



Contents lists available at ScienceDirect

# Journal of Experimental Child Psychology

journal homepage: [www.elsevier.com/locate/jecp](http://www.elsevier.com/locate/jecp)



## Brief Report

# Children's memory for gender-neutral pronouns

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## ARTICLE INFO

### Article history:

Received 25 May 2022

Revised 26 August 2022

### Keywords:

Pronouns

Nonbinary inclusive language

Gender inclusive language

Gender-neutral pronouns

Gender

Social cognitive development

Language development

## ABSTRACT

Are there disparities in children's memory for gender-neutral pronouns compared with gendered pronouns? We explored this question in two preregistered studies with 4- to 10-year-old children ( $N = 168$ ; 79 boys, 89 girls, 0 gender-diverse). Participants were presented with a memory task. An experimenter read an illustrated story about a target character. Participants were asked to verbally repeat the story to measure spontaneous pronoun use and then to explicitly recall the characters' pronouns. In Study 1 the story characters had typically feminine or typically masculine appearances (determined by independent raters), whereas in Study 2 the characters had gender-neutral appearances. In both studies, targets were referred to with gendered or gender-neutral pronouns. In both studies, children more accurately recalled gendered pronouns than gender-neutral pronouns. However, on most tasks, children only used "they" if a character had gender-neutral pronouns, and almost never used "they" if a character had gendered pronouns. We also found some evidence suggesting that older children more accurately recall gender-neutral pronouns compared with younger children.

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## Introduction

Natural gender languages, like English, have singular third-person pronouns (*he* and *she*) that emphasize a binary construction of gender (Gygax et al., 2019). However, in English one might also use the conventionally plural pronoun “they” to refer to a single individual for several reasons (Saguy & Williams, 2022). One reason is that increasingly people have adopted gender-neutral pronouns like “they” instead of the gendered pronouns “he” and “she,” sometimes to reflect their gender identities (The Trevor Project, 2020) and other times as an intentionally antisexist act (Saguy & Williams, 2022). Given that accurate use of someone’s pronouns signals that one’s gender identity is supported (Doyle et al., 2021), and that misgendering (e.g., referring to someone with the wrong pronouns) is associated with worse well-being for the misgendered person (The Trevor Project, 2020), it is important to understand the acquisition of gender-neutral pronoun use. The current research investigated children’s memory of gender-neutral pronouns because children are developing during a time of massive cultural change; increasingly, people state singular “they” as at least one of their pronouns, and consequently children are more likely to meet others with “they” as a pronoun.

The use of singular “they” is neither novel nor recent. In everyday conversation, English speakers often use “they” to talk about someone when their gender is unknown (as evidenced by this sentence). Furthermore, singular “they” has been used for centuries (e.g., by writers such as Jane Austen and William Shakespeare; Austen, 1813/2008; Shakespeare, 1594/1962). Still, many English speakers report feeling uncomfortable with “they” as a singular pronoun (Minkin & Brown, 2021). Research on adults’ reading suggests that they take longer to read sentences with singular “they,” only when the referent’s gender is likely to be assumed (e.g., “A truck driver should never drive when sleepy even if they may be struggling to make a delivery on time” takes longer than “Anybody who litters should be charged \$50 even if they cannot see a trash can nearby”; Doherty & Conklin, 2017; Foertsch & Gernsbacher, 1997). These findings suggest that singular “they” is not inherently cognitively taxing, but it can be when it disrupts people’s notions of gender. Similar results have been found with English readers using gender-typical pronouns; adults take longer to read sentences when the gender a pronoun conveys does not accord with stereotypes (e.g., “A truck driver should never drive when sleepy even if she may be struggling to make a delivery on time” takes longer than the same sentence with the pronoun “he”; Sanford, 1985). These results suggest that gender-based stereotypes or expectations, rather than something inherent to particular pronouns, may contribute to our challenges in interpreting and using pronouns as adults.

English-speaking children are familiar with gendered pronouns (Charney, 1980) and use a pronoun’s gender to infer the subject (i.e., who the sentence is talking about; Arnold et al., 2007) and the direct object (i.e., who is receiving the subject’s action; Naigles et al., 2011). For example, when children hear the sentence “She is tickling him,” they look to an image of a girl tickling a boy, not a boy tickling a girl. Children may be unfamiliar with the idea that gender-neutral pronouns can refer to individuals, so we might expect their memory of these pronouns to be especially impaired. It is clear that pronouns convey conventional gender-based information to children, but this work is the first to investigate children’s use of gender-neutral pronouns.

## General method

Our sample included 4- to 10-year-old English-speaking children in both Study 1 ( $N = 84$ ;  $M_{\text{age}} = 7.58$  years,  $SD = 2.01$ ; 39 boys, 45 girls; 50 White, 2 Black, 3 Hispanic or Latino, 11 Asian, 1 Native Hawaiian or Pacific Islander, 8 multiracial, 1 of another racial or ethnic group [8 parents declined to provide this information]); 9 knew someone with “they” pronouns, 56 did not [19 parents did not provide this information]) and Study 2 ( $N = 84$ ;  $M_{\text{age}} = 7.52$  years,  $SD = 1.90$ ; 40 boys, 44 girls; 45 White, 2 Black, 3 Hispanic or Latino, 14 Asian, 1 Native American or Alaskan Native, 13 multiracial, [6 parents declined to provide this information]); 20 knew someone with “they” pronouns, 63 did not [1 child’s parents did not provide this information]). These studies were preregistered. Our sample age range was determined based on active other studies in the lab. Participants were recruited from a database shared by developmental psychology labs at Yale University, participated via Zoom, and

received a \$5.00 Amazon gift code. All experimental procedures were approved by the institutional review board at Yale University.

## Study 1

### Method

#### Materials and procedure

**Introduction and practice trials.** A researcher read aloud an illustrated story about a novel target character, and participants were asked to immediately repeat the story. Participants completed a total of 10 trials: 2 practice trials, and 8 experimental trials. All stories had the same format: (a) introduction of the respective target by name, (b) target's pronoun and location, and (c) target's pronoun and action (e.g., "This is Harbor. He went to a lake. At the lake, he went fishing on a boat."). Character names were independently rated a priori as gender-neutral, whereas appearances were rated as appearing "typically" feminine (longer hair or ponytails) and masculine (shorter hair). Children completed the 2 practice trials before continuing on to the experimental trials. Practice trial targets had "typically" masculine and feminine appearances and were referred to with congruent pronouns (data collected from these trials are not included in analyses). Stories were presented in a randomized order.

**Experimental trials.** Participants heard eight stories about novel targets. Conventionally feminine-appearing targets were presented with the pronoun "she" or "they," and masculine-appearing targets were presented with the pronoun "he" or "they." Targets presented with "they" pronouns, as well as the contents of each story, were counterbalanced.

**Free recall.** In the first task, participants repeated back the stories immediately after hearing them. Experimenters live-typed story retellings and prompted participants to try their best if they struggled to recall the stories (live-typings were confirmed against video-recordings by trained research assistants for accuracy). See [Table 1](#).

**Table 1**

A descriptive summary of participants' pronoun use on the free recall task in Studies 1 and 2.

Variable	Study 1 data				Study 2 data		
	"She" trials	"He" trials	Feminine-appearing "they" trials	Masculine-appearing "they" trials	"She" trials	"He" trials	"They" trials
Proportion consistently "she"	100%	100%	51%	2%	84%	8%	16%
Proportion switched to "she" from "he"	0%	0%	0%	0%	0%	0%	0%
Proportion switched to "she" from "they"	0%	0%	4%	0%	1%	0%	0%
Proportion consistently "he"	0%	0%	4%	56%	14%	90%	40%
Proportion switched to "he" from "she"	0%	0%	0%	0%	0%	0%	0%
Proportion switched to "he" from "they"	0%	0%	1%	4%	0%	0%	0%
Proportion consistently "they"	0%	0%	36%	36%	1%	0%	39%
Proportion switched to "they" from "she"	0%	0%	4%	0%	1%	0%	0%
Proportion switched to "they" from "he"	0%	0%	0%	2%	0%	1%	5%
Usable trials	133	131	135	134	123	118	114

Note: The percentages represent the proportion of times each pronoun was used for trials in which children used a pronoun.

**Explicit recall.** After completing all eight experimental trials, the experimenter presented children with pictures of the individual targets (in the same order as they appeared in the first task). For each target, the experimenter asked a forced-choice question: “Which word did I use when I talked about [character name]? Was it ‘she,’ ‘he,’ or ‘they’?” See [Table 2](#).

## Results

### Free recall

Transcriptions of participants’ responses were recoded as (a) correct (i.e., used the same pronoun as the story; switched to the correct pronoun), (b) incorrect (i.e., used a different pronoun than the story; switched to an incorrect pronoun), or (c) no-pronouns (i.e., did not use any pronouns).

We conducted a linear mixed probability model ([Gomila, 2021](#)) with accuracy (correct or incorrect) as the dependent measure and condition (gendered or neutral), age (continuous), and their interaction as predictors, with a random intercept for participant to account for repeated observations. We found a main effect of condition; children were more accurate with gendered pronouns (100%) than with gender-neutral pronouns (41%) [ $\beta = 0.86$ ,  $SE = 0.11$ ;  $t(228) = 7.81$ ,  $p < .001$ ]. There was no main effect of age [ $\beta = 0.01$ ,  $SE = 0.01$ ;  $t(136) = 0.49$ ,  $p = .62$ ]. The main effect of condition was qualified by an interaction between condition and age [ $\beta = 0.03$ ,  $SE = 0.01$ ;  $t(453) = 2.49$ ,  $p = .01$ ], indicating that the difference between the gendered and neutral conditions was smaller for older children. See [Fig. 1](#).

In response to a reviewer’s suggestion, we conducted a binary logistic regression with condition (gendered or neutral pronoun) as a predictor of participants saying “they,” again with a random intercept for participant to account for repeated observations. This model in fact confirmed that participants were more likely to say “they” in the gender-neutral pronoun condition (41%) than in the gendered condition (0%) [ $\beta = 3.91$ ,  $SE = 0.56$ ,  $p < .001$ ].

### Explicit recall

To determine participants’ accuracy, we conducted a linear mixed probability model with condition (gendered or neutral) and age (continuous) as predictors and a random intercept for participant to correct for multiple responses. The model revealed a main effect of condition; children were more accurate with gendered pronouns (71%) than with gender-neutral pronouns (41%) [ $\beta = 0.54$ ,  $SE = 0.14$ ;  $t(668) = 3.76$ ,  $p < .001$ ]. There was no main effect of age [ $\beta = 0.01$ ,  $SE = 0.01$ ;  $t(668) = 0.37$ ,  $p = .71$ ], nor was there an interaction between condition and age [ $\beta = 0.04$ ,  $SE = 0.02$ ;  $t(668) = 1.75$ ,  $p = .08$ ]. See [Fig. 2](#).

For the explicit recall task, we conducted the same exploratory binary logistic regression as the free recall task. This model failed to confirm whether participants were more likely to say “they” in the gender-neutral pronoun condition (41%) than in the gendered condition (25%) [ $\beta = 0.02$ ,  $SE = 0.19$ ,  $p = .92$ ].

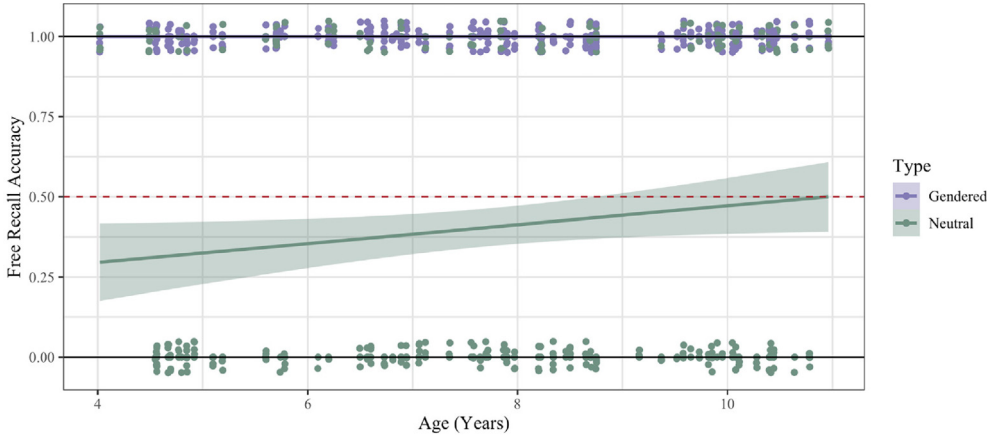
### Study 1 discussion

Children correctly used “they/them” pronouns 30% to 40% of the time on the free recall task and rarely said “they” to refer to someone previously described with gendered pronouns, demonstrating

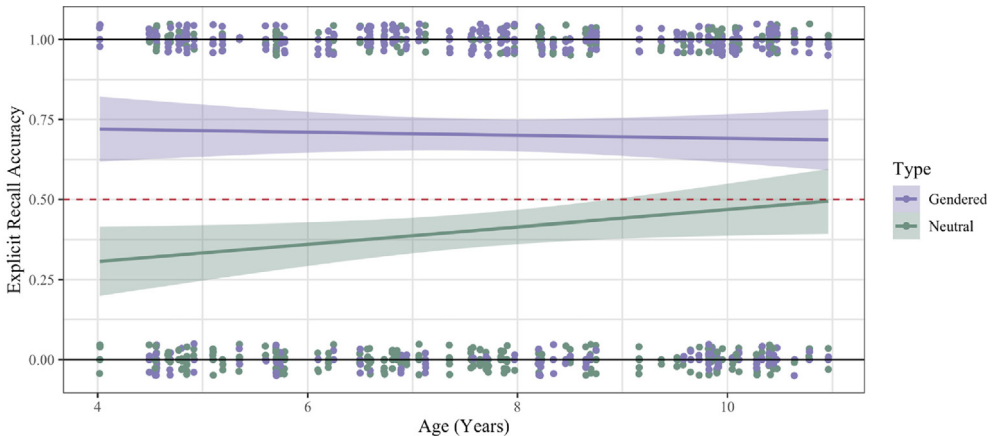
**Table 2**

Percentages of time participants used each type of pronoun in the forced-choice recall task as a function of trial type in Studies 1 and 2.

Variable	Study 1 data				Study 2 data		
	“She” trials	“He” trials	Feminine-appearing “they” trials	Masculine-appearing “they” trials	“She” trials	“He” trials	“They” trials
Proportion “she”	72%	3%	61%	1%	49%	0%	0%
Proportion “he”	4%	74%	5%	53%	0%	60%	75%
Proportion “they”	24%	25%	35%	46%	52%	40%	25%



**Fig. 1.** Free recall (Study 1). Each dot represents whether a participant was accurate (1) or inaccurate (0) on a trial (y axis), plotted with jitter to avoid overplotting. The regression lines represent the probability of a participant giving an accurate response given the trial type (gendered or neutral) and the participant's age (x axis). Each participant has one data point for each of the eight experimental trials. Notably, we do not see an error line for gendered trials because participants were 100% accurate. Here, we found that participants were more accurate on the free recall task with gendered pronouns compared with gender-neutral pronouns and that accuracy with neutral pronoun trials improves with age.



**Fig. 2.** Explicit recall (Study 1). Each dot represents whether a participant was accurate (1) or inaccurate (0) on an experimental trial (y axis), plotted with jitter to avoid overplotting. Each participant contributed eight data points due to the participant's responses to the eight experimental trials. The lines represent the overall probability of participants providing an accurate response given the trial type (gendered or neutral) and participants' continuous age (x axis). Here, we found that participants were more accurate on the explicit recall task for targets with gendered pronouns compared with gender-neutral pronouns.

that many children attended to the targets' gender-neutral pronouns and spoke about the targets accordingly. Still, children were significantly worse at recalling gender-neutral pronouns for both tasks. On the free recall task, recollection of gender-neutral pronouns improved with age; however, given the small sample size per age group and the lack of replication on the explicit recall task, we treat this finding cautiously. Likewise, it is possible that participants were no more likely to say "they" in the neutral condition during the explicit recall task because they had forgotten the targets' pronouns during the brief delay and were guessing.

In Study 1, children had two cues: appearance and pronoun. In Study 2, we investigated whether children would still default to gender-typical pronouns if all targets had gender-neutral appearances. Many (but not all) people who use gender-neutral pronouns have a more androgynous appearance (Galupo et al., 2021). It is possible that the absence of strong gender cues will help children to overcome their gender binary predisposition that is potentially grounded in conventionalized appearances. However, it is also possible that their strong default to binary gender pronouns will persist.

## Study 2

### Method

#### Materials and procedure

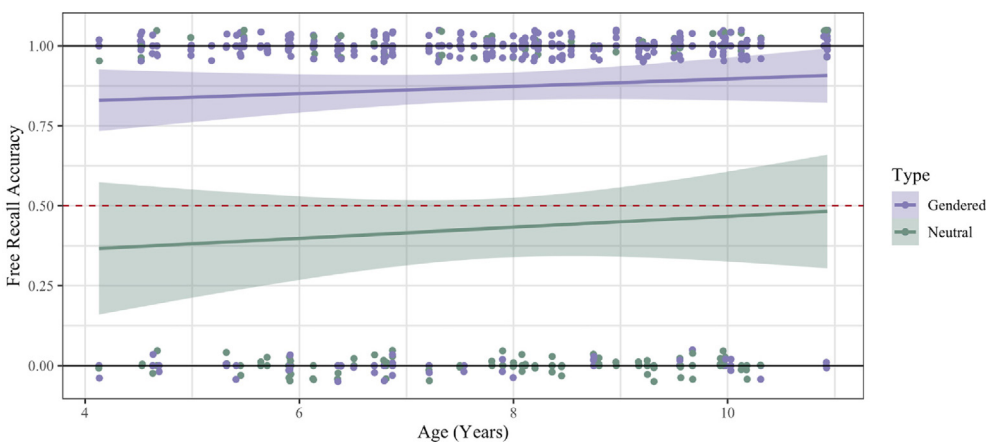
The procedure of Study 2 was identical to that of Study 1 except that Study 2 featured targets with gender-ambiguous appearances (determined a priori by independent raters). Targets had medium-length hair and wore medium-length shorts and T-shirts. In addition, participants heard six (instead of eight) stories. No Study 1 participants participated in Study 2.

### Results

#### Free recall

Transcription, coding, and primary analyses of the free recall task mirrored those of Study 1. The model predicting accuracy yielded a main effect of condition; children were more accurate in the gendered condition (87%) than in the gender-neutral condition (44%) [ $\beta = 0.53$ ,  $SE = 0.20$ ;  $t(143) = 2.703$ ,  $p = .008$ ]. We did not find a main effect of age [ $\beta = 0.01$ ,  $SE = 0.02$ ;  $t(116) = 0.68$ ,  $p = .50$ ], nor did we find an interaction between condition and age [ $\beta = 0.01$ ,  $SE = 0.02$ ;  $t(290) = 0.42$ ,  $p = .67$ ]. See Fig. 3. Our exploratory model predicting “they” pronoun use confirmed that participants were more likely to say “they” in the neutral condition (44%) than in the gendered condition (3%) [ $\beta = 4.61$ ,  $SE = 0.78$ ,  $p < .001$ ].

For the gender-neutral condition, we conducted an additional exploratory analysis examining how often participants said “he” versus “she” on trials in which they did not use “they,” revealing an interesting trend; out of 68 incorrect trials, participants said, “he” much more often (50 times) than they



**Fig. 3.** Free recall (Study 2). Each dot represents whether a participant was accurate (1) or inaccurate (0) on an experimental trial (y axis), plotted with jitter to avoid overplotting. Again, each participant has eight data points, one for each of the eight experimental trials. The lines represent the probability of a participant giving an accurate response given the trial type (gendered or gender-neutral) and the participant's age (x axis). Here, we found that participants were more accurate on the free recall task for targets with gendered pronouns compared with gender-neutral pronouns.

said “she” (18 times). A binomial test revealed that “he” responses (74%) were significantly greater than chance ( $p = .001$ ; 95% confidence interval (CI) [.61, .84]).

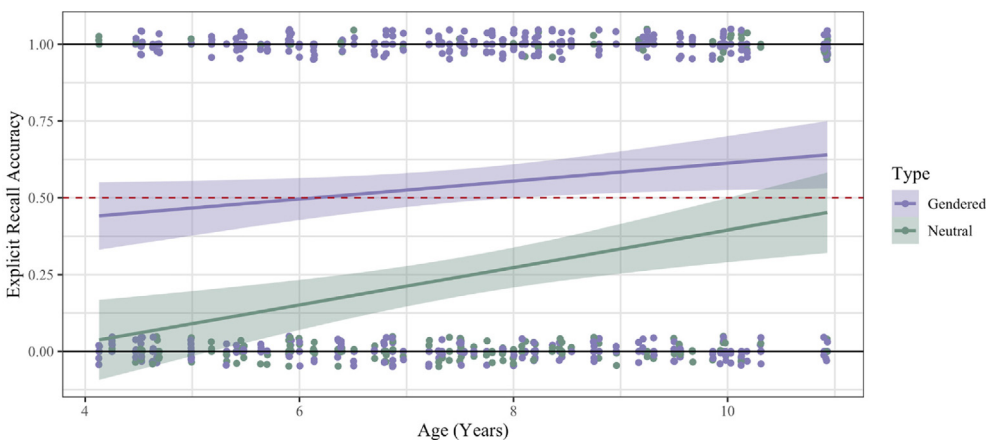
### Explicit recall

Primary analyses mirrored those of Study 1. The model predicting accuracy revealed a main effect of condition; children more accurately recalled gendered pronouns (54%) than gender-neutral pronouns (24%) [ $\beta = 0.53$ ,  $SE = 0.18$ ;  $t(417) = 2.97$ ,  $p = .003$ ]. The model also yielded a main effect of age; older children’s explicit recall of pronouns was more accurate [ $\beta = 0.03$ ,  $SE = 0.01$ ;  $t(157) = 2.06$ ,  $p = .04$ ]. However, there was not a significant interaction between condition and age [ $\beta = 0.03$ ,  $SE = 0.02$ ;  $t(417) = 1.36$ ,  $p = .17$ ]. See Fig. 4. Contrary to expectations, the exploratory model predicting “they” pronoun use was significant; participants were more likely to say “they” in the gendered condition (46%) than in the neutral condition (24%) [ $\beta = -1.02$ ,  $SE = 0.22$ ,  $p < .001$ ].

As for the free recall task, we explored how often participants said a target’s pronouns were “he” versus “she” on incorrect trials in the gender-neutral condition. Across the 126 trials, all participants said “he” (126 times) and never said, “she” (0 times). A binomial test confirmed that the proportion of trials for which participants said “he” (100%) was significantly greater than chance ( $p < .001$ , 95% CI [.97, 1.00]).

### Study 2 discussion

Study 2 replicated the main findings of Study 1 regarding children’s overall better memory for gendered pronouns compared with gender-neutral pronouns. Even though the stimuli appeared more gender-androgynous, children showed better memory for gendered pronouns, suggesting that children’s default use of gendered pronouns is strong even in the absence of typical gender cues. Our analysis exploring whether participants said “they” more for the neutral condition revealed that participants were actually more likely to say “they” in the gendered condition on the explicit recall task. However, given that we found conflicting (null) results for the same task in Study 1, we do not further interpret this effect. It is also interesting that children defaulted to assuming masculinity in the absence of gender cues based on their use of “he” more than “she” on both recall tasks. These findings are in line with prior work suggesting that children show signs of androcentrism, or



**Fig. 4.** Explicit recall (Study 2). Each dot represents whether a participant was accurate (1) or inaccurate (0) on an experimental trial (y axis), plotted with jitter to avoid overplotting. The lines represent the probability of a participant giving an accurate response given the trial type (gendered or neutral) and the participant’s age (x axis). Here, we found that participants were more accurate on the explicit recall task for targets with gendered compared to gender-neutral pronouns. Accuracy improves with age.



defaulting to a masculine worldview (e.g., [Hsiao et al., 2021](#)). However, it could also be the case that children perceived the specific images to be more masculine than did the independent raters.

## General discussion

The current work provides the first look at children's ability to recall gender-neutral pronouns. Children were overall worse at spontaneously using and explicitly remembering gender-neutral pronouns compared with gendered pronouns regardless of the appearance of the target characters. However, it is noteworthy that participants were more likely to use "they" pronouns in the neutral condition on the free recall tasks. These results suggest that young children—at least English-speaking children with relatively little exposure to gender-neutral pronouns—mostly default to using gendered pronouns, but many are able to pick up on the use of "they" as a singular pronoun. Below, we briefly discuss potential mechanisms driving our results, possible limitations, and directions for future research.

There are a number of potential reasons why children default to using gendered pronouns. The available evidence suggests that children have a binary construction of gender ([Weisman et al., 2015](#)) and treat gender as a natural social category ([Kinzler et al., 2010](#)). In addition, many societal structures facilitate and enforce a binary construction of gender such as children's classrooms ([Alan et al., 2018](#)), media ([Lemish, 2010](#)), and toys ([Leaper & Bigler, 2018](#)). This binary is likely further enforced in our language, including in the more common use of binary pronouns in everyday life. In addition, "they" and "them" pronouns applied to individuals may be at odds with some aspects of linguistic development such as the difficulty of incorporating new closed-class items (like pronouns) into one's lexicon ([Chafetz, 1994](#)). Our findings could also be influenced by a general "binary bias," meaning that people tend to compress continuous information into distinct, dichotomous categories ([Fisher & Keil, 2018](#)). Thus, it is possible that some people find it difficult to think about the concept of gender on a continuous spectrum because humans tend to treat continuous information as binary information. Furthermore, it is also possible that children are simply unfamiliar with the concept of gender-neutral pronouns. Even among children who may know someone with gender-neutral pronouns, they most likely know far more people who use gendered pronouns. Consequently, they do not often hear the singular "they" and therefore are less likely to have practiced its use.

These findings provide a foundation for potential intervention-based work geared toward teaching children about gender-inclusive language. Such work is especially important because the number of people with "they" as a pronoun is increasing, and those whose pronouns are respected by the people in their lives are twice as likely to have positive mental health outcomes ([The Trevor Project, 2020](#)). These interventions could be simple such as telling children that some people like to be called "they" or reading gender-inclusive books to children. Further work investigating cognitive development and understanding the flexibility of gender as a category could perhaps illuminate ways in which interventions can deconstruct beliefs of binary gender and encourage support of a spectrum of gender identities.

The primary limitations of the current work concern its generalizability. First, our participant sample consisted of English-speaking children. Future research should explore the use of gender-neutral pronouns by children who speak languages that convey different amounts of gendered information. In addition, our sample did not include many children who knew people who had "they" pronouns or whose parents reported that their children were nonbinary. Thus, perhaps children who have greater exposure to or close contact with individuals whose pronouns are "they/them" or children whose pronouns are "they/them" would more accurately remember gender-neutral pronouns. Another limitation was our sample size, which did not provide enough statistical power for a thorough test of developmental change. Future work can address this limitation by including larger sample sizes to better examine the developmental trajectory. In addition to the sample limitations, there may be limitations to our stimuli. The characters in our experiments were cartoons, but perhaps participants would have felt a greater demand to accurately recall gender-neutral pronouns if they believed they were talking about real humans. Relatedly, our stimuli were rated as masculine, feminine, or neutral by adult independent raters, but it is possible that adults and children have different intuitions about how physical appearance markers reveal gender information.



## Conclusion

Gender-based pronouns are present in everyday conversation and can be used to communicate and internalize social information about people's identities. Given recent research finding that the use of correct pronouns signals that one's gender identity is supported (Doyle et al., 2021), understanding disparities in gender-neutral pronoun use compared with gendered pronoun use is necessary. Here, our research shows that although children can quickly adopt some gender-neutral pronoun use, gendered pronouns are recalled more accurately than gender-neutral pronouns by elementary school-aged English-speaking children who had limited exposure to gender-neutral pronouns. By conducting further research specifically examining how to improve recall of gender-neutral pronouns, we can perhaps improve our communication to support the identities of people who identify as nonbinary or gender-diverse. In short, it is essential to conduct and continue this line of research with children so that they can develop into adults who fluently talk about others with gender-neutral pronouns.

## Acknowledgments

We thank the researchers who helped to collect data for this project: Fareeda Adejumo, Mack Briscoe, Elizabeth Calabresi, Annya Dahmani, Josie Davies, Michael Garvey, Vanessa Llamas, Michelle Marti, Sayda Martinez-Alvarado, Ilayda Orhan, Sifana Sohail, Kira Sze, Grace Williams, Georgia Wosco-boinik, Kate Yeager, and Chloe Young. We also thank Natanya Rosen and Mikaela Boone for creating experimental stimuli and coding transcriptions for accuracy. Kristina Olson's time on this study was supported in part by a National Science Foundation grant (SMA-1837857/SMA-2041463). Lastly, we thank our participating families and members of the Social Cognitive Development Lab at Yale University for supporting this research.

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