



Trust behaviour of sexual minorities: Evidence from a large-scale trust game experiment^{☆,☆☆}

Francesco Berlingieri^{a,✉}, Matija Kovacic^{b,c,✉,*}, Elena Stepanova^a

^a European Commission, Joint Research Centre (JRC), Ispra, Italy

^b University of Verona, Verona, Italy

^c Global Labor Organization (GLO), Essen, Germany

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ABSTRACT

Using a large-scale incentivized trust game experiment conducted across all 27 EU member states, we find that sexual minorities exhibit on average greater prosocial behaviour toward another vulnerable group but not toward an unknown counterpart, compared to heterosexual individuals. The observed differences are both relationship- and context-specific. Specifically, bisexual individuals and those identifying with a sexual orientation other than lesbian, gay, or heterosexual demonstrate higher average trusting behaviour toward counterparts who frequently experience loneliness. This result is not attributable to higher expectations of return, differences in risk preferences, or the individual's own loneliness status. Furthermore, we find evidence that this relationship-specific prosocial behaviour among sexual minorities is more pronounced in countries with lower levels of LGBTIQ+ rights protection, suggesting that it is heightened in contexts where minorities face a greater risk of exclusion or discrimination. We do not find statistically significant differences in overall trustworthiness across sexual orientations. However, the results offer some evidence that bisexual individuals are more trustworthy than heterosexual trustees when they feel a strong connection to their counterpart.

1. Introduction

Between 5% and 10% of people in Europe report having a sexual orientation other than heterosexual or straight (Berlingieri & Kovacic, 2025; Ipsos, 2024). The actual size of sexual minority populations in Europe is likely even larger, as respondents may be unwilling to disclose their true sexual orientation in surveys (Coffman et al., 2017). Despite improvements in social attitudes toward sexual minorities over the past decades (Badgett et al., 2024), more than 40% of LGBTIQ+ individuals in Europe still report experiencing discrimination in various areas of life, including the workplace, housing, healthcare, and social services (FRA, 2020). Experienced and perceived discrimination have been shown to contribute to minority stress, negatively impacting health and well-being (Dohrenwend, 2000; Hoy-Ellis, 2023; Meyer, 1995, 2003; Meyer et al., 2019; Rivers et al., 2018). Discrimination may also

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* Corresponding author at: University of Verona, Verona, Italy.

E-mail address: matija.kovacic@univr.it (M. Kovacic).

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affect how sexual minorities interact with unfamiliar individuals, influencing their trust in others and their prosocial attitudes, with potential negative consequences for social cohesion and the economy.

Existing research on trust and pro-sociality among disadvantaged groups yields mixed findings. On the one hand, some studies suggest that individuals from marginalized backgrounds, such as racial and ethnic minorities, exhibit lower levels of generalized trust (Wilkes & Wu, 2018). A possible explanation for this is that experiences of discrimination, social exclusion, or economic disadvantage may lead individuals to be more cautious in their interpersonal interactions and less trusting of others. On the other hand, social psychology research indicates that social exclusion can, in some cases, foster prosocial behaviour rather than diminish it. Specifically, excluded individuals tend to mistrust and avoid their excluders but display higher empathy and altruism toward others (Gerber & Wheeler, 2009; Maner et al., 2007). There is also evidence that such attitudes and behaviours are transmitted across generations by historically excluded groups (Ramos-Toro, 2023). While some previous studies suggest that the level of trust among sexual minorities depends on the characteristics of their counterpart and the context (Platt & Scheitle, 2019), little is known about the specific contextual factors, such as group identity, shared vulnerability, and perceived social connection, that shape trust, trustworthiness, and prosocial attitudes among sexual minorities.

This study examines the trusting and trustworthiness behaviour of LGB+ individuals (i.e., lesbian, gay, bisexual, or those with a sexual orientation other than heterosexual or straight) using a large-scale incentivized trust game experiment involving nearly 24,000 respondents across all 27 EU member states. Specifically, we investigate whether disclosing information about a counterpart's psychological state, namely, their experience of frequent loneliness, affects trustor behaviour and trustee reciprocity. On the one hand, a counterpart's loneliness status may signal a shared vulnerability for LGB+ individuals who also experience loneliness. On the other hand, LGB+ individuals who do not feel lonely may perceive lonely individuals as belonging to a different marginalized group, as loneliness is often associated with stigma and discrimination (Barreto et al., 2022; Kerr & Stanley, 2021; Lau & Gruen, 1992; Neves & Petersen, 2025).

Distinctive characteristics of this study is the sample it is based on. As the economic game was incorporated into a population-wide cross-national survey, the sample is substantially larger and more diverse than those typically used in previous papers, which are often specific to a single country. Thereby, it allows to focus on the behaviour of minority groups, i.e. sexual minorities, and investigate differences by country-specific institutional and cultural characteristics. Another distinctive characteristics of this study is the measure of the perceived closeness to a game counterpart. We capture this psychological construct through a simple yet powerful visual tool based on overlapping Venn diagrams (Aron et al., 1992; Baader et al., 2024). The visual format offers an alternative to text-based measurement that is less cognitively demanding and promotes greater respondent engagement with the survey. Perceived relationship closeness has a long-standing history of research in psychology and has been used in experimental economics (Gächter et al., 2025; Goette & Tripodi, 2021; Robson, 2021). It has been shown to be strongly associated with prosocial preferences (Schütt, 2023) and we provide additional support for this association.

We find that bisexual individuals and those identifying with another sexual orientation (i.e., those who do not identify as heterosexual, gay, lesbian, or bisexual, and who instead may describe their orientation as fluid, queer, asexual, sapiosexual, or another identity) exhibit significantly higher levels of trust toward a lonely counterpart than their heterosexual counterparts. However, the increased trusting behaviour of these sexual minority groups is relationship-specific, as we do not observe significant differences in trusting behaviour by sexual orientation when no information about the counterpart is provided in the same game setting. The observed difference in trusting behaviour cannot be attributed to more optimistic beliefs about a counterpart's actions, stated risk preferences, or the individual's own loneliness status. This indicates that the result is not merely due to in-group favouritism but rather suggests prosocial behaviour toward another potentially vulnerable group. Moreover, the trusting behaviour of sexual minorities toward lonely counterparts is higher in countries with weaker protections for LGBTIQ+ rights. This suggests that their behaviour is also context-specific, with stronger potential exclusion or discrimination being associated with greater trust toward game partners who may face similar exclusion or stigmatization.

Relational closeness to the counterpart and the stigmatization of loneliness appear to influence the higher trusting behaviour of sexual minorities. Specifically, the increased trusting behaviour of bisexual individuals and those identifying with another sexual orientation toward lonely trustees is more pronounced among individuals who perceive a stronger connection to the counterpart and among those who do not stigmatize loneliness. Moreover, while we do not observe statistically significant differences in trustworthiness behaviour by sexual orientation overall, we find that bisexual individuals exhibit higher trustworthiness toward lonely counterparts than heterosexual individuals when they perceive a strong connection to the counterpart.

Overall, the findings support the notion of higher unconditional prosocial behaviour among sexual minority groups toward another vulnerable group. Survey evidence on self-reported prosocial behaviour aligns with this finding, suggesting that LGB+ individuals, particularly women, exhibit a greater willingness to donate and volunteer. In contrast, bisexual individuals report lower generalized trust in others compared to heterosexual individuals, while the differences for other sexual minority groups are not statistically significant. Although self-reported generalized trust and trusting behaviour in an incentivized game may not provide fully comparable measures of trust (Glaeser et al., 2000), the results generally suggest that sexual minorities do not exhibit generally higher trust in others but rather show greater trust toward other vulnerable and potentially excluded groups.

Our study contributes to the literature examining the prosocial behaviours of socially excluded groups. While pro-sociality is a broad concept that extends beyond utility considerations in economic games, it encompasses behaviours that benefit others, sometimes at a personal cost. It is associated with charitable giving, volunteering, acts of kindness, and other forms of altruistic behaviour. A series of experiments by Twenge et al. (2007) found that socially excluded individuals were less likely to engage in prosocial behaviours such as donating to a student fund, volunteering for further experiments, helping after a mishap, and cooperating in mixed-motive games. This reduction in prosocial behaviour is thought to result from a diminished sense of

responsibility toward others following exclusion. However, some studies suggest that social exclusion can also drive pro-sociality. Gerber and Wheeler (2009) found that experiences of social exclusion decrease prosocial behaviour only toward those responsible for the exclusion while increasing pro-sociality toward new potential sources of affiliation. Similarly, Ramos-Toro (2023) uses the case of leper colonies in Colombia as a historical example to show that socially excluded individuals tend to be more prosocial but exhibit mistrust toward those who excluded them. Research in social psychology has reached similar conclusions: socially excluded individuals tend to avoid interacting with those who excluded them while displaying greater empathy and altruism, particularly toward underprivileged groups (Greenberg et al., 2018; Maner et al., 2007; Vollhardt & Staub, 2011).

Our study also relates to the experimental literature examining behaviours in trust game settings involving sexual and gender minorities (Aksoy et al., 2024, 2023) or other minority groups (Cetre et al., 2024; Kudashvili & Lergetporer, 2022). The trust game is commonly used in studies of discrimination, as it allows researchers to measure how participant's behaviour varies depending on the social identity of their counterpart. Discrimination has been documented across a wide range of individual characteristics, including race, ethnicity, gender, nationality, age and sexual orientation, even extending to arbitrary characteristics experimentally induced in laboratory settings (Lane, 2016). The extent to which individuals exhibit discriminatory behaviour based on their own characteristics has also been examined (Chuah et al., 2023). A central focus of this literature is the powerful role of the intergroup effect where individuals tend to favour members of their own social group over those of out-groups (Cappelen et al., 2025; Enke, 2024). In contrast, our study focuses on intersectional solidarity—the idea that members of one disadvantaged group may act with heightened concern for the welfare of other marginalized groups. Rather than examining discrimination against minorities, we investigate whether and under what conditions solidarity among marginalized groups emerges.

Additionally, as the trust game is embedded in a survey with rich information about individual preferences and attitudes, we contribute to the emerging literature on the social and economic preferences of sexual and gender minorities (Coffman et al., 2024). In particular, we extend recent results on differences in patience and risk taking by sexual orientation (Berlingieri & Kovacic, 2025; Carpenter et al., 2025) by documenting that LGB+ women display a greater willingness to volunteer and to donate compared to heterosexual women.

The rest of the article is organized as follows. Section 2 describes the trust game, the survey used and the hypotheses. In Section 3, we show descriptive statistics and differences in self-reported trust and prosocial attitudes by sexual orientation. Section 4 presents the results of the trust game, followed by Section 5 in which we critically discuss the findings and provide conclusive remarks.

2. Methodology

This study makes a part of a broader research project on trusting behaviour in experimental context. Being an extension, it follows the experimental and treatment setup of the original study (Stepanova et al., 2024) that we explain below. This study is developed as a stand-alone research product to allow a more focused examination of the behaviour of a minority group and the possible factors explaining it.

This research relies on data from the European Union Loneliness Survey (EU-LS), which was conducted online across all 27 EU member states in late 2022 with participants aged 16 and above. The trust game experiment was incorporated into the survey with the general objective of examining trusting behaviour toward lonely individuals (Stepanova et al., 2024).

2.1. Trust game

To assess trusting behaviour and trustworthiness, a standard two-player, one-shot trust game was employed, following the framework established by Berg et al. (1995). In this game, two anonymous participants were randomly assigned to either the role of trustor (A player) or trustee (B player). Each participant, regardless of role or country of residence, began with an endowment of five coins. Trustors then decided how much of their endowment to transfer to the trustee. Any transferred amount was subsequently tripled, and the trustee then decided how many of the available coins to return to the trustor.

The game was introduced halfway through the survey. After engaging with an instructional module and completing an interactive tutorial, participants were required to answer two control questions designed to assess their comprehension of the game's structure and implications. Trustees indicated the amount they would return for each potential amount (ranging from 1 to 5 coins) transferred by the trustor. Participants were informed that, upon completion of the game, coins would be converted into survey points (the “currency” used for compensation by the survey provider) at a predefined exchange rate specific to each country (details about the payment schemes in each country are provided in Section 1.5 of the Online Appendix). The exchange rate varied across countries to ensure comparability of incentives, adjusted for purchasing power parity. Additionally, participants were made aware that payouts would be probabilistic, with one in every 25 participants being selected for payment. Implementing partial payment selection is a common practice in large-scale experimental studies (Charness et al., 2016), which, while potentially influencing the amount transferred, has not been found to significantly alter reciprocal behaviour (Johnson & Mislin, 2011).

For the trustee's role, the Selten (1967)'s strategy method was implemented, meaning that trustees were required to decide in advance how much they would return in response to each possible transfer from the trustor (1, 2, 3, 4, or 5 coins). This method is widely used in trust game experiments and has been shown to yield behaviourally equivalent results to direct response methods (Brandts & Charness, 2011).

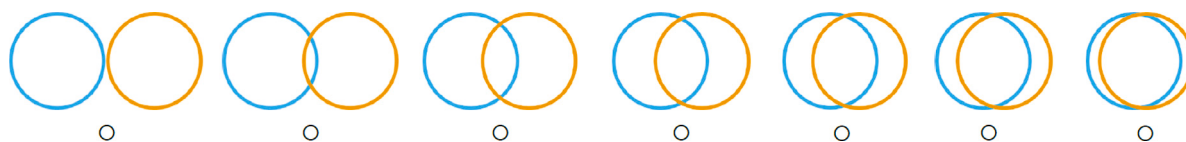


Fig. 1. Perceived closeness to the counterpart.

2.1.1. Belief elicitation

After making their decisions, both trustors and trustees were asked to provide an incentivized prediction about their counterpart's behaviour. Correct predictions were rewarded with an additional coin. Trustees were asked how many coins they believed the trustor had sent to them, while trustors, in turn, were supposed to predict the trustee's response:

- i. Trustors: *Imagine you sent 3 coins, meaning B receives 9 coins, making their total budget 14 coins. How many coins do you think B will return to you?*
- ii. Trustees: *How many coins do you think A will send you?*

Belief reports from trustors were standardized, as they referred to a common reference point (the same budget) rather than being dependent on actual transfers, ensuring their comparability.

2.1.2. Information treatments

Participants were assigned to one of three treatments that varied the level of information available about their counterpart's loneliness status. The experimental conditions were structured as follows:

- i. Baseline (control) treatment: Neither the trustor nor the trustee received any information about their counterpart.
- ii. Trustee-lonely treatment: Trustors were informed that the trustee assigned to them had reported feeling lonely. Trustees received no information about their trustor, and trustors were explicitly told that their counterpart remained unaware of their own status.
- iii. Trustor-lonely treatment: Trustees were informed that their assigned trustor had reported feeling lonely, while trustors received no information about their trustee. Trustees were also made aware that trustors did not receive information about their own status.

To ensure the credibility of these treatments, participant matchings were conducted ex post, and participants were not explicitly informed that their own loneliness status was exposed to their interaction partner. All pairings in the game, therefore, reflected truthful information as disclosed in each treatment condition.

2.1.3. Perceived closeness to the counterpart

To assess the perceived closeness to the counterpart in the game, participants were asked to report their feeling of connection to their counterpart using the "Inclusion of the Other in the Self" (IOS) Scale (Aron et al., 1992) (Fig. 1). Fong and Luttmer (2009) show that the closer potential donors feel to the perceived race of donation recipients, the more they donate. Their findings reaffirm that claiming to "feel close to" can arguably be interpreted as a stated preference toward a group. In the analysis, we distinguish three levels of perceived closeness to the counterpart: no connection (circles not touching), low connection (small overlapping region), and high connection (large overlapping region).

2.2. The EU loneliness survey (EU-LS)

The EU-LS survey was conducted by LE Europe, Ipsos, and VVA Market Research. Participants were recruited from the CINT online panels, which adhered to industry standards, including those set by ESOMAR (European Society for Opinion and Marketing Research) and the Insights Association. The survey includes approximately 1000 respondents aged 16 and above per country, except for Cyprus, Luxembourg, and Malta (around 500). Quotas based on the population of each member state were applied to sample selection from online consumer panels to ensure representation in terms of age, gender, education, and NUTS region of residence. At the beginning of the survey, respondents signed a consent form and were informed that the survey was conducted as part of a research project looking at well-being across the European Union. They were also informed that the survey contained questions on sensitive topics, for which a *prefer not to say* option would be available. The survey obtained ethical approval from the JRC Ethics Review Board.

While the main focus of the EU-LS was to measure loneliness and social connectedness, individuals were also asked about their sexual orientation. In particular, they were asked the following question: *Which of the following best describes your sexual orientation?* The possible answers were: *Heterosexual/straight*, *Lesbian or gay*, *Bisexual*, *Other sexual orientation*, *Don't know* and *Prefer not to say*. The category *Other sexual orientation* refers to respondents who do not identify as heterosexual, gay, lesbian, or bisexual, and who instead describe their orientation in another way. This may include, for example, people who identify as fluid (whose orientation changes over time or depending on context), asexual (experiencing little or no sexual attraction to others), queer (a broad or fluid

sexual orientation), sapiosexual (primarily attracted to intelligence), among others. The survey also includes a question on gender identity, allowing for the category *in another way* besides *male* and *female*. However, given that few respondents do not identify with the male or female gender identity and the survey does not allow to include the full range of sexual minorities and gender identities, in our analysis we only focus on sexual minorities. Indeed, only 0.4% of the respondents in the EU-LS survey select the category *in another way* when answering the gender question. The survey does not include information about being transgender.

A direct question that asked participants how often, during the past 4 weeks, they have been feeling lonely (5-point Likert scale: from *None of the time* to *all of the time*) was used to identify lonely individuals. Only individuals who reported feeling lonely *most* or *all of the time* in the last four weeks were eligible to be selected as counterparts in the information treatment setup of the trust game, ensuring that all pairings in the game for payouts were truthful to the information given to participants. Based on this question, we also construct a dummy variable denoting whether individuals feel lonely most or all of the time to analyse heterogeneous effects of the treatment depending on the loneliness status of survey respondents.

Participants were also asked to report several socio-economic preferences and attitudes. Self-reported general trust was elicited by asking participants: *In general how much do you trust most people?* (10-points Likert scale from *not at all* to *completely*) (OECD, 2017). Prosocial preferences were elicited by asking about the willingness to donate money and to volunteer with an answer scale of ten points from not willing at all to very willing to do so (Falk et al., 2018). Time preferences were elicited by asking participants how much they were willing to give up benefits today for future profits with answer scale of ten points from not willing at all to very willing to do so (Falk et al., 2018). Respondents were also asked about their risk attitudes in three different domains (i.e., financial, health and adventure risk taking). In particular, the following question was asked to measure financial risk attitudes: *Are you more of a risk-taking person, or do you try to avoid risks when it concerns taking financial decisions?* (Dohmen et al., 2012).

Finally, the survey asked individuals about a full range of demographic and socio-economic characteristics, childhood experiences, and behaviours in other domains, such as time usage, patterns, motivations, and potential overuse of social media (Berlingieri et al., 2024).

2.3. Hypotheses

Our empirical analysis involves testing three pre-registered hypotheses.¹ First, we examine trusting behaviour and trustworthiness of sexual minorities in comparison to their heterosexual counterparts. Next, we investigate how sexual minorities' trusting behaviour is influenced when information regarding the counterpart's loneliness is disclosed. In addition, we explore whether and how certain contextual factors, such as the protection of LGBTIQ+ rights and the strength of social norms and beliefs, shape the behaviours of sexual minorities. Accordingly, we define the following hypotheses:

Hypothesis 1. Sexual minorities exhibit higher trust and trustworthiness behaviour in terms of coins sent and coins returned compared to heterosexual individuals.

Hypothesis 2. Sexual minorities exhibit higher trust and trustworthiness behaviour towards the lonely counterpart compared to heterosexual individuals.

Hypothesis 3. Differences in trust and trustworthiness between sexual minorities and heterosexual people are larger in countries with a lower protection of LGBTIQ+ rights.

The first two hypotheses rely on the literature demonstrating that socially marginalized individuals exhibit heightened prosocial behaviour with general tendencies towards empathy and altruism (Greenberg et al., 2018; Maner et al., 2007; Ramos-Toro, 2023; Vollhardt & Staub, 2011). The third hypothesis has to do with the degree of marginalization of sexual minorities. Since social and emotional marginalization is generally higher in societies with lower protection of sexual minorities rights and/or in more traditional countries where pre-defined rules of conduct embedded in social norms and restrictions are more pronounced (Berlingieri & Kovacic, 2025), we expect that the prosocial behaviour of sexual minorities is more accentuated in those societies.

3. Descriptive statistics

3.1. Trust game

Our analytical sample consists of 23,990 respondents residing in all 27 EU member states who participate in the trust game and answer the loneliness question. Approximately half of the respondents were assigned the role of trustor and the other half the role of trustee. In each of the two player groups, a random half did not receive any information about the counterpart in the game, while the other randomly selected half was informed that their counterpart had reported feeling lonely. Trustors send on average 2.6 coins out of the endowment of 5 coins, while trustees expect to receive only 2.2 coins (see Table 1). Trustees send back to trustors on

¹ The analysis plan for this study was pre-registered on the AsPredicted platform of the Penn Wharton Credibility Lab (registration #200580, <https://aspredicted.org/fsx6-4x79.pdf>). We acknowledge that this was a post-data-collection pre-analysis plan, meaning that the registration was completed after data collection but prior to conducting any empirical analyses. The hypotheses presented in this paper correspond to those specified in the above-cited registration. For the experimental treatment component, a pre-registration was completed prior to data collection (<https://osf.io/vc53k/overview>).

Table 1
Summary statistics for the trust game.

Variable	Mean	Std. Dev.	Min.	Max.	N
Panel A: trustors (A players)					
Treated	0.502	0.5	0	1	12 074
Amount sent	2.604	1.475	0	5	12 074
Amount expected from trustee	4.005	2.025	0	9	12 074
Number of correct answers	0.713	0.72	0	2	12 074
Closeness	3.692	1.959	1	7	12 074
No connection	0.155	0.362	0	1	12 074
Low connection	0.535	0.499	0	1	12 074
High connection	0.31	0.463	0	1	12 074
Panel A: trustees (B players)					
Treated	0.5	0.5	0	1	11 916
Share returned	0.626	0.204	0	1	11 916
Amount expected from trustor	2.277	1.519	0	5	11 916
Number of correct answers	0.723	0.733	0	2	11 916
Closeness	4.076	2.062	1	7	11 916
No connection	0.148	0.355	0	1	11 916
Low connection	0.456	0.498	0	1	11 916
High connection	0.397	0.489	0	1	11 916

Notes: No connection refers to Venn diagram circles not touching (closeness scale equal to 1), low connection to a small overlapping region (closeness scale equal to 2, 3 or 4), and high connection to a large overlapping region (closeness scale equal to 5, 6 or 7)..

average 63% of the amount received, while trustors expect to receive on average 4 coins, which represents 51% of the average amount sent (2.6) multiplied by 3 (following the rules of the game). The average perceived degree of closeness to the counterpart is 3.7 (measured in a 1-7 scale) for trustors and 4.1 for trustees, with circa 15% of both trustors and trustees reporting no connection at all (i.e. Venn diagram circles not touching).

3.2. Sample characteristics by sexual orientation

The survey's large sample size allows for a separate analysis of different sexual orientations. Table 2 shows that 89% of respondents identify as heterosexual/straight, 2.5% as lesbian/gay, 3.9% as bisexual, 1% as having another sexual orientation, while 2.5% prefer not to disclose their sexual orientation. When comparing these estimates of sexual minority populations with data from other surveys conducted across the 27 EU member states, notable consistencies as well as some variations emerge. For example, the proportion of individuals identifying as LGB+ in the 2021 IPSOS LGBT+ Pride Global Survey conducted online in 27 countries (including 9 within the EU) are nearly identical, differing by no more than one percentage point, in France, the Netherlands, and Sweden. However, in other EU countries such as Belgium, Germany, Hungary, Italy, Poland, and Spain, the EU-LS figures tend to be lower than those found by IPSOS. One possible reason is that the IPSOS survey specifically addressed issues related to LGBTQIA+ equality, which may have attracted greater participation from respondents belonging to sexual minorities. Conversely, national-level surveys that use face-to-face or telephone interviewing methods generally report smaller proportions of sexual minority individuals compared with the EU-LS, which is mainly due to the survey mode (see Berlingieri and Kovacic (2025) for more details).

Table 2 also presents key demographic and socio-economic characteristics considered in the analysis, by sexual orientation. Sexual minorities (i.e., lesbian/gay, bisexual individuals, and those with other sexual orientations) tend to be younger than heterosexual individuals and have lower household incomes. Moreover, they are more likely to be single and less likely to be married or to have children under the age of six.

In addition, sexual minorities are more likely than heterosexual individuals to feel lonely most or all of the time (see Table 3). While bisexual individuals do not differ from heterosexual individuals in terms of risk attitudes, lesbian and gay individuals, as well as those with another sexual orientation, tend to be more risk-prone, particularly in the health domain (see also Berlingieri and Kovacic (2025)). Finally, lesbian and gay individuals are more likely to report being patient (i.e., willing to forgo immediate benefits for future gains) compared to their heterosexual peers. While we do not include controls for loneliness, risk aversion, and patience in the main analysis, we present separate robustness checks demonstrating that differences in these characteristics do not drive our main findings.

4. Results

4.1. Trust game behaviour of sexual minorities

This section presents our main findings. Trustors send on average 3.52 coins to an unknown counterpart and 3.69 coins when informed that their counterpart is feeling lonely (see Fig. 2). The difference is statistically significant in an unpaired t-test (t-statistics = 6.53) suggesting that the treatment has a positive effect on trust behaviour, in line with the results of Stepanova et al. (2024) finding that the overall population displays a significantly higher trusting behaviour towards lonely individuals. This result is

Table 2
Summary statistics by sexual orientation, main covariates.

	Heterosexual	Lesbian/gay	Bisexual	Other SO	Pref. not say
Age					
16-25	2,353 (11.0%)	141 (23.7%)	269 (28.7%)	72 (30.9%)	68 (11.2%)
26-35	3,937 (18.4%)	142 (23.9%)	199 (21.2%)	56 (24.0%)	73 (12.1%)
36-45	4,599 (21.5%)	138 (23.2%)	191 (20.4%)	44 (18.9%)	126 (20.8%)
46-55	4,937 (23.1%)	105 (17.7%)	137 (14.6%)	38 (16.3%)	142 (23.5%)
56-65	3,094 (14.5%)	49 (8.2%)	78 (8.3%)	12 (5.2%)	107 (17.7%)
65+	2,432 (11.4%)	19 (3.2%)	64 (6.8%)	11 (4.7%)	89 (14.7%)
Education					
≤ Secondary	7,748 (36.3%)	213 (35.9%)	385 (41.0%)	96 (41.2%)	269 (44.5%)
Post-secondary	8,025 (37.6%)	226 (38.0%)	374 (39.9%)	75 (32.2%)	206 (34.0%)
Postgraduate	5,579 (26.1%)	155 (26.1%)	179 (19.1%)	62 (26.6%)	130 (21.5%)
Gender					
Male	10,276 (48.1%)	382 (64.3%)	394 (42.0%)	76 (32.6%)	199 (32.9%)
Female	11,052 (51.8%)	193 (32.5%)	517 (55.1%)	138 (59.2%)	405 (66.9%)
In another way	24 (0.1%)	19 (3.2%)	27 (2.9%)	19 (8.2%)	1 (0.2%)
HH income					
Quintile 1	2,471 (11.6%)	99 (16.7%)	152 (16.2%)	52 (22.3%)	107 (17.7%)
Quintile 2	3,458 (16.2%)	110 (18.5%)	188 (20.0%)	50 (21.5%)	103 (17.0%)
Quintile 3	4,616 (21.6%)	124 (20.9%)	202 (21.5%)	43 (18.5%)	129 (21.3%)
Quintile 4	5,028 (23.5%)	126 (21.2%)	189 (20.1%)	39 (16.7%)	81 (13.4%)
Quintile 5	4,427 (20.7%)	107 (18.0%)	141 (15.0%)	37 (15.9%)	62 (10.2%)
DK/refusal	1,352 (6.3%)	28 (4.7%)	66 (7.0%)	12 (5.2%)	123 (20.3%)
Type of residence					
Rural area	5,013 (23.5%)	117 (19.7%)	229 (24.4%)	61 (26.2%)	148 (24.5%)
Small town	6,517 (30.5%)	197 (33.2%)	289 (30.8%)	57 (24.5%)	190 (31.4%)
City	9,696 (45.4%)	278 (46.8%)	410 (43.7%)	111 (47.6%)	256 (42.3%)
DK/refusal	126 (0.6%)	2 (0.3%)	10 (1.1%)	4 (1.7%)	11 (1.8%)
Relationship					
Single	4,205 (19.7%)	280 (47.1%)	295 (31.4%)	90 (38.6%)	156 (25.8%)
In rel.	2,937 (13.8%)	165 (27.8%)	185 (19.7%)	40 (17.2%)	64 (10.6%)
Married/cohab.	11,945 (55.9%)	124 (20.9%)	377 (40.2%)	81 (34.8%)	297 (49.1%)
Separated	1,628 (7.6%)	23 (3.9%)	57 (6.1%)	12 (5.2%)	37 (6.1%)
Widowed	564 (2.6%)	2 (0.3%)	16 (1.7%)	7 (3.0%)	34 (5.6%)
DK/refusal	73 (0.3%)	0 (0.0%)	8 (0.9%)	3 (1.3%)	17 (2.8%)
Working status					
working	14,224 (66.6%)	395 (66.5%)	545 (58.1%)	122 (52.4%)	331 (54.7%)
studying	1,149 (5.4%)	52 (8.8%)	145 (15.5%)	30 (12.9%)	33 (5.5%)
unemployed	1,398 (6.5%)	76 (12.8%)	87 (9.3%)	35 (15.0%)	58 (9.6%)
retired	3,142 (14.7%)	36 (6.1%)	89 (9.5%)	17 (7.3%)	116 (19.2%)
houseperson	1,439 (6.7%)	35 (5.9%)	72 (7.7%)	29 (12.4%)	67 (11.1%)
Children in HH					
No young kids	13,179 (61.7%)	433 (72.9%)	598 (63.8%)	140 (60.1%)	410 (67.8%)
Kids, below 6	1,968 (9.2%)	26 (4.4%)	72 (7.7%)	15 (6.4%)	39 (6.4%)
Kids, 6-15	6,205 (29.1%)	135 (22.7%)	268 (28.6%)	78 (33.5%)	156 (25.8%)
Observations	21,352 (89.0%)	594 (2.5%)	938 (3.9%)	233 (1.0%)	605 (2.5%)

Notes: The overall sample consists of 23,990 observations. Statistics on 268 individuals answering do not know to the sexual orientation question (1.1% of the sample) are not reported.

confirmed in columns (1) and (2) of Table 4, which display the estimated coefficients from our baseline specification regressing the standardized amounts of trustors' contributions on the treatment and sexual orientation categories with or without the inclusion of a full set of demographic and socio-economic characteristics. Individuals have 0.12 standard deviations higher trust behaviour towards lonely individuals compared to an unknown counterpart.

Table 4 also shows that there are statistically significant differences in average trust behaviour by sexual orientation. While lesbian and gay trustors do not exhibit a significantly different behaviour than heterosexual trustors, bisexual individuals and those reporting another sexual orientation have respectively on average a 0.1 standard deviation and 0.2 standard deviation higher trust behaviour than heterosexual individuals (bisexual vs. heterosexual: $p = 0.044$; other sexual orientation vs. heterosexual: $p = 0.019$). However, columns (3)-(6) show that the differences by sexual orientation are only statistically significant when the counterpart is feeling lonely (treatment) and are smaller and not significant when the counterpart is unknown. As shown in Fig. 2, the amount sent by bisexual individuals (mean: 3.92) and those with other sexual orientations (mean: 4.07) to a lonely counterpart is substantially higher than that sent by heterosexual individuals (mean: 3.67). However, it is worth noticing that, while the difference between the average coins sent by bisexual and other sexual orientation trustors in the treatment and control case (0.30-0.31) is almost double as large as the same difference for heterosexual trustors (0.16), the treatment effect is not statistically larger for these sexual minorities than for heterosexual individuals (see Table 2.1 in the Online Appendix for a formal test of the differential effects).

Our pre-registered hypotheses did not differentiate among sexual minority subgroups. Nonetheless, the observation that bisexual trustors differ in their behaviour from heterosexual trustors, while gay and lesbian trustors do not, may be accounted for by prior

Table 3
Loneliness and attitudes by sexual orientation.

	Lonely	Risk-taking (scale)			Patience
	(direct) (1)	adventure (2)	financial (3)	health (4)	(scale) (5)
Lesbian/gay	0.051** (0.015)	0.221 (0.173)	0.285 (0.139)	0.427* (0.173)	0.242* (0.104)
Bisexual	0.079*** (0.010)	−0.112 (0.089)	−0.164 (0.086)	0.063 (0.099)	0.065 (0.071)
Other SO	0.063** (0.021)	0.122 (0.241)	0.033 (0.235)	0.787*** (0.183)	0.325 (0.176)
Don't know	0.083* (0.034)	0.127 (0.168)	0.086 (0.139)	0.164 (0.171)	0.034 (0.134)
Prefer not say	−0.005 (0.014)	0.075 (0.137)	0.244 (0.130)	0.374* (0.148)	−0.145 (0.110)
Constant	0.183*** (0.010)	4.120*** (0.116)	3.880*** (0.107)	4.033*** (0.094)	6.156*** (0.068)
Control variables	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Observations	22 195	22 195	22 195	22 195	22 195
R-squared	0.049	0.098	0.093	0.091	0.076

Notes: The table reports coefficients from OLS regressions. The dependent variables are a dummy variable denoting feeling lonely most or all of the time in column (1), 1–10 scales measuring risk tolerance when driving or riding a bike (i.e. adventure), when taking financial decisions and in the health domain in columns (2)–(4), and a 1–10 scale measuring the willingness to forgo immediate benefits for future gains in column (5). The reference category of sexual orientation are heterosexual people. Control variables includes: age, gender, education, household income quintiles, number of kids aged 0–5 and 6–15 and rural versus urban. Robust standard errors clustered at the country of residence level are reported in parenthesis. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

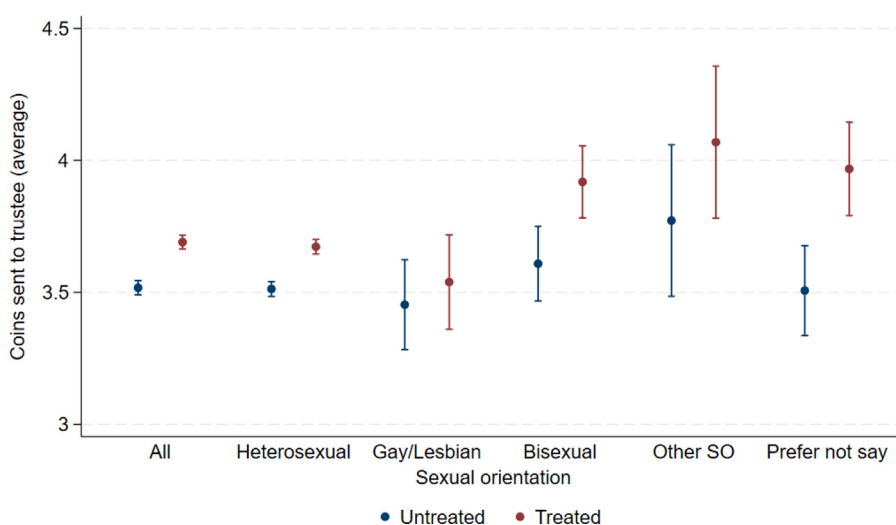


Fig. 2. Coins sent by trustors, by sexual orientation and treatment

Notes: The figure shows the average number of coins sent by all trustors as well as by trustors of different sexual orientation for the untreated sample and the treated one (i.e. information that trustee is feeling lonely). The lines show 95% confidence intervals. Number of observations: 12074 (6057 treated and 6017 untreated).

findings in the literature. Several studies suggest that bisexual individuals experience higher levels of emotional distress (e.g., feelings of worthlessness, nervousness, hopelessness, and unhappiness) and loneliness compared to lesbian and gay individuals (Berlingieri & Kovacic, 2025; Cross et al., 2024; Jorm et al., 2002; Semlyen et al., 2016). This phenomenon may be attributed to the so-called “biphobia” (Meyer, 2003), which posits that bisexual individuals are particularly vulnerable due to discrimination and prejudice from both heterosexual and other sexual minority groups, in addition to the broader social stressors internalized by the entire LGB+ community (Friedman et al., 2014; Mereish et al., 2017). At the same time, as shown by Berlingieri and Kovacic (2025), gay and lesbian individuals generally do not differ from their heterosexual peers in these characteristics. Nonetheless, the negative (albeit insignificant) average difference in coins sent by gay/lesbian versus heterosexual individuals is unexpected and should be explored in future analyses.

Table 4
Trust behaviour by sexual orientation and treatment.

	Overall		Untreated		Treated	
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.118*** (0.020)	0.123*** (0.019)				
Lesbian/gay	−0.068 (0.093)	−0.055 (0.081)	−0.040 (0.102)	−0.059 (0.089)	−0.090 (0.114)	−0.044 (0.104)
Bisexual	0.114* (0.050)	0.101* (0.048)	0.064 (0.059)	0.052 (0.057)	0.165* (0.062)	0.146* (0.065)
Other SO	0.220* (0.098)	0.208* (0.083)	0.174 (0.141)	0.180 (0.121)	0.266* (0.114)	0.226* (0.103)
Don't know	0.024 (0.096)	−0.043 (0.103)	−0.056 (0.182)	−0.160 (0.189)	0.097 (0.125)	0.034 (0.127)
Prefer not say	0.096 (0.049)	0.072 (0.046)	−0.004 (0.071)	−0.025 (0.069)	0.198* (0.079)	0.176* (0.071)
Constant	−0.074* (0.028)	0.048 (0.049)	−0.068* (0.029)	0.192** (0.060)	0.039 (0.029)	0.032 (0.073)
Control variables	No	Yes	No	Yes	No	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12 074	12 074	6017	6017	6057	6057
R-squared	0.005	0.084	0.001	0.087	0.003	0.088

Notes: The table reports coefficients from OLS regressions for the overall sample of trustors in columns (1)–(2), the subsample of untreated trustors in columns (3)–(4) and the subsample of treated trustors in columns (5)–(6). The dependent variable is the amount sent by trustors (standardized). The reference category of sexual orientation are heterosexual people. Control variables includes: age, gender, education, household income quintiles, number of kids aged 0–5 and 6–15, rural versus urban, expectation about counterpart's behaviour and comprehension controls. The method of estimation is OLS. Robust standard errors clustered at the country of residence level are reported in parenthesis. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The finding that bisexual individuals and those reporting another sexual orientation exhibit higher levels of trust toward a lonely counterpart partially supports [Hypothesis 2](#), suggesting that social exclusion may enhance pro-sociality toward other vulnerable and potentially stigmatized groups ([Gerber & Wheeler, 2009](#); [Ramos-Toro, 2023](#)). Conversely, the absence of higher trust among sexual minorities toward an unknown counterpart does not confirm [Hypothesis 1](#), although this result aligns with some existing studies. For instance, [Gerber and Wheeler \(2009\)](#) provide empirical evidence that experiences of social exclusion lead to a reduction in pro-social behaviour toward those responsible for the exclusion, while simultaneously fostering an increase in pro-social tendencies toward alternative potential sources of social affiliation. Similarly, [Ramos-Toro \(2023\)](#), drawing on the historical case of leper colonies in Colombia, demonstrates that socially marginalized individuals exhibit heightened pro-social behaviour yet display distrust toward their excluders. Findings in social psychology converge on similar conclusions, indicating that socially excluded individuals tend to avoid interactions with those who have ostracized them while exhibiting broader tendencies toward empathy and altruism ([Greenberg et al., 2018](#); [Maner et al., 2007](#); [Vollhardt & Staub, 2011](#)).

Finally, it is worth noting that individuals who prefer not to disclose their actual sexual orientation also display a higher trusting behaviour towards a lonely counterpart compared to heterosexual individuals ([Table 4](#), column (6), $p = 0.021$). This specific subset of individuals may feel particularly uncomfortable or unsafe revealing their identity, even in anonymous online surveys, due to internalized negative beliefs and stigma. Indeed, the average amount of coins sent by trustors not disclosing their sexual orientation (3.97) is even slightly higher than that of bisexual trustors (3.92), though still lower than that observed among trustors with another sexual orientation (4.07).

[Table 5](#) shows that, also for trustworthiness (i.e., the share returned of the amount received), the treatment effect is positive and significant ($p = 0.023$), a result already documented by [Stepanova et al. \(2024\)](#). Differences in trustworthiness by sexual orientation, on the other hand, remain statistically insignificant regardless of the treatment condition. This finding does not fully support our first two hypotheses, which suggest higher trustworthiness among sexual minorities. However, significant trusting behaviour combined with insignificant trustworthiness has been observed in some experimental economics and behavioural studies.

The absence of increased trustworthiness aligns with research indicating that reciprocity is less influenced by social cues and is more rigidly tied to strategic considerations or personal norms. Trustworthiness, therefore, appears to be less sensitive to social information than trust. While trustors may act altruistically based on perceived need, trustees' reciprocal behaviour is often driven by strategic concerns rather than empathy. Indeed, [Cox \(2004\)](#) finds that trustors send more when they perceive their counterpart as needy or deserving, supporting our result that knowledge of loneliness increases initial contributions. Conversely, trustees' reciprocation does not significantly change based on the trustors' behaviour or condition, likely because their decisions are influenced by incentives distinct from trust and reciprocity.

Similarly, [Ashraf et al. \(2006\)](#) examine whether trust is driven by altruism, expectations of reciprocity, or risk preferences, and whether trustworthiness is affected by received trust or other social preferences. Their findings indicate that trust is partially driven by beliefs about the counterpart's trustworthiness as well as by social preferences (i.e., a willingness to help the other player even when self-interest is not maximized). However, trustworthiness (reciprocity) does not significantly respond to variations in trust, meaning that even when trustors send more money, trustees do not systematically return more. Finally, [Ben-Ner et al. \(2004\)](#) suggest

Table 5
Trustworthiness behaviour by sexual orientation and treatment.

	Overall		Untreated		Treated	
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.169*** (0.023)	0.161*** (0.023)				
Lesbian/gay	−0.024 (0.116)	0.019 (0.090)	0.018 (0.149)	0.050 (0.123)	−0.064 (0.107)	−0.014 (0.090)
Bisexual	0.032 (0.051)	0.019 (0.047)	0.051 (0.080)	0.034 (0.073)	0.012 (0.041)	0.003 (0.044)
Other SO	0.054 (0.084)	0.055 (0.088)	0.054 (0.110)	0.082 (0.128)	0.054 (0.118)	0.036 (0.114)
Don't know	−0.038 (0.080)	−0.051 (0.074)	−0.084 (0.104)	−0.142 (0.091)	0.016 (0.128)	0.030 (0.120)
Prefer not say	0.068 (0.072)	0.052 (0.067)	0.095 (0.087)	0.060 (0.087)	0.046 (0.083)	0.040 (0.068)
Constant	−0.088** (0.029)	−0.143** (0.047)	−0.090** (0.029)	−0.049 (0.050)	0.083** (0.028)	−0.057 (0.059)
Control variables	No	Yes	No	Yes	No	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11 916	11 916	5958	5958	5958	5958
R-squared	0.007	0.058	0.000	0.060	0.000	0.058

Notes: The table reports coefficients from OLS regressions for the overall sample of trustees in columns (1)–(2), the subsample of untreated trustees in columns (3)–(4) and the subsample of treated trustees in columns (5)–(6). The dependent variable is the share returned by trustees (standardized) out of the amount they received. The reference category of sexual orientation are heterosexual people. Control variables includes: age, gender, education, household income quintiles, number of kids aged 0-5 and 6-15, rural versus urban, expectation about counterpart's behaviour and comprehension controls. The method of estimation is OLS. Robust standard errors clustered at the country of residence level are reported in parenthesis. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

that reciprocity does not increase linearly with the amount received but instead remains relatively stable, reinforcing the idea that reciprocity is not purely conditional on the trust received. Moreover, while trustors are sensitive to their counterpart's condition, trustees tend to act more independently, basing their reciprocity decisions on fixed internal fairness norms rather than external social signals.

The differing behaviour of LGB+ individuals when interacting with a counterpart experiencing loneliness may be linked to the strength of their perceived closeness. If trustors perceive themselves as emotionally, socially, or relationally close to the trustee, they may be more inclined to extend trust, anticipating reciprocity or a lower risk of dishonesty. Likewise, if trustees feel a strong connection to trustors, they may choose to return more coins as a demonstration of greater trustworthiness and unconditional kindness.

Following the trust game, players were asked to assess their perceived closeness to their counterpart using different representations of Venn diagrams (see Fig. 1). Table 6 presents regression results for trust and trustworthiness behaviour that include the closeness measure and its interaction with sexual orientation, as well as separate analyses for subsamples classified into three closeness categories: no connection (circles not touching), low connection (small overlapping region), and high connection (large overlapping region). Feeling closer to the counterpart is generally associated with higher levels of trust and trustworthiness. However, there are notable heterogeneities by sexual orientation. For trust behaviour, although the interaction terms are not statistically significant in the full-sample regression, significant differences by sexual orientation emerge when the sample is split by the different levels of closeness. The difference in trusting behaviour between bisexual and heterosexual individuals is particularly pronounced among those who report high perceived closeness to their counterpart ($p = 0.021$), whereas it is insignificant among those who report no or low perceived closeness. On the other hand, the difference in the amount trusted between individuals of other sexual orientations and heterosexual individuals is significant only among those reporting low perceived closeness to their counterpart ($p = 0.001$), and not among those reporting high or no closeness.²

For trustworthiness behaviour, in contrast to the overall findings, we observe that bisexual trustees return significantly more coins to lonely trustors than heterosexual trustees when they perceive a high level of closeness to their counterpart. This pattern is evident both in the regression including the interaction term with closeness and in the regression restricted to trustees reporting a high connection to their counterpart ($p = 0.047$). These findings suggest that the higher levels of trust and pro-sociality observed among bisexual individuals are, at least in part, associated with the degree of perceived closeness to their lonely counterpart.

4.2. Robustness of the main results

In this section, we examine whether the higher amounts of coins sent by LGB+ trustors to a lonely counterpart can be attributed to factors other than greater trust or pro-social behaviour among sexual minorities. First, given that LGB+ individuals are more

² Note that the differences by sexual orientation within each of the 7 categories of the closeness scale are mostly statistically insignificant, possibly due to the small sample size in each group (see Figure 2.1 in the Online Appendix).

Table 6

Trust and trustworthiness behaviour towards lonely counterpart, by degree of closeness.

	Trust behaviour				Trustworthiness behaviour			
	All	Connection			All	Connection		
	(1)	No (2)	Low (3)	High (4)	(5)	No (6)	Low (7)	High (8)
Lesbian/gay	−0.118 (0.189)	−0.264 (0.222)	−0.056 (0.088)	−0.047 (0.212)	0.231 (0.294)	0.349 (0.279)	−0.016 (0.092)	−0.180 (0.205)
Bisexual	−0.032 (0.147)	−0.089 (0.225)	0.114 (0.064)	0.346* (0.139)	−0.238* (0.105)	−0.050 (0.197)	−0.126 (0.078)	0.169* (0.081)
Other SO	0.100 (0.182)	−0.081 (0.235)	0.424*** (0.107)	0.146 (0.291)	0.096 (0.287)	0.339 (0.280)	0.030 (0.189)	−0.104 (0.238)
Prefer not say	0.016 (0.138)	0.073 (0.174)	0.040 (0.095)	0.377* (0.153)	0.219 (0.210)	0.170 (0.210)	−0.031 (0.113)	0.055 (0.141)
Closeness	0.058*** (0.007)				0.048*** (0.007)			
Lesbian/gay ×Close.	0.016 (0.058)				−0.062 (0.077)			
Bisexual ×Close.	0.047 (0.037)				0.056* (0.027)			
Other SO ×Close.	0.043 (0.057)				−0.017 (0.066)			
Prefer not say ×Close.	0.042 (0.034)				−0.045 (0.049)			
Constant	−0.151 (0.075)	0.118 (0.148)	0.023 (0.062)	0.198 (0.114)	−0.223** (0.064)	0.042 (0.198)	−0.010 (0.079)	−0.054 (0.083)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6057	945	3310	1802	5958	858	2791	2309
R-squared	0.103	0.167	0.084	0.095	0.067	0.105	0.068	0.080

Notes: The table reports coefficients from OLS regressions. The dependent variable is the amount sent by trustors (standardized) in columns (1)–(4) and the share returned by trustees (standardized) out of the amount they received in columns (5)–(8). The reference category of sexual orientation are heterosexual people. Control variables includes: age, gender, education, household income quintiles, number of kids aged 0–5 and 6–15, rural versus urban, expectation about counterpart's behaviour and comprehension controls. Robust standard errors clustered at the country of residence level are reported in parenthesis. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

likely to experience loneliness than heterosexual individuals (Berlingieri & Kovacic, 2025), it is essential to rule out the possibility that their increased trust toward a lonely counterpart is fully explained by their own loneliness status. From now on, for the sake of space and clarity, we do not report the coefficients for the “don't know” category, as it is never statistically significant and applies to only a limited number of respondents (134 for trust behaviour e 134 for trustworthiness). Nonetheless, all regression models continue to control for this response category.

Table 7 presents results on trust behaviour toward a lonely counterpart, stratified by the loneliness status of trustees. Columns (1) and (3) show insignificant coefficients for all sexual minority groups reporting high level of loneliness, as measured by both a direct question (having felt lonely most or all of the time in the past four weeks) and the UCLA loneliness scale (4–6 versus 0–3). Conversely, coefficients are statistically significant and relatively large in size for bisexual trustors with low levels of loneliness according to the UCLA measure (column (4)) and for trustors with other sexual orientations who report not feeling lonely in the direct question (column (2)). These findings suggest that the higher levels of trust exhibited by LGB+ individuals toward lonely counterparts compared to heterosexual individuals are not driven by their own loneliness status, nor can they be attributed to in-group bias — that is, differential behaviour arising from a perceived sense of belonging to the same group.

While the differing behaviour of LGB+ trustors is not driven by their own loneliness status, the results of the previous section suggest that it may be partially explained by their stronger perceived closeness to their counterpart. This could stem from a greater understanding of feelings of loneliness and the challenges associated with a disadvantaged condition. Lonely individuals are often subject to social stigma (Lau & Gruen, 1992), and their loneliness is frequently perceived as a condition that individuals can fully control and change (Barreto et al., 2022). Table 7 presents heterogeneous results based on whether respondents believe that loneliness is primarily due to factors and circumstances beyond an individual's control (no stigmatization) or whether they attribute some degree of personal responsibility to those experiencing loneliness (some stigmatization). Bisexual trustors and trustors with other sexual orientations behave differently from their heterosexual peers when they do not stigmatize loneliness, whereas differences are not statistically significant among those who attribute some level of stigma to lonely individuals. This finding provides some support for the notion that the distinct trust behaviour of LGB+ individuals is linked to a greater understanding of their counterpart's disadvantaged condition and a lower tendency to stigmatize loneliness.

Table 8 shows that the findings on trust behaviour toward a lonely counterpart remain robust after incorporating various controls. As emphasized by Sapienza et al. (2013) and Schechter (2007), among others, trust behaviour in the trust game is influenced by several additional factors, such as risk aversion and expectations regarding the trustee's trustworthiness. According to these authors, for any given level of expectations, a more altruistic or less risk-averse sender will transfer a larger amount (Sapienza et al., 2013).

Table 7

Trust behaviour versus lonely counterpart: heterogeneity by loneliness status and loneliness stigmatization.

	Loneliness (direct)		Loneliness (UCLA)		Stigmatization	
	High (1)	Low (2)	High (3)	Low (4)	None (5)	Some (6)
Lesbian/gay	−0.108 (0.214)	−0.051 (0.102)	−0.214 (0.106)	0.085 (0.134)	0.041 (0.124)	−0.196 (0.133)
Bisexual	0.197 (0.124)	0.137 (0.078)	0.005 (0.088)	0.318** (0.086)	0.225** (0.072)	0.080 (0.082)
Other SO	−0.322 (0.438)	0.286* (0.122)	0.031 (0.158)	0.373 (0.186)	0.357 (0.185)	0.121 (0.132)
Prefer not say	0.151 (0.316)	0.184** (0.063)	0.190 (0.125)	0.198* (0.082)	0.171 (0.105)	0.127 (0.105)
Constant	−0.145 (0.169)	0.023 (0.070)	0.279** (0.098)	−0.136 (0.083)	−0.068 (0.086)	0.164 (0.081)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	772	5285	2371	3561	2323	3501
R-squared	0.090	0.098	0.086	0.106	0.115	0.091

Notes: The table reports coefficients from OLS regressions with the amount sent by trustors (standardized) as dependent variable. The reference category of sexual orientation are heterosexual people. Control variables includes: age, gender, education, household income quintiles, number of kids aged 0-5 and 6-15, rural versus urban, expectation about counterpart's behaviour and comprehension controls. Robust standard errors clustered at the country of residence level are reported in parenthesis. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 8

Trust behaviour of LGB+ individuals versus lonely counterpart, different controls.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lesbian/gay	−0.090 (0.114)	−0.065 (0.109)	−0.044 (0.104)	−0.046 (0.102)	−0.044 (0.102)	−0.049 (0.106)	−0.044 (0.103)	−0.048 (0.101)
Bisexual	0.165* (0.062)	0.139* (0.061)	0.146* (0.065)	0.142* (0.065)	0.144* (0.066)	0.143* (0.064)	0.146* (0.065)	0.134 (0.066)
Other SO	0.266* (0.114)	0.221* (0.106)	0.226* (0.103)	0.227* (0.102)	0.222* (0.103)	0.216 (0.108)	0.245* (0.104)	0.215 (0.108)
Prefer not say	0.198* (0.079)	0.177* (0.080)	0.176* (0.071)	0.177* (0.072)	0.172* (0.075)	0.188* (0.074)	0.195** (0.070)	0.175* (0.074)
Constant	0.039 (0.029)	0.015 (0.073)	0.032 (0.073)	0.012 (0.075)	0.056 (0.097)	−0.005 (0.097)	0.049 (0.072)	0.012 (0.076)
Control variables	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Expectations	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Loneliness	No	No	No	Yes	No	No	No	No
Risk aversion	No	No	No	No	Yes	No	No	No
Impatience	No	No	No	No	No	Yes	No	No
Social network	No	No	No	No	No	No	Yes	No
Childhood exp.	No	No	No	No	No	No	No	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6057	6057	6057	6057	6057	6057	6057	6057
R-squared	0.003	0.034	0.088	0.089	0.092	0.091	0.090	0.091

Notes: The table reports coefficients from OLS regressions with the amount sent by trustors (standardized) as dependent variable. The reference category of sexual orientation are heterosexual people. Control variables includes: age, gender, education, household income quintiles, number of kids aged 0-5 and 6-15, rural versus urban, country fixed effects, expectation about counterpart's behaviour and comprehension controls. Robust standard errors clustered at the country of residence level are reported in parenthesis. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Column (3) reports our baseline model, where the expected amount returned by the trustee is included among the control variables. However, the coefficients for sexual orientation remain largely stable even when expectations are excluded, suggesting no differential behaviour (see column (2)). The results also hold when accounting for the trustor's own loneliness status (column (4)), consistent with prior findings. Furthermore, trustor behaviour does not appear to be driven by individual-specific traits, such as domain-specific risk preferences (i.e., adventure, financial, and health risk-taking; column (5)) or patience (column (6)).

Furthermore, in columns (7) and (8), we account for two additional factors that may influence trust: the characteristics of individuals' social networks (Helliwell & Putnam, 2004; van der Horst & Coffé, 2012) and exposure to adverse conditions during childhood, such as emotional neglect, social isolation, or environmental instability (Reiter et al., 2023). The number of close friends and family members, as well as the frequency of contact with them, does not affect the results, despite the fact that sexual minorities are more likely to report having fewer close family members and/or friends and less frequent interactions (Berlingieri & Kovacic, 2025). In contrast, adverse childhood experiences, including a low quality relationship with parents or not always having a group of friends during most of the school years, decrease the coefficients of average amounts sent by sexual minorities, which become not

Table 9

Trust behaviour of LGB+ individuals by rights protection in country.

	Low protection				High protection			
	Treated		Untreated		Treated		Untreated	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lesbian/gay	0.031 (0.095)	0.024 (0.091)	0.041 (0.154)	0.049 (0.147)	−0.075 (0.133)	−0.087 (0.130)	−0.134 (0.087)	−0.139 (0.089)
Bisexual	0.256** (0.078)	0.261** (0.080)	0.133 (0.083)	0.139 (0.083)	0.043 (0.094)	0.040 (0.094)	0.002 (0.069)	0.006 (0.070)
Other SO	0.209 (0.135)	0.213 (0.146)	0.137 (0.187)	0.155 (0.179)	0.248 (0.178)	0.253 (0.164)	0.204 (0.120)	0.218 (0.132)
Prefer not say	0.150 (0.097)	0.151 (0.091)	−0.097 (0.062)	−0.061 (0.059)	0.223* (0.096)	0.230* (0.103)	0.158 (0.160)	0.170 (0.152)
Constant	−0.004 (0.093)	−0.013 (0.118)	0.202* (0.084)	0.211 (0.102)	0.025 (0.126)	−0.044 (0.128)	−0.131 (0.089)	−0.085 (0.110)
Response time	No	Yes	No	Yes	No	Yes	No	Yes
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3215	3215	3168	3168	2842	2842	2849	2849
R-squared	0.104	0.108	0.101	0.104	0.082	0.088	0.080	0.083

Notes: The table reports coefficients from OLS regressions with the amount sent by trustors (standardized) as dependent variable. The reference category of sexual orientation are heterosexual people. Control variables includes: age, gender, education, household income quintiles, number of kids aged 0-5 and 6-15, rural versus urban, expectation about counterpart's behaviour and comprehension controls. Response time refers to decile categories of the response time to the sexual orientation question. Robust standard errors clustered at the country of residence level are reported in parenthesis. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

statistically significant for both bisexual individuals ($p = 0.054$) and individuals with another sexual orientation ($p = 0.057$). This may reflect the disproportionate impact of low-quality early relationships with parents or friends on trust among sexual minorities, or it may result from greater susceptibility to colouring or recall bias in this group.

Finally, we estimated the main results using linear models, disregarding the fact that the dependent variables are fractions of fixed endowments and therefore bounded (participants could not send very large or negative amounts). To account for this, we show that the results for both trust and trustworthiness are robust when using tobit or fractional logit regressions instead of OLS models (see Table 2.2 in the Online Appendix).

4.3. Heterogeneity analysis

In this section, we examine whether the results vary by specific contextual factors, including the degree of protection of LGBTIQ+ rights in individuals' country of residence and the strength of societal social norms. Understanding these differential impacts is crucial for assessing the extent to which the social context in which individuals live, as well as the actual or perceived discrimination they face, may influence differences in trust and pro-social behaviour among sexual minorities.

Table 9 divides the sample based on the Rainbow Index, which measures equality and non-discrimination laws, legal gender recognition, bodily integrity, protection from hatred and violence, and family rights of sexual and gender minorities in individuals' country of residence (ILGA-Europe, 2022). We classify countries into two groups: those with low enforcement of LGBTIQ+ rights (Rainbow Index scores below the median of 50) and those with high enforcement (Rainbow Index scores above the median). The results reveal a clear heterogeneous effect on the likelihood of increased trust. In particular, bisexual individuals send significantly more to lonely trustees compared to heterosexual individuals in societies where the rights of sexual and gender minorities are less enforced ($p = 0.006$, column (1)). This finding supports Hypothesis 3, which predicts that the pro-social behaviour of sexual minorities is more pronounced in societies with weaker protections for sexual minority rights.

A word of caution is needed when interpreting these results, since individuals' reporting of sexual orientation may be influenced by the level of protection of LGBTIQ+ rights. Indeed, the share of respondents who prefer not to answer this question is higher in countries where the rights of sexual and gender minorities are less strongly enforced (see Table 2.3 in the Online Appendix). Reassuringly, the coefficient for bisexual orientation remains very similar when the regression includes indicators for the decile of the response time to the sexual-orientation question (see Table 9, column (2)). This variable is likely to capture individuals' openness regarding their sexual orientation (Berlingieri & Kovacic, 2025), and the relationship between the Rainbow Index and the probability of refusing to answer the sexual-orientation question becomes statistically insignificant once it is controlled for (see Table 2.3 in the Online Appendix).

Finally, in Table 10, we examine whether trust behaviours vary based on another contextual factor: the degree of restraint in individuals' cultures of origin, as defined by Hofstede et al. (2010). Restraint societies are characterized by strict social norms and prohibitions that limit individual freedom of choice, where the prevailing belief is that everyone should conform to established rules and norms governing socially acceptable behaviour. This cultural dimension, also referred to as "life-control", captures the extent to which individuals perceive themselves as having full autonomy over their lives (Hofstede et al., 2010; Minkov, 2009). As shown by Berlingieri and Kovacic (2025), individuals from more restrained societies are, on average, less likely to openly declare their sexual

Table 10

Trust behaviour of LGB+ individuals by degree of restraint (proxy for the strength of social norms) in country.

	High restraint				Low restraint			
	Treated		Untreated		Treated		Untreated	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lesbian/gay	−0.042 (0.111)	−0.053 (0.111)	0.106 (0.146)	0.104 (0.134)	−0.042 (0.123)	−0.052 (0.124)	−0.135 (0.105)	−0.136 (0.106)
Bisexual	0.271** (0.084)	0.283** (0.081)	0.127 (0.094)	0.127 (0.090)	0.063 (0.085)	0.061 (0.083)	0.011 (0.074)	0.016 (0.074)
Other SO	0.107 (0.134)	0.121 (0.144)	0.199 (0.247)	0.215 (0.240)	0.366* (0.168)	0.362* (0.159)	0.129 (0.099)	0.135 (0.115)
Prefer not say	0.165 (0.104)	0.162 (0.098)	−0.129 (0.072)	−0.102 (0.074)	0.187 (0.093)	0.212* (0.095)	0.135 (0.128)	0.158 (0.118)
Constant	0.307** (0.091)	0.235 (0.125)	0.269* (0.107)	0.294* (0.096)	0.053 (0.117)	0.010 (0.120)	0.172 (0.096)	0.204 (0.119)
Response time	No	Yes	No	Yes	No	Yes	No	Yes
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2844	2844	2817	2817	3213	3213	3200	3200
R-squared	0.114	0.120	0.098	0.100	0.077	0.084	0.087	0.091

Notes: The table reports coefficients from OLS regressions with the amount sent by trustors (standardized) as dependent variable. The reference category of sexual orientation are heterosexual people. Control variables includes: age, gender, education, household income quintiles, number of kids aged 0-5 and 6-15, rural versus urban, expectation about counterpart's behaviour and comprehension controls. Response time refers to decile categories of the response time to the sexual orientation question. Robust standard errors clustered at the country of residence level are reported in parenthesis. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

orientation, as these cultures tend to be more resistant to homosexuality (Adamczyk, 2017; Janssen & Scheepers, 2019; Whitley, 2001).

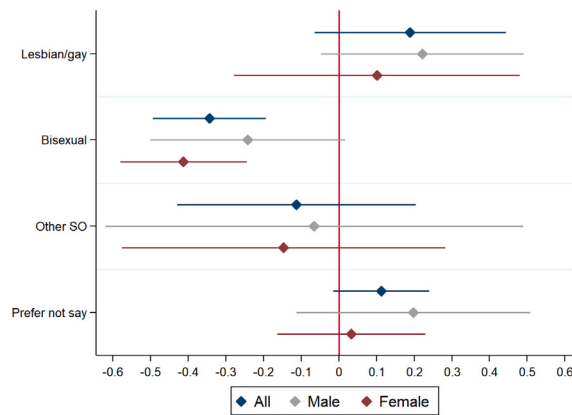
As expected, bisexual trustors facing stronger societal restrictions and discrimination (high restraint) exhibit significantly greater pro-social behaviour toward a lonely counterpart relative to heterosexual trustors ($p = 0.008$, column (1)), whereas this pattern does not hold for trustors from less conservative countries ($p = 0.470$, column (5)). Although the degree of restraint in a country may also affect individuals' likelihood of questioning or disclosing their sexual orientation, the results remain robust to the inclusion of response-time controls, which are likely to capture such differential reporting. This finding complements the evidence from Table 9, which suggests that lower levels of protection and higher discrimination may act as a driving force for pro-social behaviour, particularly toward disadvantaged individuals, such as those experiencing loneliness.

4.4. Self-reported trust and prosocial attitudes of sexual minorities

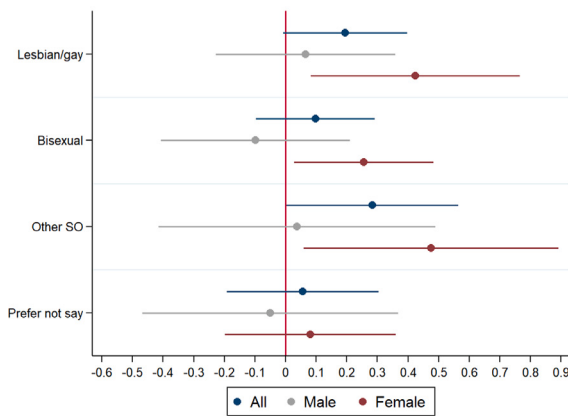
Besides eliciting trust behaviour through the game, the survey also includes a question on self-reported generalized trust. Unlike trust elicited in the experiment, generalized trust captures a broader attitudinal belief about whether people are generally trustworthy. Whereas the former reflects an incentivized behavioural decision under uncertainty, shaped not only by individuals' general beliefs about others' trustworthiness but also by their risk preferences and expectations of reciprocity, the self-reported measure reflects wider social attitudes, is more susceptible to social desirability bias, and is less sensitive to the incentives and interpersonal dynamics embedded in the game.

Despite notable conceptual differences, the two measures of trust are positively correlated, although the correlation is not particularly strong. When self-assessed trust is added to the baseline regression, its coefficient is positive and significant ($p = 0.026$), yet the coefficients on sexual orientation remain unaffected (see Table 2.4 in the Online Appendix). Moreover, differences in self-reported trust across sexual-orientation groups do not mirror the patterns observed in the trust game. The estimates reported in Fig. 3 suggest that bisexual individuals, in particular women, exhibit significantly lower levels of trust compared to their heterosexual counterparts. Lesbian women and gay men, on the other hand, have, on average, higher levels of trust but these differences are not statistically different from zero. This finding aligns with Pew Research on the LGBT community in the United States (Pew, 2013), as well as the work of Wilkes and Wu (2018) and Platt and Scheitle (2019), who argue that individuals from marginalized backgrounds, including sexual minorities, tend to report lower levels of generalized trust due to experiences of discrimination, social exclusion, or economic disadvantage.

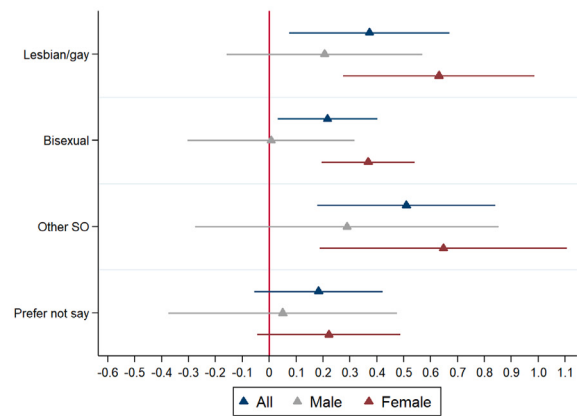
The fact that bisexual individuals show lower generalized trust yet display higher interpersonal trust in experimental settings, particularly when their counterparts appear disadvantaged or potentially marginalized, provides further evidence that interpersonal trust may be strongly context-dependent and that the two measures of trust capture different aspects of individuals' behaviour. In other words, marginalized or potentially discriminated individuals become more trusting when they recognize that the person they are interacting with is suffering from some form of disadvantage (in this specific case, loneliness), which may make them more vulnerable and marginalized. This effect may stem from compassion or a deeper understanding of the counterpart's situation, in contrast to interactions with individuals who are not disadvantaged, where the counterpart's condition does not represent a meaningful gradient.



(a) Generalised trust



(b) Donations



(c) Volunteering

Fig. 3. Self-reported trust and willingness to donate and volunteer, by sexual orientation.

Notes: The figure reports coefficients for sexual orientation categories with heterosexual as a reference group from OLS regressions estimated on the overall sample, as well as on the subsamples of males and females. Dependent variables are self-reported trust measured on a scale ranging between 1 (low trust) and 10 (high trust); willing to give to good causes and volunteer, both measured on a scale ranging between 1 (not at all) and 10 (perfectly). Control variables include: age, education, employment status, relationship status, household income quintiles, number of kids aged 0-5 and 6-15, rural versus urban, and country fixed effects. Robust standard errors are clustered at the country of residence level. The lines show 95% confidence intervals. Number of observations: 23,990.

At the same time, sexual minorities are generally more willing to engage in concrete pro-social behaviours, such as donating and volunteering, than heterosexual individuals. Indeed, panels (b) and (c) of Fig. 3 show that non-heterosexual women exhibit stronger social attitudes toward others in both donation and volunteering activities. This finding, along with the observation that certain sexual minority groups display significantly more generous behaviour in the trust game compared to their heterosexual peers, provides an interesting insight into potential differences in trust and pro-social tendencies across population subgroups based on sexual orientation.

5. Discussion and conclusions

Our findings provide compelling evidence of relationship-specific prosocial behaviour among sexual minorities. The study demonstrates that bisexual individuals and those identifying with a sexual orientation other than heterosexual, lesbian, or gay exhibit greater trust towards a lonely counterpart compared to heterosexual individuals, though not toward an unknown counterpart. This result aligns with theories suggesting that marginalized groups may show increased prosocial behaviour toward other disadvantaged individuals.

An interesting finding is that the observed difference is more pronounced in countries with lower levels of LGBTIQ+ rights protection and stricter social norms, which suggests that social context may play a critical role in shaping the prosocial behaviours

of sexual minorities. In societies where sexual minorities face greater exclusion and discrimination, their inclination to trust other vulnerable individuals appears to be amplified. This may be driven by a sense of solidarity with other marginalized individuals or a broader awareness of social disadvantage and stigma.

Interestingly, while bisexual and other non-heterosexual individuals exhibit higher levels of trust towards lonely counterparts, the study does not find statistically significant differences in overall trustworthiness behaviour across sexual orientations. This may suggest that while sexual minorities may be more willing to extend trust to others in certain contexts, their willingness to reciprocate trust remains comparable to heterosexual individuals. The lack of increased trustworthiness highlights that increased trust in one domain does not necessarily translate to greater overall pro-sociality in all interpersonal interactions. However, the results offer some evidence that bisexual trustees return significantly more coins to lonely trustors than heterosexual trustees when they feel a strong connection to their counterpart, which suggests that the higher levels of trust and pro-sociality observed among bisexual individuals are, at least in part, associated with the degree of perceived closeness to their lonely counterpart.

The study also provides insight into the mechanisms underlying this behaviour. The results indicate that the higher trusting behaviour of sexual minorities towards lonely individuals is not driven by expectations of return, differences in risk preferences, or their own loneliness status. Instead, it is linked to relational closeness and the stigmatization of loneliness. The difference is particularly pronounced among individuals who perceive a strong connection to their counterpart and among those who do not stigmatize loneliness, reinforcing the notion that empathy and perceived shared experience play a crucial role in these trust dynamics.

While the findings contribute significantly to our understanding of trust behaviour among sexual minorities, several open questions remain. One limitation is that the study focuses on trust within a specific experimental context, which may not fully capture the complexities of trust and pro-sociality in real-world social interactions. Future research could explore how these behaviours manifest in everyday economic, social, and political settings. Moreover, future research could assess whether these prosocial behaviours change as social acceptance and legal protections for LGBTIQ+ individuals improve globally. Finally, further investigation is needed to determine the underlying psychological and social mechanisms that drive the observed behaviours. Experimental designs that incorporate qualitative measures of perceived discrimination, social identity, and in-group/out-group dynamics could help clarify why certain subgroups within the LGBTIQ+ community display heightened trust in specific contexts.

Overall, this study sheds light on the complex interplay between sexual orientation, social context, and trust behaviour. It provides robust evidence that sexual minorities, particularly bisexual individuals and those with other non-heterosexual orientations, exhibit greater prosocial behaviour towards lonely individuals. However, this behaviour may be context-dependent and driven by perceived relational closeness and a shared experience of social vulnerability.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this work, ChatGPT was used only for limited grammar and language editing in selected parts of the manuscript. The authors reviewed and approved all revisions and take full responsibility for the content of the manuscript.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.joep.2026.102926>.

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