Rooting for Their Own Gender: Preschoolers' Selective Preference for Winners

Cristina-ioana Galusca, Anna Eve Helmlinger, Elodie Barat, Olivier Pascalis, Jean-Baptiste Van der Henst

Developmental Science

WILEY

Developmental Science

SHORT REPORT OPEN ACCESS

Rooting for Their Own Gender: Preschoolers' Selective Preference for Winners

Cristina-Ioana Galusca[1,2] | Anna Eve Helmlinger[3] | Elodie Barat[3,4] | Olivier Pascalis[1] | Jean-Baptiste Van der Henst[3]

[1]LPNC, CNRS UMR 5105,Université Grenoble Alpes, Saint-Martin-d'Heres, France | [2]LIP-PC2S, Université Grenoble Alpes, Saint-Martin-d'Heres, France | [3]Université Claude Bernard Lyon 1, CNRS, INSERM, Centre de Recherche en Neurosciences de Lyon CRNL U1028 UMR5292, TRAJECTOIRES, Bron, France | [4]Team Vulnerability, Capability, and Recovery (VCR), School of Practitioners' Psychologists, Catholic University of Paris, Paris, France

Correspondence: Cristina-Ioana Galusca (c.galusca@gmail.com)

Received: 21 October 2023 | **Revised:** 10 September 2024 | **Accepted:** 12 September 2024

Keywords: dominance relations | gender stereotypes | gendered power | mixed-gender interactions | own-gender bias

ABSTRACT

Children's social preferences are influenced by the relative status of other individuals, but also by their social identity and the degree to which those individuals are like them. Previous studies have investigated these aspects separately and showed that in some circumstances children prefer high-status individuals and own-gender individuals. Gender is a particularly interesting case to study because it is a strong dimension of social identity, but also one of the most prevalent forms of social hierarchy, with males conceptualised as superior to females, by adults and children alike. Here we directly asked how children's social preferences are influenced by status (winner or loser of a zero-sum conflict) and winner gender (female or male) in different scenarios (same or mixed-gender). In Experiment 1, children saw same-gender conflicts between two females or two males and they displayed an overall preference for winners. In Experiment 2, participants watched two mixed-gender conflicts, one where the female prevailed and one where the male prevailed. In this case, children chose the winner, but only when they had the same gender as themselves. Experiment 3 confirmed that children preferred own-gender individuals in the absence of conflict or status. Overall, children are sensitive to the relative status of other individuals and use this information to make social decisions. However, preschoolers do not prefer just any individual who wins access to a resource. They preferred dominant individuals, but only when they were of their own gender. This suggests that children's dominance evaluations are modulated by children's social identity.

1 | Background

In social species, dominance hierarchies play a pivotal role in structuring relationships between individuals. In humans, hierarchies often derive from the social categories individuals belong to, and gender is one of the most ubiquitous group-based hierarchies across ages and cultures. From an early age, children are aware of both hierarchical relationships and gender categories. For instance, by preschool age, children are sensitive to dyadic third-party power relations based on achieving goals, controlling resources or giving permission (Castelain et al. 2016; Charafeddine et al. 2015; Enright et al. 2020; Gülgöz and Gelman 2017; Shutts et al. 2016), but also to physical cues of relative force and dominance (Cogsdill et al. 2014; Galusca et al. 2023; Terrizzi et al. 2019). They can also reliably judge someone else's gender, as well as their own (Stennes et al. 2005). By age 4, children acquire gender stereotypes about clothing, toys and physical appearance (Etaugh and Duits 1990; Weinraub et al. 1984; Weinraub and Brown 1983). Around the same age, they begin to represent gender hierarchically and are more likely to associate power with

Olivier Pascalis and Jean-Baptiste Van der Henst shared the last authorship.

Summary

- Children prefer dominant individuals, but only when their own gender is not disadvantaged.
- Unlike adults, children show no preference for male over female dominance.
- In mixed-gender interactions, preschoolers prefer same-gender winners following zero-sum conflicts.
- Early social preferences are modulated not only by dominance but also by biases for own-gender individuals.

males than with fem (Charafeddine et al. 2020). These early representations of gendered power may simply reflect children's sensitivity to the power distribution in their environment, but not their attitudes towards gendered power. Here, we addressed how children evaluate gendered power, and if their attitudes towards dominant individuals are equivalent regardless of gender.

1.1 | Children's Representation of Gendered Hierarchies

Across different scenarios, preschoolers expect men to have more power than women. For instance, when shown two non-gendered characters facing each other, one displaying a dominant posture and the other a subordinate posture, children from France, Lebanon and Norway consistently associated the male gender with the dominant character (Charafeddine et al. 2020, but see Charefeddine, Castelain, and Van der Henst 2023). However, when the gender of the stimuli was made salient, boys attributed more decision-making power and control over resources to a male than to a female puppet, but girls were at the chance (Charafeddine et al. 2020). In another study, Mandalaywala, Tai and Rhodes (2020) used a rope task to evaluate gendered power beliefs, where fictional characters placed at the top of the rope had more resources and decisional power than at the bottom. Here, 4- to 7-year-old boys expected boys to have more social power (i.e., to own more toys and to decide who to play with) than girls, while girls had equivalent expectations for girls and boys. Using a task in which children aged 6–10 were asked to associate male and female faces with high- or low-power roles, Reyes-Jaquez and Koenig (2022) also found that boys systematically predicted males to have more power, while girls were at chance. Taken together, these studies found an equivalent pattern of results indicating that the male-power association and the own-gender bias interact in children. This leads boys to associate their own-gender with a dominant role, while girls are at chance due to two factors that cancel each other: own-gender biases and male-power stereotypes (see also Santhanagopalan, Heck, and Kinzler 2022).

1.2 | Children's Evaluation of Individuals Based on Dominance and Gender

Preschoolers do not merely understand and passively represent aspects of their social world, but much like adults, they adopt an evaluative stance towards others. Both the gender and the dominance level of an individual are likely to influence children's social preferences in the context of gendered power dynamics. First, preschoolers overwhelmingly privilege gender information when making social judgements or expressing social preferences (Diesendruck and HaLevi 2006; Rhodes and Chalik 2014). Children prefer same-gender playmates, as well as the information, toys or games endorsed by them (Kinzler, Shutts, and Correll 2010; Renno and Shutts 2015; Shutts, Banaji, and Spelke 2010; Shutts et al. 2013).

As for the preference for dominant individuals, the data are rather mixed and context-dependent. On the one hand, when shown right-of-way zero-sum conflicts between two geometrical figures, toddlers prefer dominant individuals, but not when they win by force (Thomas et al. 2018). Preschoolers tend to prefer high-status individuals who control more resources, exercise decision-making power or exhibit physical supremacy (Castelain et al. 2016; Enright et al. 2020; Shutts et al. 2016). Yet, other studies did not observe a preference for dominant individuals (e.g., see Bernard et al. 2016, Experiment 2; Charafeddine et al. 2018; Enright et al. 2020, Study 1), suggesting that dominance preferences are susceptible to context variations. Taken together, these findings suggest that gender has a more robust influence than dominance on children's social preferences, and its impact is less susceptible to contextual variations. The current study examined the interplay between these two factors, and if children's gendered power representations modulate their evaluations of individuals engaged in gendered power dynamics.

In adults, gender stereotypes are not merely descriptive, they are also prescriptive: adults do not only believe that women *have* less power than men, but they consider that they *should have* less power (Eagly, Makhijani, and Klonsky 1992; Eagly and Karau 2002; Fiske and Stevens 1993). Women holding positions of power are more negatively evaluated than men, especially when they occupy male-oriented roles (Eagly, Makhijani, and Klonsky 1992). Gender status beliefs appear to legitimate male power and penalize female power (Ridgeway 2001). Because of gender alone, women are automatically associated with a lower status, while men are linked with a higher status (Rudman and Kilianski 2000). The status incongruity hypothesis suggests that dominant women are incongruent with their prescribed status, and this violation of status expectations is bound to elicit a backlash. Thus, dominant women should be penalized for threatening the existing norms around gender hierarchy (Rudman and Phelan 2008; Rudman et al. 2012). More generally, women who display agentic behaviours and engage in organizing or leadership tasks are perceived as deviating from their gender role, and in consequence, they are also expected to be less communal (Chatman et al. 2008, 2022; Okimoto and Brescoll 2010). Counterstereotypical traits and behaviours, such as being an agentic woman, negatively impact likeability (Hernandez Bark et al. 2022) and the likelihood of being hired (Bowles et al. 2007), and are penalized and sanctioned more (Rudman et al. 2012; Rudman and Glick 1999). Understanding if gender status beliefs begin to influence social preferences early in development can shed light on important societal issues, as this directly addresses how children evaluate gender inequality and whether male power guides their preferences.

In a study investigating children's leader choices in the context of a collaborative construction project, Reyes-Jacquez and Koenig (2022, Study 2A) found that 6- to 10-year-old boys and girls displayed similar own-gender biases. All children, including girls, chose own-gender leaders, when the leader did not incur any costs on the other team members, nor did it restrict access to resources. However, sometimes leaders do incur costs (Maner 2017). Some hierarchies are established through social dominance and antisocial principles since they entail a conflict situation where only one individual can prevail against another one. In these situations, there is a clear winner, who has full access to resources, and a clear loser, who has no access to resources. Here, we evaluated preschoolers' attitudes towards gendered individuals in dyadic power relations using zero-sum conflicts (i.e., one individual winning directly implies that the other one is losing). This paradigm has been widely used with infants, toddlers and preschoolers because it unambiguously conveys a dyadic dominance relation and is easily understood from the first year of life (Lourenco, Bonny, and Schwartz 2016; Mascaro and Csibra 2012; Thomsen et al. 2011; Thomas et al. 2018).

Given that research on children's preference for dominant individuals reported mixed results, Experiment 1 introduced same-gender conflicts to establish whether children prefer the dominant individual in a zero-sum conflict paradigm. Experiment 2 presented zero-sum conflicts between mixed-gender pairs. Multiple outcomes are possible in this scenario. The first possibility is that children may accept and endorse the power imbalance between genders, and penalise female power as suggested by the status incongruity hypothesis (Rudman et al. 2012). According to this hypothesis, a stronger preference for male winners compared to female winners should be observed (H1). A second hypothesis is that children's attitudes are mainly influenced by own-gender biases, and they will primarily prefer own-gender individuals, regardless of their dominance level (H2). This hypothesis is in line with the findings of Reyes-Jacquez and Koenig (2022), where older children chose own-gender individuals as leaders. A third hypothesis is that children's preferences are mainly driven by positive attitudes towards dominance, therefore they will primarily choose winners, regardless of their gender (H3). Finally, Experiment 3 was a control experiment testing children's preferences for adults of their own gender in the absence of conflict.

2 | Experiment 1

2.1 | Methods

2.1.1 | Participants

A total of 49 girls and 56 boys preschoolers (M age = 5.26; SD = 0.74; range = 3.14–6.75 years) participated in this experiment. There was no significant age difference (p = 0.386) between girls (M age = 5.33; SD = 0.69) and boys (M age = 5.20; SD = 0.78). We tested four 3-year-olds (1 girl, 3 boys), thirty-four 4-year-olds (12 girls, 22 boys), forty-five 5-year-olds (28 girls, 17 boys) and seventeen 6-year-olds (6 girls, 11 boys). Data were acquired in Lyon, France where race/ethnicity information cannot legally be collected. The study was conducted in accordance with guidelines laid down in the Declaration of Helsinki. The study was approved by the Ethical Committee of the French National Institute of Health and Medical Research (INSERM, IRB00003888, IORG0003254), which endorsed a non-opposition agreement instead of a written consent. Thus, parents were informed about the goals of the study prior to data collection through an official letter. All children were included in the study unless parents expressed their written disapproval. Children gave their verbal consent prior to participation.

2.1.2 | Exclusion Criteria

We excluded four participants due to technical or experimental errors (N = 3), or refusal to answer the experimental questions (N = 1). We excluded two individual trials (N = 2) when participants refused to respond to the social preference task.

2.1.3 | Stimuli and Procedure

The experiment was conducted in the children's school. We started with two warm-up questions, similar to those asked in the experimental phase. First, they were asked if they preferred to play with a child or an adult. The second question was whether they preferred to play with a friend or a stranger. Immediately after, the children had to watch several videos. Each child saw two trials introducing dyadic zero-sum conflicts between same-gender adults over a resource, a book or a chair. One trial presented two females and the other two males. Actors belonged to the same age group (between 25 and 35 years), had equivalent heights and were similarly dressed. We chose adult actors for the videos as it would have been difficult to render such videos naturalistic had we tried to record them with children. The order of the female and male pairs, as well as disputed resources were counterbalanced across participants. Trials started with a familiarization phase, followed by a conflict and a test phase.

2.1.3.1 | Familiarization Phase. Each trial had two familiarization videos (duration = 13 s) starting with an otherwise empty scene, except for the target resource: the book, placed on a table, or the chair, in the middle of the room. Each video introduced one individual at a time (two individuals in total, different pairs for the book and chair trials). Each individual demonstrated their interest in the resource and their ability to grasp it in the absence of conflict. In book trials, individuals stopped behind the table, grabbed the book, flicked its pages smiling and showing interest in its content. In chair trials, individuals sat in the office chair and turned happily from left to right.

2.1.3.2 | Conflict Phase. Here, the same two individuals from the familiarization phase entered the scene simultaneously, from opposite sides. They walked towards the resource, looked at it, looked at each other, then grabbed it at the same time. They pulled the resource from one side to the other trying to win full access to it. The video ended (duration = 18.5 s) with one individual winning the object and the other retreating to the side in a subordinate pose (see Figure 1). This video was played twice for each child.

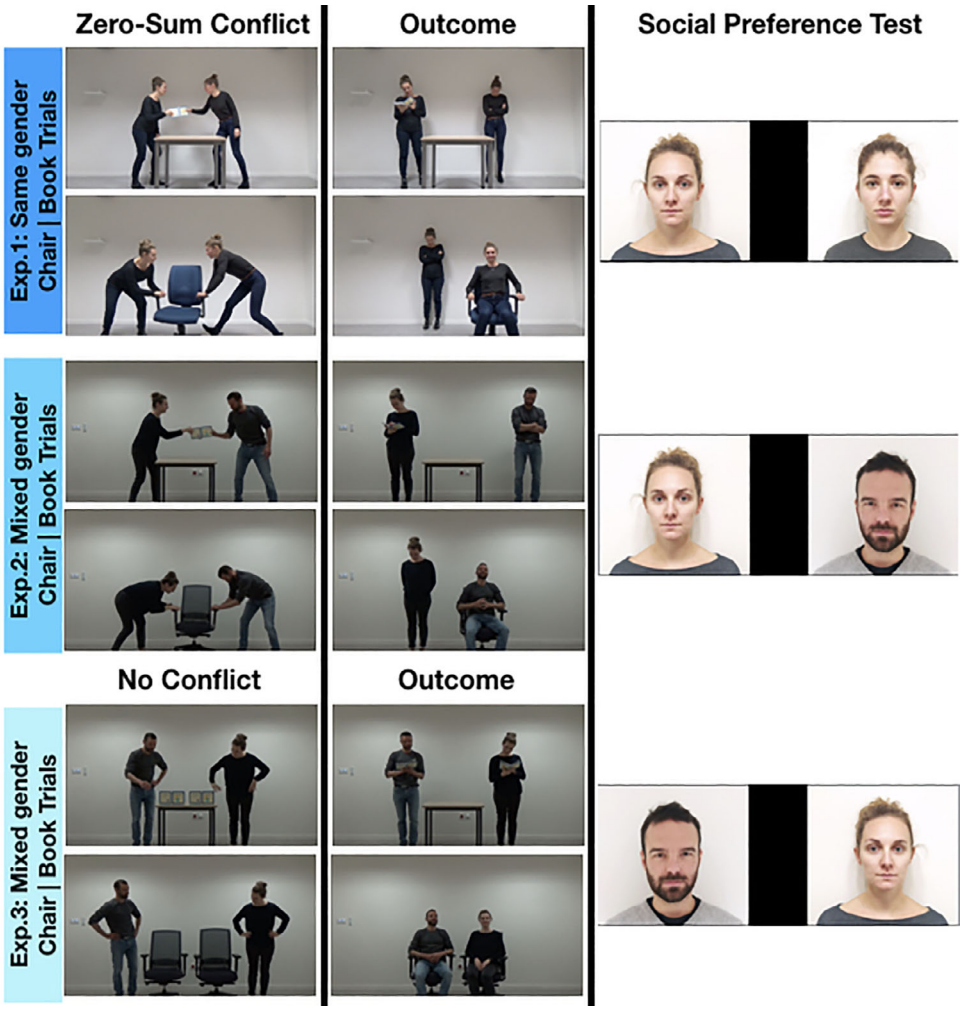

FIGURE 1 | Schematic representation of the key phases of the paradigm, from the zero-sum conflict and no conflict videos, and the side-by-side photo presentation of the two individuals previously engaged in a conflict during the social preference test phase.

2.1.3.3 | Test Phase. Children were shown side-by-side photos of the individuals in each pair displaying neutral facial expressions and were asked who they preferred to play with, if they had the chance (see Figure 1). Each photo was presented on the side corresponding to that same actor or actress during familiarization and conflict videos. At the end, we asked children who won the book (or the chair), which served as a memory control question.

2.2 | Results and Discussion

Children remembered correctly the winner of the conflict in 90% of the trials (183 out of 203 trials). Subsequent analyses are conducted on correct trials, where responses for the two types of resources are pooled together. Overall, children preferred the winner significantly above chance (63% of the trials, 116 out 183 trials, Wilcoxon signed-rank test $p = 0.001$). A Bayesian test against the test value = 0.5 revealed a Bayes factor of 68.084, considered strong evidence in favour of the hypothesis that preschoolers did not choose winners and losers at equivalent rates.

To test whether child gender or winner gender impacted children's social preferences, we conducted a generalized linear mixed model (GLMM), with child gender (girl, boy) and winner gender (own gender, other gender) as fixed effects predictors. To account for the repeated measures among participants, we included child ID as a random effect. Children's social preference (winner vs. loser) in a given trial was the outcome variable. The model was specified as follows:

Child Choice (winner vs. loser) ~ Child Gender * Winner Gender + (1 | ID).

Results from this GLMM (see Figure 2) revealed no significant interaction between child gender and winner gender ($Z = 0.716$, $p = 0.474$), and no main effects of child gender ($Z = -0.096$, $p = 0.924$) or winner gender ($Z = -0.093$, $p = 0.926$).

Finally, we investigated the role of age in children's social preferences. A GLMM was conducted with age (continuous), child gender (girl, boy) and winner gender (own gender, other gender) as fixed effects, as well as random intercepts for participants. The model revealed no significant interaction, nor any main effects ($p > 0.471$).

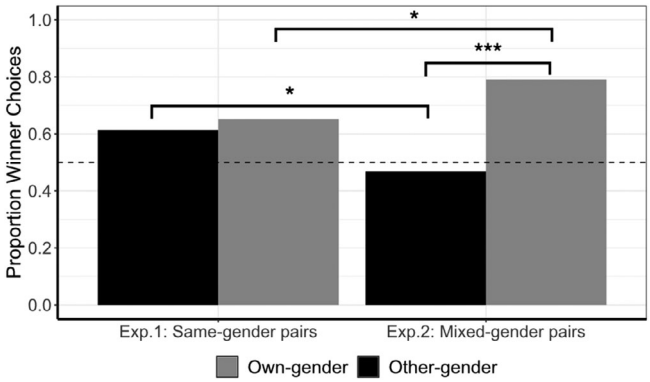

FIGURE 2 | Proportion winner choices for Experiments 1 and 2, split by winner-child gender congruence. The dashed horizontal line at 0.5 represents the chance level. The stars represent significance levels.

In Experiment 1, children watched zero-sum conflicts between pairs of same-gender individuals and they showed preferences for winners of these conflicts. Our results corroborate previous studies showing social preferences for high-status individuals in Western preschoolers (Enright et al. 2020), and even toddlers (Thomas et al. 2018). Finally, we found no effect of child or winner gender. Research with adults suggests that women are more egalitarian than men and less likely to engage in competitions (Niederle and Vesterlund 2007; Schmid Mast 2004). While child and winner gender had no impact on social attitudes in same-gender conflicts, gendered power stereotypes and own-gender biases may more likely be triggered in mixed-gender scenarios, where opposite-gender individuals compete against each other. Experiment 2 tested children's affiliative preferences for winners in mixed-gender scenarios.

3 | Experiment 2

3.1 | Methods

3.1.1 | Participants

A total of 53 girls and 51 boys (M age = 5.20 years; SD = 0.83 years; range = 3.07–6.96 years) participated in this experiment. There was no significant age difference ($p = 0.98$) between girls (M age = 5.20; SD = 0.83) and boys (M age = 5.20; SD = 0.84). We tested a total of seven 3-year-olds (4 girls, 3 boys), thirty-four 4-year-olds (18 girls, 16 boys), forty-three 5-year-olds (19 girls, 24 boys) and eighteen 6-year-olds (9 girls, 9 boys). Data were collected and parents were informed about this study as in Experiment 1.

3.1.2 | Exclusion Criteria

We excluded eight participants due to technical or experimental errors ($N = 2$), or refusal to choose one individual ($N = 6$). We excluded 14 individual trials when participants refused to respond to the social preference task or when they chose both individuals.

3.1.3 | Stimuli and Procedure

The stimuli and procedure were identical to those of Experiment 1, except for one crucial aspect: here, each trial introduced mixed-gender pairs (see Figure 1). In one trial, the female won and in the other, the male won. The order of presentation of the winner of each gender was counterbalanced across participants. Videos starred the same actors and actresses as in Experiment 1.

3.2 | Results and Discussion

Here children remembered who was the winner in 95% of the trials (185 out of 194 trials). Subsequent analyses are conducted only on correct trials. Overall, children preferred the winner in 63% of the trials, which is significantly above chance (116 out 185 trials, Wilcoxon signed-rank test $p = 0.003$). A Bayesian test against a 0.5 test value revealed a Bayes factor of 37.135, considered strong evidence in favour of the hypothesis that toddlers did not choose equally between winners and losers.

Additionally, children also displayed their own gender preference in 67% of the trials, which is significantly above chance (123 out 185 trials, Wilcoxon signed-rank test $p < 0.001$). A Bayesian test against a 0.5 test value revealed a Bayes factor of 1252, considered strong evidence in favour of the hypothesis that children did not choose equally between own gender and other gender individuals.

To test the impact of child gender or winner gender on social attitudes, we conducted a GLMM with child gender (girl, boy) and winner-child gender congruence (own gender, other gender) as fixed effects predictors. Child ID was included as a random effect. Children's choice (winner vs. loser) in a given trial was the outcome variable. The model was specified as follows:

Child Choice (winner vs. loser) ~ Child Gender * Winner-Child Gender Congruence + (1 | ID).

This GLMM (see Figure 2) revealed no significant interaction between child gender and winner-child gender congruence ($Z = 0.073$, $p = 0.942$), and no main effect of child gender ($Z = 1.268$, $p = 0.205$). However, we found a significant main effect of winner-child gender congruence ($Z = 3.106$, $p = 0.002$). Children chose their own-gender winners (M = 80%) significantly more than other-gender winners (M = 47%). The preference for own-gender winners was significantly above the 50% chance level (72 out of 91 trials, binomial test $p < 0.001$, 95% CI [0.69, 0.87]). The Bayes factor was 1,483,000, considered strong evidence in favour of the hypothesis that toddlers chose the winner either more or less than 50% of the time when the winner had the same gender as the child. However, the preference for other gender winners did not significantly differ from chance (44 out of 94 trials, binomial test $p = 0.606$, 95% CI [0.36, 0.57]). The Bayes factor was 6.45, considered moderate evidence in favour of the single-point hypothesis that children chose winners and losers equally when the winner had a different gender from that of the child.

Finally, we used a GLMM to investigate the role of age in children's preferences. We declared age (continuous), child gender (girl, boy) and winner gender (own gender, other gender)

as fixed effects, as well as random intercepts for participants. The model revealed no significant interaction, nor any main effects ($p > 0.465$).

3.3 | Comparisons Between Experiments 1 and 2

We used a GLMM (see Figure 2) to explore the role of context (same or mixed gender) in children's preferences. We declared experiment (same or mixed gender), and winner gender (own gender, other gender) as fixed effects, as well as random intercepts for participants. The model revealed a significant interaction ($Z = 3.008$, $p = 0.003$), as well as a main effect of the experiment ($Z = -1.965$, $p = 0.049$). Follow-up Wilcoxon signed-rank tests revealed that children chose significantly more own-gender winners in the mixed-gender context than in the same-gender context ($p = 0.036$). However, children chose significantly more other gender winners in the same gender context compared to the mixed gender context ($p = 0.050$).

In line with findings from Experiment 1, children also showed a global preference for winners of zero-sum conflicts in mixed-gender scenarios, and additionally, they displayed an own-gender preference. However, when two individuals from opposite genders were in conflict, preschoolers endorsed winners matching their own gender much more than other-gender winners. To confirm that the pattern of results in Experiment 2 is indeed driven by own-gender biases, Experiment 3 tested children's attitudes towards for individuals in mixed-pairs in the absence of conflict, or status.

4 | Experiment 3

4.1 | Methods

4.1.1 | Participants

A total of 51 girls and 50 boys (M age = 5.22 years; SD = 0.88 years; range = 3.02–6.99 years) participated in this experiment. There was no significant age difference ($p = 0.11$) between girls (M age = 5.08; SD = 0.88) and boys (M age = 5.36; SD = 0.87). We tested a total of seven 3-year-olds (4 girls, 3 boys), thirty-five 4-year-olds (20 girls, 15 boys), forty-one 5-year-olds (18 girls, 23 boys) and eighteen 6-year-olds (9 girls, 9 boys). Data were collected and parents were informed about this study as in Experiment 1.

4.1.2 | Exclusion Criteria

We excluded three participants due to refusal to choose one individual and nine individual trials when participants refused to respond to the social preference task or when they chose both individuals.

4.1.3 | Stimuli and Procedure

The stimuli and procedure were identical to those of Experiment 2, except for one crucial aspect: there was no conflict when the two individuals entered the scene because there were two resources present at the centre of the scene (two books or two chairs) and each individual could have unrestrained access to one of them on their corresponding side. Videos starred the same actors and actresses as in Experiments 1 and 2.

4.2 | Results and Discussion

Children displayed their own gender preference in 70% of the trials, which is significantly above chance (136 out 193 trials, Wilcoxon signed-rank test $p < 0.001$). A Bayesian test against a 0.5 test value revealed a Bayes factor of $11200*e^{80}$, considered strong evidence in favour of the hypothesis that children chose their own gender individuals significantly above chance.

To test the impact of child gender on social preferences, we conducted a GLMM with child gender (girl, boy) as a fixed effects predictor. Child ID was included as a random effect. Children's choice (own gender vs. other gender) in a given trial was the outcome variable. The model was specified as follows:

Child Choice (own vs. other) ~ Child Gender + (1 | ID).

This GLMM revealed no main effect of child gender ($Z = 1.589$, $p = 0.112$).

Finally, we used a GLMM to investigate the role of age in children's preferences. We declared age (continuous), and child gender (girl, boy) as fixed effects, as well as random intercepts for participants. The model revealed no significant interaction, nor any main effects ($p > 0.478$).

In line with our results from Experiment 2 and with previous studies (Kinzler, Shutts, and Correll 2010; Renno and Shutts 2015; Shutts, Banaji, and Spelke 2010; Shutts et al. 2013), children displayed a clear own-gender preference when the two individuals in the videos had an equivalent status.

4.3 | Comparisons Between Experiments 1 and 3

We used a GLMM to individual roles of status and gender in children's preferences. We declared the experiment (status or gender) as a fixed effect, as well as random intercepts for participants. This GLMM revealed no significant main effect of the experiment ($Z = 1.443$, $p = 0.149$), suggesting that status and gender have an equivalent strength in driving children's preferences.

Though children chose more often own-gender individuals (70%) than winners (63%), we have no statistical evidence that children hold gender to a higher degree than dominance. Previous literature found that preferences for dominant individuals are not as systematic as preferences for own-gender individuals (Bernard et al. 2016, Experiment 2; Charafeddine et al. 2018; Enright et al. 2020). Here, we found no evidence of such difference, however. One aspect that may have boosted children's preferences for dominant individuals in our setup, is that the dominant individuals won access to the resource by means of a fair physical competition, and they did not inflict any physical harm to the subordinate in order to achieve their goal, unlike some of the previous setups (see Thomas et al. 2018; Terrizzi et al. 2019 for instance). Another aspect that may have potentially reduced own

gender preferences is that we used adult actors. Most studies documenting own-gender preferences used stimuli of same-age peers (Kinzler, Shutts, and Correll 2010; Renno and Shutts 2015; Shutts, Banaji, and Spelke 2010; Shutts et al. 2013).

5 | General Discussion

We investigated children's attitudes towards gendered power, implemented through videos of zero-sum conflicts between adults. We found strong evidence that children prefer winners when conflicts are between same-gender individuals (Experiment 1). However, for mixed-gender conflicts, children only preferred winners matched in gender with themselves. They were at chance for winners of the opposite gender to their own (Experiment 2). In the absence of conflict, children affiliated more with own-gender individuals (Experiment 3).

Our findings suggest that preschoolers prefer to affiliate with winners, but not when their own gender is at a disadvantage. Children's behaviour in mixed-gender scenarios where individuals differed in status, does not fully confirm any of our a priori hypotheses. Instead, their preferences are a combination of H2 and H3, where their attitudes are simultaneously driven by status and gender. One reason for children's choice to affiliate with adult winners is that adults usually play with children in a cooperative way, so choosing an adult who can succeed in a conflict can only be beneficial for children. However, with other peers children may more often engage in competitions. Future research should address children's social preferences for peer winners and losers. We also show that while children preferred their own-gender, they did not do so blindly: their choices were modulated by power. In mixed-gender situations, children were at chance when losers were of the same gender as them. It appears that own-gender preferences were modulated by preferences for winners, balancing each other out.

One surprising aspect is the strength of own-gender biases, despite the fact that videos presented adult actors, from a different age group than our participants. Most studies to date documented gender-based affiliative preferences in children using child puppets or characters, and expected gender identification to be stronger between individuals of the same age (Shutts, Banaji, and Spelke 2010, 2013, 2015). However, our findings align with those of Alto and Mandalaywala (2023) that children apply gender character traits (e.g., nice vs. confident), and activity stereotypes (e.g., cooking vs. mowing the lawn) equivalently for children and adults. Future studies should investigate early attitudes towards gendered power using child characters, to test if gendered power stereotypes have a stronger impact on children's evaluations when using stimuli that represent their peers, thus closer to their real-world social choices.

Moreover, girls were not less likely than boys to choose their own-gender in a position of power. Previous studies found that under some circumstances boys have stronger associations of male-to-power (Charafeddine et al. 2020; Mandalaywala, Tai, and Rhodes 2020; Reyes-Jaquez and Koenig 2022). One possible interpretation of our findings is that even though girls may be well aware of power stereotypes attributing less power to their own gender, these beliefs do not yet impact their affiliative preferences for dominant females. When given the opportunity to endorse the male or the female winner, boys and girls are equally likely to root for their own gender. Thus, preschoolers' gendered power representations may simply capture the statistical distribution of power in their environment, but the current state of affairs has little impact on their social preferences. To further understand how gender stereotypes and power dynamics shape children's evaluations, future studies should also test children's attitudes towards individuals of the opposite gender, when they are both winners or losers of a conflict. Asking children to choose between a man and a woman, who are either both in a position of power, or both in a subordinate position, could help us further understand if and how gender stereotypes influence early social attitudes.

Hence, they did not show the same type of male power preference as previously documented in adults. Despite their equivalent traits and behaviour, adults evaluate female leaders more negatively than male leaders, particularly when their leadership style is masculine, or when they assume a male-dominated profession (Eagly, Makhijani, and Klonsky 1992; Rudman et al. 2012). One possibility is that this negative evaluation emerges later in development. A second possibility is that children may have no expectations regarding the gender of the winner in zero-sum conflicts as those presented here. In our study, actors and actresses were equivalent in height and body size, which also implies equivalent physical strength. Hence, here the success may have been due to other physical abilities, such as agility, quickness, mobility, complemented by mental abilities, such as determination and drive. In our simple zero-sum conflicts, dominance may not necessarily evoke masculine characteristics, and children may engage in different evaluative mechanisms for dominant roles that are more typically male. Moreover, in the current task, the social interaction presented to the participants illustrates a dominant situation typically involving physical competition for resources. In the evaluation process, this may trigger the consideration of physical qualities such as strength, agility and quickness. However, other dimensions of power, such as setting norms, giving orders or being imitated, which are not based on physical interaction, induce social influence or decision-making skills that may differently be evaluated than the physical skills in the current task. Given that children do understand these dimensions (Charafeddine et al. 2015; Gülgöz and Gelman 2017; Over and Carpenter 2015), it would be worthwhile to examine how they influence their preferences regarding gendered power in future research.

6 | Conclusions

We found strong own-gender biases in children's evaluation of gendered power. Our results showed that early social preferences are modulated not only by power status but also by the gender of the winner. This suggests that children do not merely seek affiliation with winners for the profits this may entail, but that their group membership is paramount in driving their attitudes towards others. We hope that future work on children's attitudes towards individuals with different statuses will include social category information, as these automatic classifications appear to be crucial for children's social behaviour. Future research on early social cognition should also include race, weight and disability

(amongst others) when studying children's evaluative stance of power.

Author Contributions

C.I.G., O.P. and J.B.V.D.H. conceptualised and designed the study. C.I.G. recorded the videos, prepared the stimuli, and analysed the results. A.E.H. collected the data. All authors discussed the findings. C.I.G. wrote the first draft of the manuscript and all authors reviewed it.

Acknowledgments

This work was supported by a Fondation de France grant to OP and JBVDH (0089590), and an Agence Nationale de la Recherche grant to JBVDH and OP (CHILD-GAP, ANR-21-CE28-0014). We thank Olivier Clerc for assisting with the video recording, and Camille Crouzet, Shani Gluck and Clémence Lecomte for help with data collection. We are very grateful to the actresses and actors who participated in these videos: Merrick Dida, Lucrèce Heux, Laura Machart and Martin Rouy. The datasets used and analysed during the current study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The author has provided the required Data Availability Statement, and if applicable, included functional and accurate links to said data therein, unless the article type is exempt.

References

Alto, A. T., and T. M. Mandalaywala. 2023. "Boys and Girls, Men and Women: Do Children Take Stimulus Age Into Account When Expressing Gender Stereotypes?" *Developmental Psychology* 59, no. 4: 637. https://doi.org/10.1037/dev0001504.

Bernard, S., T. Castelain, H. Mercier, L. Kaufmann, J. B. Van der Henst, and F. Clément. 2016. "The Boss Is Always Right: Preschoolers Endorse the Testimony of a Dominant Over That of a Subordinate." *Journal of Experimental Child Psychology* 152: 307–317. https://doi.org/10.1016/j.jecp.2016.08.007.

Bowles, H. R., L. Babcock, and L. Lai. 2007. "Social Incentives for Gender Differences in the Propensity to Initiate Negotiations: Sometimes It Does Hurt to Ask." *Organizational Behavior and Human Decision Processes* 103, no. 1: 84–103. https://doi.org/10.1016/j.obhdp.2006.09.001.

Castelain, T., S. Bernard, J. B. Van der Henst, and H. Mercier. 2016. "The Influence of Power and Reason on Young Maya Children's Endorsement of Testimony." *Developmental Science* 19, no. 6: 957–966. https://doi.org/10.1111/desc.12336.

Charafeddine, R., C. Billamboz, I. Noveck, and J. B. Van der Henst. 2018. "Preschoolers' Social Preferences in a Dominance Context." *Language, Evolution and the Mind: Essays in Honour of Anne Reboul* 35: 247–262.

Charefeddine, R., T. Castelain, and J. B. Van der Henst. 2023. "When Maya Children Do Not See Power as More Masculine: Evidence From Self-Perception and Gender-Power Association Tasks." *Cross-Cultural Research* 58, no. 2–3: 157–179. https://doi.org/10.1177/10693971231202885.

Charafeddine, R., H. Mercier, F. Clément, et al. 2015. "How Preschoolers Use Cues of Dominance to Make Sense of Their Social Environment." *Journal of Cognition and Development* 16, no. 4: 587–607. https://doi.org/10.1080/15248372.2014.926269.

Charafeddine, R., I. M. Zambrana, B. Triniol, et al. 2020. "How Preschoolers Associate Power With Gender in Male-Female Interactions: A Cross-Cultural Investigation." *Sex Roles* 83: 453–473. https://doi.org/10.1007/s11199-019-01116-x.

Chatman, J. A., A. D. Boisnier, S. E. Spataro, C. Anderson, and J. L. Berdahl. 2008. "Being Distinctive Versus Being Conspicuous: The Effects of Numeric Status and Sex-Stereotyped Tasks on Individual Performance in Groups." *Organizational Behavior and Human Decision Processes* 107, no. 2: 141–160. https://doi.org/10.1016/j.obhdp.2008.02.006.

Chatman, J. A., D. Sharps, S. Mishra, L. J. Kray, and M. S. North. 2022. "Agentic but Not Warm: Age-Gender Interactions and the Consequences of Stereotype Incongruity Perceptions for Middle-Aged Professional Women." *Organizational Behavior and Human Decision Processes* 173: 104190. https://doi.org/10.1016/j.obhdp.2022.104190.

Cogsdill, E. J., A. T. Todorov, E. S. Spelke, and M. R. Banaji. 2014. "Inferring Character From Faces: A Developmental Study." *Psychological Science* 25, no. 5: 1132–1139. https://doi.org/10.1177/0956797614523297.

Diesendruck, G., and H. HaLevi. 2006. "The Role of Language, Appearance, and Culture in Children's Social Category-Based Induction." *Child Development* 77, no. 3: 539–553. https://doi.org/10.1111/j.1467-8624.2006.00889.x.

Eagly, A. H., and S. J. Karau. 2002. "Role Congruity Theory of Prejudice Toward Female Leaders." *Psychological Review* 109, no. 3: 573. https://doi.org/10.1037/0033-295X.109.3.573.

Eagly, A. H., M. G. Makhijani, and B. G. Klonsky. 1992. "Gender and the evaluation of leaders: A meta-analysis." *Psychological Bulletin* 111, no. 1: 3. https://doi.org/10.1037/0033-2909.111.1.3.

Enright, E. A., D. J. Alonso, B. M. Lee, and K. R. Olson. 2020. "Children's Understanding and Use of Four Dimensions of Social Status." *Journal of Cognition and Development* 21, no. 4: 573–602. https://doi.org/10.1080/15248372.2020.1797745.

Etaugh, C., and T. Duits. 1990. "Development of Gender Discrimination: Role of Stereotypic and Counterstereotypic Gender Cues." *Sex Roles* 23: 215–222. https://doi.org/10.1007/BF00290044.

Fiske, S. T., and L. E. Stevens. 1993. *What's So Special About Sex? Gender Stereotyping and Discrimination*. CA, USA: Sage Publications, Inc Thousand Oaks, 1993.

Galusca, C. I., M. Mermillod, J. C. Dreher, J. B. van der Henst, and O. Pascalis. 2023. "Toddlers' Sensitivity to Dominance Traits From Faces." *Scientific Reports* 13, no. 1: 22292. https://doi.org/10.1038/s41598-023-49385-7.

Gülgöz, S., and S. A. Gelman. 2017. "Who's the Boss? Concepts of Social Power Across Development." *Child Development* 88, no. 3: 946–963. https://doi.org/10.1111/cdev.12643.

Hernandez Bark, A. S., K. Seliverstova, and S. Ohly. 2022. "Getting Credit for Proactivity? The Effects of Gender." *Journal of Applied Social Psychology* 52, no. 8: 660–675. https://doi.org/10.1111/jasp.12833.

Kinzler, K. D., K. Shutts, and J. Correll. 2010. "Priorities in Social Categories." *European Journal of Social Psychology* 40, no. 4: 581–592. https://doi.org/10.1002/ejsp.739.

Lourenco, S. F., J. W. Bonny, and B. L. Schwartz. 2016. "Children and Adults Use Physical Size and Numerical Alliances in Third-Party Judgments of Dominance." *Frontiers in Psychology* 6: 2050. https://doi.org/10.3389/fpsyg.2015.02050.

Mandalaywala, T. M., C. Tai, and M. Rhodes. 2020. "Children's Use of Race and Gender as Cues to Social Status." *PLoS ONE* 15, no. 6: e0234398. https://doi.org/10.1371/journal.pone.0234398.

Maner, J. K. 2017. "Dominance and Prestige: A Tale of Two Hierarchies." *Current Directions in Psychological Science* 26, no. 6: 526–531. https://doi.org/10.1177/0963721417714323.

Mascaro, O., and G. Csibra. 2012. "Representation of Stable Social Dominance Relations by Human Infants." *Proceedings of the National Academy of Sciences* 109, no. 18: 6862–6867. https://doi.org/10.1073/pnas.1113194109.

Niederle, M., and L. Vesterlund. 2007. "Do Women Shy Away From Competition? Do Men Compete Too Much?" *The Quarterly Journal of Economics* 122, no. 3: 1067–1101. https://doi.org/10.1162/qjec.122.3.1067.

Okimoto, T. G., and V. L. Brescoll. 2010. "The Price of Power: Power Seeking and Backlash Against Female Politicians." *Personality and Social Psychology Bulletin* 36, no. 7: 923–936. https://doi.org/10.1177/0146167210371949.

Over, H., and M. Carpenter. 2015. "Children infer affiliative and status relations from watching others imitate." *Developmental science* 18, no. 6: 917–925.

Renno, M. P., and K. Shutts. 2015. "Children's Social Category-Based Giving and Its Correlates: Expectations and Preferences." *Developmental Psychology* 51, no. 4: 533. https://doi.org/10.1037/a0038819.

Reyes-Jaquez, B., and M. A. Koenig. 2022. "Early Presence of a "Power = Males" Association: Girls Link Power to Their Gender Less Often Than Boys but Can Be as Motivated to Gain It." *Journal of Experimental Child Psychology* 220: 105419. https://doi.org/10.1016/j.jecp.2022.105419.

Rhodes, M., and L. Chalik. 2014. "The Interplay Between Intuitive Psychology and Intuitive Sociology." *British Journal of Developmental Psychology* 32, no. 3: 248–251. https://doi.org/10.1111/bjdp.12050.

Ridgeway, C. L. 2001. "Gender, Status, and Leadership." *Journal of Social Issues* 57, no. 4: 637–655. https://doi.org/10.1111/0022-4537.00233.

Rudman, L. A., and P. Glick. 1999. "Feminized Management and Backlash Toward Agentic Women: The Hidden Costs to Women of a Kinder, Gentler Image of Middle Managers." *Journal of Personality and Social Psychology* 77, no. 5: 1004. https://doi.org/10.1037/0022-3514.77.5.1004.

Rudman, L. A., and S. E. Kilianski. 2000. "Implicit and Explicit Attitudes Toward Female Authority." *Personality and Social Psychology Bulletin* 26, no. 11: 1315–1328. https://doi.org/10.1177/0146167200263001.

Rudman, L. A., C. A. Moss-Racusin, P. Glick, and J. E. Phelan. 2012. "Reactions to Vanguards: Advances in Backlash Theory." *Advances in Experimental Social Psychology* 45: 167–227.

Rudman, L. A., C. A. Moss-Racusin, J. E. Phelan, and S. Nauts. 2012. "Status Incongruity and Backlash Effects: Defending the Gender Hierarchy Motivates Prejudice Against Female Leaders." *Journal of Experimental Social Psychology* 48, no. 1: 165–179. https://doi.org/10.1016/j.jesp.2011.10.008.

Rudman, L. A., and J. E. Phelan. 2008. "Backlash Effects for Disconfirming Gender Stereotypes in Organizations." *Research in Organizational Behavior* 28: 61–79. https://doi.org/10.1016/j.riob.2008.04.003.

Santhanagopalan, R., I. A. Heck, and K. D. Kinzler. 2022. "Leadership, Gender, and Colorism: Children in India Use Social Category Information to Guide Leadership Cognition." *Developmental Science* 25, no. 3: e13212. https://doi.org/10.1111/desc.13212.

Schmid Mast, M. 2004. "Men are Hierarchical, Women are Egalitarian: An Implicit Gender Stereotype." *Swiss Journal of Psychology* 63, no. 2: 107–111. https://doi.org/10.1024/1421-0185.63.2.107.

Shutts, K., M. R. Banaji, and E. S. Spelke. 2010. "Social Categories Guide Young Children's Preferences for Novel Objects." *Developmental Science* 13, no. 4: 599–610. https://doi.org/10.1111/j.1467-7687.2009.00913.x.

Shutts, K., E. L. Brey, L. A. Dornbusch, N. Slywotzky, and K. R. Olson. 2016. "Children Use Wealth Cues to Evaluate Others." *PLoS ONE* 11, no. 3: e0149360. https://doi.org/10.1371/journal.pone.0149360.

Shutts, K., C. K. P. Roben, and E. S. Spelke. 2013. "Children's Use of Social Categories in Thinking About People and Social Relationships." *Journal of Cognition and Development* 14, no. 1: 35–62. https://doi.org/10.1080/15248372.2011.638686.

Shutts, K. 2015. "Young children's preferences: Gender, race, and social status." *Child Development Perspectives* 9, no. 4: 262–266.

Stennes, L. M., M. M. Burch, M. G. Sen, and P. J. Bauer. 2005. "A Longitudinal Study of Gendered Vocabulary and Communicative Action in Young Children." *Developmental Psychology* 41, no. 1: 75. https://doi.org/10.1037/0012-1649.41.1.75.

Terrizzi, B. F., E. Brey, K. Shutts, and J. S. Beier. 2019. "Children's Developing Judgments About the Physical Manifestations of Power." *Developmental Psychology* 55, no. 4: 793. https://doi.org/10.1037/dev0000657.

Thomas, A. J., L. Thomsen, A. F. Lukowski, M. Abramyan, and B. W. Sarnecka. 2018. "Toddlers Prefer Those Who Win but Not When They Win by Force." *Nature Human Behaviour* 2, no. 9: 662–669. https://doi.org/10.1038/s41562-018-0415-3.

Thomsen, L., W. E. Frankenhuis, M. Ingold-Smith, and S. Carey. 2011. "Big and Mighty: Preverbal Infants Mentally Represent Social Dominance." *Science* 331, no. 6016: 477–480. https://doi.org/10.1126/science.1199198.

Weinraub, M., and L. M. Brown. 1983. "The Development of Sex-Role Stereotypes in Children: Crushing Realities.", In Franks, V. and E. D. Rothblum. (Eds), *The Stereotyping of Women: Its Effects onMental Health*, New York, NY: Springer, pp. 30–58.

Weinraub, M., L. P. Clemens, A. Sockloff, T. Ethridge, E. Gracely, and B. Myers. 1984. "The Development of Sex Role Stereotypes in the Third Year: Relationships to Gender Labeling, Gender Identity, Sex-Types Toy Preference, and Family Characteristics." *Child Development* 55, no. 4: 1493–1503.