant interaction between social dominance orientation and condition ($\beta=0.045$, $p=.11$, CI $[-0.0092, 0.0994]$).

Discussion

The current research studied fragility perceptions of sexual orientation, comparing perceptions of heterosexual identity to gay identity, and examined the effect of six possible moderators in two novel populations (e.g., Germany and Italy). Consistent with results from previous studies within the UK, we predicted and found that perceptions of fragility were higher for heterosexual identity than for gay identity and that this relationship was moderated by estimates of the gay/lesbian population. Further, but in contrast to the UK population, we expected and found that prejudice against gay people would moderate the relationship between sexual orientation and fragility perceptions. We also studied other possible moderators, including experiences of contact with the outgroup and individual differences in intergroup ideologies.

Participants in our study consistently showed higher fragility perceptions for heterosexual identity than gay identity of others regardless of an individuals' country of residence. These results parallel with findings from previous literature on asymmetrical perceptions of sexual orientation (Duran et al. 2007; Flanders and Hatfield, 2014; Mize and Manago, 2018; West et al. 2021). Duran et al. (2007), showed that the number of behaviours required to change a students' perception of a target's sexual orientation were significantly higher when the target was heterosexual than when it was gay. Relatedly, findings from Flanders and colleagues (2014), revealed that regardless of type of behaviour, incongruent sexual behaviours lead to perceptions of a gay identity within an American sample. Perhaps, most importantly, the fragile heterosexuality effect has been found using four different methods in a British population (West et al. 2021). Altogether, previous studies have found supporting evidence for the fragile heterosexuality effect for British and American populations. Our German-Italian results therefore show the stability of higher fragility perceptions for heterosexuality across nations, and provide further evidence that this phenomenon is not limited to the UK or the USA, perhaps showing that this effect transcends the Northern Anglo-Saxon region. Further, this study provides additional validity of the consistency of the effect when using gender-neutral statements. Accordingly, the current study contributes to our understanding of the reach of the fragility of heterosexuality across the West and its possible moderators (Mize and Manago 2018; Duran et al. 2007; Flanders and Hatfield, 2014).

The difference in fragility perceptions between heterosexual and gay identity of others was moderated by estimates of the size of the gay/lesbian population. In line with our predictions and results from an earlier study in the UK, higher estimates of

gay/lesbian population resulted in less asymmetry in perceptions of fragility between heterosexual and gay identities of others. Further, differently from the UK, but according to our expectations, we found that the asymmetry in fragility perceptions between heterosexual and gay identities was also moderated by prejudice against gay/lesbian people. The difference in perceptions of fragility between heterosexual and gay identities of others were greater when participants were highly prejudiced than when they were moderately prejudiced. It is important to recognize that our results (e.g., effect size) show that prejudice may have a practical impact on the asymmetry in sexual orientation perceptions of others only when this is medium-to-high.

Our findings of the higher perceptions of fragility for heterosexuality underline important similarities with other types of easily compromised social categories. For example, it is scientifically uncontroversial that race (in the sense of Whiteness or Blackness) is not a genuine biological construct but rather a social one where the criteria to be perceived as White is much stricter than that to be perceived as Black (Hickman 2016; Ho et al. 2011). Similarly, within the context of gender identities, a man's masculinity has been found to be a status that is hard to get and keep, while women's femininity is only contingent on being born female (Bosson and Vandello 2011; Bosson, Vandello, Burnaford, Weaver, and Arzu Wasti 2009; Vandello, Bosson, Cohen, Burnaford, and Weaver 2008). We do acknowledge that there are also important differences between these constructs. Contrary to race and gender, sexual orientation categorization is based on a mere ambiguous process. Sex and race are often easily inferred from visual cues, but there are no evident physical traits that could reliably identify a person as having a particular sexual orientation (Rule et al. 2015).

Participants' estimates of the size of the gay/lesbian population moderated the relationship between fragility perceptions of others and sexual orientation within a UK sample (West et al. 2021). We expanded on this research by testing whether this effect was found in other European countries. Within the German-Italian population studied here, lower estimates of the gay population increased the difference in fragility perceptions between heterosexual and gay identities of others, whereas higher estimates decreased the fragility differences between the conditions. These results go in line with the social normativity literature (Monteith et al. 1996; Zarate and Smith 1990), which suggests that perceptions of a larger population of the minority group may reflect a society's transformation of standards. Moreover, this theory proposes that group norms guide an individual's behaviour and perceptions of reality (Monteith and Deneen 2010). Hence, the results found here reflect how Germans and Italians respond differently depending on what they may consider as the less 'deviant' category. In fact, Germany and Italy have had recent developments in the fight for LGBTQ rights, which may show just this. On one hand Germany has pledged to implement a multifaceted foreign policy strategy that will set the rights of sexual minorities as a priority (Commitments in Foreign Policy Aid, 2021). On the other hand, a law that criminalizes hate speech and attacks against the LGBTQ community has been proposed in Italy (Roberts, 2021).

Implications and Future Directions

The main focus of this investigation was to study perceptions of fragility of different sexual orientations of others in novel populations (Germany and Italy), as well as understanding the effect of six possible moderators on the relationship between sexual orientation and perceptions of fragility. It is important to acknowledge related limitations in our study.

The absence of bisexuality as another relevant sexual orientation in our study. This exclusion was needed as we wanted to replicate findings from earlier studies in similar countries (e.g., United Kingdom), where the heterosexual and gay identity were the only sexual orientations taken into account. However, the existence of bisexual identity puts into question the core definition of heterosexual identity by making evident the range of possible gender identities (Moore and Norris 2005; Peery and Bodenhausen 2008; Savin-Williams 2016), therefore future studies should consider the bisexual identity, perhaps by including it as a third condition.

The current study showed that as in the United Kingdom (West et al. 2021), there was less of a disparity in fragility perceptions between heterosexual and gay identities when participants reported higher estimates of the gay/lesbian population. We believe that the similarities between our study and that of West et al. 2021 reflect that this part of Europe is moving in the direction of not seeing differences between sexual orientations (Wilson and Cariola 2020). In line with the social normativity model (Monteith, Deneen and Tooman 1996; Costa-Lopes, Vala and Judd 2012; Dovidio, Gaertner and Isen 1995), and West et al. 2021, these results suggest a change in population size estimate perceptions of the majority and minority groups of sexual orientation of others, that is the changing of sexual orientation norms within the German and Italian population. Indeed, the equal treatment of sexual minorities has been advocated within the judicial system of both countries (Commitments in Foreign Policy Aid, 2021; Roberts, 2021). This idea should be tested in future studies where the majority-privileged status of heterosexual participants is no longer the majority or privileged group.

Another important limitation of our study is that the results found here cannot be entirely extrapolated into the realities of other countries. The fragile heterosexuality effect may be a western concept, however there are more nuances to the nature of this phenomenon. In fact, this effect was moderated by estimates of gay/lesbian population in the UK (West et al. 2021), whereas it was also moderated by prejudice against gay/lesbian people in our sample. Future research should focus on studying the fragile heterosexuality effect in non-Western, non-WEIRD populations.

Globally, there is clear evidence of differences in how heterosexual identity is perceived and reassured (Lee and Kwan 2014; Mize and Manago 2018; West et al. 2021). Some appear to see moral intention as particularly important, and thus interpret being straight as a choice to resist same-sex behaviours regardless of prior physical experience (Haider, 2016; Haldeman, 1991). Others, instead see physical experience as paramount to demonstrate one's sexual orientation (Lee and Kwan 2014). These conceptualisations diverge on multiple important points, and differences like these could contribute to the asymmetrical nature of the concept of heterosexual identity.

Future research could explore these different aspects of the construct, including their divergent antecedents and consequences for responses to sexual minorities.

As stated before, perceptions of sexual orientation matter because of the negative consequences associated to being perceived as a sexual minority. Additionally, the progress towards equal treatment of the LGBTQ community has not been consistent across different regions of Europe. Our study's focus was therefore to understand if the fragile heterosexuality effect found in the UK was found in other regions of Europe. We admit that the fragile heterosexuality effect found here was small *overall*. However, this is partially a reflection of the finding that the effect is not universal, but varies significantly based on participant characteristics. Our results showed that for some people (e.g., those high on prejudice against gay/lesbian people), the effect was larger (Fig. 2), and hence more likely to be consequential. Further, the differences between the estimated effect size ($\eta^2=0.089$) and the effect size found here ($\eta^2=0.003$), could reflect differences in the sampled populations. Participants in the pilot study were mostly students, whereas the current study used a German and Italian representative sample. It should be noted that findings from a previous study in the UK (West et al. 2021), with a similar sample size, showed a somewhat similar effect size ($\eta^2=0.011$) to the one found here ($\eta^2=0.003$). Finally, the difference in effect size between the prior UK-based research and the current study could be indicative of genuine cultural differences in the perceptions of sexual orientation categories of others, or suggest that the measures used did not resonate as much with the German and Italian participants. Future research would be necessary to address these competing hypotheses, such as research using different methodologies to assess the Fragile Heterosexuality effect. Nonetheless, it would seem that an important step towards a reduction in prejudice against sexual minorities is to understand the processes by which individuals are categorised as sexual majority or sexual minority group members in different cultures.

Conclusion

Prior research has demonstrated that heterosexual identity is perceived as more fragile than gay identity in the United Kingdom and the United States of America. The current research extended that work by: (a) demonstrating that this effect occurs in other Western regions (i.e., Germany and Italy) (b) confirming that it is found when using gender neutral statements; (c) replicating findings from the UK on the moderation effect of estimates of the gay/lesbian population and (d) finding novel evidence that prejudice against gay/lesbian people moderates the relationship between sexual orientation and perceptions of fragility in Germany and Italy. Heterosexual identity of others was perceived as more easily compromised than gay identity. Higher estimates of the gay/lesbian population predicted lesser disparity in fragility perceptions between the two sexual orientations. Additionally, higher prejudice against gay/lesbian people predicted a greater disparity in fragility perceptions between heterosexual and gay identities of others. Our findings provide evidence of the stability of the fragile heterosexuality effect across Western nations, perhaps showing that this effect transcends the United Kingdom and the United States of America.

Author Contributions Authors A and B contributed to the study conception and design. Material preparation, data collection and analysis were performed by Authors A, and Author B. The first draft of the manuscript was written by Authors A, and Author B, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Funding This work was supported entirely by the ERC (European Research Council), via the starting grant. Author A and B were supported by this grant.

Declarations

Competing interests The authors have no conflicts of interest to disclose.

Ethics Approval This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of X University.

Consent to Participate Informed consent was obtained from all individual participants included in this study.

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