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2025 EEA Congress

Measuring the Sources of Taste-Based Discrimination Using List Experiments

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August 27th, 2025

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Motivation

- Large share of studies focus on testing whether there is any **evidence of discrimination** in the labor market for women and protected minorities
  - A much smaller number of studies try to disentangle the **different drivers of discrimination**
    - An even more limited set of studies attempts to uncover the potential **source of taste-based discrimination**
      - Does discrimination stem from **employers', co-workers', or customers' preferences** not to interact with members of a certain group?

Research questions

- What is the **level of comfort** with sexual minority individuals in the workplace among supervisors, co-workers, and customers?
- Is there evidence of **misreporting** in these self-reported attitudes?
- Do individuals **underestimate** the broader societal support for sexual minority individuals?
- Finally, do these stated attitudes influence **real-world behaviours**?

This study

- **Double list experiments** focused on identifying the sources of taste-based discrimination against sexual minority individuals in the workplace
  - Level of comport supervising gay employee
    - Gay co-worker
    - Gay cashier
  - Country: Chile
    - Limited literature outside high-income countries
  - Very large dataset

Discrimination and policy

- Understanding drivers of discrimination has important policy implications
  - **Statistical discrimination** based on incorrect beliefs: informational campaigns to correct such beliefs
  - Taste-based discrimination due to **employers' preferences**: properly enforced anti-discrimination laws
    - Such laws are less likely to reduce taste-based discrimination due to **customers' preferences**

LGBTQ+ literature

- Rise in the share of individuals identifying as LGBTQ+: **10%** of individuals identify as LGBTQ+ in Chile, close to the global average of 9% (Jackson 2023)
- Substantial literature analyzing discrimination based on gender, age, race, and disability. The number of studies focusing on LGBTQ+ discrimination is **smaller** – although rapidly raising (Badgett et al. 2024)
  - Very limited literature **outside high-income countries**
    - <u>If you are not counted, you don't count</u>
- Most of the previous studies have found **large disparities in the labor market** affecting sexual and gender minority individuals (Badgett et al. 2024)

Social desirability bias

- Perception that expressing a certain opinion or reporting a certain behaviour could result in **negative reprisals**
- Desire of respondents to **avoid embarrassment** and **project a favourable image** to others (or themselves)

- Various methods have been proposed to deal with this bias
  - We focus on list experiments

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List experiments: Methodology

List experiment: control

- Show respondents a list
- Ask respondents to report the number of statements in a survey that apply to them (or that they agree with, etc.)
- Short list (**control group**): 4 base items

Gay cashier

- Q: How many of the following statements are true for you?
- **Short list**:
  - I know someone who owns a car or a motorcycle
  - I have a lot of confidence in political parties
  - I think the military should work with the police to fight crime
  - I believe that half of the legislators in Congress should be women

List experiment: treatment

- Show respondents a list
- Ask respondents to report the number of statements in a survey that apply to them (or that they agree with, etc.)
- Short list (**control group**): 4 base items
- Long list (**treatment group**): Short list + key item

Gay cashier /2

- Q: How many of the following statements are true for you?
- **Short list**:
  - I know someone who owns a car or a motorcycle
  - I have a lot of confidence in political parties
  - I think the military should work with the police to fight crime
  - I believe that half of the legislators in Congress should be women
- Additional item for **long list**:
  - I would feel comfortable having a cashier at the supermarket who is gay

- Order of the items randomized

List experiment: comparison

- Ask respondents to report the number of statements in a survey that apply to them (or that they agree with, etc.)
- Short list (**control group**): 4 base items
- Long list (**treatment group**): Short list + key item

- The **difference in means between the treatment and control group** is the estimated share of the population with the sensitive attribute
- Veiled treatment: more **privacy** (but more noise)

Gay cashier /2

- Q: How many of the following statements are true for you?
- **Short list**:
  - I own a car or a motorcycle.
  - I have a lot of confidence in political parties.
  - I think the military should work with the police to fight crime.
  - I believe that half of the legislators in Congress should be women.

  $\bar{x}_{A,S}$
- **Long list**:
  - 4 statements as in short list
  - I would feel comfortable having a cashier at the supermarket who is gay.

  $\bar{x}_{A,L}$

- $\bar{x}_A = (\bar{x}_{A,L} - \bar{x}_{A,S})$ estimated proportion of the population who would be comfortable having a gay cashier

List experiment vs direct q

- Ask **direct sensitive question** near the end of the survey (after list experiment and demographic information)
  - Provide **baseline estimate** of share of population with the sensitive attribute
  - Compare with list experiment to estimate size of **social desirability bias**

Gay cashier /3

- Q: How many of the following statements are true for you?
- **Short list**:
  - I know someone who owns a car or a motorcycle
  - I have a lot of confidence in political parties
  - I think the military should work with the police to fight crime
  - I believe that half of the legislators in Congress should be women
- Additional item for **long list**:
  - I would feel comfortable having a cashier at the supermarket who is gay
- **Direct question** (end of survey)
  - Would you be comfortable having a cashier at the supermarket who is gay? (Yes/No)

Gay employees – List A

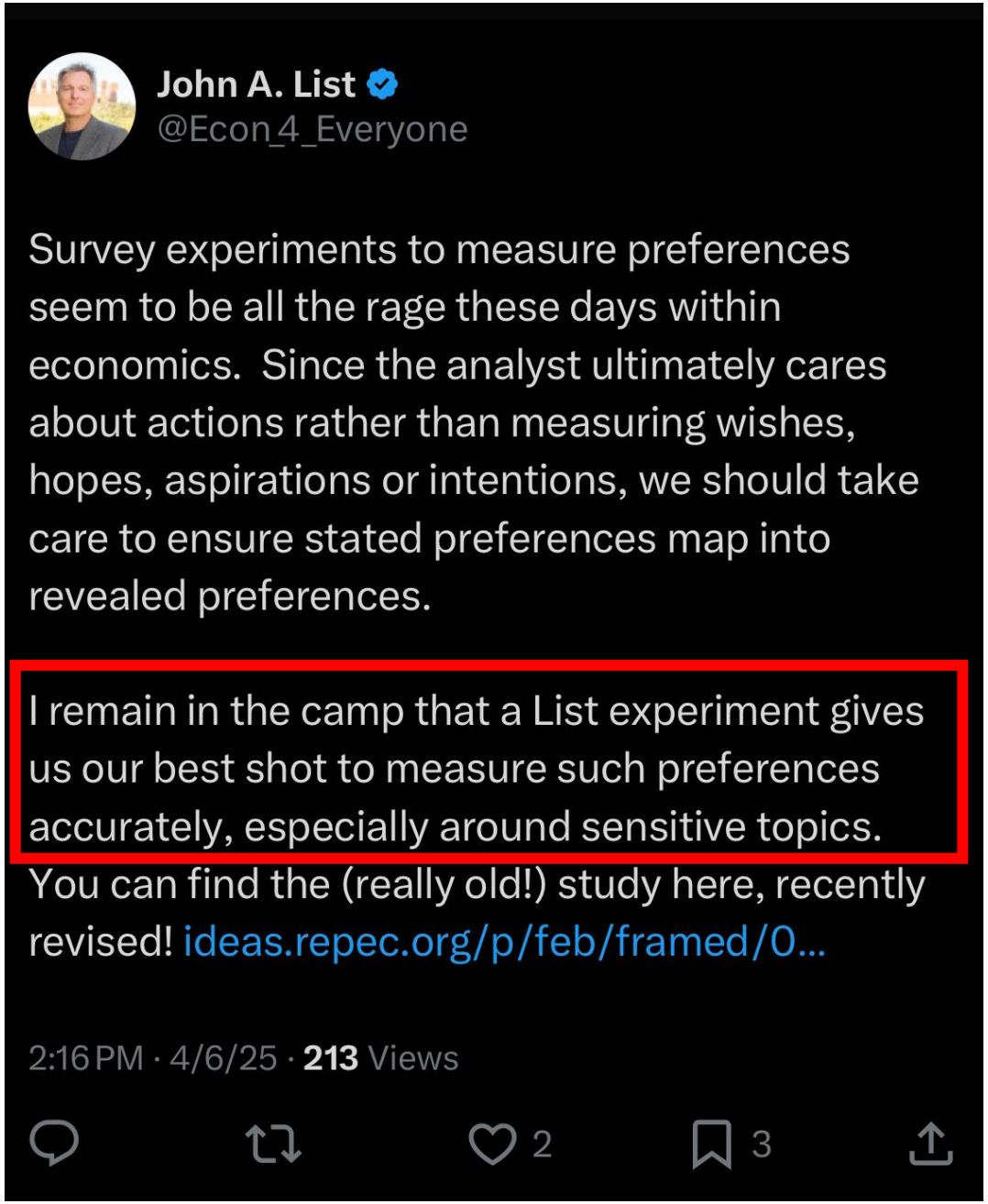
- Q: How many of the following statements are true for you?
- **Short list**:
  - I own a cell phone
  - I can fluently speak at least three languages
  - I believe that women should be responsible for the care of their children
  - I think it would be wrong to apply the death penalty, regardless of the crime
- Additional item for **long list**:
  - I would feel comfortable supervising a gay employee
- **Direct question** (end of survey)
  - Would you feel comfortable supervising a gay employee? (Yes/No)

Gay co-worker – List A

- Q: How many of the following statements are true for you?
- **Short list**:
  - I own a computer
  - I have met Don Francisco personally
  - I agree with the ban on abortions
  - I agree with Chile accepting more refugees from other countries
- Additional item for **long list**:
  - I would feel comfortable having to work closely with a gay co-worker
- **Direct question** (end of survey)
  - Would you feel comfortable having to work closely with a gay co-worker? (Yes/No)

Economists are using it

- List experiments have been used extensively in other social sciences such as **sociology** and political science (Lax et al. 2016; Gervais and Najle 2018; Streb et al. 2008; Blair et al. 2020; Li and Van den Noortgate 2022)
- Less common in **economics** (Coffman et al. 2017; Aksoy et al. 2024; Jamison et al. 2013; Chuang et al. 2021; Boring and Delfgaauw 2024; McKenzie and Siegel 2013; Agüero and Frisancho 2022)
  - Latin America (de Jonge 2015; Ham et al. 2024; Gutiérrez and Rubli 2024)



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List experiments: Data and results

Data collection

- **Expert review** of experimental design (June-July 2024)
- **Pre-Analysis Plan** uploaded in July 2024
- **Ethical approval** in July 2024
- Questionnaire coded in Qualtrics (mobile-friendly)
- **Prolific** pilot (535 respondents from Chile)
- Local survey company (**DATAVOZ**)
  - 10 **cognitive interviews** (August 2024)
  - **Pilot**: N=235
  - **Soft launch**: N=62

Data collection /2

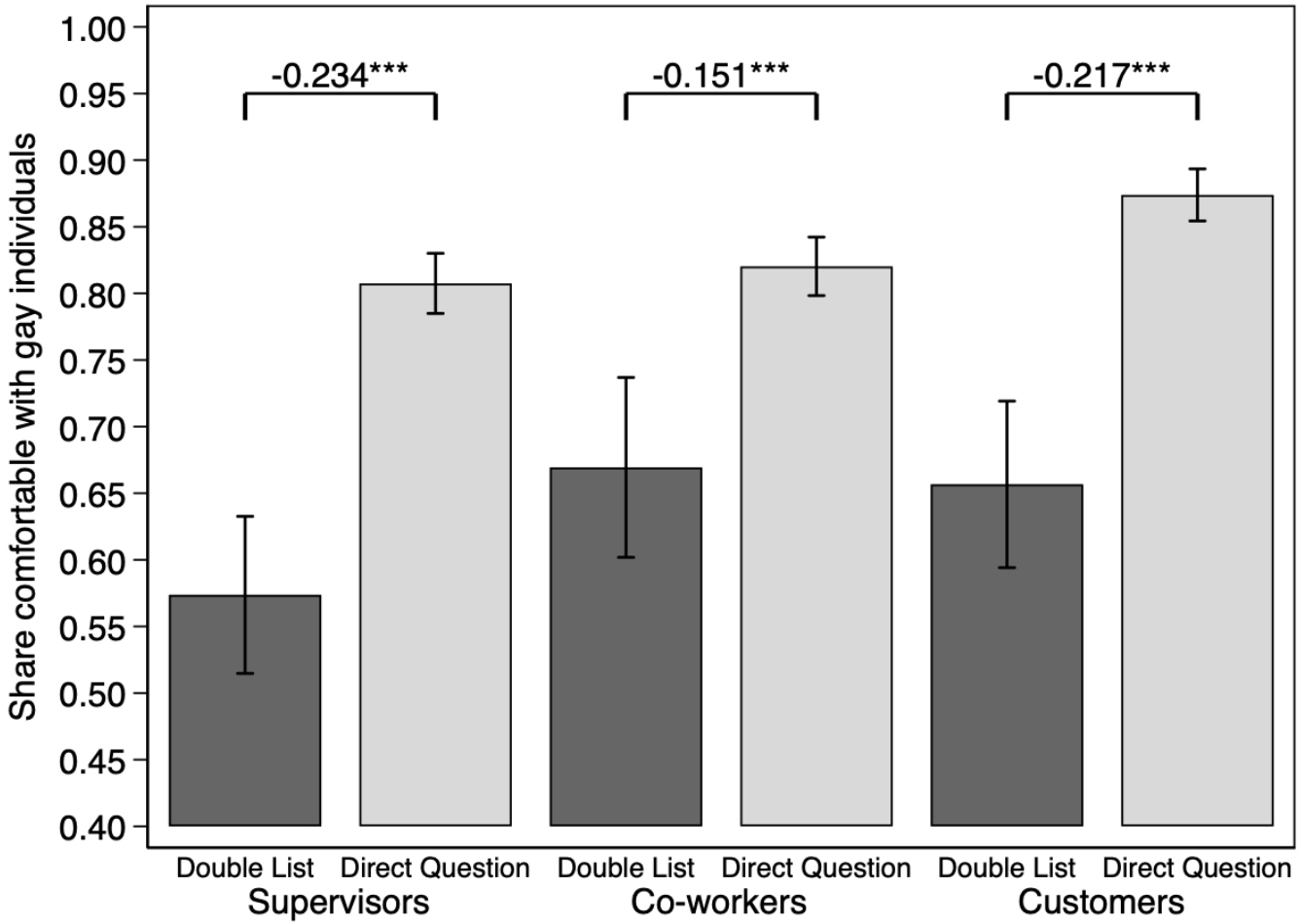
- Main data: **N=4,000** (October-December 2024)
- **Quota** based on sex, region, and age
- **Weights** by sex, age, education, and geographical location
- Median time to complete: 14 minutes
- 50 gift cards ($50 each) raffled among respondents
- Final sample size **much larger** than in most previous studies (Li et al. 2022)
  - Almost all previous list experiments had fewer than 1,000 respondents (Blair et al. 2020)
    - Likely to have been key factor in some studies not having **enough power** to detect differences in prevalence rates or social desirability bias, especially across subgroups

Sample representativeness

- Weighted data representative of Chilean population in terms of **sex, age, education, and geographical location** (by construction)

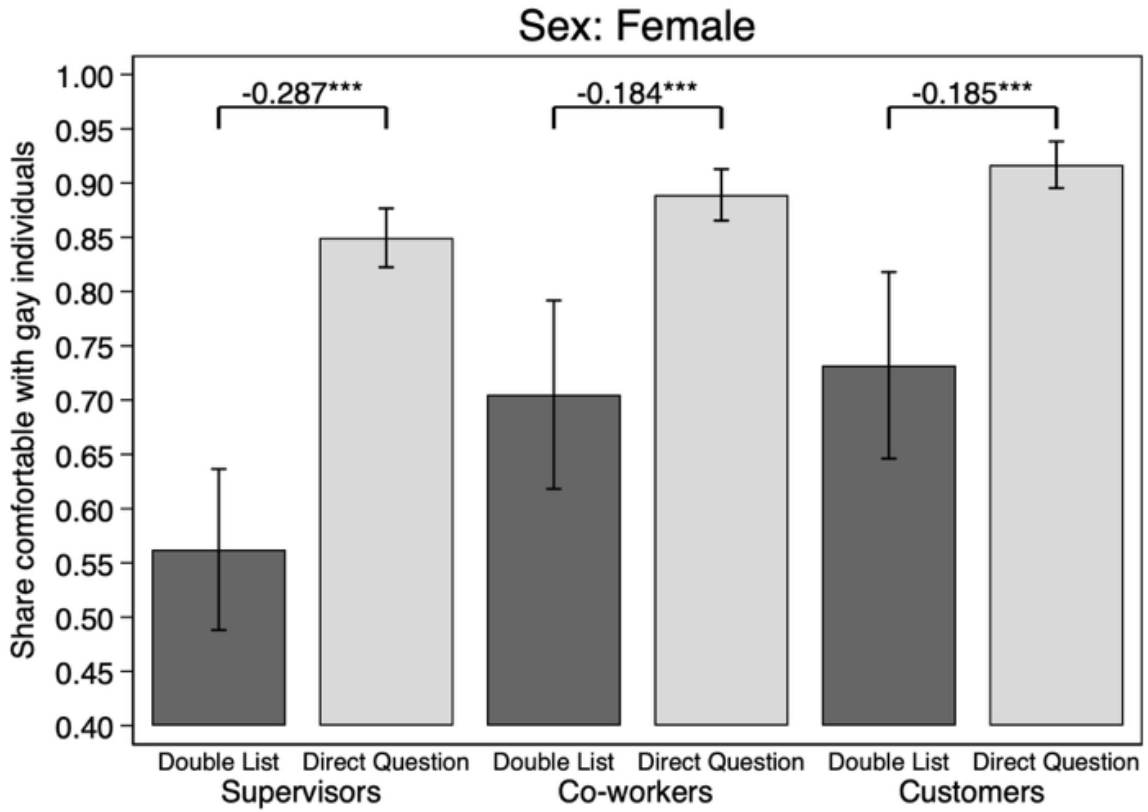
- 32% of our respondents report **no religious affiliation**, compared to 29% of respondents from 2023 Latinobarometro from Chile
- 55% of our respondents ”lean left” on a right-left **political scale**, compared to 47% of respondents from the 2018 World Value Survey from Chile
- 10% of our sample report **indigenous descent**, compared to 13% of respondents from the 2017 Chilean Census
- Weighted average **income** CLP [1,200,001-1,450,000] and median [975,000-1,2000,000], compared to average CLP 1,304,771 in 2022 CASEN

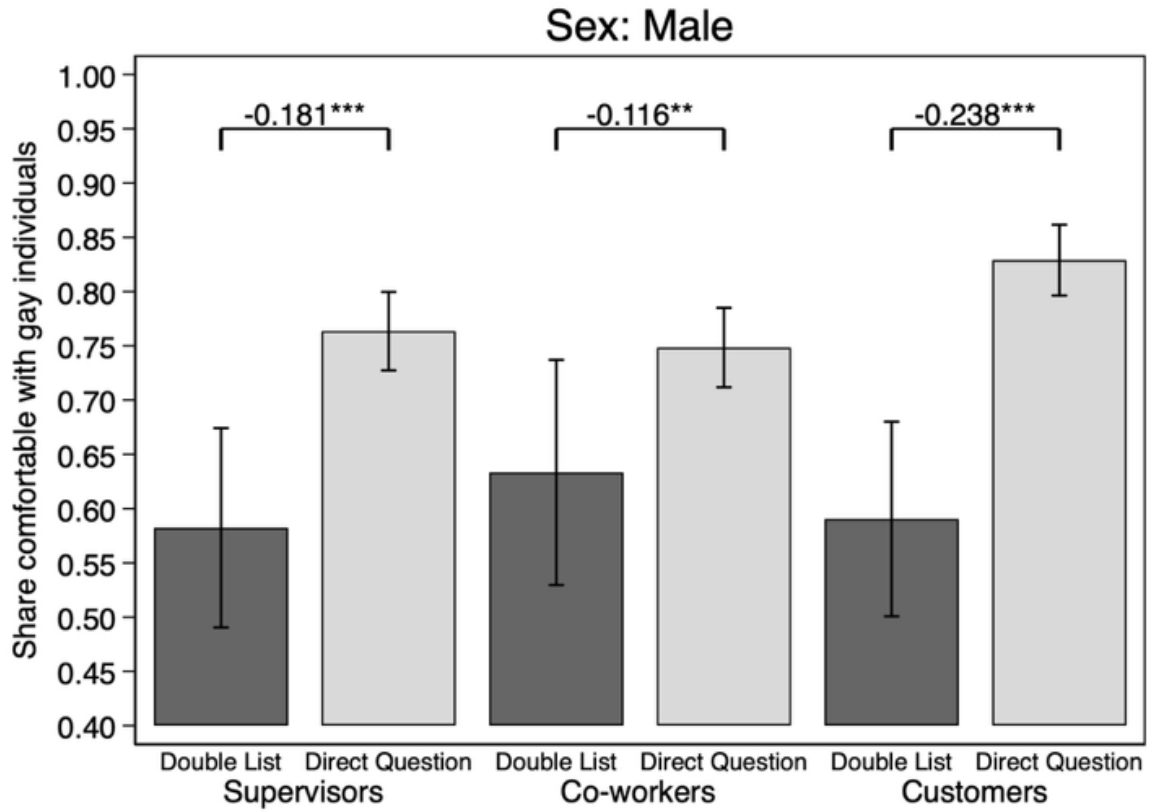
List experiments



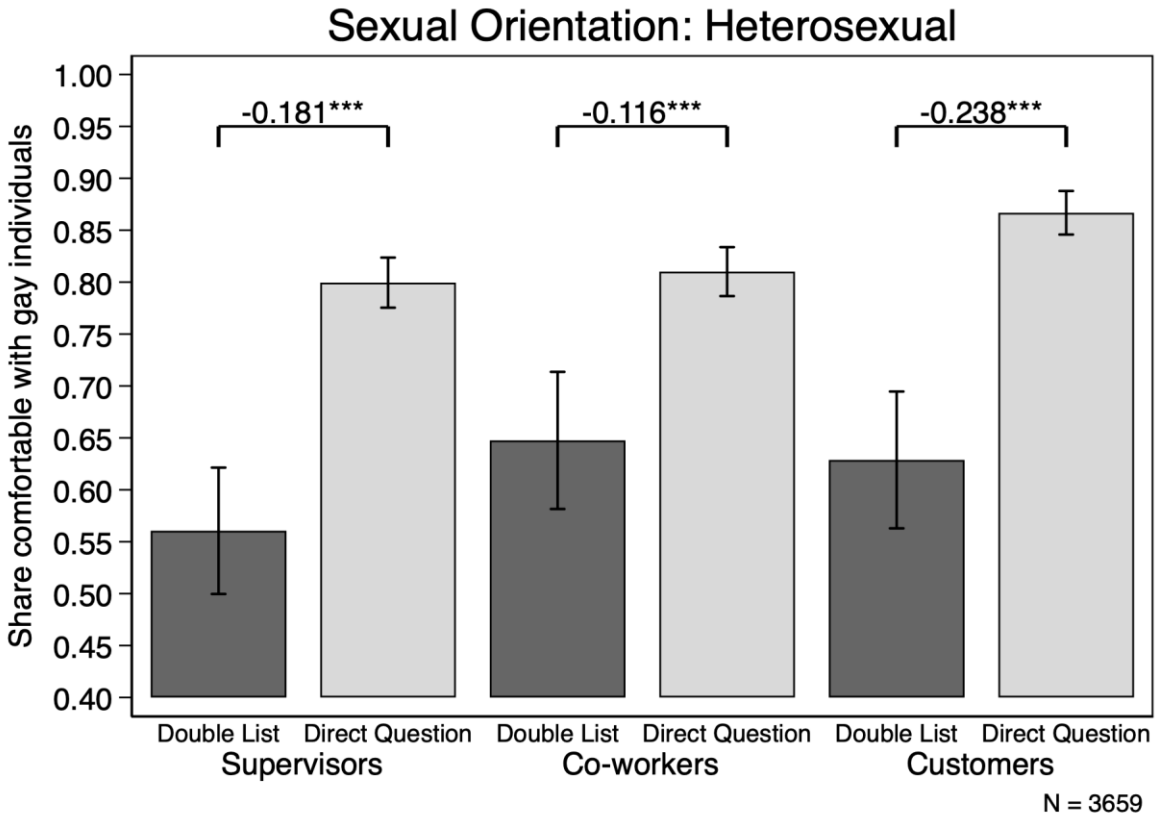
- Discomfort with gay individuals from supervisors, co-workers, and customers substantially **underreported** by 15-23 p.p.
- **Majority** of respondents still comfortable even after accounting for social desirability bias

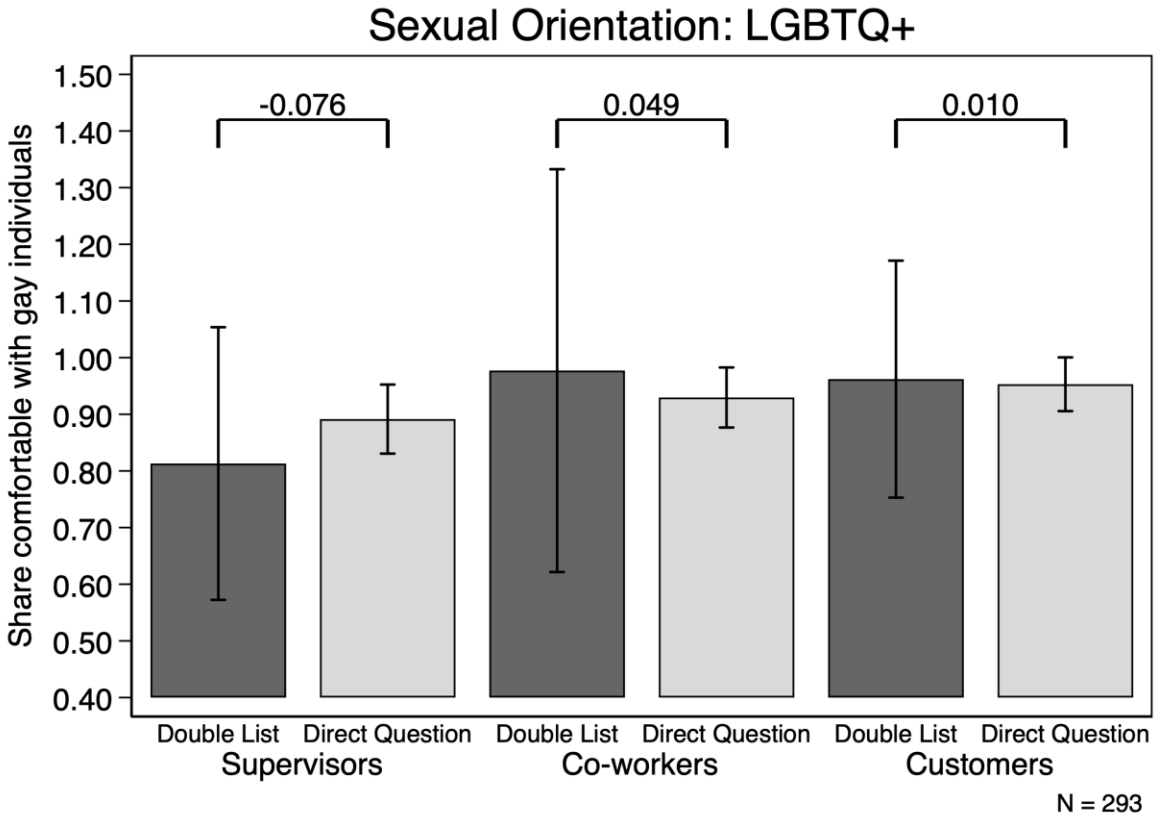
Heterogeneity by sex



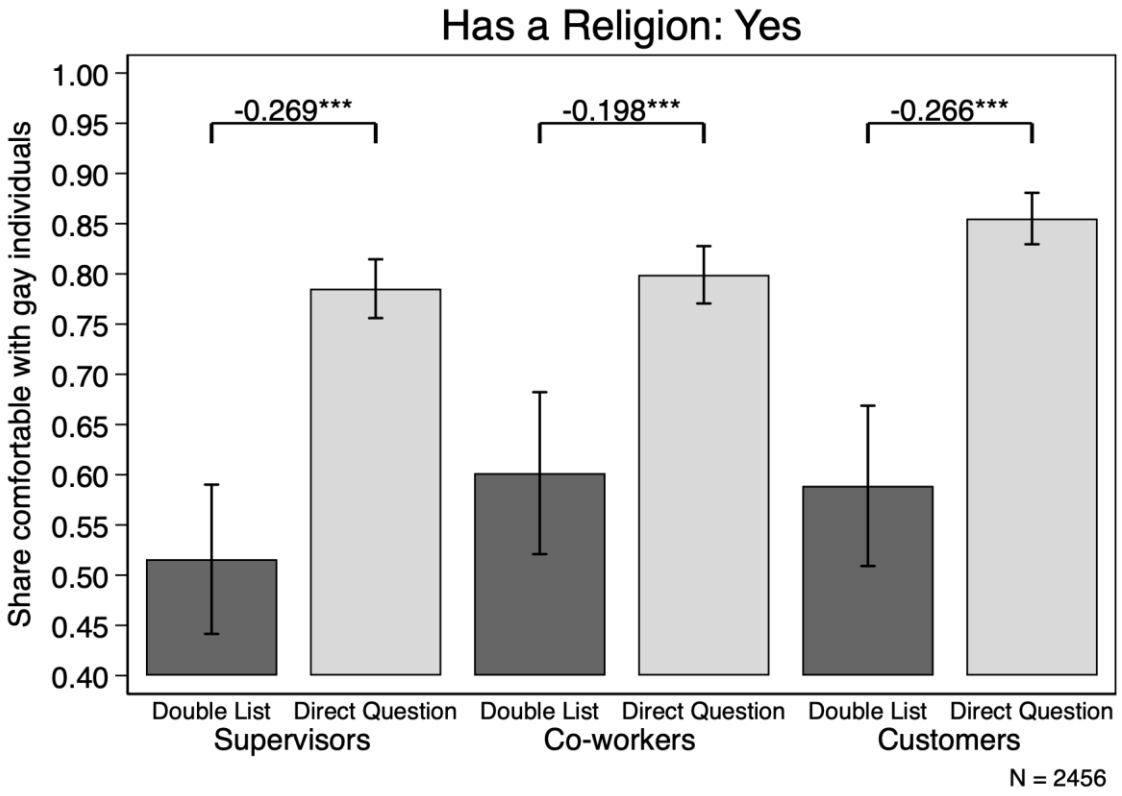


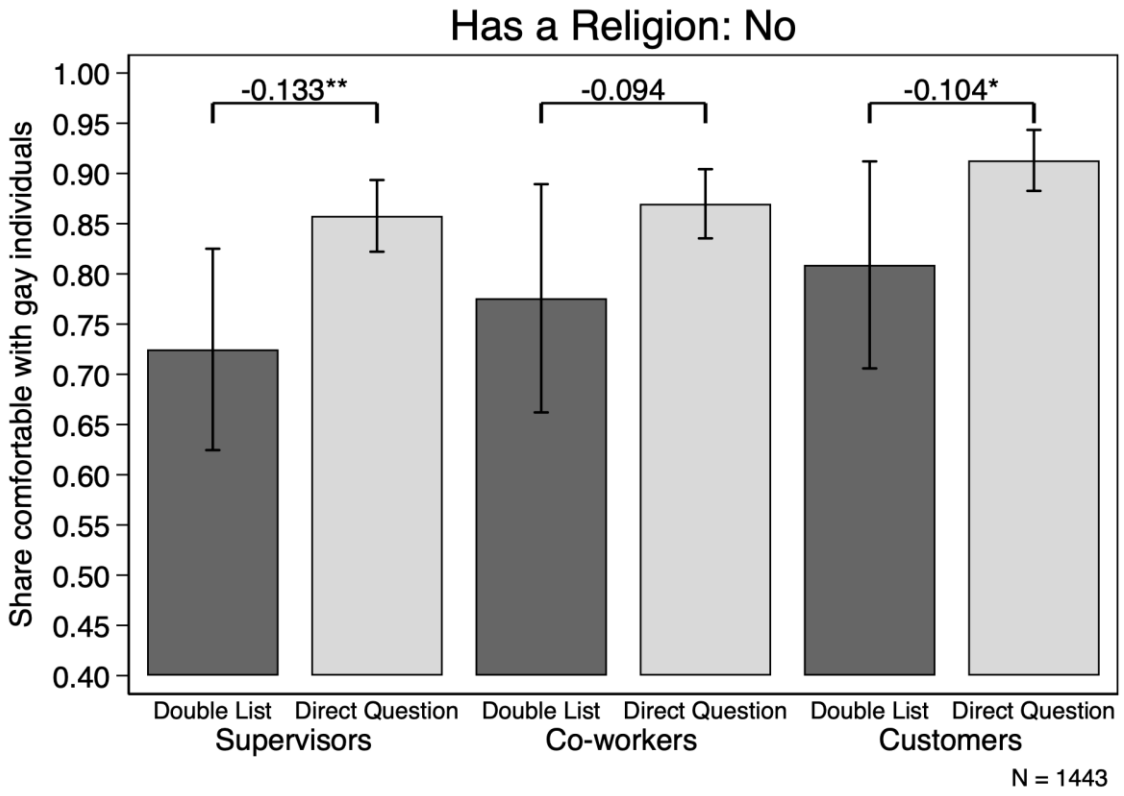
Heterogeneity by sexual orientation



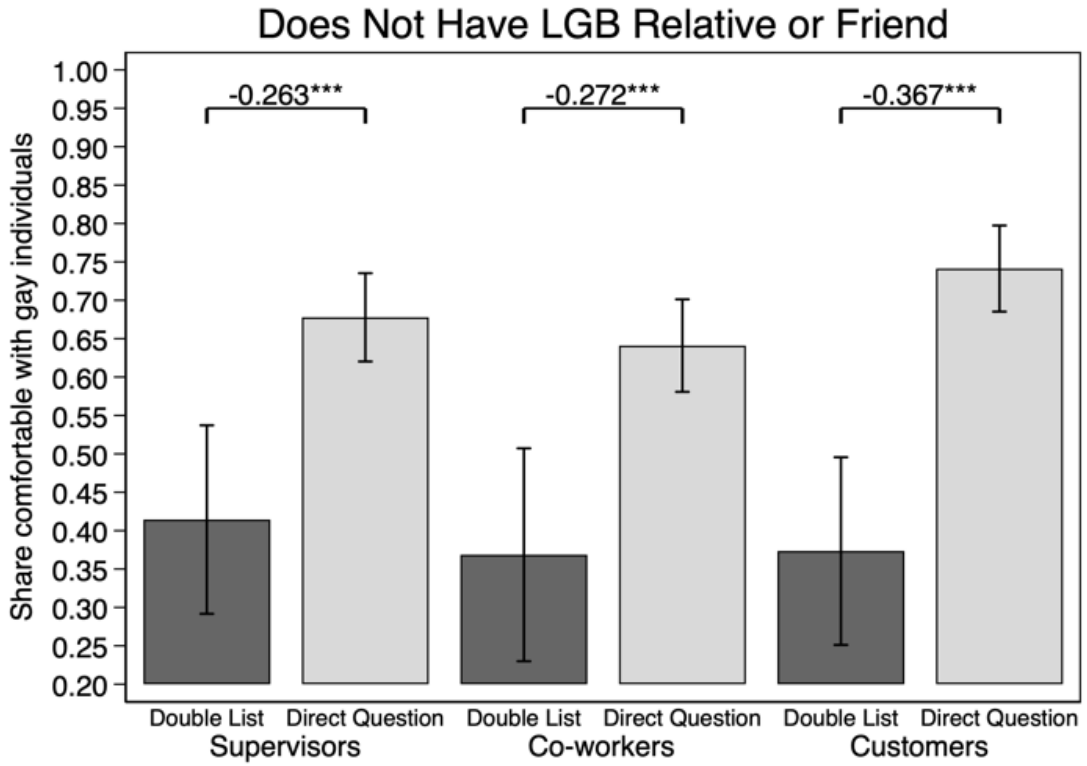


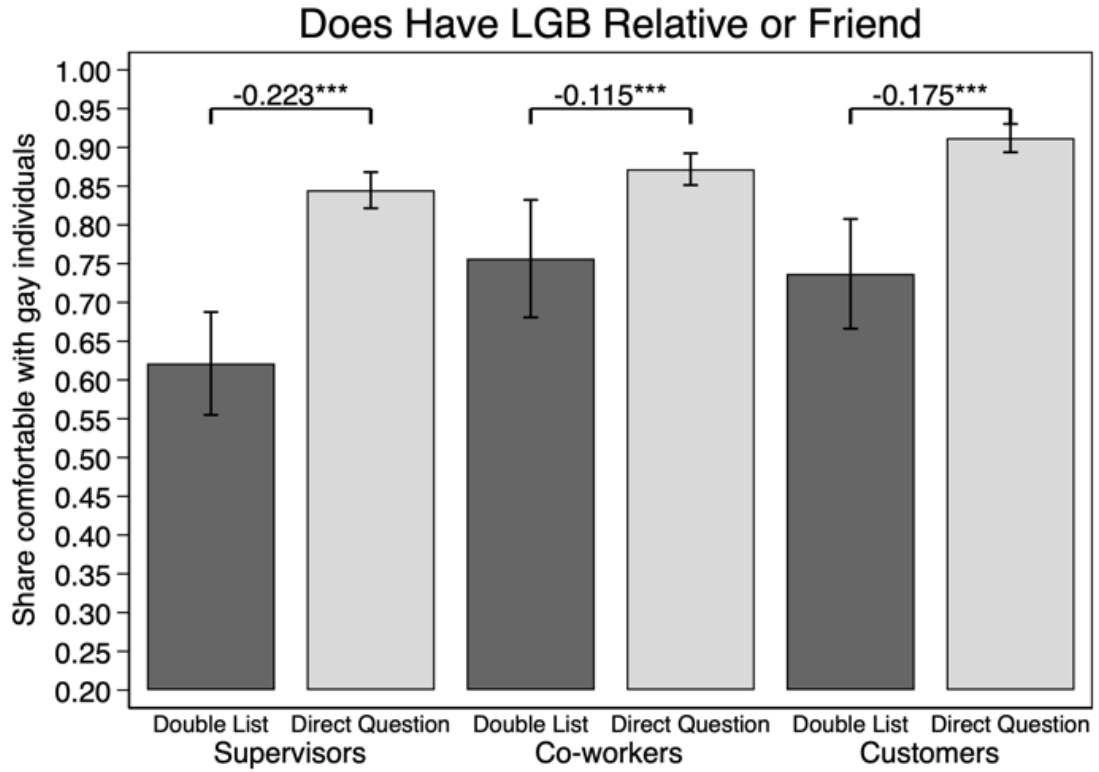
Heterogeneity by religiosity



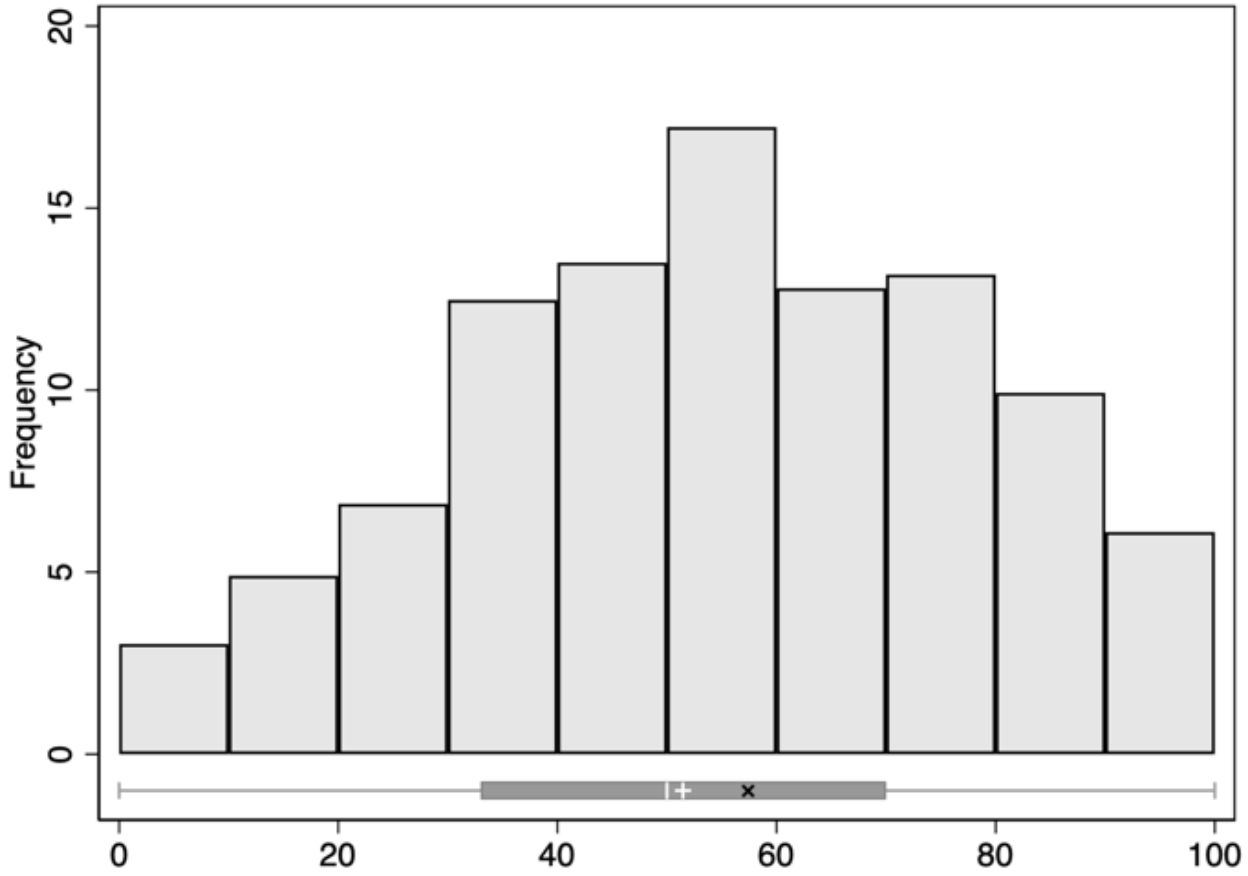


Heterogeneity by LGB familiarity



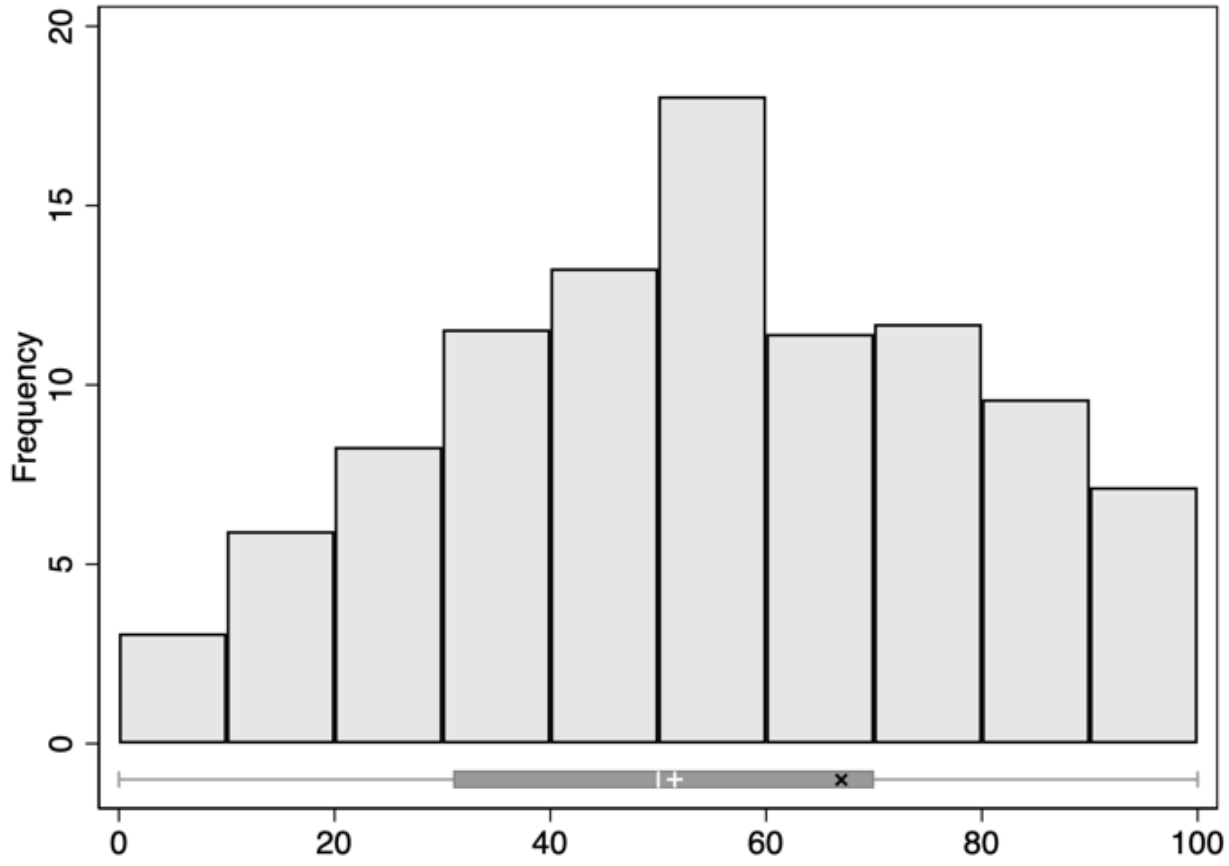


Beliefs on population attitudes



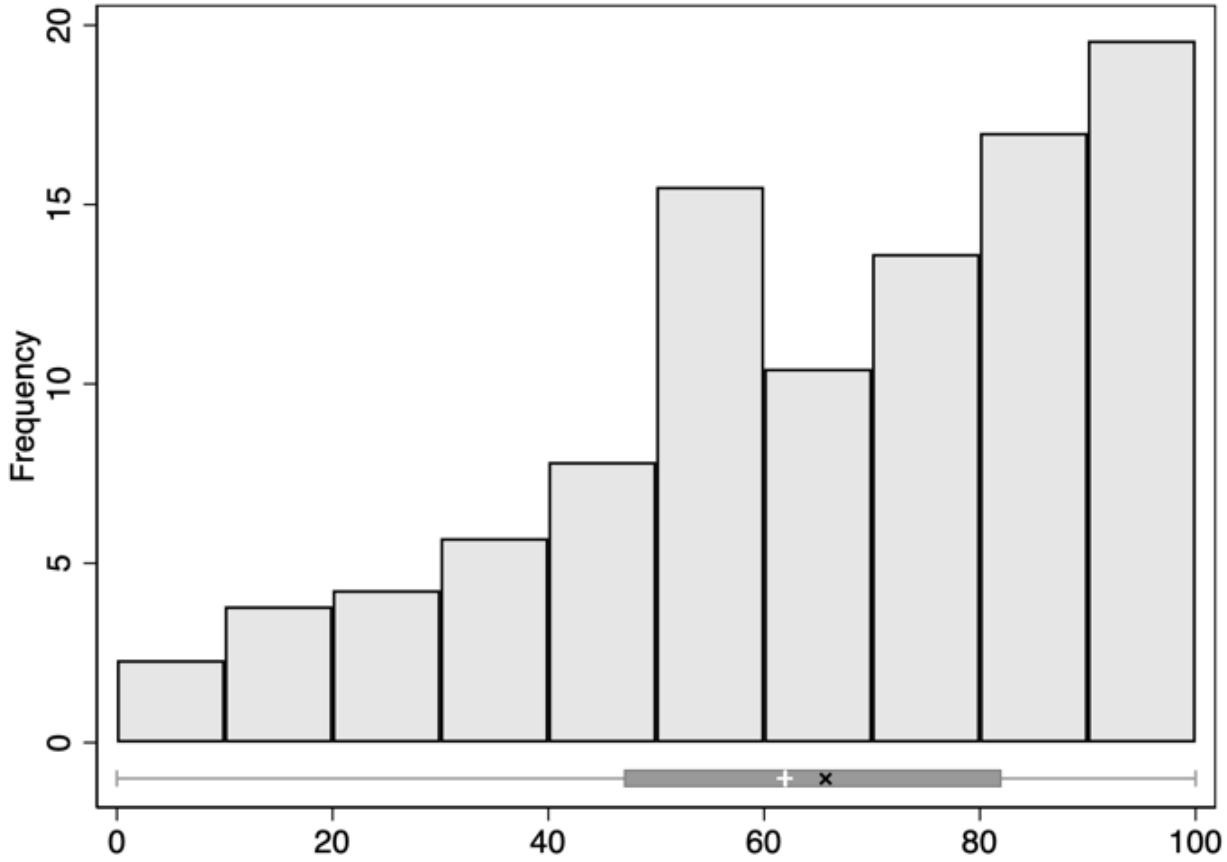
- “In the adult Chilean population, I think approximately __ out of every 100 people would feel comfortable supervising a **gay employee**”
- Individuals **underestimate** true share of comfort with and support for gay workers in the labour market, especially regarding gay employees and co-workers

Beliefs on population attitudes /2



- “In the adult Chilean population, I think approximately __ out of every 100 people would feel comfortable working closely with a **gay co-worker**”
- Individuals **underestimate** true share of comfort with and support for gay workers in the labour market, especially regarding gay employees and co-workers

Beliefs on population attitudes /3

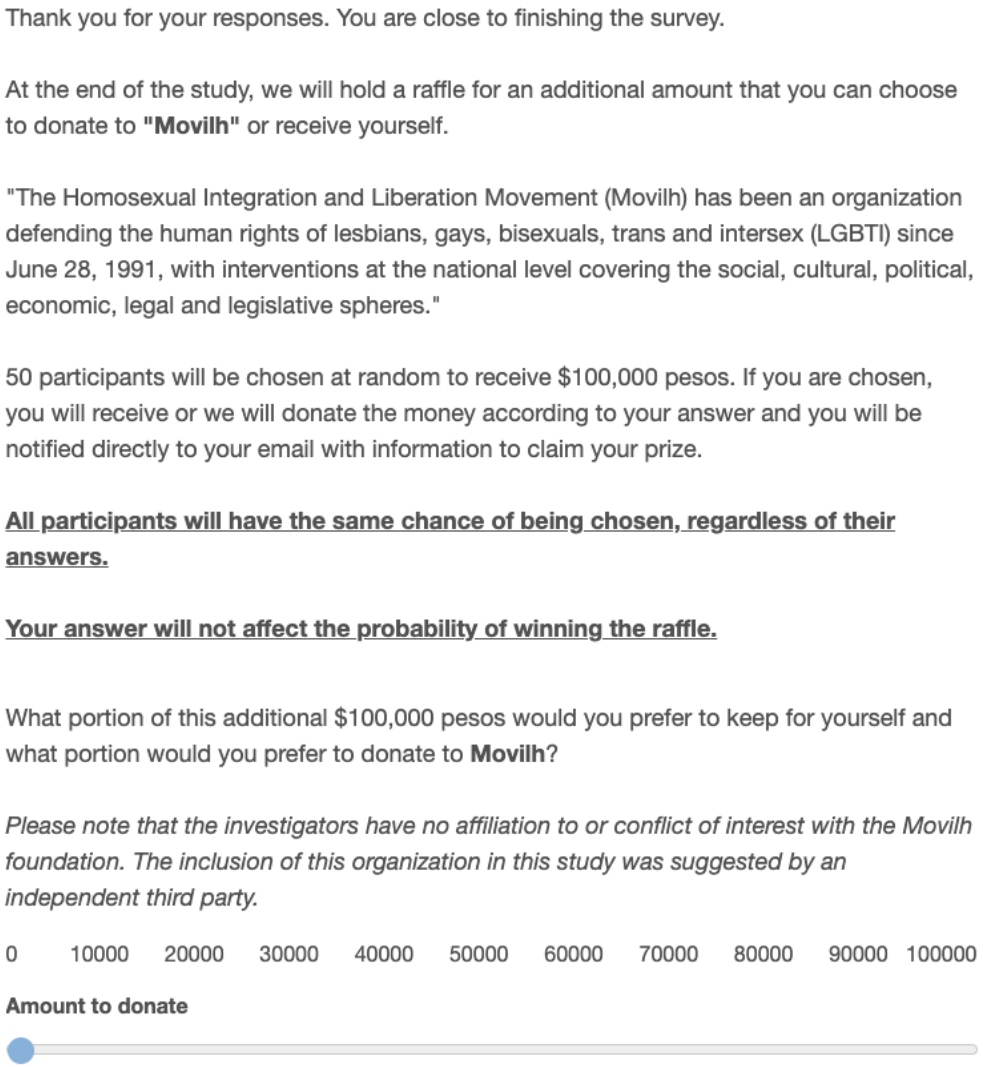


- “In the adult Chilean population, I think approximately __ out of every 100 people would feel comfortable having a **cashier at the supermarket who is gay**”

Comparison with other attitudes

- Highest share of comfort reported from **indigenous** co-worker statement
- **Shorter interactions** with gay individuals (checking out at the supermarket with a gay cashier, having a gay realtor, having a gay taxi driver or having a gay waiter) results in very high reported levels of comfort

Donations to LGBTQ+ charity



Thank you for your responses. You are close to finishing the survey.

At the end of the study, we will hold a raffle for an additional amount that you can choose to donate to **"Movilh"** or receive yourself.

"The Homosexual Integration and Liberation Movement (Movilh) has been an organization defending the human rights of lesbians, gays, bisexuals, trans and intersex (LGBTI) since June 28, 1991, with interventions at the national level covering the social, cultural, political, economic, legal and legislative spheres."

50 participants will be chosen at random to receive $100,000 pesos. If you are chosen, you will receive or we will donate the money according to your answer and you will be notified directly to your email with information to claim your prize.

All participants will have the same chance of being chosen, regardless of their answers.

Your answer will not affect the probability of winning the raffle.

What portion of this additional $100,000 pesos would you prefer to keep for yourself and what portion would you prefer to donate to **Movilh**?

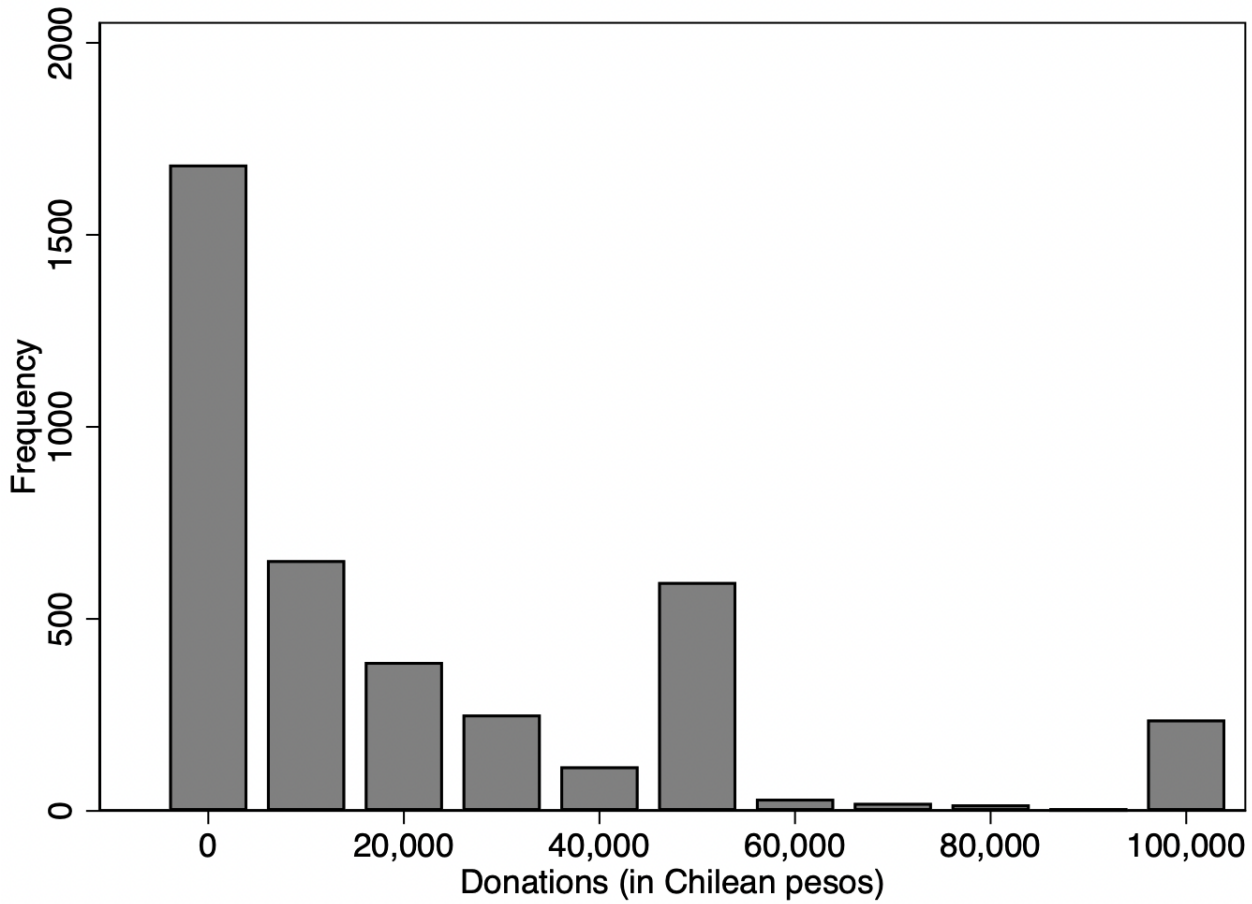
Please note that the investigators have no affiliation to or conflict of interest with the Movilh foundation. The inclusion of this organization in this study was suggested by an independent third party.

0 10000 20000 30000 40000 50000 60000 70000 80000 90000 100000

Amount to donate

- Respondents asked whether they would donate any amount of their earnings to one of two local LGBTQ-related NGOs, if they were to be **randomly selected** to win this prize
- The local NGOs are Iguales and Movilh

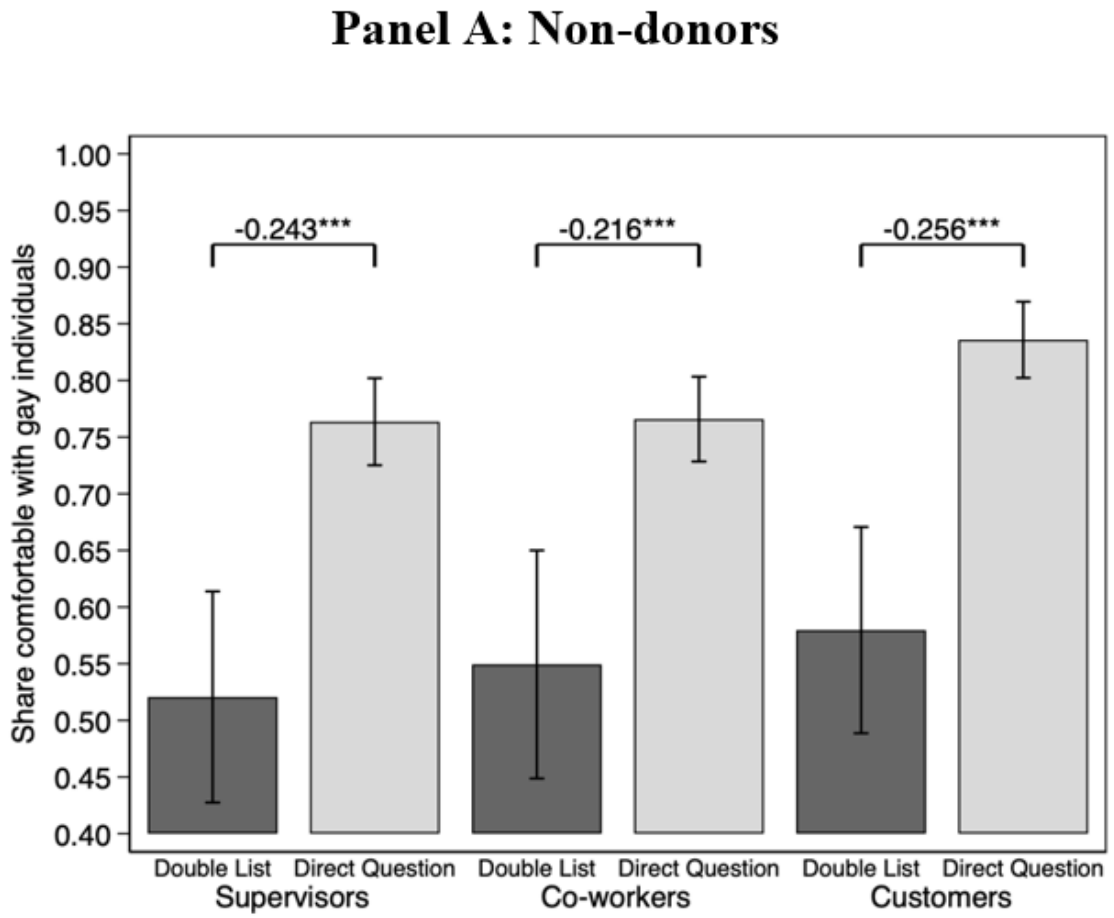
Donations to LGBTQ+ charity /2

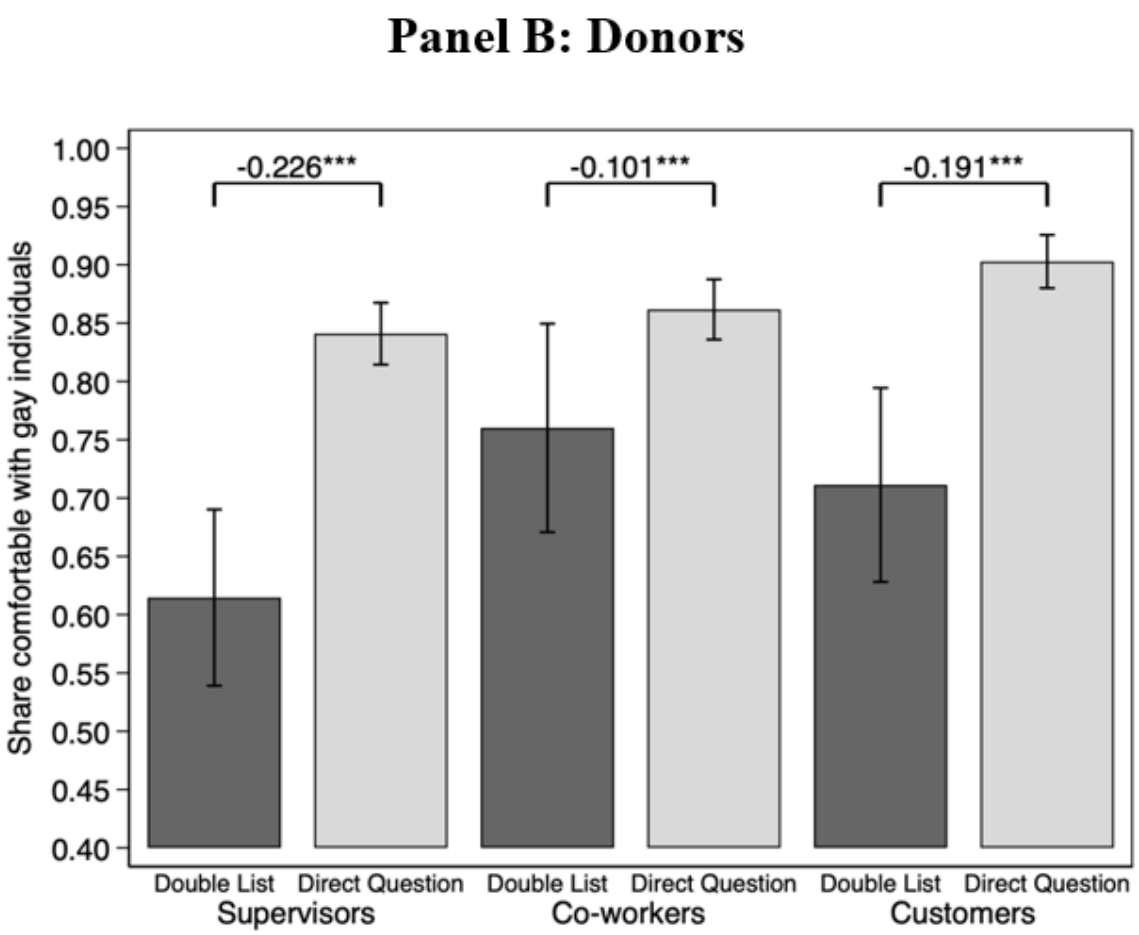


- **43%** of participants do not donate any amount
- 14% of participants donate 50% of their bonus
- 4% of participants donate their full amounts

Heterogeneity by donation

- Higher support and lower social desirability bias among donors





Implications

- Even if people may report support for minorities because they want to conform to laws and norms, their actual views and behaviours may not be consistent with their stated beliefs
  - This mismatch may lead to **no reduction** in large socioeconomic and health inequalities by sexual orientation documented in literature even while opinion surveys report increasing acceptance of LGBTQ+ individuals
    - **Cultural changes** and actual reductions in conscious and unconscious biases may be needed to generate real and sustained decline in socioeconomic disparities

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Review LGBTQ+ literature on my website

Thank you!

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Appendix

Are attitudes important?

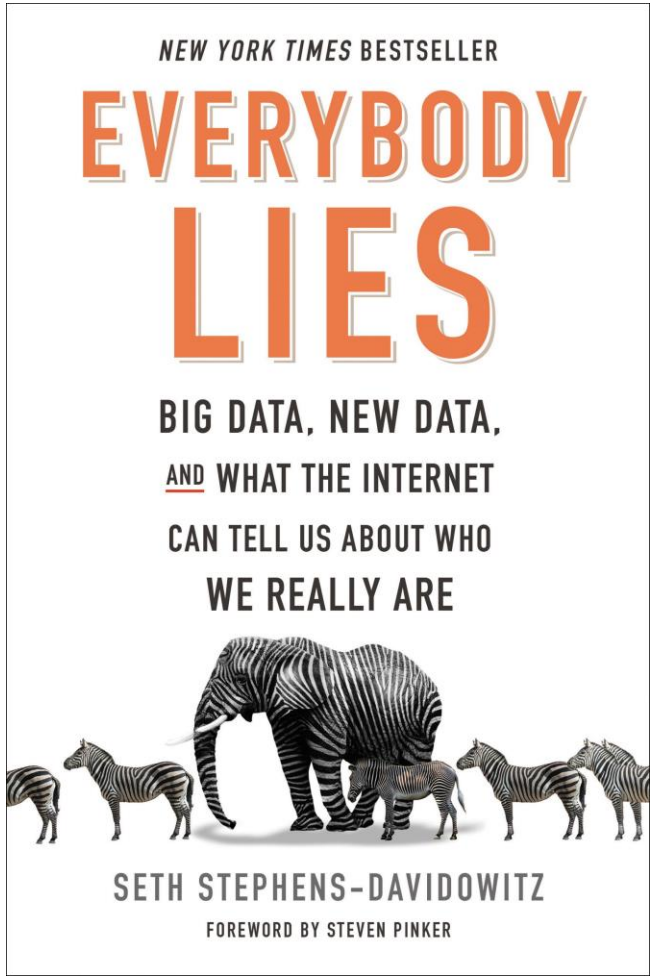
- Understanding attitudes is important, as they could **affect health and socio-economic behaviour**, outcomes, and disparities (NASEM 2020)
- Attitudes can directly impact minority individuals through **minority stress** (Meyer, 1995)
- **Effectiveness** of policies and laws depends on compliance and level of support they receive
  - If employers have high distaste for sexual minority individuals, they will try to find ways to elude these laws
- Are policies supported by the **majority** of voters?
- Attitudes can affect **voting** behaviour

Donation question

- Link individuals' responses to **actual behavior**: respondents participate in a **lottery** for a chance of winning roughly USD 100 extra
- Asked to decide how they would allocate this extra funding in case of winning the lottery between themselves and a **local NGO promoting LGBTQ+ equality**

People misreport in surveys

- 2014 General Social Survey:
  - Heterosexual men average 63 sex acts per year, condoms in 23% of those: **1.6 billion heterosexual condom uses**
  - Heterosexual women average 55 sex acts per year, condoms in 16% of those: **1.1 billion heterosexual condom uses**
- Nielsen industry 2014 data on condom purchases: **600 million condoms** per year or less (Stephens-Davidowitz 2015)



Why Chile?

- Most LGBTQ+ studies have focused on **high-income countries**
  - A few exceptions (Muñoz and Sansone 2024; Muñoz, Saavedra, and Sansone 2024a-b; Muñoz, Sansone, and Ysique 2024; Nettuno 2024; Tampellini 2024)
    - Reduce **invisibility** of LGBTQ+ individuals in middle-income countries
- Chile has a **developed formal labor market**
- **Legislative advances**: same-sex sexual activities decriminalized in 1999, employment anti-discrimination law in 2016, same-sex marriage in 2021
  - **Attitudes** towards LGBTQ+ individuals are generally positive (Muñoz, Sansone, and Ysique 2024)
  - Evidence of recent **backlashes** and generational differences
    - Important to understand if majority of Chilean population still supports LGBTQ+ individuals and if such support is context-specific or limited only to certain minorities

Survey experiments

- List experiments are an example of survey experiments
- Surveys are not only a way of collecting data, but they allow researchers to create their own **identifying and controlled variation** (Statcheva 2023)
- **Administrative data** are great resources, but unlike surveys they cannot capture things like perceptions, beliefs, **attitudes**, knowledge, and reasoning
- Economists like the **reveal preference approach**, but many perceptions, beliefs, attitudes, or reasonings not easily revealed from observed behaviour
  - Employers', co-workers', and customers' choices to hire or interact with sexual minority individuals influenced by wide range of factors: number and quality of available alternatives, legal constraints, and beliefs on differential productivity

List experiments: literature

- Using list experiments in **low- and middle-income countries** particularly valuable (Osman, et al. 2024)
  - Observational analysis using Kitagawa-Oaxaca-Blinder decomposition limited by what variables can be directly observed
  - Correspondence experiments less feasible in economies with lots of small firms not relying on resumes or job websites

List experiment: caveats

- Goal: provide extra layer of anonymity and increase perception of **privacy**
  - Removes **social desirability bias**

- List experiments work better for **attitudinal questions** rather than behaviour or personal characteristics (Ehler et al. 2021)
- List experiments address bias in measures of explicit attitudes, not **implicit attitudes**

List experiments: literature

- List experiments have been used extensively in other social sciences such as **sociology** and political science (Lax et al. 2016; Gervais and Najle 2018; Streb et al. 2008; Blair et al. 2020; Li and Van den Noortgate 2022)
- Less common in **economics** (Coffman et al. 2017; Aksoy et al. 2024; Jamison et al. 2013; Chuang et al. 2021; Boring and Delfgaauw 2024; McKenzie and Siegel 2013; Agüero and Frisancho 2022)
  - Latin America (de Jonge 2015; Ham et al. 2024; Gutiérrez and Rubli 2024)
- List experiments provide increased estimates of prevalence only for stigmatized views: no evidence of this technique leading to an increase in **reporting of innocuous behaviours** (Tsuchiya et al. 2007)
  - No significant misreporting when key statement in the longer list was “It has rained once where I live in the last four days” (Coffman et al. 2017)

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Double list experiments

Single List vs. Double List

- **Single List Experiment**: use one list for each key statement
  - Half of the participants see Short List A
  - Half of the participants see Long List A

  → *Estimated Proportion (A)*

- **Double List Experiment**: use two of lists (List A and List B)
  - Half of the participants see Short List A and then Long List B
  - Half of the participants see Long List A and then Short List B

  Short List A / Long List A → *Estimated Proportion (A)*

  Long List B / Short List B → *Estimated Proportion (B)*

- The average of these two estimates gives us a more precise estimate of the share of the population by minimizing the variance (Droitcour et al. 1991; Glynn 2013)

Gay cashier – List B

- Q: How many of the following statements are true for you?
- **Short list**:
  - I have a driver's license
  - I believe that in Chile there are no corrupted politicians currently in Parliament
  - I am against public demonstrations that obstruct the passage of cars
  - I think all secondary schools should teach sex education
- Additional item for **long list**:
  - I would feel comfortable having a cashier at the supermarket who is gay
- **Direct question** (end of survey)
  - Would you be comfortable having a cashier at the supermarket who is gay? (Yes/No)

Gay employees – List B

- Q: How many of the following statements are true for you?
- **Short list**:
  - I have at least one social media account (e.g., Facebook, TikTok, Instagram)
  - I have visited more than twenty countries
  - I believe that the poor make little effort to get out of poverty
  - I think environmental protection laws are not strict enough to combat climate change
- Additional item for **long list**:
  - I would feel comfortable supervising a gay employee
- **Direct question** (end of survey)
  - Would you feel comfortable supervising a gay employee? (Yes/No)

Gay co-worker – List B

- Q: How many of the following statements are true for you?
- **Short list**:
  - I have an internet connection at home
  - I have met Arturo Vidal personally
  - The national government should lower taxes for businesses
  - I am in favor of the legalization of the recreational use of marijuana
- Additional item for **long list**:
  - I would feel comfortable having to work closely with a gay co-worker
- **Direct question** (end of survey)
  - Would you feel comfortable having to work closely with a gay co-worker? (Yes/No)

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Experimental design and data

Survey design

- Consent form
  - Stated goal: **views on social issue** (no LGBTQ+ specific reference)
- List experiments
  - Instruction and example
  - 3 double list experiments (**randomized order**)
  - Attention check

Survey design /2

- Demographic and socioeconomic questions
- Direct questions
- Additional LGBTQ+ questions
- Population-level beliefs
- Donation lottery

Online sample

- Main drawbacks of online samples are that it is difficult to estimate the margin of error for the general population and that they do not include respondents from the **non-Internet population**
- Most probability-based panels have relatively **high nonresponse rates**: differences in extent of selection between probability-based and quota-based online datasets might not be that large in practice (Haaland et al. 2023)
- Online and offline populations hardly differ in terms of survey responses and **experimental results** (Haaland et al. 2023)
- 90% of Chilean population used an **Internet connection** in 2021, comparable to the 92% in the US (World Bank 2022)

Online sample: advantages

- Online surveys give people the **flexibility** to complete surveys at their convenience
  - Allow individuals who need to juggle different responsibilities (e.g., carers) to take part in a study
- **Convenience** of mobile technologies may entice some people who would otherwise not want to fill out questionnaires or answer questions on the phone
- Online surveys can **reach** people who would be hard to interview in person
- Variety of **rewards** for taking surveys can appeal to a broader group of people

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Prolific pilot

Effect of list experiments on direct questions

	With list experiments	Direct questions only	Difference
Would you feel comfortable…	(1)	(2)	(2) – (1)
supervising a gay employee?	0.96	0.97	0.01
	(0.20)	(0.18)	[0.6191]
working closely with a gay colleague?	0.95	0.96	0.01
	(0.21)	(0.20)	[0.8032]
having a gay cashier at the supermarket?	0.99	0.98	-0.01
	(0.09)	(0.15)	[0.1610]

- Half of the respondents asked to respond to both list experiments and survey questions, while other half shown only survey questions
- Average levels of comfort with gay individuals as reported in the direct questions **not affected** by whether respondents were also asked to participate in the list experiments

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Additional results

Regression analysis (Lists A-B)

$$y_i = \beta_0 + \beta_1 T_i + \beta_2 X_i + \mu_i$$

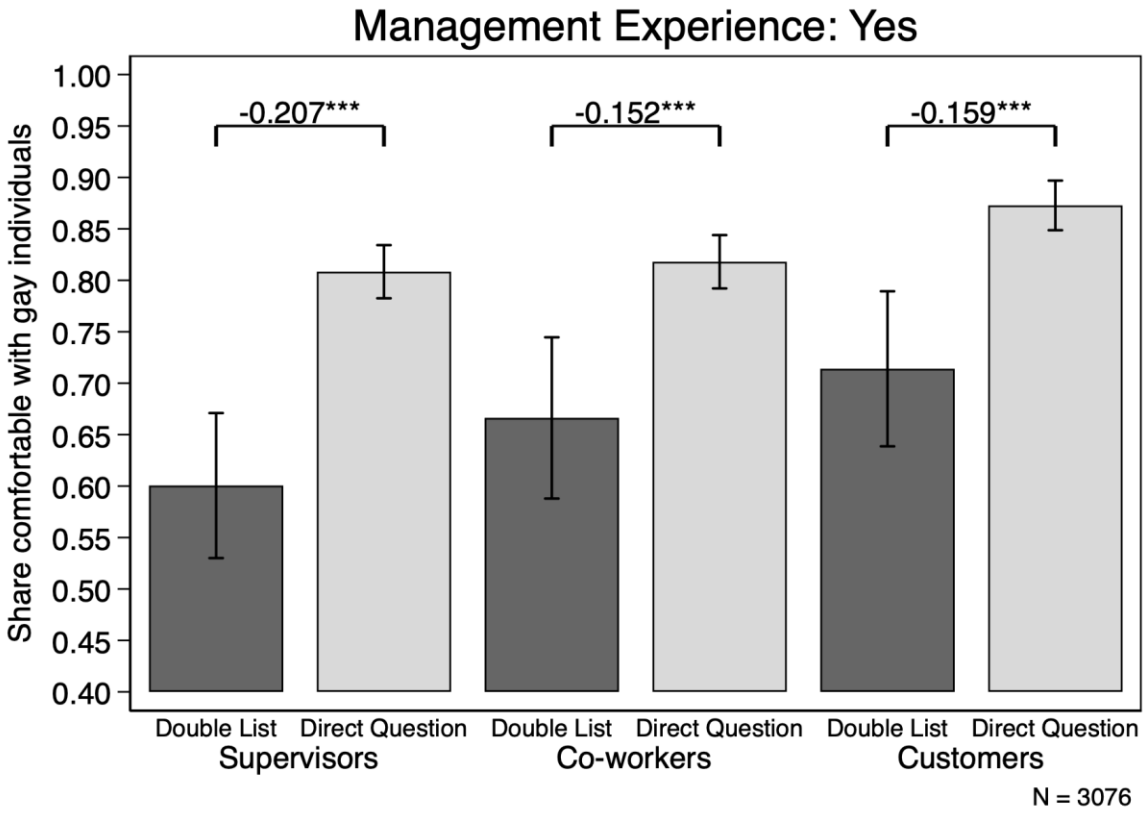
- y_i number of items reported
- T_i takes a value of 1 if the list includes the key statement (i.e., long list)
- X_i is a vector of control variables
  - **Demographic controls**: age, sex at birth, sexual orientation
  - Current **region-commune of residence**
  - **Socioeconomic controls**: education level, employment status, income, religious and political affiliation, and beliefs about population attitudes
  - **Additional controls**: children in the household, household size, marital status, day of the week the respondent started the experiment and the week number since sample collection started

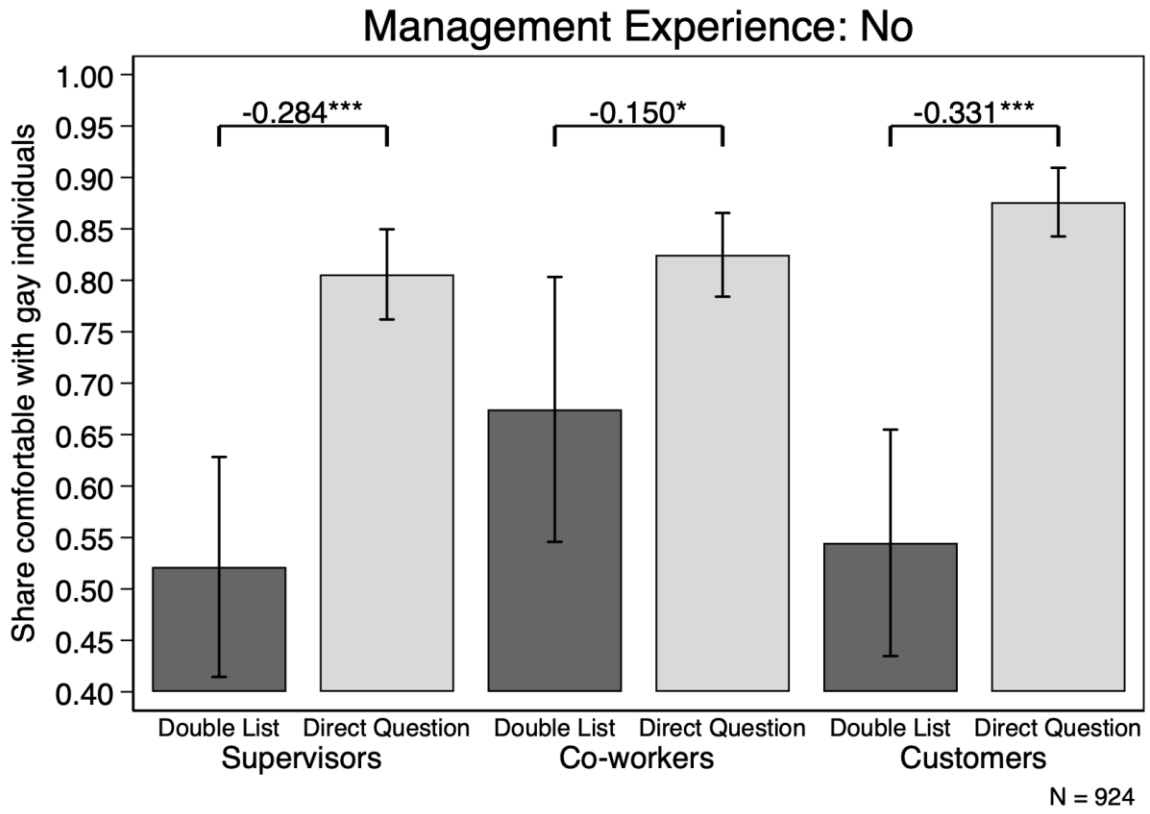
Regression analysis (Lists A-B) /2

- Adding controls does **not alte**r main findings from list experiment

	List A				List B			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Supervisors								
Subject saw list with key statement	0.676	0.664	0.640	0.667	0.472	0.480	0.496	0.504
	(0.054)	(0.044)	(0.043)	(0.044)	(0.050)	(0.047)	(0.050)	(0.049)
R^2	0.152	0.234	0.220	0.242	0.076	0.133	0.156	0.207
Estimated bias	15.075	16.275	18.675	15.975	35.475	34.675	33.075	32.275
Panel B: Co-workers								
Subject saw list with key statement	0.772	0.754	0.740	0.773	0.567	0.580	0.594	0.611
	(0.054)	(0.048)	(0.048)	(0.050)	(0.046)	(0.045)	(0.047)	(0.046)
R^2	0.174	0.228	0.247	0.283	0.115	0.162	0.191	0.238
Estimated bias	6.575	8.375	9.775	6.475	27.075	25.775	24.375	22.675
Panel C: Customers								
Subject saw list with key statement	0.685	0.684	0.671	0.709	0.628	0.637	0.645	0.656
	(0.054)	(0.047)	(0.047)	(0.046)	(0.055)	(0.050)	(0.053)	(0.051)
R^2	0.140	0.202	0.205	0.268	0.107	0.192	0.217	0.267
Estimated bias	20.75	20.85	22.15	18.35	26.45	25.55	24.75	23.65
Controls for:								
Region-commune fixed effects		✓	✓	✓		✓	✓	✓
Demographic controls		✓	✓	✓		✓	✓	✓
Socioeconomic factors			✓	✓			✓	✓
Additional controls				✓				✓
Observations	4,000	3,947	3,514	3,293	4,000	3,947	3,514	3,293

Heterogeneity by managerial experience





Heterogeneity: multivariate analysis

Interaction of treatment variable with:	Supervisors (1)	Co-workers (2)	Customers (3)
Age: 18–44	0.126*	0.125*	-0.049
	(0.068)	(0.072)	(0.066)
Race: African Descent	-0.345	-0.001	0.082
	(0.224)	(0.178)	(0.217)
Indigenous	0.027	0.159	-0.031
	(0.121)	(0.124)	(0.127)
Sex: Female	0.009	0.164**	0.203***
	(0.065)	(0.070)	(0.067)
Sexual orientation: Heterosexual	-0.178	-0.254	-0.388***
	(0.124)	(0.181)	(0.113)
Household income: More than $1,500	0.074	-0.171**	0.002
	(0.064)	(0.068)	(0.068)
Education: More than high school	0.042	0.066	0.144*
	(0.085)	(0.089)	(0.081)
Employment status: Employed	0.098	0.135*	-0.043
	(0.083)	(0.079)	(0.086)
Management Experience	0.147**	0.143*	0.171**
	(0.073)	(0.080)	(0.068)
Region: Outside metro	0.006	-0.119*	-0.062
	(0.059)	(0.065)	(0.061)
Political affiliation: Lean left	0.094	0.036	0.017
	(0.067)	(0.076)	(0.068)
Current religious affiliation: Not religious	0.125*	0.115	0.220***
	(0.070)	(0.078)	(0.073)
Belief: 50% or more comfortable supervising gay employees	0.109*		
	(0.064)		
Belief: 50% or more comfortable with gay co-workers		0.179***	
		(0.068)	
Belief: 50% or more comfortable with gay cashiers			0.050
			(0.072)
Constant	0.300*	0.498**	0.667***
	(0.164)	(0.223)	(0.170)
Observations	3,518	3,518	3,518

- Larger level of comfort among women, sexual minorities, **highly educated**, non-religious people, and in the **capital region**

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List experiments in Spanish

Gay employees – List A

Hay cinco (5) afirmaciones en la siguiente lista. ¿Cuántas de estas afirmaciones son verdaderas para ti?

- Tengo un teléfono móvil.
- Creo que las mujeres deben ser las responsables del cuidado de los niños.
- Puedo hablar al menos tres idiomas fluidamente.
- Me sentiría cómodo supervisando a un empleado gay.
- Creo que está mal aplicar la pena de muerte, sin importar el delito.

Por favor, ingresa el número total de estas afirmaciones que son verdaderas para ti:

SIGUIENTE

Gay employees – List B

Hay cinco (5) afirmaciones en la siguiente lista. ¿Cuántas de estas afirmaciones son verdaderas para ti?

- Me sentiría cómodo supervisando a un empleado gay.
- Creo que las leyes de protección del medio ambiente no son lo suficientemente estrictas para combatir el cambio climático.
- He visitado más de veinte países.
- Tengo, por lo menos, una cuenta de redes sociales (por ejemplo, Facebook, TikTok, Instagram, u otras).
- Creo que los pobres hacen pocos esfuerzos para salir de la pobreza.

Por favor, ingresa el número total de estas afirmaciones que son verdaderas para ti:

SIGUIENTE

Gay co-worker – List A

Hay cinco (5) afirmaciones en la siguiente lista. ¿Cuántas de estas afirmaciones son verdaderas para ti?

- Tengo un computador.
- Estoy de acuerdo con la prohibición del aborto.
- Me sentiría cómodo trabajando estrechamente con un compañero de trabajo gay.
- Estoy de acuerdo con que Chile acepte a más refugiados de otros países.
- He conocido personalmente a Don Francisco (Mario Kreutzberger).

Por favor, ingresa el número total de estas afirmaciones que son verdaderas para ti:

SIGUIENTE

Gay co-worker – List B

Hay cinco (5) afirmaciones en la siguiente lista. ¿Cuántas de estas afirmaciones son verdaderas para ti?

- He conocido personalmente a Arturo Vidal.
- Me sentiría cómodo trabajando estrechamente con un compañero de trabajo gay.
- El gobierno debe reducir los impuestos a las empresas.
- Estoy a favor de la legalización del uso recreativo de la marihuana.
- Tengo una conexión a internet en mi casa.

Por favor, ingresa el número total de estas afirmaciones que son verdaderas para ti:

SIGUIENTE

Gay cashier – List A

Hay cinco (5) afirmaciones en la siguiente lista. ¿Cuántas de estas afirmaciones son verdaderas para ti?

- Tengo mucha confianza en los partidos políticos.
- Creo que la mitad de los legisladores en el Congreso deben ser mujeres.
- Me sentiría cómodo siendo atendido en el supermercado por un cajero que es gay.
- Conozco a alguien que tiene un auto o motocicleta.
- Creo que los militares deben trabajar con la policía para combatir el crimen.

Por favor, ingresa el número total de estas afirmaciones que son verdaderas para ti:

SIGUIENTE

Gay cashier – List B

Hay cinco (5) afirmaciones en la siguiente lista. ¿Cuántas de estas afirmaciones son verdaderas para ti?

- Me sentiría cómodo siendo atendido en el supermercado por un cajero que es gay.
- Creo que en todas las escuelas se debería enseñar educación sexual.
- Estoy en contra de las protestas que obstruyen el paso de los vehículos.
- Tengo una licencia de conducir.
- Creo que en Chile no hay políticos corruptos en el Congreso.

Por favor, ingresa el número total de estas afirmaciones que son verdaderas para ti:

SIGUIENTE

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Data quality

Descriptive statistics

Variable	N	Mean	SD	Min	Max
Age	4,000	45.93	14.06	18	87
Between 18 and 34	4,000	0.320	0.467	0	1
Between 35 and 49	4,000	0.274	0.446	0	1
Between 50 and 64	4,000	0.295	0.456	0	1
65 or older	4,000	0.111	0.314	0	1
Sex assigned at birth: Female	4,000	0.511	0.500	0	1
African Descent	4,000	0.049	0.215	0	1
Indigenous	4,000	0.101	0.301	0	1
Gender Identity and Sexual Orientation					
Cisgender	3,990	0.991	0.094	0	1
Heterosexual	3,952	0.920	0.271	0	1
Income: More than $975	3,838	0.602	0.490	0	1
Education					
High School	4,000	0.406	0.491	0	1
Bachelor's Degree	4,000	0.194	0.396	0	1
Post-Graduate Degree	4,000	0.076	0.265	0	1
Employed	4,000	0.806	0.395	0	1
Management Experience	4,000	0.667	0.471	0	1
Region: Non-Metro	4,000	0.578	0.494	0	1
Political Affiliation					
Leans Right	3,763	0.445	0.497	0	1
Leans Left	3,763	0.555	0.497	0	1
Religious Affiliation					
Catholic	3,899	0.499	0.500	0	1
No Religion	3,899	0.320	0.467	0	1
LGBTQ+ Comfortable	3,742	0.976	0.153	0	1
Has Gay Relative(s) or Friend(s)	4,000	0.777	0.417	0	1

- Low item non-response rates

List design

- Followed best practices in the literature (Glynn 2013; Aksoy et al. 2025)
- Number of key statements should be **high enough** to avoid a ceiling effect (participants reporting that all statements are true for them) thus removing the privacy protection provided by the list experiment
- Number of key statements **cannot be too high** otherwise respondents may not be able to remember or focus on all statements in the list, thus leading to higher variance and measurement error
- Each list includes a statement expected to be **true for most people** to avoid flooring effect (participants reporting zero items) thus also removing the privacy protection provided by the list experiment

List design /2

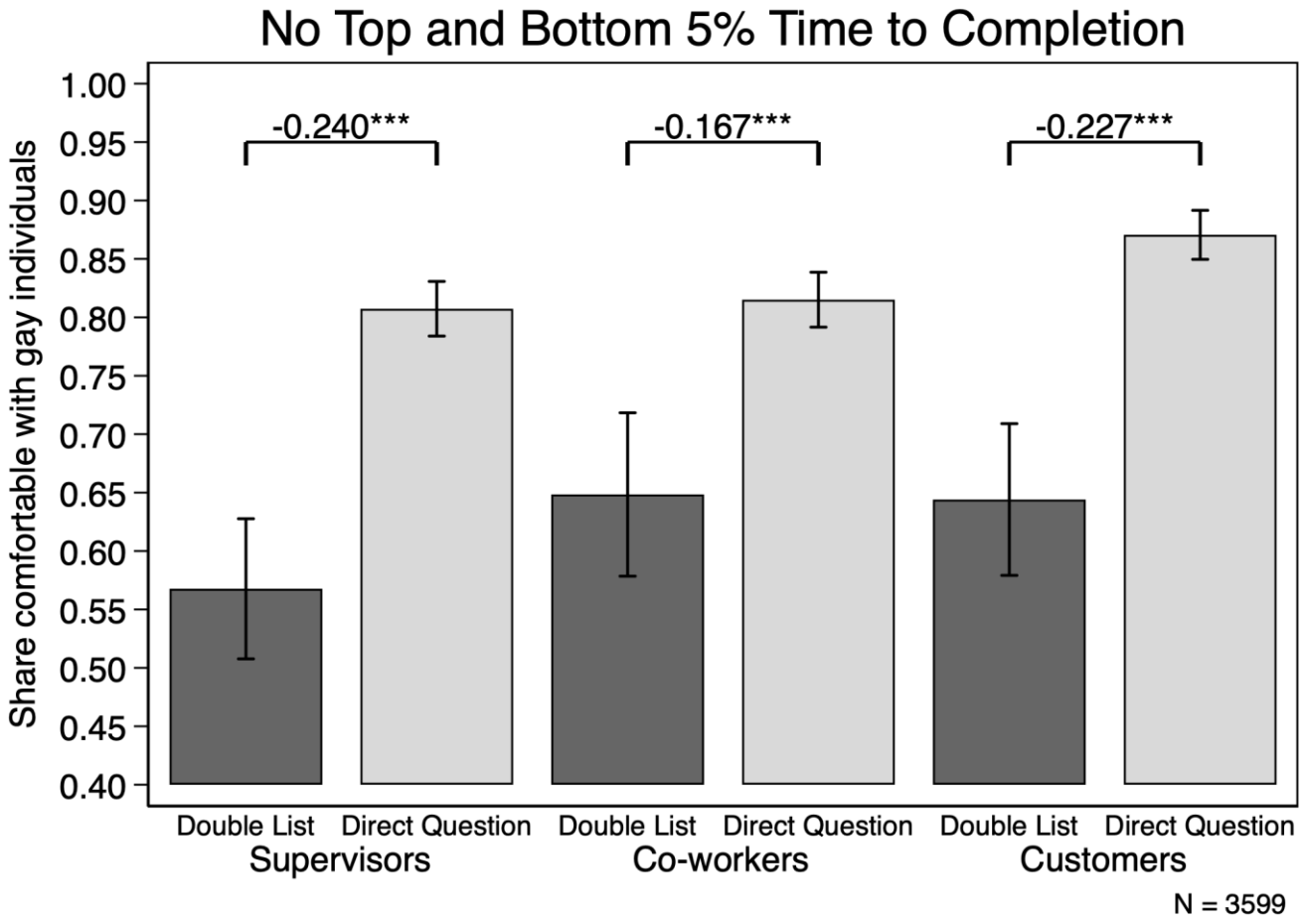
- Two non-key statements were chosen such that they were expected to be **negatively correlated**
- Non-key statements in Lists A and B were also designed to be **positively correlated** across lists
- To draw less attention to the key statements, some of the non-key statements in the lists were **political or sensitive** in nature
- Participants were not provided a **“don’t know” option** in the direct question since individuals who held socially stigmatized opinions may hide their opinions behind a “don’t know” response
- List experiments work better when the stigmatized answer in the related direct question is a **“no” instead of a “yes”**

Attention checks

- Following the recommendation of Haaland et al. (2023), respondents were **explained** at the beginning of the study the rationale for including such attention checks
  - This explanation can mitigate concerns about participants' **negative emotional reactions** to the use of attention checks

- 3,239 (80.97%) of participants passed the first attention check
- 3,968 (**99.20%**) of participants passed the second and third attention checks

Procrastinators and speeders



- Main findings are robust to excluding participants who took less than 491 seconds (approx. 8 minutes - **top 5%**) or more than 3,354 seconds (approx. 56 minutes - **bottom 5%**)

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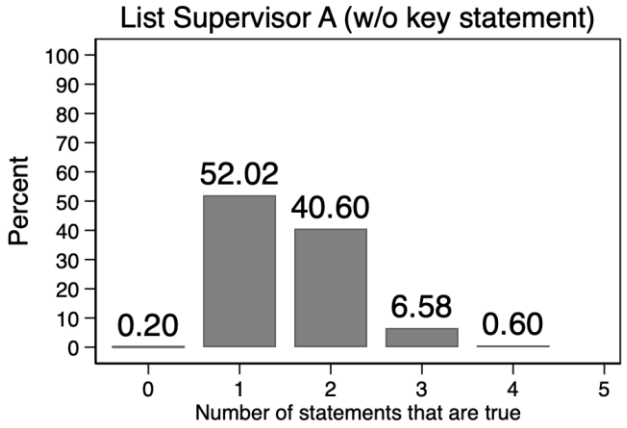
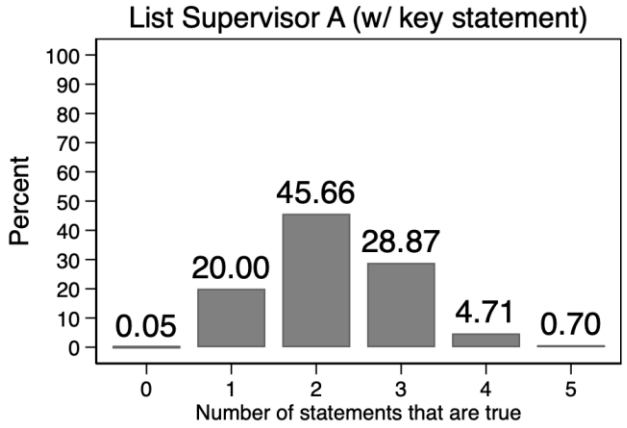
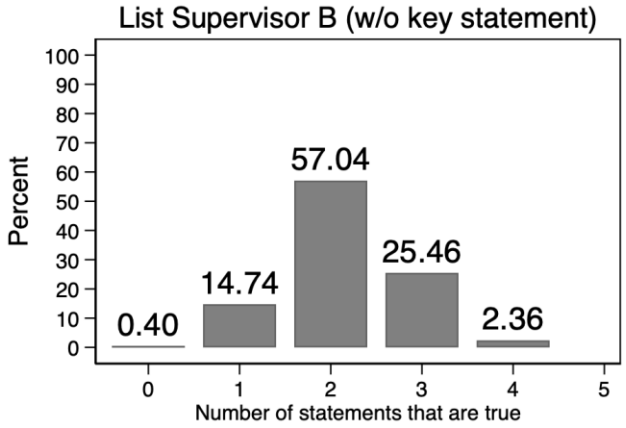
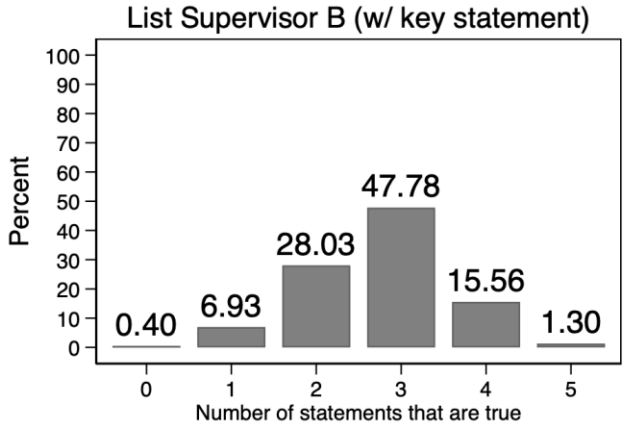
Ceiling and Flooring effects

Gay employees - distribution



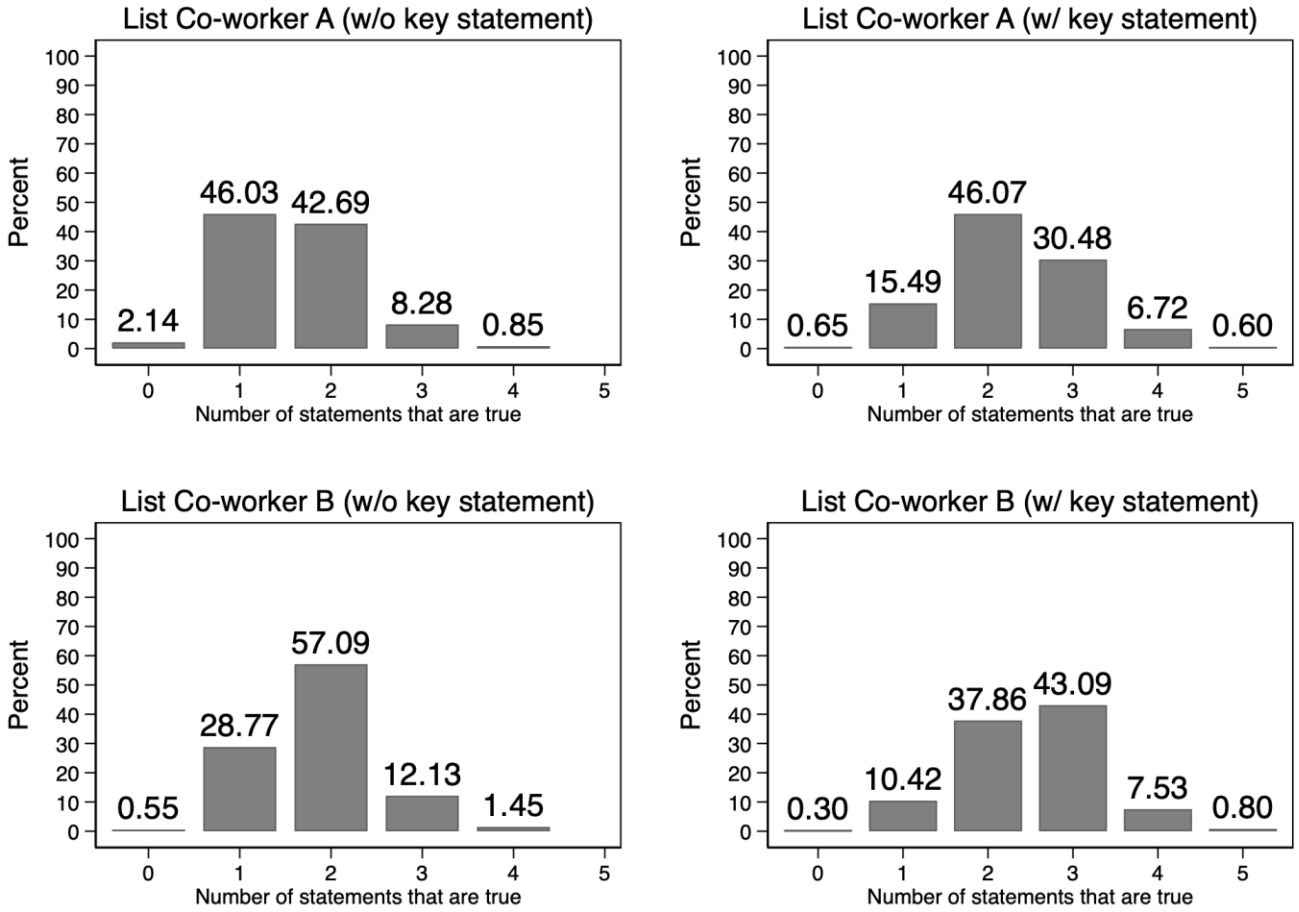






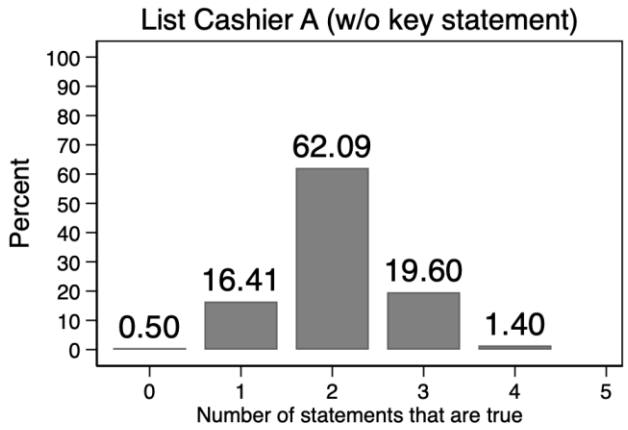
- Only a **very small share** of participants reports the highest and lowest possible items in each of the lists
- Flooring and ceiling effects are negligible in these experiments

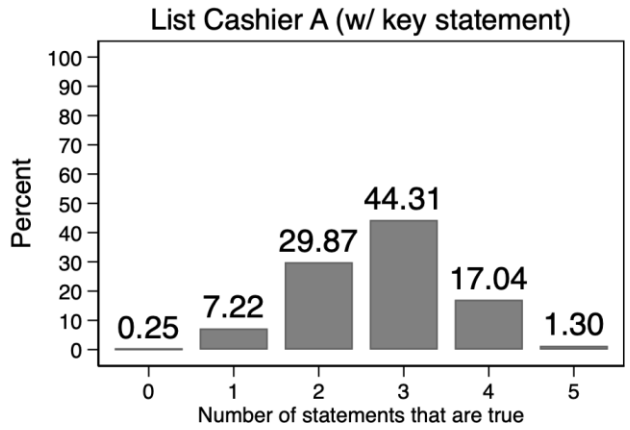
Gay co-worker - distribution

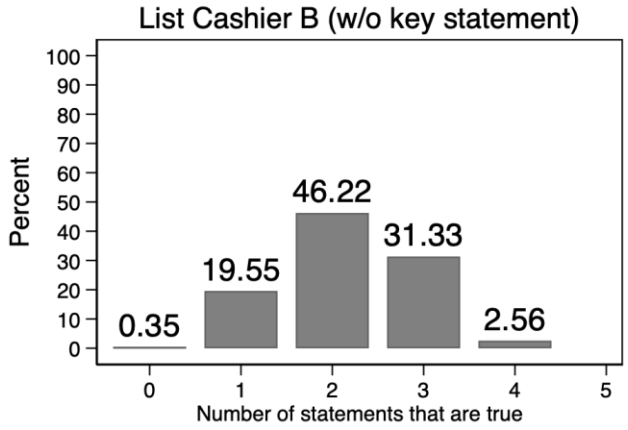


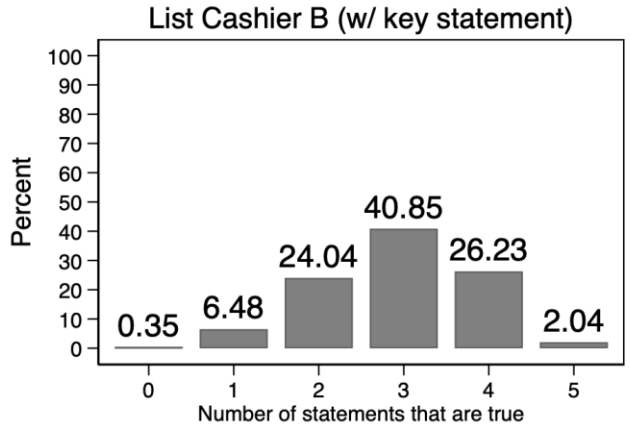
- If the distributions of responses had followed a uniform distribution, then it would have indicated that most respondents provided **random answers** (Coffman, et al. 2017)
- Reassuring to note that the distributions of responses do not follow such a **uniform distribution**

Gay cashier - distribution









- Note the very similar distribution of responses for List A and B
- The **selection of non-key items** does not affect the main findings

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List experiment assumptions

Assumptions

1. Treatment randomization
2. No design effect
3. No liar

Treatment randomization

Variable	Treatment A Mean	Treatment B Mean	Difference	*p*-value
Age	47.61	47.77	0.16	0.678
Between 18 and 34	0.131	0.125	-0.006	0.594
Between 35 and 49	0.477	0.457	-0.019	0.221
Between 50 and 64	0.280	0.313	0.033	0.022**
65 or older	0.113	0.105	-0.008	0.414
Sex assigned at birth: Female	0.477	0.463	-0.014	0.380
African Descent	0.032	0.027	-0.004	0.438
Indigenous	0.067	0.066	-0.001	0.916
Gender Identity and Sexual Orientation				
Cisgender	0.992	0.994	0.002	0.552
Heterosexual	0.926	0.926	-0.000	0.995
Income: More than $1,000	0.614	0.642	0.028	0.064*
Education				
High School	0.181	0.168	-0.014	0.248
Bachelor's Degree	0.470	0.489	0.019	0.227
Post-Graduate Degree	0.219	0.223	0.004	0.767
Employed	0.847	0.852	0.005	0.674
Management Experience	0.771	0.767	-0.004	0.773
Region: Non-Metro	0.366	0.355	-0.011	0.477
Political Affiliation				
Leans Right	0.460	0.454	-0.006	0.704
Leans Left	0.540	0.546	0.006	0.704
Religious Affiliation				
Catholic	0.490	0.483	-0.007	0.644
No Religion	0.365	0.376	0.011	0.483
LGBTQ+ Comfortable	0.975	0.982	0.006	0.172
Has Gay Relative(s) or Friend(s)	0.806	0.798	-0.008	0.552

- **No significant differences** between groups to important variables in the survey
- Main analysis does not only rely on means comparisons but also employs **regression analyses** controlling for observable characteristics

No design effect

- Requires respondents **not to change their answers to non-key statements** depending on whether the key statement appeared in the list (i.e., whether they saw the long list)
- Suppose that a respondent in the short list group answered two non-key statements affirmatively. If they had been assigned to the long list group, their answer must have been either ‘2’ or ‘3’: they either answered two non-key statements affirmatively or they answered two non-key statements plus the key statement affirmatively
- It is not assumed that subjects gave truthful answers to these non-key statements, it is only assumed that the answers were consistent in short and long list groups

No design effect /2

- Blair and Imai (2012) proposed a statistical test for the no design effect assumption
- We conducted this test for all of our of lists and **failed to reject the null** hypotheses in all cases

No design effect /3

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- Step 1: estimate probabilities of all possible types of item-count responses
  - For example, Pr(R=0,S=1) estimates the joint probability of answering all nonkey items negatively and answering the key item affirmatively.
  - If this estimate is a nonsensical value (e.g., a negative value), it would raise doubts about the validity of the no-design-effect assumption
- Step 2: check whether negative estimates arisen by chance. Two tests:
    - One tests null hypothesis that none of Pr(R=r,S=0) is smaller than zero
    - The other tests that none of Pr(R=r,S=1) is smaller than zero
      - When either of these tests is statistically significant, no-design-effect assumption does not hold
      - We want these tests NOT to be statistically significant (large p-values)

No liar

- It is not statistically feasible to check the ‘no liar’ assumption, not only because respondents’ answers to the key statement are by design unobserved, but also because their truthful answers are unknown (otherwise there would be no point in using the list experiment technique)
- This study tried to limit any concerns about this assumption by running these experiments in an **online anonymized platform**
  - And by making sure when designing the lists that **agreeing to all or none of the statements is highly unlikely**

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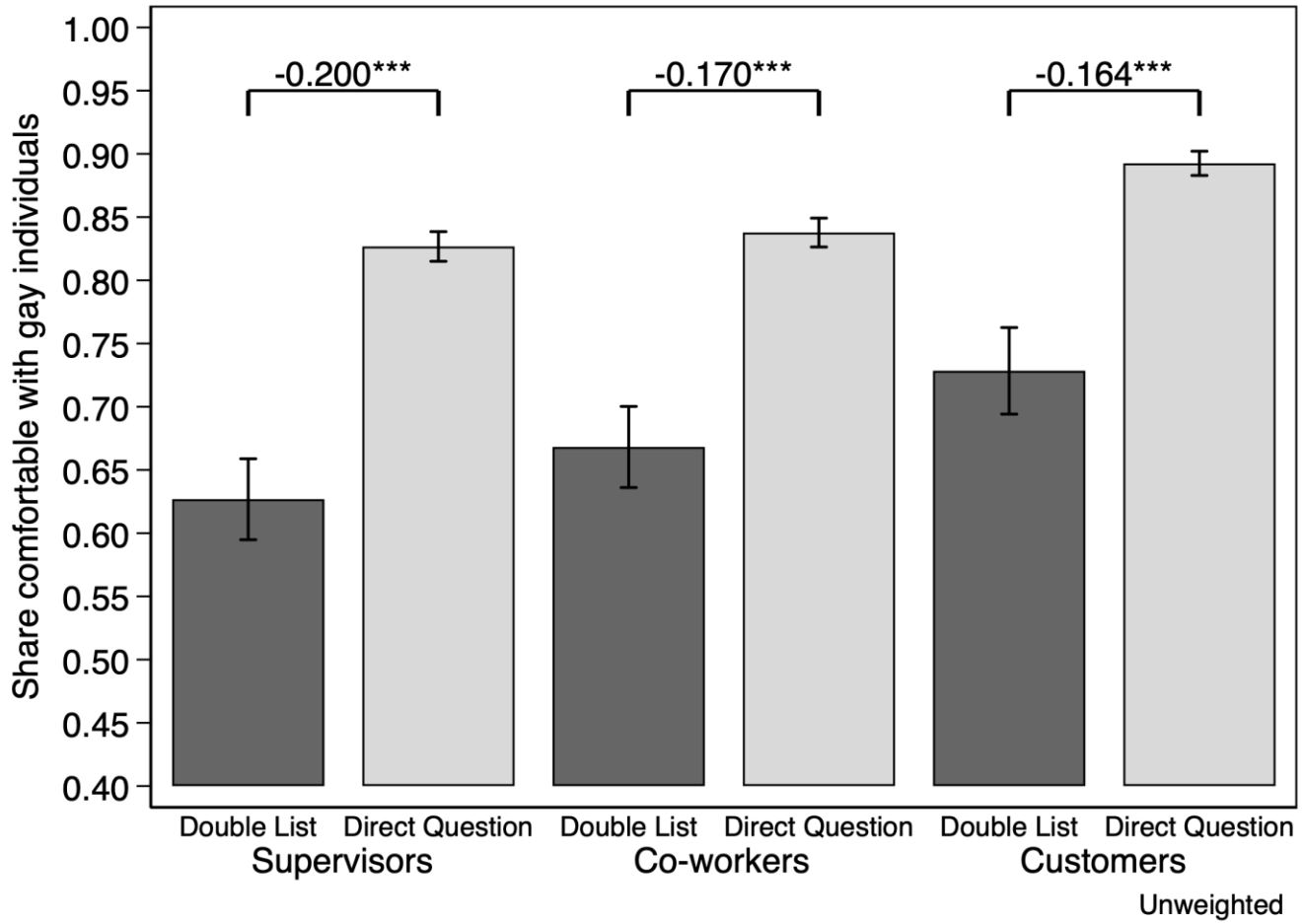
Additional robustness checks

Unweighted list experiments



- Similar conclusions