

Children's Personal Pronoun Errors and Parents' Responses in Picture Reading Activities

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Introduction

Children often have difficulty pairing personal pronouns with correct referents, before the age of five. Scholes Robert J. (1981) has studied the comprehension of the third-person personal pronouns of English in children aged three to seven. He used line drawings of human figures to ask children which picture represented the correct number, case, and gender of personal pronouns in the sentence read by the experimenter (e.g., “He is touching them.”). By separately testing the comprehension of the number, case, and gender aspects, Scholes found that older groups between age five and age seven scored significantly higher uniformly across the three components. Also, children generally acquired gender distinction faster than case and number distinctions, among all age groups (Scholes, 1981). Because of this variability and complexity in the acquisition of personal pronouns, numerous research has studied how extralinguistic factors can support or influence children’s learning of personal pronouns.

Personal Pronouns and Discourse Context

Children’s comprehension of personal pronouns is dependent on the social discourse context, which is especially evident at the age of two. Charney (1980) has found that two-year-old children acquired the personal pronoun differently or in different orders based on their conversation roles, such that children learned the first person pronouns (e.g., “my”) faster than the second person pronouns (e.g., “your”) when they were speakers but the opposite learning effect occurred when they were addressed. On the other hand, Moyer et al. (2015) have found that two-year-olds had adult-like comprehension of the first and second-person pronouns regardless of their conversation roles, with the aid of “felicitous discourse” that children collaborated with experimenters in building blocks to establish familiarity with one another.

Personal Pronouns and Domains

Children's use of personal pronouns changes along with the type of a referent. Alleen Pace Nilsen (1977) found that children aged four to twelve preferred using masculine pronouns (e.g., "he") to using gender-neutral and feminine pronouns (e.g., "it"; "she") when describing an animal category of indeterminate sex (i.e., unclothed cartoon animal pictures without doing any gender-biased activities). However, when an animal was typically associated with feminine characteristics (e.g., "cat"), children used gender-neutral and feminine pronouns more frequently than masculine pronouns (Nilsen, 1977). Gender bias or mental representations of referential typical gender may influence children's choice of a personal pronoun's gender component. In addition to referents' domain, referents' countability also impacts children's interpretation of personal pronouns. Chipman & Dardel (1974) have found that children interpreted "it" in the directive "give it to me" with higher accuracy when presented with an uncountable noun item (e.g., "clay"), compared to two-count noun items or an item that can be both countable or uncountable (e.g., "box of 5 marbles"; "chocolate").

Theoretical Gaps and Questions

Most research investigating how extralinguistic factors interacted with the acquisition of personal pronouns has focused on children's speech roles and referential characteristics but failed to consider how parents might play a role in directing children's use of personal pronouns. Past research has shown that parents responded differentially to children's speech errors, compared to nonparents. Bohannon & Stanowicz (1988) have found that adults preferred using recasts (i.e., repetitions with speech errors corrected) and expanded utterances (i.e., repetitions with new information added) after children's speech errors, and parents were more likely to use repetitions as responses to children's speech compared to nonparents. Also, they would provide clarification

questions (e.g., CHI: “That is a dog”; Adult: “What?”) to children if there was a major communicative problem because clarification queries more explicitly suggested a verbal error in children’s previous utterance (Bohannon & Marquis, 1977). Moreover, Clark & Bernicot (2008) have found that parents’ intention of using repetitions after children’s speech changed along with children’s developmental stages. For younger children aged two, parents repeated children’s speech to check upon children’s intended meaning and correct speech errors; for older children aged three, parents’ repetitions were more likely to add new information and correct some ill-formed speech (Clark & Bernicot, 2008).

As parents are often the first and primary instructors for children’s language learning, the current study aimed to investigate parents’ responses as an ecological factor that may influence children’s personal pronoun acquisition. The first question of interest was thus how parents respond to children’s personal pronoun errors. Moreover, previous research regarding children’s personal pronoun acquisition often provided limited kinds of stimuli for children to interact with. The stimuli were mainly from the same domain, such as toys, pictures of animals, and line drawings of human subjects. The second question of interest was then what kinds of personal pronoun errors children would be more likely to make for referents from different referential domains, specifically human referents (e.g., “baseball player”) versus nonhuman referents (e.g., “horse”). Gelman et al. (2014) have found the domain difference for children to use generics (e.g., “Ducks are green.”) when they were describing referents, such that they used generics frequently in animal and food referents compared to people referents. Based on existing literature, we have made the following hypotheses:

1. We hypothesized that parents would most frequently use repetitions, with corrected and expanded forms, to respond to children's personal pronoun errors.
2. Children would make significantly more semantic personal errors than morphological personal errors. Specifically, they would make more gender errors in the animal domain and more number errors in the animal domain and the food domain, because of the gender bias and the use of generics.
3. Parents would make more corrective responses when responding to semantic personal errors because the semantic errors induced more ambiguous references compared to morphological errors.

Method

Corpus and Participants

We used Gelman's 2014 Individual Differences corpus from the Child Language Data Exchange System database (Gelman et al., 2014; CHILDES, MacWhinney, 2000). 33 interactions between English-speaking four-year-old children ($M_{age} = 55.09$ months; $SD_{age} = 1.41$ months; $Range_{age} = 45 - 59$ months; 16 females) and their parents as well as 33 interactions between children and experimenters were analyzed. Each child participated in two picture book-reading sessions in a developmental lab, and they were either interacting with their parent or the researcher. In each interaction session, the child and the parent or the experimenter looked through a wordless 15-page picture book depicting equal numbers of animals, foods, and people (see Appendix A). Parents were asked to read it to their children as they normally would, and experimenters encouraged children to describe pictures to a puppet named "Zorg." Interactions have been transcribed and segmented based on referents; transcripts were shared by the research team on the CHILDES.

Coding Schemes and Procedures:

We coded parents' responses after each type of their children's personal pronoun errors in the parent-child interactions, to answer the first question of how parents responded to children's pronoun errors. The predictor variable of interest is children's types of personal pronoun errors, with a general classification as form/morphological errors vs. meaning/semantic errors. The outcome variable of interest is parents' responses after children's personal pronoun errors, with classification adapted from Bohannon & Stanowicz's and Clark & Bernicot's studies (1988; 2008; See Appendix B). 1) *Repetitions*: a. *Simple repeat*: a re-repeat of a word/phrase (e.g., child: "This is a duck"; parent: "A duck?"); b. *Expanded repeat*: repetition with new information (e.g., child: "This is a duck"; parent: "This is a duck swimming in a pond."); c. *Corrected repeat*: repetition with errors corrected (e.g., child: "The king had its pipe"; parent: "The king had his pipe."); 2) *Nonrepetitive utterances*: responses to children's previous utterance without repeating major sentential elements (e.g., child: "he's dirty in the mud"; parent: "I think those are just spots."). We initially divided the nonrepetitive utterances into the ones containing corrective actions and the ones without correction. However, there were no cases where parents made corrective, nonrepetitive utterances in the transcripts, and hence the nonrepetitive utterance here only refers to non-corrective ones; 3) *Acknowledgment*: a. *Minimal acknowledgment* (e.g., "hum."); b. *Full acknowledgment* (e.g., "Yes."). 4) *No Follow-ups*: utterances without continuing the topic of the children's previous sentence that contained the pronoun error (e.g., child: "he's dirty in the mud"; parent: "what color do you see?").

We coded children's specific types of personal pronoun errors in the child-researcher interactions because we were interested in the relationships between children's personal pronoun errors and

domains to answer the second question of how children's pronoun errors differed by referential domains. The predictor variable of interest is the referential domain, animal vs. food vs. people. The outcome variable of interest is children's types of personal pronoun errors, adapted from the coding paradigm in Zane et al.'s study (2021; See Appendix B). 1) *Form/Morphological errors*: a. *Case* (e.g., “*Us* is going to the grocery store.”); b. *Morphological errors*: noncase morphological errors (e.g., “That is *shes* cup.”); 2) *Meaning/Semantic errors*: a. *Number* (e.g., “us” for the reference of himself); b. *Gender* (e.g., “it” in place of “she”); c. *Person* (e.g., “you had a ball” for the non-addressed person); d. *Undefined*: when the child used a personal pronoun that induced ambiguous or multiple interpretations (e.g., “I have nothing to about *it*” where “it” can refer to both the referent and the picture book).

We only numbered on-task utterances and excluded off-task ones which were not related to picture reading activities (e.g., MOT: “um did she say knock on the glass?” when the mother referred to the end of the study). In the child-parent interactions, we calculated the number of each type of general personal pronoun errors children made and the number of parents' responses after each type of pronoun error by the utterance level. In the child-researcher interactions, we calculated the number of specific pronoun errors by the utterance level.

Reliability:

To establish reliability, all three coders annotated the same transcript. Coders were randomly assigned to annotate 22 transcripts as the primary coder. Each transcript was then annotated by the other two secondary coders. Any disagreement was resolved through discussion.

Data Analysis Plan:

Data were analyzed using t-tests corrected for multiple comparisons.

Results

Parents' Responses to Children's Personal Pronoun Errors

The critical question was how parents responded to children's pronoun errors. To analyze this, we did a factorial MANOVA test to compare parents' average rates of providing each kind of response, which was calculated by dividing the sum of each type of parental response by 33. We found that there was a significant difference among parents' general response types (i.e., repetitions vs. nonrepetitive utterances vs. acknowledgment vs. no follow-ups) ($F(3, 30) = 5.604$; $p = .004$). Then we conducted some pairwise comparisons based on our hypotheses, the average number of repetitions parents used was significantly greater than the average number of nonrepetitive utterances and no follow-ups respectively ($M_{R-N} = .455$, $t(32) = 2.782$, $p = .006$; $M_{R-NFU} = .758$, $t(32) = 4.100$, $p < .001$; See Figure 1), but the difference between the number of repetitions and the number of acknowledgments was insignificant ($M_{R-A} = .152$, $t(32) = 0.681$, $p = .250$). The hypothesis that parents most often included repetitions in their responses to children's pronoun errors was thus supported. However, different from what we hypothesized, the differences among parents' specific response types were not significant ($F(6, 27) = .952$, $p = .475$). Regarding repetitions, Parents responded with simple repetitions more often than corrected repetitions and expanded repetitions, contrary to the hypothesis that parents would use more corrected and expanded ones ($M_{SR} = .364$ vs. $M_{CR} = .303$ vs. $M_{ER} = .212$; See Figure 2). It was worth noting that parents hardly neglected their children's utterances that had pronoun errors since they were least likely to provide no follow-ups to children's pronoun errors ($M_{NFU} = .121$).

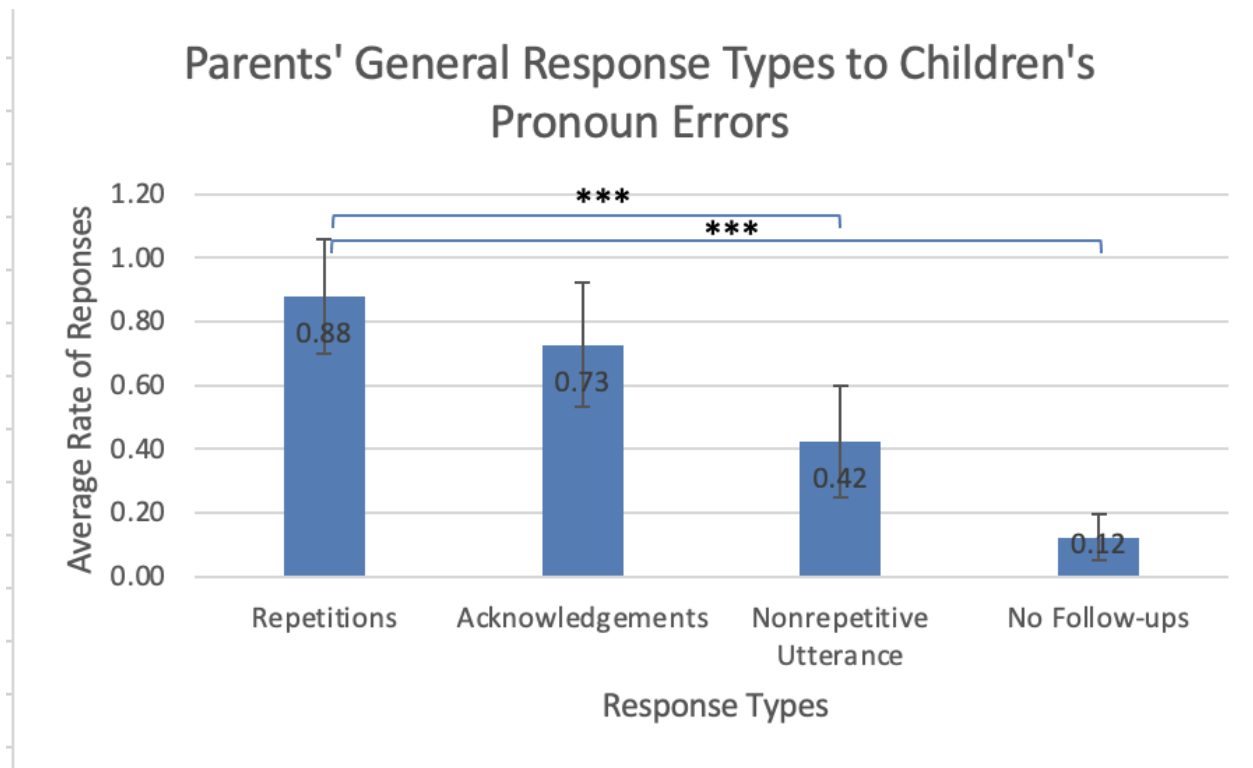


Fig 1. The average rate of each parental general response type to children's personal pronoun errors

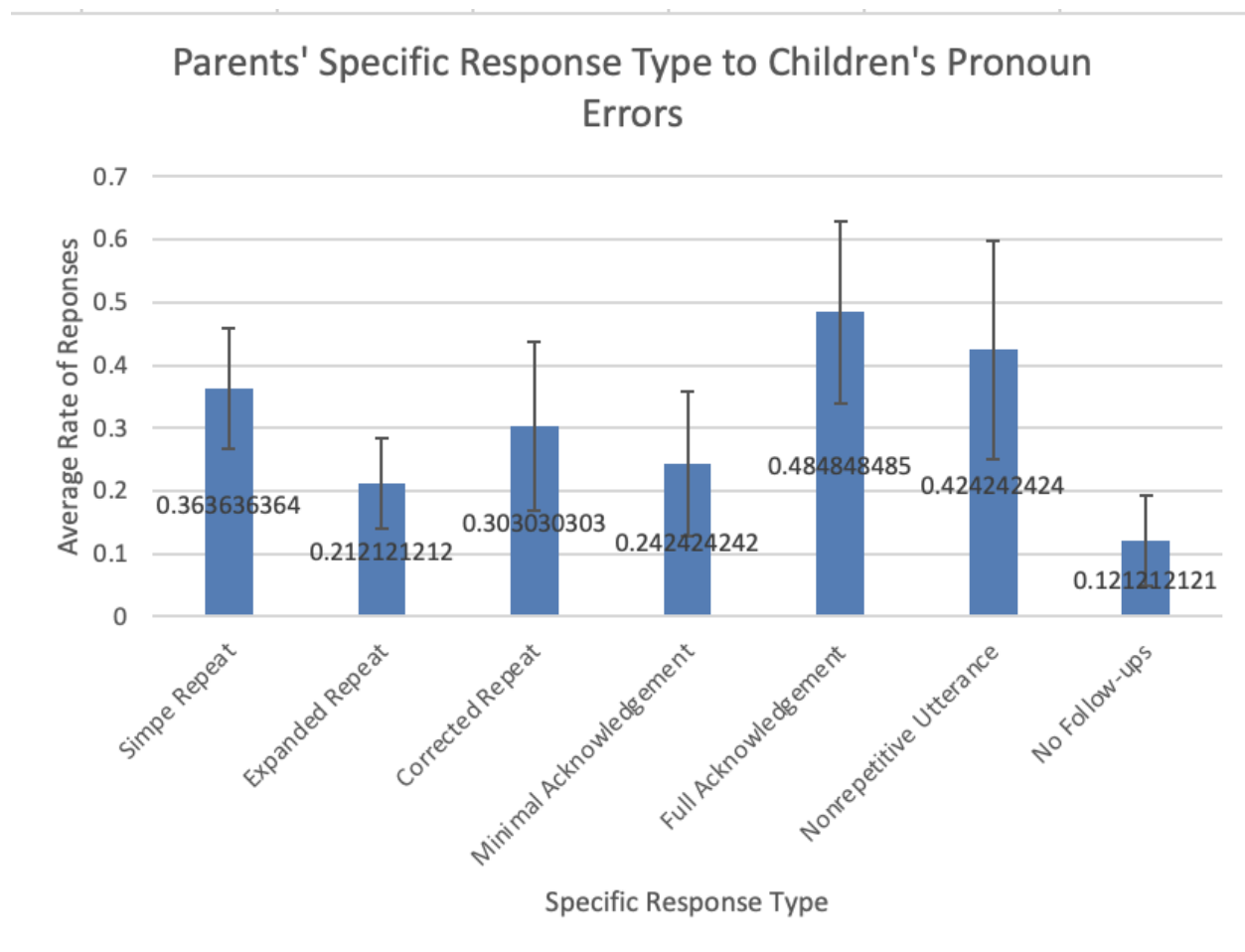


Fig 2. The average rate of each parental specific response type to children's personal pronoun errors

Children's Personal Pronoun Errors

The second critical question was about what types of pronoun errors four-year-old children made. To analyze this, we did a factorial MANOVA test to compare children's average rates of making each type of error, which was calculated by dividing the sum of each pronoun error type by 33. There was a significant difference among children's specific pronoun error types ($F(5, 28) = 10.211, p < .001$). By paired samples t-tests, the average number of number errors and the average number of gender errors were significantly greater than the average number of the case, morphological, person, and undefined errors, respectively (See Figure 3). This finding supported

our hypothesis that semantic errors, especially the number and gender errors, occurred the most frequently among children's personal pronoun errors.

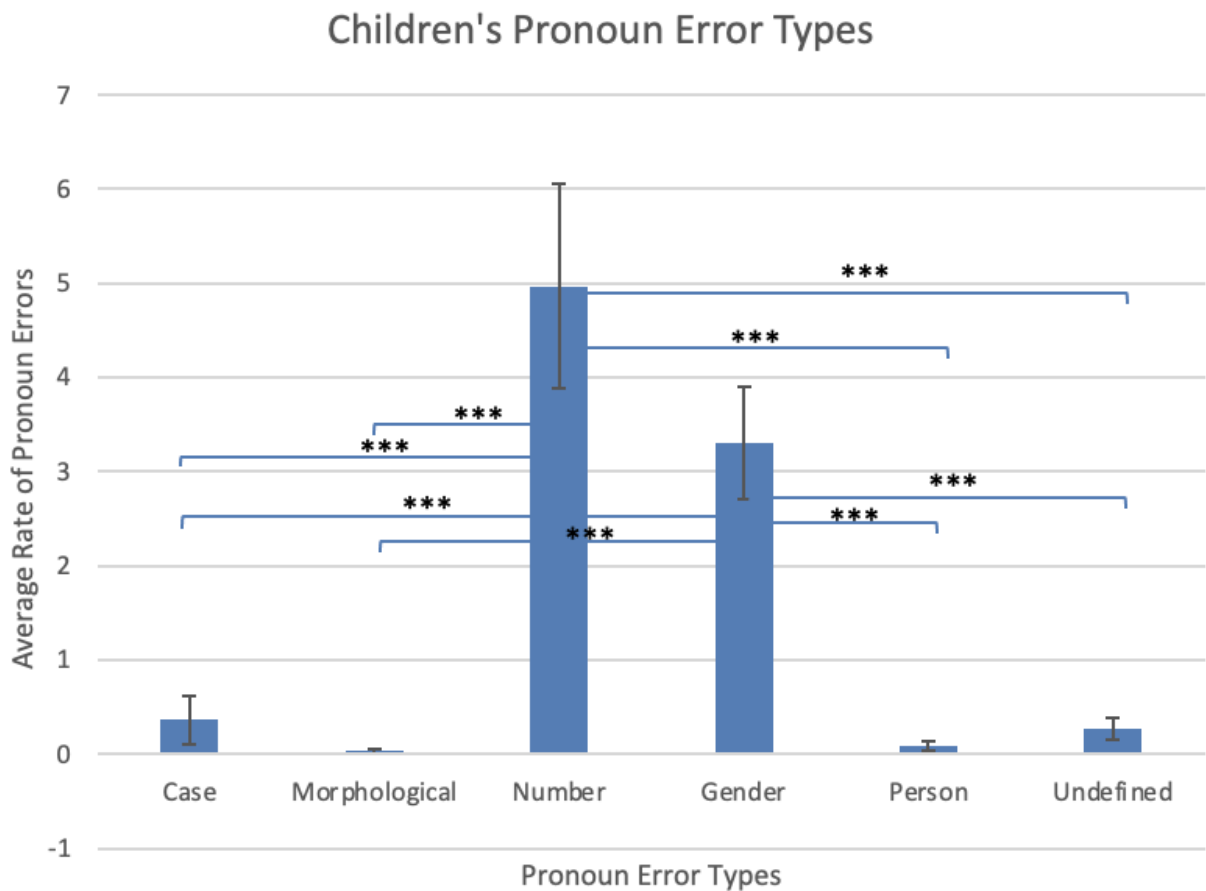


Fig 3. The average rate of children's pronoun error types

The Relationship between Referential Domains and Children's Pronoun Errors

Another critical question was how the frequency of children's pronoun errors differed by the referential domains. Regarding form errors, the differences in the case errors and the morphological errors were insignificant among the three referential domains, supporting the hypothesis that children's form-related pronoun errors would be largely independent of referential domains. On the other hand, their semantic errors differed significantly across three referential domains, with a marginally significant difference between animal referents and social

referents, which was consistent with the hypothesis that children's meaning-related pronoun errors would be highly correlated to referential domains ($M_{A-S} = 2.303$, $t(32) = 2.113$, $p = .021$; $M_{A-F} = 3.788$, $t(32) = 4.316$, $p < .001$; $M_{S-F} = 1.485$, $t(32) = 2.872$, $p = .004$). Specifically, as expected, children made significantly more gender errors in the animal domain compared to the social domain ($M_{A-S} = 1.364$, $t(32) = 1.850$, $p = .037$; See Figure 4). Moreover, they referred to the animal referent using "he" significantly more often than using "she," consistent with the hypothesis that they had a male pronoun bias when describing a gender-neutral animal referent ($M_{he-she} = 2.091$, $t(32) = 3.748$, $p < .001$; See Figure 5). Also, it was worth noting that children were generally sensitive to the gender difference between human referents, although there were a few cases where they referred to the human referent as "it" (e.g., CHI: "It teaches." for the teacher referent).

Contrary to the hypothesis that children made significantly more number errors in the nonhuman domains compared to the human domain, the difference in the number errors between the animal domain and the social domain as well as between the food domain and the social domain was insignificant after controlling for multiple comparisons ($M_{A-S} = 1.030$, $t(32) = 1.448$, $p = .079$; $M_{S-F} = .606$, $t(32) = 1.755$, $p = .044$; See Figure 6). Something against our hypothesis was that the number errors differed significantly between the nonhuman domains since children made significantly more numbers in the animal domain compared to the food domain ($M_{A-F} = 1.636$, $t(32) = 2.640$, $p = .006$). The occurrence of person errors and undefined errors was infrequent

and differed insignificantly among the three referential domains.

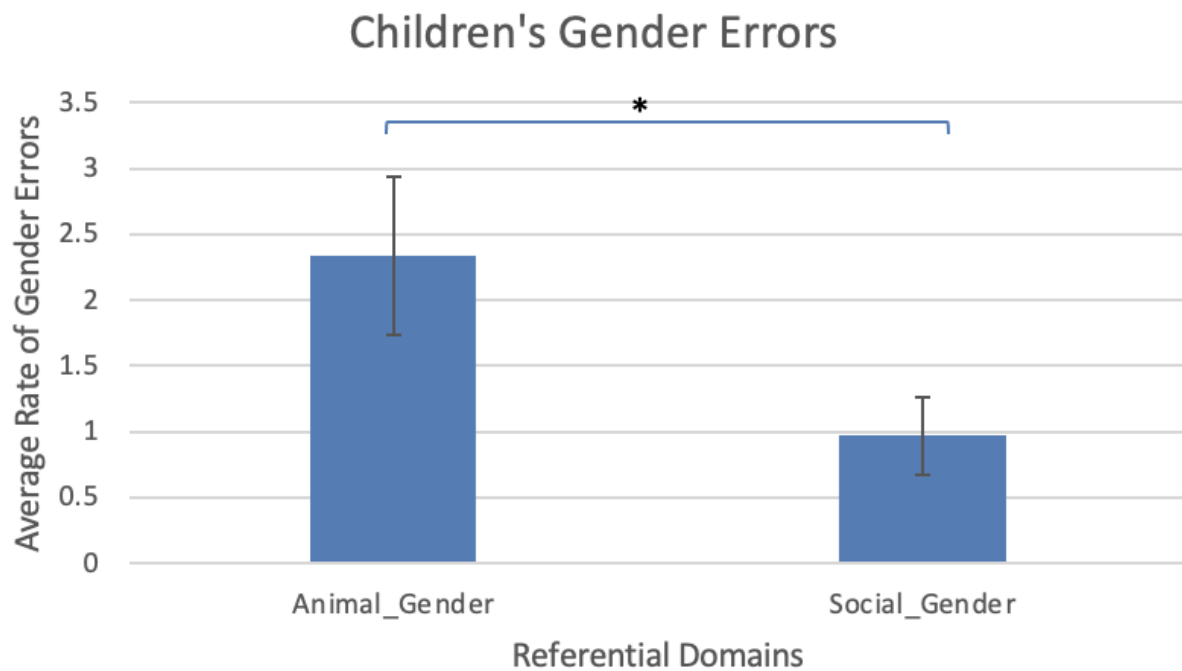


Fig 4. The means of gender errors in the animal domain and the social domain

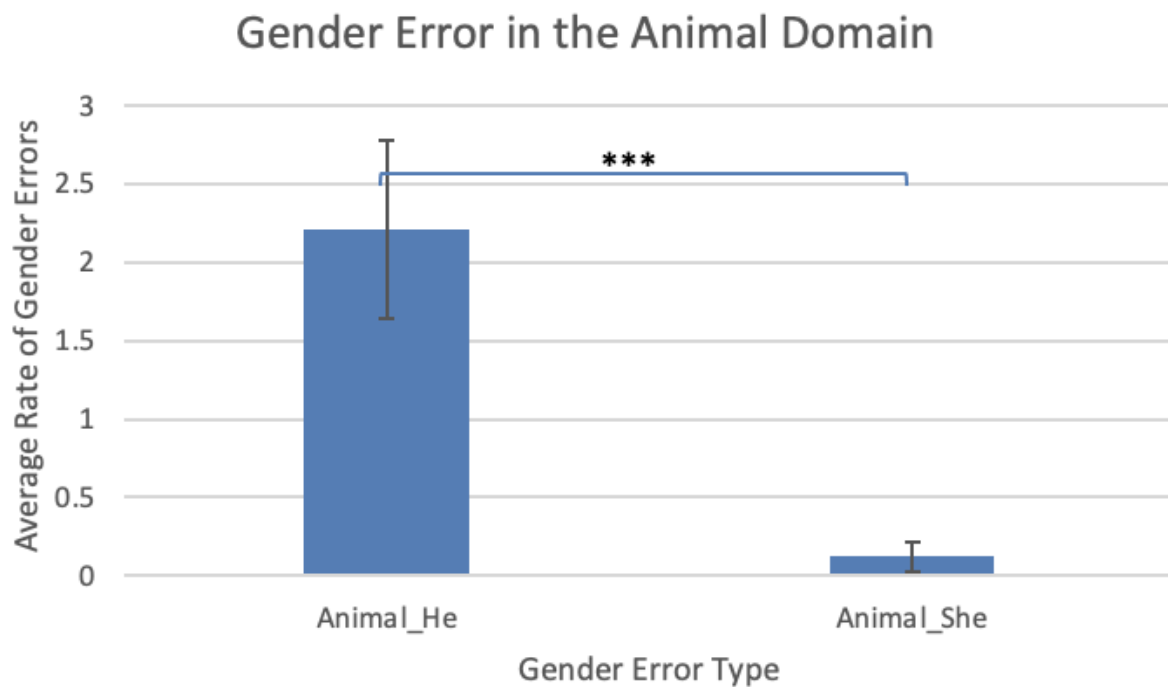


Fig 5. The means of “he” and “she” gender errors when children referred to the animal referent

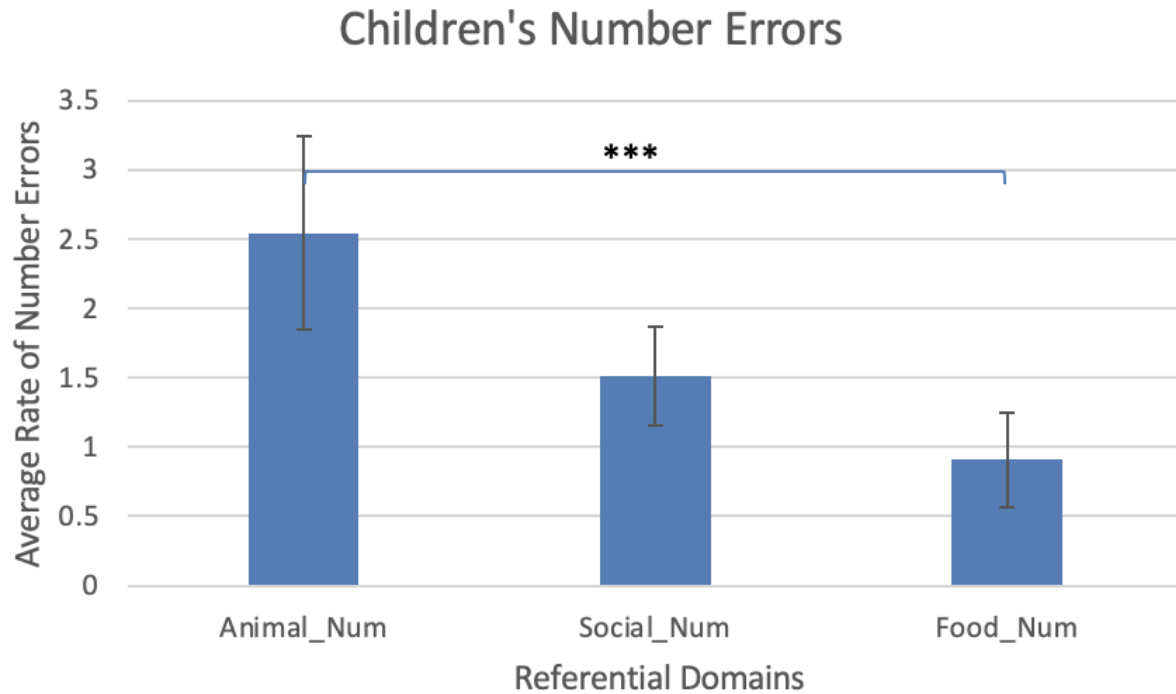


Fig 6. The means of number errors among the three referential domains

The Relationship between the Type of Pronoun Errors and Parents' Responses

Another critical question was whether parents' responses differed by the pronoun error types. To analyze this, we did a multivariate multiple regression. We found that children's morphological and semantic personal pronoun errors had a significant effect on the utterance type parents responded with ($F(4, 27) = .825, p < .001$; $F(4, 27) = .866, p < .001$). We found a significant, positive effect of children's semantic pronoun errors on parents' use of repetition, which supported the hypothesis that children's semantic pronoun errors would be positively correlated to parents' repetitions ($F(1,30) = 24.523, p < .001, B = .366$). Specifically, the more semantic pronoun errors children made, the more corrected repetitions parents responded with ($F(1,30) =$

27.227, $p < .001$, $B = .284$). Something we did not hypothesize but found in the exploratory analysis was that children's semantic pronoun errors also positively predicted acknowledgments from parents ($F(1,30) = 42.711$, $p < .001$, $B = .564$). Specifically, the more semantic pronoun errors, the more minimal acknowledgment parents responded with ($F(1,30) = 31.206$, $p < .001$, $B = .310$). Consistent with the hypothesis that parents' response types would be affected by non-corrective utterance types, we found a significant, positive effect of children's morphological pronoun errors on parents' use of nonrepetitive utterances ($F(1,30) = 86.972$, $p < .001$; $B = 1.456$). Overall, the findings suggested that parents responded differentially by the form and meaning pronoun errors.

Discussion

In summary, parents responded with repetitions most frequently to children's personal pronoun errors, about 40% of the time. They also often used acknowledgments about 30% of the time. Children's number and gender errors outnumbered other types of personal pronoun errors, which frequently appeared in the animal domain. Moreover, parents provided more corrective responses and minimal acknowledgments for children's semantic personal pronoun errors, but more nonrepetitive utterances for children's morphological errors.

These results have supported previous literature on how parents responded to children's speech errors, such that they used repetitions to facilitate their conversations with children to signal any new information based on children's previous utterances and hint at potential errors (Bohannon & Stanowicz, 1988). This repetitive feedback, different from the negative evidence (e.g., "No, you can not say that!"), is advantageous to children's personal pronoun acquisition. Most of the children's number and gender errors occurred when they were describing a gender-neutral animal

referent and using “they” immediately when they noticed a single referent. These were speech errors that were specifically tied to children’s comprehension of each referent and cultural habits, since using the gender-neutral pronoun “they” is common in America. Either direct denial of children’s pronoun errors or full acknowledgment fails to accurately position this type of “error.”

In addition, the distribution of children’s gender error types in the animal domain supports the attitudinal theory regarding children’s language acquisition, such that personal involvement or familiarity with referents other than the pure linguistic aspect impacts children’s choice of words (Nilsen, 1977). Children used “he” to refer to the gender-neutral animal referent 63% of the time, and it was worth noting that the use of “he” was not intensely associated with “strong, active, brave” referents as Nilsen described in her study. “He” and “they” seemed to be children’s priority choices to refer to gender-neutral animal referents, which was heavily influenced by American culture and parents’ tacit approval as their parents often repeated their choice of pronoun.

While the current study suggests that parents facilitate children’s personal pronoun acquisition by using repetitive communicative strategies, the monolingual language background and the sample size of participants indicate that future studies could look into how parents interact with their children from other language backgrounds and cultures. Moreover, when children no longer used “he” for gender-neutral referents could be further investigated because this can suggest the time when children began to associate the concept of gender bias with their language development.

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Appendix A

Domain	Book A	Book B	Book C	Book D
Animal	Frog	Alligator	Butterfly	Duck
Animal	Lion	Elephant	Cat	Ladybug
Animal	Owl	Horse	Dolphin	Pig
Animal	Snake	Lobster	Parrot	Puppy
Animal	Rabbit	Penguin	Skunk	Turtle
Food	Corn	Broccoli	Cracker	Banana
Food	Milk	Cake	Ice cream	Bread
Food	Pie	Cereal	Muffin	Carrot
Food	Pretzel	Orange	Pineapple	Cheese
Food	Strawberry	Popcorn	Pumpkin	Cookie
Social	Farmer	Clown	Ballerina	Baby
Social	King	Football player	Firefighter	Baseball player
Social	Police officer	Pilot	Judge	Doctor
Social	Surfer	Teacher	Old lady	Painter
Social	Weightlifter	Witch	Race car driver	Pirate

Note. Referent list in Gelman's 2014 Individual Differences corpus

Appendix B

Form (2)		
Case (C)	the selection of a phonological form depending on whether the pronoun is subjective (e.g., they/I), objective (e.g., them/me), or possessive (e.g., theirs/mine).	e.g., Us is going to the grocery store.
Morphological (M)	Incorrect grammatical transformation	e.g., That is shes cup.
Meaning (4)		
Number (N)	1. whether that referent includes a single member (singular) or multiple members (plural). 2. consistency of using a specific number	e.g., “us” for the reference of himself e.g., It is a dolphin; they can swim.
Gender (G)	whether that referent is male, female, or neither.	e.g., “it” in place of “her” or “he”
Person (P)	It identifies whether the referent is the speaker (first person), the listener (second person), or another person who is not being spoken to directly (third person).	e.g., “you had a ball” instead of “she had a ball.”
Undefined Referents (U)	when the child used a personal pronoun that induced ambiguous or multiple interpretations	e.g., “I have nothing to talk about it” when “it” can refer to the referent gardener or the picture book.

Note. Children’s personal pronoun error types

1. Repetitions	
Simple Repeat (exact, contracted) (S)	a re-repeat of a word or phrase
Expanded Repeat (E)	repeat+new information
Corrected Repeat (recast) (C)	repeat but correct errors, not restricted to directly correct personal pronouns (e.g., chi: “her woke up early;” parent: “Isabella woke up early” in an indirect way.)
2. Nonrepetitive utterances	respond to the child's previous utterance without repeating major sentential elements
New Arguments/Questions (N)	Example: he’s dirty in mud; well I think those are just spots/ he’s dirty in mud; would those be spots?
3. NA	
No Follow-up (NA)	no follow-up to the sentence the child is making personal pronoun errors
4. Acknowledgment	
Minimal Acknowledgment (M)	mm, hum
Full Acknowledgment (F)	yes

Note. Parents’ response types