



The hers and his of prosociality across 10 countries

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Is there a 'more helpful' gender? The present research assessed gender differences in prosocial self-perceptions, prosocial behavioural intentions, and prosocial (transfer) behaviour in same- and other-gender interactions in 10 countries ($N = 1,915$). The present results showed negligible differences in the degree to which women and men saw themselves as prosocial. However, larger gender differences emerged in regard to prosocial behavioural intentions and prosocial (transfer) behaviours across different help contexts (i.e., same- vs. other-gender interactions). In a hypothetical work scenario, women reported greater prosocial behavioural intentions than men when the recipient of the help was of the same gender. In contrast, when the recipient of the help was of the other gender, men reported greater prosocial behavioural intentions than women. In addition, men transferred more than women to both same- and other-gender interaction partners in a prisoner's dilemma game. Taken together, the present findings suggest that there is no 'more helpful' gender. Instead, gender differences in prosociality are dynamic and contextual. Different theoretical perspectives are taken into consideration in discussing gender differences in the present research.

For the past half-century, research has documented gender differences across a range of behaviours, including prosocial behaviours. Previous research has attributed gender differences in prosocial behaviour to different reasons, including gender role expectations (in line with a social role theory account of gender differences; Croft, Atkinson, Sandstrom, Orbell, & Akin, 2020) or sexual selection processes (in line with an evolutionary account of gender differences; Balliet, Li, Macfarlan, & Van Vugt, 2011). In the present research, we bring together previous mixed findings in regard to the question of who is the most 'helpful gender' by assessing gender differences in prosocial self-perceptions (based on self-reports), prosocial behavioural intentions (based on responses to hypothetical scenarios in a work context), and prosocial behaviour towards a stranger (based on monetary transfers in a prisoner's dilemma game) in both same- and other-gender interactions across 10 countries. Furthermore, we investigate a central tenet of social role theory (Eagly & Wood, 2012): Is the perceived gender segregation in communal

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occupations in one's society associated with gender differences in communal prosocial behaviours?

Gender differences in prosocial behaviour

Prosocial behaviours are broadly defined as acts that benefit others (Penner, Dovidio, Piliavin, & Schroeder, 2005). Thus, prosocial behaviour can involve helping, sharing, cooperating, comforting, guiding, rescuing, and defending another individual. Numerous studies have documented gender differences in prosocial behaviours (see reviews by Eagly, 2009; Wiepking & Bekkers, 2012). Can previous research help us answer the question of whether there is a 'more helpful' gender? At first glance, the research literature seems somewhat inconsistent. Some studies suggest that women are more prosocial than men (Brañas-Garza, Capraro, & Rascon-Ramirez, 2018; Charbonneau & Nicol, 2002), whereas other studies suggest that men are more prosocial than women (De Caroli & Sagone, 2013; Dorough & Glöckner, 2019). However, reviews of the research literature conclude that women are not more or less helpful than men. Instead, gender differences in prosocial behaviour depend on the context (i.e., some situations seem to elicit more prosocial behaviour in women, whereas other situations seem to elicit more prosocial behaviour in men; Balliet et al., 2011; Croft et al., 2020; Diekmann & Clark, 2015; Van den Akker, van Assen, van Vugt, & Wicherts, 2020).

One important contextual factor identified by Balliet et al., (2011) is whether help is given to someone of the *same* as opposed to *other* gender. In a review of the economic game literature on gender differences in cooperation, Balliet et al. conclude that—consistent with sexual selection processes—men are more cooperative in same-gender interactions, whereas women are more cooperative in other-gender interactions. However, in a review of social psychological research, Diekmann and Clark (2015) conclude that—consistent with social role theory—men help more in situations that appeal to chivalrous norms (i.e., when interacting with the *other* gender; Eagly & Crowley, 1986). In the present study, we extend previous research on prosociality by investigating gender differences in cooperation (in an economic game) and in intentions to help (in a hypothetical work context) in same- and other-gender interactions. This allows us to investigate whether gender differences in helping behaviour hinge on the gendered context (i.e., whether help is given to someone of the same or other gender) and/or the operationalization of prosocial behaviour.

Communal prosocial behaviour

According to a social role theory account of gender differences, women and men express prosocial behaviours in ways that are congruent with their gender role (Eagly, 2009). Gender roles are rooted in the unequal distribution of women and men across different occupational roles (e.g., Eagly, Wood, & Diekmann, 2000). Across the world, women are overrepresented in communal (caring-oriented) roles, whereas men are overrepresented in agentic (achievement-oriented) roles (Kan, Sullivan, & Gershuny, 2011; World Economic Forum (WEF), 2017). Repeatedly observing women and men in roles that are associated with different degrees of communion and agency gives rise to gender role beliefs (Koenig & Eagly, 2014). For example, men's underrepresentation in communal roles has led to the belief that women are (or should be) more communal—warm, nurturing, and sensitive—than men. Women's underrepresentation in agentic roles, on the other hand, has led to the belief that men are (or should be) more agentic—dominant and

assertive—than women. Such gender role beliefs are, in turn, assumed to give rise to gender differences in behaviour (Eagly & Wood, 2012), as women and men internalize gender role beliefs and regulate their behaviour against their internal standards (Witt & Wood, 2010; Wood, Christensen, Hebl, & Rothgerber, 1997).

Many aspects of prosociality are associated with communal qualities. For example, help can originate in altruistic motivations or take place within close relationships (Eagly, 2009). In line with gender role expectations for women, studies that have assessed gender differences in prosocial behaviour in communication and leadership styles have shown that women are more likely than men to communicate in a supportive manner and to mentor employees (see reviews by Burleson & Kunkel, 2006; Eagly, Johannesen-Schmidt, & van Engen, 2003). In addition, research that has assessed gender differences in prosocial behaviour through economic games, in which participants have to decide how to divide money between themselves and another player, has shown that women give more money to friends (see Espinosa & Kovářík, 2015). It may therefore be reasonable to assume that women are more likely to engage in ‘communal’ helping. Men, on the other hand, may be more likely to engage in ‘agentic’ helping, for example, protecting someone from harm (Rankin & Eagly, 2008).

A social role theory account of gender differences in (communal prosocial) behaviour

Recently, researchers have called for more research on how to promote communal behaviour in men (e.g., Croft, Schmader, & Block, 2015). To inform the design of this research and related interventions and to advance theorizing on gender differences, it is important to identify contexts in which gender differences are reduced (Hyde, 2014). According to social role theory, gender differences are malleable based on the extent to which women and men are perceived to engage in different roles. Previous research shows that gender differences in prosocial behaviour vary between countries (e.g., Kumru, Carlo, Mestre, & Samper, 2012), which suggests that gender differences in behaviour are dynamic (as would be expected from a social role perspective) rather than universal and slow to change (as would be expected from an evolutionary perspective).

Social role theory postulates that ‘sex differences and similarities in behaviour reflect *gender role beliefs* that in turn represent people’s *perceptions* [emphasis added] of men’s and women’s *social roles* in the society in which they live’ (p. 459; Eagly & Wood, 2012). The extent to which gender differences correspond with gender segregation in the labour market is sometimes interpreted as evidence for social role theory (e.g., Falk & Hermle, 2018). Since it is women’s and men’s *perceptions* of the gender-based division of roles that are theorized to influence their behaviour (Eagly & Wood, 2012), previous evidence hinges on the premise that people can accurately estimate gender segregation in roles in their society. However, research suggests that although people are aware of occupational gender segregation, they tend to underestimate its magnitude (Beyer, 2018; Froehlich, Olsson, Dorrough, & Martiny, 2020). In the present research, we therefore predicted gender differences from *perceived* gender segregation in occupational roles. Specifically, we examine the degree to which perceiving men in communal occupations is associated with communal prosocial behaviour in men.

Overview and hypotheses

The first goal of our research was to test gender differences in prosociality. We selected and developed scales of prosocial self-perceptions and behavioural intentions,

respectively, to measure interpersonal, altruistic, and empathic helping (i.e., ‘communal’ helping). In line with gender role expectations of women, we hypothesize that women will report higher prosocial self-perceptions (H1a) and prosocial behavioural intentions in same-gender interactions than men (H1b). In addition, we explore gender differences in prosocial behavioural intentions towards the other gender. In order to bring together different research traditions that have assessed gender differences in prosocial behaviour using different measures, we also explore gender differences in actual prosocial behaviour (based on a monetary transfer in an economic game) towards same- and other-gender interaction partners.

For theory development, it is important to generalize findings not only across measures and helping contexts, but also across countries (Henrich, Heine, & Norenzayan, 2010). We therefore assess gender differences in prosociality across 10 countries (Chile, China, Colombia, Indonesia, Japan, Mexico, Russia, Spain, Sweden, and the United States). These countries vary significantly in economic wealth, gender equality, and WEIRDness (Henrich et al., 2010), which further increases generalizability.

The second goal of our research was to assess predictors of men’s engagement with communal prosociality. On the basis of social role theory, we hypothesize that participant gender will interact with the perceived proportion of men in communal occupations in predicting communal prosociality. Specifically, we expect that men who perceive a larger proportion of men in communal occupations will report more prosocial self-perceptions (H2a) and prosocial behavioural intentions in same-gender interactions (H2b). Conversely, we hypothesize that the degree to which women perceive men in communal occupations will have a non-existent or even reversed effect on their prosocial self-perceptions and prosocial behavioural intentions in same-gender interactions.

The data reported here are part of a larger data set (used to test several other research questions^{1,2,3}). The hypotheses tested here were pre-registered on the Open Science Framework (OSF; <https://osf.io/cs4yf/>) prior to analyses but after data collection (see Appendix S1 for details of minor deviations from planned analyses).

Previous research shows that subjective socioeconomic status (SES) and age correlate with individuals’ engagement in prosocial behaviour (Piff & Robinson, 2017; Sze, Gyurak, Goodkind, & Levenson, 2012). Moreover, gender differences increase with the economic development and degree of gender equality of a country (a phenomenon that has become known as the gender equality paradox effect; Falk & Hermle, 2018; Stoet & Geary, 2018). In order to test the robustness of gender differences in prosocial behaviour (Wiepking & Bekkers, 2012), we control for individual-level subjective SES and age, as well as country-level GDP per capita and gender equality (see Appendix S1 for exploratory analyses related to the gender equality paradox effect).

Method

Participants and design

Data were collected via an online panel provider (Toluna: <https://de.toluna.com/>). The sample was recruited to be representative of the population in each country in terms of

¹ The extent to which risk preferences mediate gender differences in the amount transferred in a prisoner’s dilemma game is reported in DorrOUGH and Glöckner (2020).

² The extent to which women and men in female- and male-dominated occupations are perceived as agentic and communal is reported in Froehlich et al., (2020).

³ Gender differences in compensation and punishment are reported in DorrOUGH et al., (2020).

age and gender (see Appendix S1 for targeted and achieved gender and age distribution per country). Data were collected at 2 time points (at an interval of approximately 1 week, see OSF for an overview of measures included at Part 1 and Part 2: <https://osf.io/ec25t/>). A total of 2,467 participants from 10 countries were invited to participate in the study via an online questionnaire in September 2018 (attrition rate = 17%). Participants were included in the analyses if they completed both parts of the questionnaire, entered a valid participant code, and indicated the same country of origin that they had registered with the panel provider. In addition, participants who reported an improbable age ($n = 2$) or specified *other* as their gender ($n = 3$) were excluded. A final sample of $N = 1915$ was analysed (see Appendix S1 for power analyses). See Table 1 for sample size by country.

In line with recommendations for cross-cultural research by Sidanius, Levin, Liu, and Pratto (2000), we sampled cultures across the whole spectrum of gender equality. Countries were selected based on their ranking on the Gender Inequality Index (GII, 2017, which measures gender equality with regards to reproductive health, empowerment, and economic status; <http://hdr.undp.org/en/content/gender-inequality-index-gii>). We divided the GII into 10 sections and selected one country from each section. The following countries were selected: Indonesia (GII rank 104 of 160), Colombia (rank 87), Mexico (rank 76), Chile (rank 72), Russia (rank 53), United States (rank 41), China (rank 36), Japan (rank 22), Spain (rank 15), and Sweden (rank 3).

The materials were translated from English into the official language of each country by a professional translation agency (<https://www.e-kern.com/>). Each translation was subsequently checked by a researcher in psychology who was fluent in one of the languages as well as English. Following feedback from our colleagues, the translation company revised the translations. Materials in all languages (<https://osf.io/7ybns/>) and data for the present analyses are available on the OSF (<https://osf.io/24bdf/>).

Materials

Perceived gender segregation in communal occupations

We assessed the degree to which five occupations perceived in the United States to be female-dominated and communal (i.e., geriatric aide, nurse, nursery school teacher, secretary, and therapist; Cejka & Eagly, 1999; Koenig & Eagly, 2014) were perceived to be

Table 1. Sample information for each country

Country	<i>N</i> (<i>n</i> men)	Age range
United States	115 (52)	19–86
Sweden	210 (99)	18–86
Spain	217 (105)	18–78
Japan	212 (110)	20–81
China	185 (101)	18–87
Russia	229 (96)	19–77
Chile	158 (83)	18–82
Mexico	201 (100)	18–75
Colombia	203 (98)	18–71
Indonesia	185 (80)	18–69
Total	1915 (924)	18–87

Note. The sample size varies between countries due to participant drop-out.

female-dominated and communal in each country in our sample (see Appendix S1 for more details). The perceived proportion of men across these roles was averaged to form a measure of *perceived gender segregation in communal occupations*. The scale ran from 0% men to 100% men (α ranged from .75 to .84 across countries).

Prosocial self-perceptions

We selected six items from Caprara, Steca, Zelli, and Capanna (2005) to assess *prosocial self-perceptions*. For example: 'I try to be close to and take care of those who are in need' (α ranged from .81 to .90 across countries; see Appendix S1 for testing of structural equivalence with Confirmatory Factor Analysis with multigroup comparison). The scale ran from 1 (Never true) to 5 (Always true).

Prosocial behavioural intentions

We developed five scenarios to assess participants' *prosocial behavioural intentions*. The scenarios were situated at an office as this is a context that would be familiar to both women and men across the countries in our sample. Each scenario depicted a work situation in which the participant had to report the extent to which they would help a colleague⁴. For example: 'Take a moment and imagine the following scenario. You are at the office working together in a team towards an important goal. You observe that one of your [male/female] work colleagues is not feeling very well emotionally. How likely do you think it is that you would step in and support your work colleague emotionally?' The scenarios were presented in a randomized order (α ranged from .75 to .89 in same-gender interactions and .82 – .91 in other-gender interactions across countries; see Appendix S1 for testing of structural equivalence with Confirmatory Factor Analysis with multigroup comparison). The scale ran from 1 (Very unlikely) to 7 (Very likely). We presented the scenarios to participants twice (first assessing intentions to be helpful to someone of the same gender, then assessing intentions to be helpful to someone of the other gender).

Prosocial (Transfer) behaviour

Participants' transfer during a continuous version of the prisoner's dilemma game (e.g., Dorrrough & Glöckner, 2016) was used as a measure of *prosocial behaviour*. We gave participants an initial endowment of 100 Talers (the experimental currency; 100 Talers = 1 USD). Participants were informed that they and their (anonymous) interaction partner had to decide how much of their respective endowment they would like to transfer to one another (but that neither they nor their interaction partner would be made aware of how much the other had transferred). To make cooperation more profitable, participants were informed that any amount transferred by themselves and their interaction partner would be doubled by the experimenter and may factor into their bonus payment (which could range from 0–400 Talers). Participants' bonus payment was either determined by the outcome of (1) the prisoner's dilemma game, (2) expectations in

⁴ In two of the five scenarios, a 'perpetrator' was depicted. For example: 'Take a moment and imagine the following scenario. You are at the office working together in a team towards an important goal. You observe that one of your work colleagues is suffering moderate verbal abuse from another [male/female] work colleague. How likely do you think it is that you would step in and comfort the victim?' In both scenarios, the gender of the 'perpetrator' (i.e., the person who verbally abused another teammate) was matched to the gender of the participant.

the prisoner's dilemma, (3) the Holt and Laury lotteries (Holt & Laury, 2005), (4) the SVO slider measure (Murphy, Ackermann, & Handgraaf, 2011), or (5) a compensation/punishment game that participants also completed as part of this study. If the prisoner's dilemma result had been randomly selected to form the bonus payment, participants' bonus would be the sum of their initial endowment plus the amount their interaction partner had transferred to them (multiplied by 2), minus the amount they had transferred to their interaction partner. For example, if participants transferred 50 Talers to their interaction partner and their interaction partner transferred 40 Talers to them, their bonus payment would be: $100 - 50$ (i.e., the amount they transferred to their interaction partner) $+ 40$ (i.e., the amount their interaction partner transferred to them) $\times 2 = 130$. Participants had to pass four comprehension questions assessing whether they had understood how their bonus would be calculated before being asked to decide how much they would like to transfer to an interaction partner of the same gender and then to an interaction partner of the other gender.

Control variables

Subjective SES

Participants indicated their SES along a ten-point ladder (the MacArthur scale of Subjective Socioeconomic Status; Adler, Epel, Castellazzo, & Ickovics, 2000) with higher level rungs indicating higher relative SES. The vignette read: 'Imagine that this picture of a ladder shows how your society is set up. At the top of the ladder are the people who have the highest standing in your society – they have the most money, the highest amount of schooling and the jobs that bring the most respect. At the bottom are people who have the lowest standing in your society – they have the least money, little or no education, no job or jobs that nobody wants or respects. Now think about yourself. Please select the number of the rung that shows where you think you would be on this ladder'. The scale ran from 1 (Low SES) to 10 (High SES).

Age

Participants were asked to indicate their age (in years).

GDP per capita

GDP per capita was used as a measure of country-level *economic development*. GDP per capita is a value based on a country's economic activity divided by its population. Since GDP per capita may spike from one year to another, we averaged the values from 2015 to 2017 to get a better estimate of the country's economic activities over recent years (data were retrieved from <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>). To address positive skew in the GDP per capita data, the scale was logarithmic (log) transformed.

Gender equality

The global index score from the Global Gender Gap Index (GGGI, WEF, 2017) was used as a proxy for country-level *gender equality*. The global index score is based on female-to-male ratios in economic participation and opportunity, educational attainment, health

and survival, and political empowerment. The global index score ranged from 0 to 1 (a score of 1 indicates that the number of women is equal to (or greater than) the number of men).

Results

Descriptive statistics

Prosocial self-perceptions, prosocial behavioural intentions, and prosocial (transfer) behaviour were positively correlated (see Appendix S1 for zero-order correlations between outcome variables).

Descriptive statistics showed that women and men see themselves as highly prosocial (the average response for prosocial self-perceptions and prosocial behavioural intentions was above the scale midpoint in all countries). Women and men transferred on average approximately half of their initial endowment of 100 Talers. However, men tended to transfer more than women. In the vast majority of countries, the average transfer by women was below the scale midpoint, whereas the average transfer by men was above the scale midpoint (see Table 2 for means and standard deviations for all outcome variables).

Gender differences in prosocial self-perception, prosocial behavioural intentions in same- and other-gender interactions, and prosocial (transfer) behaviour in same- and other-gender interactions showed similar directions in the vast majority of countries (see Appendix S1).

Analytical strategy

We used R and the *lme4* package (Bates, Mächler, Bolker, & Walker, 2015) to fit linear mixed models⁵ to predict gender differences in prosociality. We used the *lmerTest* package (Kuznetsova, Brockhoff, & Christensen, 2017) to obtain *p*-values for the fixed effects. The hypotheses were tested with age and subjective SES as control variables on the individual level, and log GDP per capita and gender equality as control variables on the country level⁶. All control variables were centred at the grand mean (in line with recommendations by Enders & Tofighi, 2007). Interactions were created by first centring variables and then multiplying them (Table 3).

Model 1: Gender differences in prosocial self-perceptions

In Model 1, we assessed gender differences in prosocial self-perceptions and whether gender differences in prosocial self-perceptions varied as a function of the perceived proportion of men in communal occupations. In order to examine whether there was sufficient variance at the different levels to justify a hierarchical linear model, we first ran a model that included no predictor variables. The intraclass correlation coefficient (ICC) indicated sufficient clustering at the country level (ICC = 0.09, LeBreton & Senter, 2008). To take into account that observations were non-independent and clustered within countries, we fitted a 2-level hierarchical linear model. We included intercept for country as a random effect, thereby accounting for between-country variability. We included

⁵ Testing the hypotheses with OLS regression with clustered SEs generated comparable results for all the reported findings. However, the effect of the interaction between gender, interaction type, and perceived proportion of men in communal occupations was reduced and marginally significant (for more details, see Appendix S1).

⁶ Testing the hypotheses without control variables generated comparable results for all the reported findings.

Table 2. Descriptive statistics for outcome variables within countries

Country	Self-perceptions M (SD)	Intentions (same-gender) M (SD)	Intentions (other-gender) M (SD)	Transfer (same-gender) M (SD)	Transfer (other-gender) M (SD)
United States					
Female	4.16 (0.63)	5.37 (1.13)	5.12 (1.35)	48.73 (26.73)	46.67 (27.47)
Male	4.09 (0.57)	4.73 (1.42)	4.88 (1.53)	50.47 (23.83)	50.96 (23.45)
Sweden					
Female	3.97 (0.63)	5.08 (1.11)	4.91 (1.25)	48.73 (25.35)	44.18 (24.40)
Male	3.94 (0.66)	5.11 (1.21)	5.35 (1.19)	51.21 (28.62)	53.33 (28.32)
Spain					
Female	4.05 (0.65)	5.53 (0.90)	5.35 (1.06)	45.71 (25.95)	47.41 (27.76)
Male	3.99 (0.59)	5.32 (0.97)	5.45 (1.01)	52.48 (27.24)	53.52 (26.09)
Japan					
Female	3.26 (0.76)	4.08 (1.06)	3.81 (1.02)	47.16 (27.70)	41.96 (26.37)
Male	3.37 (0.70)	4.10 (0.88)	4.20 (1.00)	43.27 (26.13)	44.18 (24.36)
China					
Female	4.36 (2.79)	4.97 (1.03)	4.73 (1.15)	47.26 (24.90)	47.30 (24.93)
Male	3.93 (0.57)	4.80 (1.03)	4.85 (1.05)	49.90 (27.59)	53.76 (25.05)
Russia					
Female	3.80 (0.93)	4.82 (1.18)	4.67 (1.40)	47.18 (21.92)	47.74 (23.07)
Male	3.62 (0.78)	4.78 (1.10)	4.90 (1.24)	53.30 (23.66)	57.66 (26.70)
Chile					
Female	4.39 (0.69)	5.85 (0.90)	5.68 (1.18)	47.07 (22.47)	48.80 (23.76)
Male	4.18 (0.70)	5.64 (1.16)	5.92 (1.24)	47.35 (24.10)	51.45 (21.59)
Mexico					
Female	4.06 (0.66)	5.51 (1.17)	5.27 (1.35)	47.72 (22.80)	46.83 (23.19)
Male	4.25 (0.63)	5.48 (1.51)	5.82 (1.30)	54.80 (24.47)	52.70 (23.82)
Colombia					
Female	4.38 (0.57)	5.87 (1.01)	5.60 (1.19)	50.57 (25.75)	46.38 (24.62)
Male	4.34 (0.53)	5.68 (1.00)	6.10 (0.98)	54.18 (25.64)	53.98 (25.23)
Indonesia					
Female	4.09 (0.64)	5.44 (1.01)	5.13 (1.16)	49.43 (27.94)	49.24 (28.24)
Male	4.23 (0.69)	5.49 (1.11)	5.38 (1.23)	52.00 (28.08)	55.12 (28.51)

gender (centred at the grand mean in line with recommendations by Enders & Tofghi, 2007; female = -0.48 , male = 0.52) and perceived proportion of men in communal occupations (centred within countries in line with recommendations by Enders & Tofghi, 2007) as predictors on the individual level. In addition, we included an interaction between gender and perceived proportion of men in communal occupations.

The results of Model 1 are displayed in Table 3. We hypothesized that women would report higher prosocial self-perceptions than men (H1a). In line with our prediction, women reported higher prosocial self-perceptions than men. However, this difference was not statistically significant ($b = -0.06$, $SE = 0.03$, $p = .066$, 95% CI [-0.12 , 0.004]).

In addition, we hypothesized that perceiving more men in communal occupations would be positively associated with men's, but negatively (or negligibly) associated with women's prosocial self-perceptions (H2a). Contrary to our predictions, the interaction between gender and perceived proportion of men in communal occupations was not statistically significant ($b = -0.002$, $SE = 0.002$, $p = .140$, 95% CI [-0.01 , 0.001]).

Table 3. Hierarchical linear regression results for prosocial self-perceptions predicted by gender and perceived proportion of men in communal occupations

	Coefficient	SE	t	95% CI		p
				LL	UL	
Fixed effects						
Level 1						
Intercept	4.00	0.07	61.51	3.86	4.14	<.001
Age	0.01	0.001	4.44	0.003	0.01	<.001
Subjective SES	-0.05	0.01	-5.29	-0.07	-0.03	<.001
Gender	-0.06	0.03	-1.84	-0.12	0.004	.066
Perceived proportion of men	0.002	0.001	2.34	0.0003	0.003	.019
Gender * Perceived proportion of men	-0.002	0.002	-1.48	-0.01	0.001	.140
Level 2						
Log GDP per capita	-0.20	0.08	-2.50	-0.37	-0.03	.031
Gender equality	3.87	1.68	2.30	0.22	7.51	.045
Random Effects						
	Coefficient	SD				
Intercept variance (country level)	0.04	0.20				

Note. Gender was coded -0.48 for females and 0.52 for males. $N = 1907$ at Level 1 (individuals). Coefficients represent unstandardized regression weights (fixed effects) and variances (random effects).

Model 2: Gender differences in prosocial behavioural intentions

In Model 2, we assessed gender differences in prosocial behavioural intentions and whether gender differences in prosocial behavioural intentions varied as a function of the perceived proportion of men in communal occupations. We transformed the data into long format (1915 participants \times 2 prosocial intentions in same- vs. other-gender interactions). To take into account that observations were non-independent at the individual (ICC = 0.82) and country level (ICC = 0.16), we fitted a 3-level hierarchical linear model. We included intercepts for country and individuals as random effects to account for within-individual and between-country variability. We included interaction type (i.e., whether helping took place in a same- vs. other-gender context) as a predictor on the observational level (centred within individuals; same-gender = -0.5 , other-gender = 0.5) and gender and perceived proportion of men in communal occupations as predictors on the individual level. In addition, we included a cross-level interaction between interaction type and gender and a cross-level interaction between interaction type, gender, and perceived proportion of men in communal occupations.

The results of Model 2 are displayed in Table 4. We hypothesized that women would report higher prosocial behavioural intentions than men in same-gender interactions (H1b). In line with our prediction, simple slopes analyses showed that in same-gender interactions, women reported higher levels of prosocial behavioural intentions than men ($b = -0.16$, $SE = 0.05$, $p = .003$, 95% CI $[-0.27, -0.06]$). In other-gender interactions, on the other hand, men reported higher levels of prosocial

Table 4. Hierarchical linear regression results for prosocial behavioural intentions predicted by gender, interaction type, and perceived proportion of men in communal occupations

	Coefficient	SE	t	95% CI		p
				LL	UL	
Fixed effects						
Level 1						
Intercept	5.17	0.10	50.57	4.94	5.39	<.001
Interaction type	-0.03	0.02	-1.76	-0.06	0.003	.079
Level 2						
Age	0.004	0.002	2.24	0.0005	0.01	.025
Subjective SES	-0.08	0.02	-5.16	-0.11	-0.05	<.001
Gender	0.04	0.05	0.75	-0.06	0.14	.453
Perceived proportion of men	0.01	0.001	4.51	0.003	0.01	<.001
Gender * Perceived proportion of men	0.0003	0.003	0.10	-0.005	0.01	.918
Level 3						
Log GDP per capita	-0.36	0.13	-2.84	-0.62	-0.08	.017
Gender equality	7.41	2.64	2.81	1.68	13.13	.019
Cross-level interaction						
Interaction type * Gender	0.40	0.03	11.91	0.33	0.47	<.001
Interaction type * Perceived proportion of men	0.002	0.001	1.88	-0.0001	0.003	.060
Interaction type * Gender * Perceived proportion of men	-0.004	0.002	-2.15	-0.01	-0.0003	.032
Random Effects						
Coefficients						
Intercept variance (individual level)	1.01	1.01				
Intercept variance (country level)	0.10	0.31				

Note. Interaction type was coded -0.5 for same-gender interactions and 0.5 for other-gender interactions. Gender was coded -0.48 for females and 0.52 for males. N = 3830 at Level 1 (observations) and N = 1915 at Level 2 (individuals). Coefficients represent unstandardized regression weights (fixed effects) and variances (random effects).

behavioural intentions than women ($b = 0.24$, $SE = 0.05$, $p < .001$, 95% CI [0.13, 0.34])⁷.

In addition, we hypothesized that gender would interact with the perceived proportion of men in communal occupations in predicting prosocial behavioural intentions in same-gender interactions (H2b). Specifically, we predicted that perceiving more men in communal occupations would be positively associated with men's, but negatively (or negligibly) associated with women's prosocial behavioural intentions. To test our hypothesis, we ran two simple slopes analyses in same-gender interactions. When examining the slope of gender at different levels of perceived proportion of men in communal occupations, we noted that gender differences in prosocial behavioural intentions in same-gender interactions were larger when the proportion of men in communal occupations was perceived to be relatively low ($-1\ SD$: $b = -0.20$, $SE = 0.08$, $p = .007$, 95% CI [-0.35, -0.05]), than relatively high ($+1\ SD$: $b = -0.12$, $SE = 0.07$, $p = .107$, 95% CI [-0.27, 0.03]). When examining the slope of perceived proportion of men in communal occupations for women and men, respectively, we noted in line with our prediction that the slope was steeper for men ($b = 0.01$, $SE = 0.002$, $p = .002$, 95% CI [0.002, 0.01]) than for women ($b = 0.004$, $SE = 0.002$, $p = .042$, 95% CI [0.0002, 0.01]), indicating that perceiving more men in communal occupations is associated with more prosocial behavioural intentions in same-gender interactions among men than women.

Model 3: Gender differences in prosocial (transfer) behaviour

In Model 3, we assessed gender differences in prosocial (transfer) behaviour and whether gender differences in prosocial (transfer) behaviour varied as a function of the perceived proportion of men in communal occupations. Again, we transformed the data into long format (1915 participants \times 2 transfer in same- vs. other-gender interactions). The ICC indicated sufficient clustering at the individual level (ICC = 0.62), but not at the country level (ICC = 0.004, LeBreton & Senter, 2008), which indicates that the distribution of individuals' transfer was similar across countries. To take into account that observations were non-independent at the individual level, we fitted a 2-level hierarchical linear model. We included a random intercept for individuals to account for within-individual variability. As in Model 2, we included interaction type (i.e., whether helping took place in a same- vs. other-gender context) as a predictor on the observational level, and gender and perceived proportion of men in communal occupations as predictors on the individual level. In addition, we included a cross-level interaction between gender and interaction type, and a cross-level interaction between interaction type, gender, and perceived proportion of men in communal occupations.

The results of Model 3 are displayed in Table 5. Simple slopes analyses for the interaction between gender and interaction type showed, in line with the findings for prosocial behavioural intentions, that in other-gender interactions, men engaged in more prosocial (transfer) behaviour than women ($b = 5.51$, $SE = 1.20$, $p < .001$, 95% CI [3.15, 7.86]). However, contrary to the findings for prosocial behavioural intentions, in same-gender interactions women engaged in less prosocial (transfer) behaviour than men ($b = 2.58$, $SE = 1.20$, $p = .032$, 95% CI [0.23, 4.94])⁸. The interaction between gender,

⁷ Testing gender differences across same- vs. other-gender interactions without including scenarios with a perpetrator generated comparable results.

⁸ Fitting a 3-level model, in which we controlled for country-level log GDP per capita and gender equality generated comparable results for gender differences in same- vs. other-gender interactions.

Table 5. Hierarchical linear regression results for prosocial (Transfer) behaviour predicted by gender, interaction type, and perceived proportion of men in communal occupations

	Coefficient	SE	t	95% CI		p
				LL	UL	
Fixed effects						
Level 1						
Intercept	49.44	0.52	94.89	48.42	50.46	<.001
Interaction type	0.18	0.51	0.35	-0.82	1.18	.727
Level 2						
Age	0.04	0.04	1.23	-0.03	0.11	.220
Subjective SES	-0.70	0.30	-2.31	-1.29	-0.11	.021
Gender	4.04	1.09	3.72	1.91	6.18	<.001
Perceived proportion of men	0.09	0.03	3.27	0.04	0.14	<.001
Gender * Perceived proportion of men	-0.05	0.06	-0.96	-0.16	0.06	.337
Level 3						
Cross-Level Interaction						
Interaction type * Gender	2.92	1.02	2.86	0.92	4.93	.004
Interaction type * Perceived proportion of men	-0.01	0.03	-0.23	-0.06	0.05	.818
Interaction type * Gender * Perceived proportion of men	-0.08	0.05	-1.48	-0.19	0.03	.139
Random effects						
Intercept variance (individual level)	394.9	19.87				

Note. Interaction type was coded -0.5 for same-gender interactions and 0.5 for other-gender interactions. Gender was coded -0.48 for females and 0.52 for males. N = 3830 at Level 1 (observations) and N = 1915 at Level 2 (individuals). Coefficients represent unstandardized regression weights (fixed effects) and variances (random effects).

interaction type, and perceived proportion of men in communal occupations was not statistically significant ($b = -0.08$, $SE = 0.05$, $p = .139$, 95% CI [-0.19, 0.03]).

Discussion

The first aim of the present research was to investigate gender differences in prosociality. The present results only showed small gender differences in prosocial self-perceptions. The prosocial self-perceptions measure we used was very general and thus may not have elicited specific gender role expectations as all people (regardless of their gender) are expected to be interpersonally helpful and supportive. However, by assessing help in different contexts (i.e., in same- vs. other-gender interactions), we seem to have elicited expectations specifically associated with the female and male gender role, which triggered larger gender differences. Specifically, we found that women reported higher helping intentions in same-gender interactions, whereas men reported higher helping intentions in other-gender interactions. These findings suggest that it may be more acceptable for women than for men to help members of their own gender. However, we did not find that women transferred more monetary resources than men in same-gender interactions (in fact, we found the contrary). Researchers have concluded that women transfer more than men because they have internalized gender role expectations to be more altruistic than men (Brañas-Garza et al., 2018; Rand, Brescoll, Everett, Capraro, & Barcelo, 2016). Our finding that men transfer more than women is not necessarily contrary to gender role expectations, as transfer could potentially lead to less profit (if the other player does not reciprocate). It is possible therefore that women transferred less than men (or men transferred more than women) because the prisoner's dilemma game elicited risk-taking, which is associated with agency (i.e., the male gender role; Charness & Gneezy, 2012). The scenarios, on the other hand, involved communal behaviour (e.g., supporting one's colleague emotionally). Hence, our findings suggest that women only help more than men in same-gender situations *if* the situation makes the female gender role salient.

In line with the findings for prosocial behavioural intentions in other-gender interactions, men also transferred more than women in other-gender interactions. Gender differences were larger in other-gender transfers than in same-gender transfers, which suggests that it may be particularly acceptable for (or expected of) men to help women. Our findings are congruent with previous research by Buunk and Massar (2012), who found that male players were more likely to share resources with female players than female players were with male players. Buunk and Massar argued that men's inclination to help women is rooted in sexual selection processes (i.e., men compete with other men for women's favour, which they gain by giving women gifts). Whereas Buunk and Massar's findings (and our own) could be explained by sexual selection processes, both findings could also be explained by benevolent sexism (i.e., the belief that a man's role is to protect and support women; Shnabel, Bar-Anan, Kende, Bareket, & Lazar, 2016).

With the present data, we are not able to determine whether or to what extent sexual selection and/or gender role expectations explain gender differences in prosociality. However, social role theory makes assumptions about gender differences that can be tested with the present data. In line with social role theory, we found that men's tendency to engage in 'communal' helping (i.e., supporting a colleague of the same gender emotionally) was more pronounced among men who

perceived relatively more men in communal occupations in their society. However, contrary to the assumptions of social role theory, this effect, albeit weaker, was also visible for women, which raises the possibility that a third variable may explain (at least part of) this effect.

Limitations and implications for future research

The present research design allowed us to test contextual factors of gender differences in prosociality. We assessed gender differences in prosociality across different measures (i.e., self-perceptions, behavioural intentions, and transfer behaviour in a prisoner's dilemma game), across different countries (that had been selected to represent a spectrum from low gender equality to high gender equality), and across same- vs. other-gender interactions. These contextual factors seem to elicit more or less helping behaviour in women and men (even after controlling for individual-level subjective SES and age, and country-level log GDP per capita and gender equality).

Despite several strengths of the present design, we outline in what follows a few recommendations for future research on gender differences in prosociality. First, the degree to which women and men interact with members of the opposite gender in their daily lives may vary between countries. Participants were therefore informed that they were first interacting with a person of the same gender. We did not find any order effects (as men recorded more prosocial intentions in the second round of interactions, whereas women recorded more prosocial intentions in the first round of interactions). Nevertheless, counterbalancing is good practice and should be considered in future research.

Second, the present findings are interpreted within a same- vs. other-gender framework (in line with previous research traditions; e.g., Balliet et al., 2011). It is, however, important to point out that our findings could be re-interpreted to mean that 'everyone intends to help women more'. Similarly, previous research by Balliet et al., (2011) could be re-interpreted to mean that 'everyone helps men more'. These mixed conclusions suggest that gender differences in helping are not solely driven by similarity in the gendered context (i.e., whether help is given to someone of the same vs. other gender). To clarify what is driving gender differences in prosocial behaviour, future research should test whether gender differences in helping are mediated by gender role expectations of the helper (e.g., the expectation for men to be chivalrous and for women to be caring) or by gender stereotypes about the potential recipient of help (e.g., perceiving that women need more help than men or that men do not want/need help). By identifying what processes underlie gender differences in helping behaviour, these findings could determine whether interventions that aim to reduce gender differences in different helping contexts should target stereotypes or role expectations of women, men, or both. Furthermore, future research can inform interventions by replicating these effects across different contexts, as gender differences in helping may be particularly pronounced in contexts that are dominated by one gender (e.g., the domestic domain; Shnabel et al., 2016).

Third, we did not replicate gender differences in same-gender interactions across different operationalizations of prosociality. Since cooperation in the prisoner's dilemma game involves some financial risk-taking (which may have primed male gender role expectations), future research should test whether women engage in more helping behaviour in same-gender interactions with a dictator game, which does not involve risk-taking. Further, sensitivity power analyses showed that we had sufficient power to detect small-to-medium (but not very small effects) within countries. Whereas the effects for

prosocial behavioural intentions and prosocial (transfer) behaviour were in the same direction in most countries, they were not always statistically significant. Larger p -values represent a greater likelihood that (if the null hypothesis is true), effects of that size (or larger) may not replicate in random samples. Future research may thus wish to replicate this study with larger samples in each respective country to assess whether gender differences in prosocial behavioural intentions and prosocial (transfer) behaviour are in fact smaller in some countries and therefore present but undetectable with the current sample size. Finally, future research should further explore what underlies gender differences in prosocial behaviours. With a larger selection of countries (30–50; Maas & Hox, 2005), future research could compare the assumptions of different theoretical perspectives of gender differences (Falk & Hermle, 2018).

Implications for society

As indicated by the range of the confidence intervals, the present effects of gender differences in prosocial behavioural intentions and prosocial (transfer) behaviour are small. However, even small gender differences in behaviour can accumulate and have substantial consequences (see Hyde & Lindberg, 2007). It is important to address men's lesser inclination to engage in communal helping as men's relative lack of communal engagement has been linked to negative effects for both women and men (see Croft et al., 2015; Meeussen, Van Laar, & Van Grootel, 2020). The present data suggest that exposure to men in communal roles may be one possible way to reduce gender differences in communal prosocial behaviour.

Conclusion

In line with the conclusions of past researchers, we conclude that there is no 'more helpful' gender. Instead, gender differences in prosocial behaviour are dynamic and contextual.

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Conflict of interest

All authors declare no conflict of interest.

Author contributions

Maria Ingrid Teresa Olsson (Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Writing – original draft; Writing – review & editing). Laura Froehlich (Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Writing – original draft; Writing – review & editing). Angela R Dorrough (Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Writing – original draft; Writing – review & editing). Sarah E Martiny (Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Supervision; Writing – original draft; Writing –review & editing).

Data availability statement

The data that support the findings of this study are openly available on the Open Science Framework at: <https://osf.io/24bdf/>

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Supporting Information

The following supporting information may be found in the online edition of the article:

Appendix S1 The hers and his of prosociality across 10 countries.