1   Preferring Politeness: Young children's implicit comprehension of linguistic politeness

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8   Abstract

9   Adults routinely demonstrate social sensitivity by utilizing polite speech. But when do

10   children begin to comprehend linguistic politeness? Existing literature indicates that basic

11   comprehension of polite speech presents early in development; however, previous studies

12   have not observed reliable preference for a polite speaker in children younger than 4 years,

13   potentially due to experimental task demands. This project uses a less challenging

14   paradigm (adapted from similar shape-preference paradigms, i.e., Hamlin, Wynn, & Bloom,

15   2007; Thomas & Sarnecka, 2019) to investigate the age of polite language acquisition. Our

16   data showed that 2-year-old and 4-year-old children indicate preference for a polite speaker,

17   whereas 3-year-old children indicate preference for an impolite speaker, suggesting that

18   preference for a polite speaker–and perhaps comprehension and acquisition of linguistic

19   politeness more broadly–does not develop as a smooth, upward trend across development.

20   In addition to informing our understanding of children's sociolinguistic development, this

21   study demonstrates the effectiveness of a simpler paradigm for future studies of linguistic

22   politeness in young children.

23   *Keywords:* politeness, language acquisition, pragmatic development, online

24   experiment

25   Word count: 5,009

Preferring Politeness: Young children's implicit comprehension of linguistic politeness

To engage in successful social interactions, an individual must demonstrate social sensitivity; the same individual must assess the social sensitivity of others to determine the desirability of their social partners. The capacity to evaluate individuals on the basis of their social interactions is universal and unlearned (Haidt & Joseph, 2004; Hamlin, Wynn, & Bloom, 2007; Hauser, 2006; Pinker, 2003). Even preverbal infants develop social preferences based on individuals' behavior toward others (Hamlin, Wynn, & Bloom, 2007). Through development, humans learn to routinely demonstrate and assess social sensitivity by employing and interpreting linguistic politeness in speech.

Linguistic politeness can be defined as a set of social behaviors, expressed verbally, which maintain, enhance, or challenge interpersonal relations (Vergis & Pell, 2020). It is a form of social etiquette, which regulates the choice of communicative forms, structures, and set phrases a person uses (Ryabova, 2015). Being polite is considered a part of adult pragmatic competence. According to Lakoff (1973), the rules of politeness include Distance (do not impose), Deference (give options), and Camaraderie (make the addressee feel good).

Grice (1975) asserts that, when conversing, rational speakers strive to obey four maxims: Quality (speak truthfully), Quantity (speak succinctly), Relation (speak relevantly), and Manner (speak clearly). These maxims describe the basis of human communication. When speaking politely, however, individuals typically do not behave rationally in accordance with Gricean Maxims: in fact, polite speech violates theories of effective communication by typically being both inefficient, indirect, and under-informative (Yoon, Tessler, Goodman, & Frank, 2020). Then why speak politely?

Yoon et al. (2020) propose a utility-theoretic solution to the problem of understanding polite speech. Utility theory is a positive theory in economics which explains human behavior by postulating that individuals possess consistent priorities. In the context of politeness, Yoon et al. suggest that polite speech emerges from a trade-off

between three competing goals of communication: to convey information (informational utility), to be kind (prosocial utility), and to present oneself as intending to be both informative and kind (self-presentational utility). Their model of polite language–which incorporates informational, social, and self-presentational utility–predicts human data remarkably well, indicating that their utility-theoretic approach correctly captures motivations underlying polite speech.

Composing a Polite Utterance

Speaking with an appropriate degree of politeness comes intuitively to most adults; however, formulating an adequately polite utterance is a fairly complex process. There are numerous considerations adults with normative socio-pragmatic competence typically make before producing a polite utterance. Ervin-Tripp (1977) asserted that two factors affect the production and comprehension of polite register: knowledge of the linguistic form of polite requests and knowledge of pragmatic request rules within a given social and situational context. We have synthesized and expanded on these factors and others cited in existing literature in Figure 1.
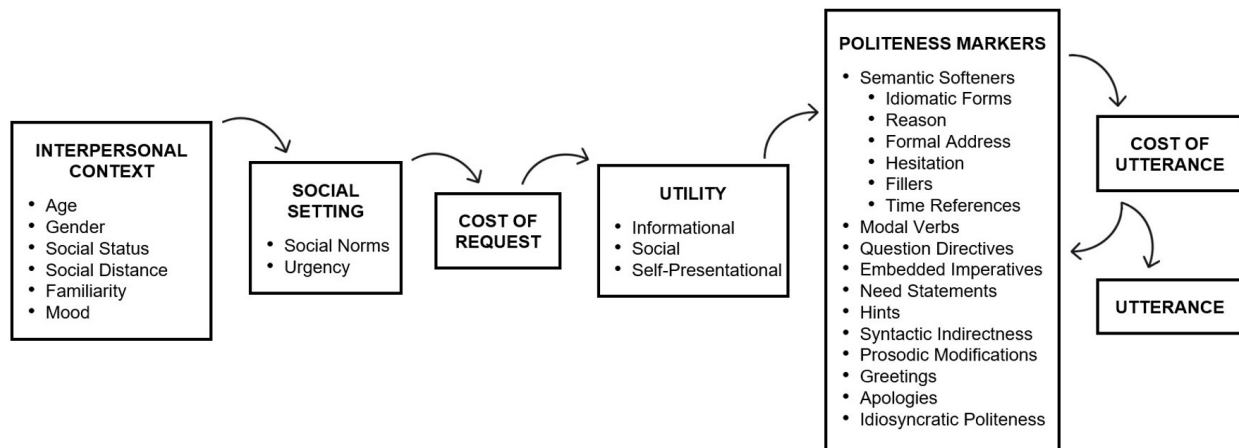

Figure 1. Considerations when selecting a polite utterance.

In selecting a polite utterance, an individual must first consider the interpersonal context of their interaction. According to Lakoff's (1973) first rule of politeness–Distance–it is important for speakers to maintain the social distance between themselves and their interlocutors. To be appropriately polite, an individual must vary their level and form of linguistic politeness depending on this social distance, which may be evinced in age, gender, occupation, and social status (Lakoff, 1973; Pedlow, Wales, & Sanson, 2001). For example, it may be more appropriate for a younger person to speak more politely to an older person than to someone of a similar age, and it may be more appropriate for a male to speak more politely to a female than to another male.

After considering the interpersonal context of their interaction, a person must consider the degree of politeness which is appropriate for the unique social setting. For instance, a sense of urgency makes it more appropriate to opt for the imperative (and less polite) phrase "Call an ambulance, now," as opposed to asking, "Ms. Smith, when you have a moment, would you mind calling an ambulance, please?"

After considering the interpersonal context and social setting of their interaction, an appropriately polite individual must consider the cost of their request and, if applicable, redress an overly costly request by increasing their degree of linguistic politeness (Labov & Fanshel, 1977).

Based on the utility-theoretic explanation of politeness goals, an individual must also decide how informative they want to be, how kind they want to be, and how informative and kind they want to appear. In doing so, the person must determine their ideal, balanced weightings of the informational, social, and self- presentational utilities of their utterance (Yoon, Tessler, Goodman, & Frank, 2020).

Then, the individual must consult their internal inventory of politeness markers and selectively compose an utterance which is appropriate for the interpersonal context, social setting, and cost of their request, as well as satisfies their desired utilities. As formalized by

93 Lakoff (1973), requests which are more imposing, present fewer options, and risk making

94 the addressee feel bad require heightened polite speech.

95   Finally, the person must weigh the cost of their utterance (e.g., a long utterance or an

96 utterance that compromises utility would be more would be particularly costly). If the cost

97 is reasonable, then the person would make the utterance, and if the utterance is too costly,

98 the person would return to their inventory of politeness markers to compose a less costly

99 utterance.

100   The broader context in which an individual composes a polite utterance can be

101 understood through a Rational Speech Act (RSA) framework (Yoon, Tessler, Goodman, &

102 Frank, 2020). RSA models (Frank & Goodman, 2012) are based on the theory that

103 probabilistic speakers and probabilistic listeners recursively reason about each other's

104 mental states in order to infer the intended meaning of utterances and to generate

105 responses. At each step in the process of composing a polite utterance, the speaker must

106 not only judge the literal meaning of their own potential utterance; they must also predict

107 the listener's interpretation to ensure that their utterance effectively communicates their

108 intended messages.

109   According to this RSA framework, a speaker chooses to produce an utterance

110 containing particular politeness markers based on their prediction of how a listener would

111 interpret it, and the listener being reasoned about interprets the utterance by reasoning

112 about the speaker's prediction, and so on (Yoon, Tessler, Goodman, & Frank, 2020).

Acquisition of Politeness

114   Being suitably polite involves masterfully combining an understanding of social and

115 contextual factors with an inventory of linguistic forms. The complexity of this ability

116 brings into question when and how humans begin to acquire polite speech.

117   Production of polite speech begins early in development among English-speaking

118   children: At 2 years, children modify their requests to adjust politeness (Bates & Silvern,

119   1977). At 2.5 years, children produce the word "please" (Read & Cherry, 1978) and use

120   hints as an indirect request strategy (Newcombe & Zaslow, 1981). By 3 years, children are

121   able to vary their utterances based on whether they are instructed to "tell" versus "ask" an

122   addressee to give them a puzzle piece (Bock & Hornsby, 1981). These children also possess

123   several politeness formulas in their repertoires and use them spontaneously and

124   appropriately quite frequently in their home context (Eisenberg, 1982).

125   Evidence from studies on children's understanding of politeness indicates that

126   children understand the implications of polite speech early on. In a study by Yoon and

127   Frank (2019), each child was read 12 stories in which two characters made requests politely

128   and impolitely. The child was then asked one of four speaker attribute questions ("Which

129   one was [more polite, more rude, nicer, or meaner]?") and one of two social implication

130   questions (either ""Which one would you rather play with?" or "Which one will [get what

131   they want]?"). Yoon and Frank ran three experiments which tested different combinations

132   of linguistic markers, prosodic cues, and facial expressions. They found that by 3 years,

133   preschool children could correctly identify whether a person was nicer, meaner, ruder, or

134   more polite than another speaker based on which speaker included politeness markers such

135   as "please" in their requests. By 4 years, preschool children understood that polite

136   speakers are more likely to have their requests granted and tended to choose polite

137   speakers as play partners over non-polite speakers; however, this study did not observe

138   reliable preference for a polite speaker in children younger than 4 years.

139   Because (1) children tend to comprehend language before producing it (Clark &

140   Hecht, 1983), (2) children produce "please" at 2.5 years (Read & Cherry, 1978), (3) polite

141   language is considered prosocial (Brown & Levinson, 1978), and (4) infants as young as 6

142   months prefer prosocial characters (Hamlin, Wynn, & Bloom, 2007), it seems plausible that

143   children at least as young as 2.5 years should indicate preference for a polite speaker.

144   Considering this, Yoon and Frank may have not observed reliable preference for a polite

145 speaker in children younger than 4 years due to experimental task demands.

146   The stimuli used by Yoon and Frank was visually complex with detailed characters

147 and backgrounds, which may have distracted children from the characters' speech. Because

148 the children were read a series of 12 stories, performance on the task required a long

149 attention span. Further, the stories were narrated, so the superfluous auditory input may

150 have made it difficult for younger children to note the difference between polite and

151 impolite speech. Overall, these features of the stimuli may have made the task less

152 accessible to younger children.

| Jamie wanted more water in her cup. Jamie said to Fred, "Please pour me more water." | Suzy also wanted more water in her cup. Suzy said to Fred, "Pour me more water." | Which one was being nicer? Which one will Fred give water to? |

Figure 2. Stimuli sample from Yoon and Frank (2019).

153   There is a precedent of using shape-preference paradigms when assessing social

154 preference in very young children. Both Hamlin et al. (2007) and Thomas and Sarnecka

155 (2019) employ shape-preference paradigms in which characters are represented by colored

156 shapes with eyes and a mouth to indicate animacy. This type of paradigm may be more

157 accessible to young children than more visually complex stimuli; basic colors and shapes

158 allow children to easily distinguish between the characters without visual distraction.
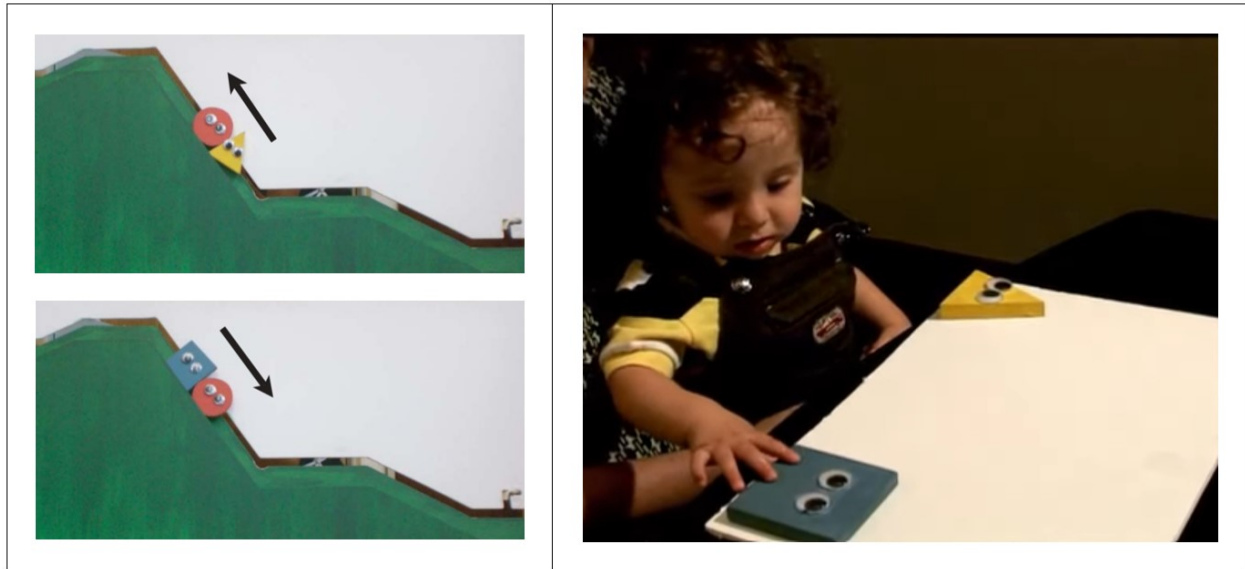
Figure 3. Stimuli sample from Hamlin et al. (2007). A character attempted to climb a hill and was either bumped up the hill by a helper (top left panel) or bumped down the hill by a hinderer (bottom left panel). The child was presented with the helper and hinder (right panel), and the child's grabbing or reaching behavior was treated as indication of preference.
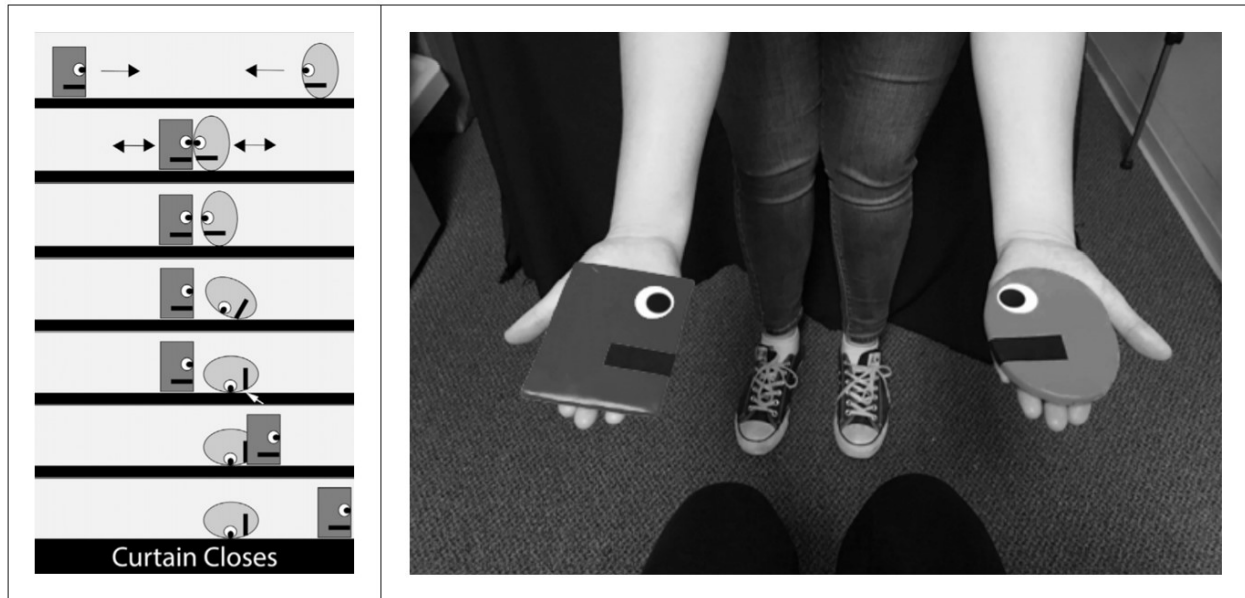
Figure 4. Stimuli sample from Thomas and Sarnecka (2019). A high-status and a low-status character approached each other and collided. The low-status character yielded by bowing and moving upstage (left panel). The child was presented with the high-status and low-status puppets (right panel), and the child's grabbing or reaching behavior was treated as indication of preference.

The Current Study

The current study tests 2-year-old, 3-year-old, and 4-year-old children's implicit understanding of linguistic politeness by assessing their preference for a polite speaker over an impolite speaker.

In this study, we adopt a visually simple shape-preference paradigm (Hamlin, Wynn, & Bloom, 2007; Thomas & Sarnecka, 2019) to minimize visual distractions and to assist children in distinguishing between characters more easily. Our stimuli consist of only two animations–one featuring a polite speaker and one featuring an impolite speaker–so children do not have to pay attention for very long. To minimize auditory distractions, our stimuli involve no narration: The only audible speech is the polite and impolite utterances.

By making these adjustments, the current study proposes a more accessible task, which could detect preference for a polite speaker in children younger than 4 years.

Hypotheses.

1. Considering our less challenging task, we predicted that 2-year-old, 3-year-old, and 4-year-old children would indicate preference for a polite speaker over an impolite speaker (i.e. the proportion of children in each age category who indicated preference for a polite speaker would differ from chance).

2. Considering evidence for graded comprehension of politeness in young children (Yoon & Frank, 2019), we predicted that children would indicate preference for a polite speaker over an impolite speaker more reliably (i.e. with a stronger effect) with increasing age.

₁₈₀ **Methods**

₁₈₁ **Participants**

₁₈₂   Participants ($N = 56$; 15 Asian, 1 Black/African, 1 Hispanic/Latinx, 1 Native

₁₈₃ American, 29 White, 6 more than one race, 3 unreported race) included English-speaking

₁₈₄ 2-year-old ($n = 18$; 9 male, $M_{age} = 2.52$ years, $SD_{age} = 0.23$), 3-year-old ($n = 18$; 7 male,

₁₈₅ $M_{age} = 3.58$ years, $SD_{age} = 0.32$) and 4-year-old children ($n = 20$; 10 male, $M_{age} = 4.55$

₁₈₆ years, $SD_{age} = 0.31$) children living in the U.S. at the time of data collection. Participants

₁₈₇ were recruited through the Department of Psychology at Stanford University through

₁₈₈ Facebook advertisements, Children Helping Science (an online recruitment platform for

₁₈₉ developmental research), and direct outreach to preschools and day cares in the Bay Area.

₁₉₀   We selected our sample size based on a Bayesian power analysis conducted in R. Our

₁₉₁ lowest-power statistical tests were by-age-category Bayesian binomial tests. To detect an

₁₉₂ effect in which 80% of children indicate preference for a polite speaker with 80% power and

₁₉₃ a 95% credible interval, we ran 15 participants in each age category (45 total). We

₁₉₄ recruited 60 participants to compensate for exclusions and missing data. A second power

₁₉₅ analysis showed that with 60 participants across age categories, we could detect an effect in

₁₉₆ which 70% of children indicate preference for a polite speaker with 80% power and a 95%

₁₉₇ credible interval.

₁₉₈   Prior to data collection, we decided to exclude a child from the study if:

₁₉₉ 1. The child was known to have any cognitive, auditory, or visual impairment, and the

₂₀₀   impairment was reported by the parent.

₂₀₁ 2. The child was known to have any neurodevelopmental disorder that significantly

₂₀₂   affects cognitive processing or social cognition, such as Down syndrome or autism

₂₀₃   spectrum disorder, and the disorder was reported by the parent. Attention deficit

₂₀₄   disorder and attention deficit hyperactivity disorder were only grounds for exclusion

if the child was unable to adequately complete test trials due to inattention or restlessness as per criterion 6.

3. The child did not hear English "all of the time" or "most of the time" as indicated by the parent upon registration.

4. A non-participant (e.g. the child's parent or sibling) interjected or interfered by pointing at the screen at any time during the experiment, audibly commenting, or providing a response to either dependent variable measure.

5. The child failed to provide a response to DV1 after four prompts.

6. The child was looking away from the screen for at least 25% of the animation.

7. The child was looking away from the screen during either speaker utterance.

8. The parent rated the video or audio quality below a 3 out of 5.

Stimuli

The animation began with a (secondary) familiarization phase (Figure 5) in which a shape (the speaker) entered from the left of the screen, spotted two cookies on the opposite side of the screen, gasped excitedly, approached the cookies, ate one cookie, and celebrated by jumping up and down. The purpose of this phase was to inform the participant that the speaker's goal was to eat a cookie.

A testing phase (Figure 6) followed in which the speaker entered from the left of the screen and stopped in front of another shape (the listener), who was standing in the way of the cookies. In the polite condition, the speaker said, "I am so hungry! May I have a cookie, please?" In the impolite condition, the speaker said, "I am so hungry! Give me a cookie now." Regardless of condition, the listener moved out of the speaker's way. The speaker gasped excitedly, crossed in front of the listener, approached the cookies, ate one cookie, and celebrated by jumping up and down.
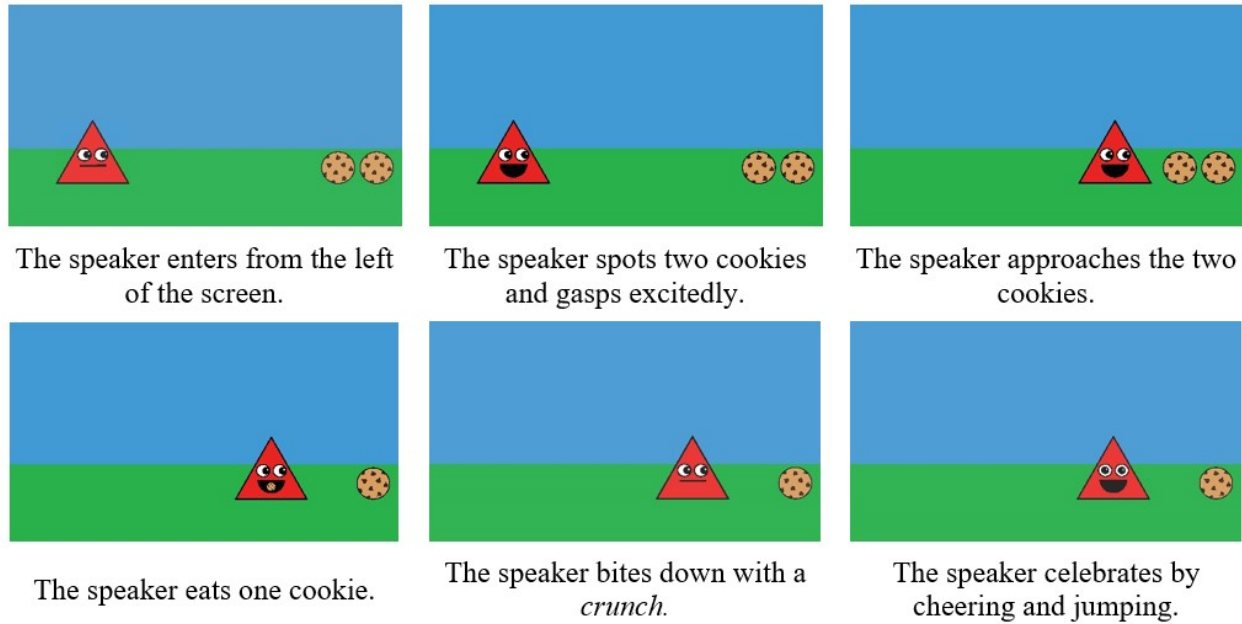
Figure 5. Familiarization phase.

²²⁹ Utterances used in the animation were prerecorded. Intonation was naturalistic and

²³⁰ did not include exaggerated "polite" or "impolite" prosody. Utterances were cleaned using

²³¹ Audacity, an audio editing and recording software (Audacity Team, 2020), and RMS was

²³² standardized across conditions using Praat, a phonetics software (Boersman & Weenink,

²³³ 2020).

²³⁴ The background consisted of a solid, green block and solid, blue block depicting grass

²³⁵ and sky. The listener was always a blue circle. The polite and impolite speakers consisted

²³⁶ of either a red triangle and yellow square or a yellow triangle and red square. The triangle

²³⁷ and square were the same height and width. The shape of the speaker (triangle/square),

²³⁸ color of the shape (red/yellow), and order of the conditions (first/second) were

²³⁹ counterbalanced across trials.

²⁴⁰ **Randomization**

²⁴¹ A generic list randomizer was used to assign the first 16 participants in each age

²⁴² category to one of 16 uniquely counterbalanced animations (without repeats). The same
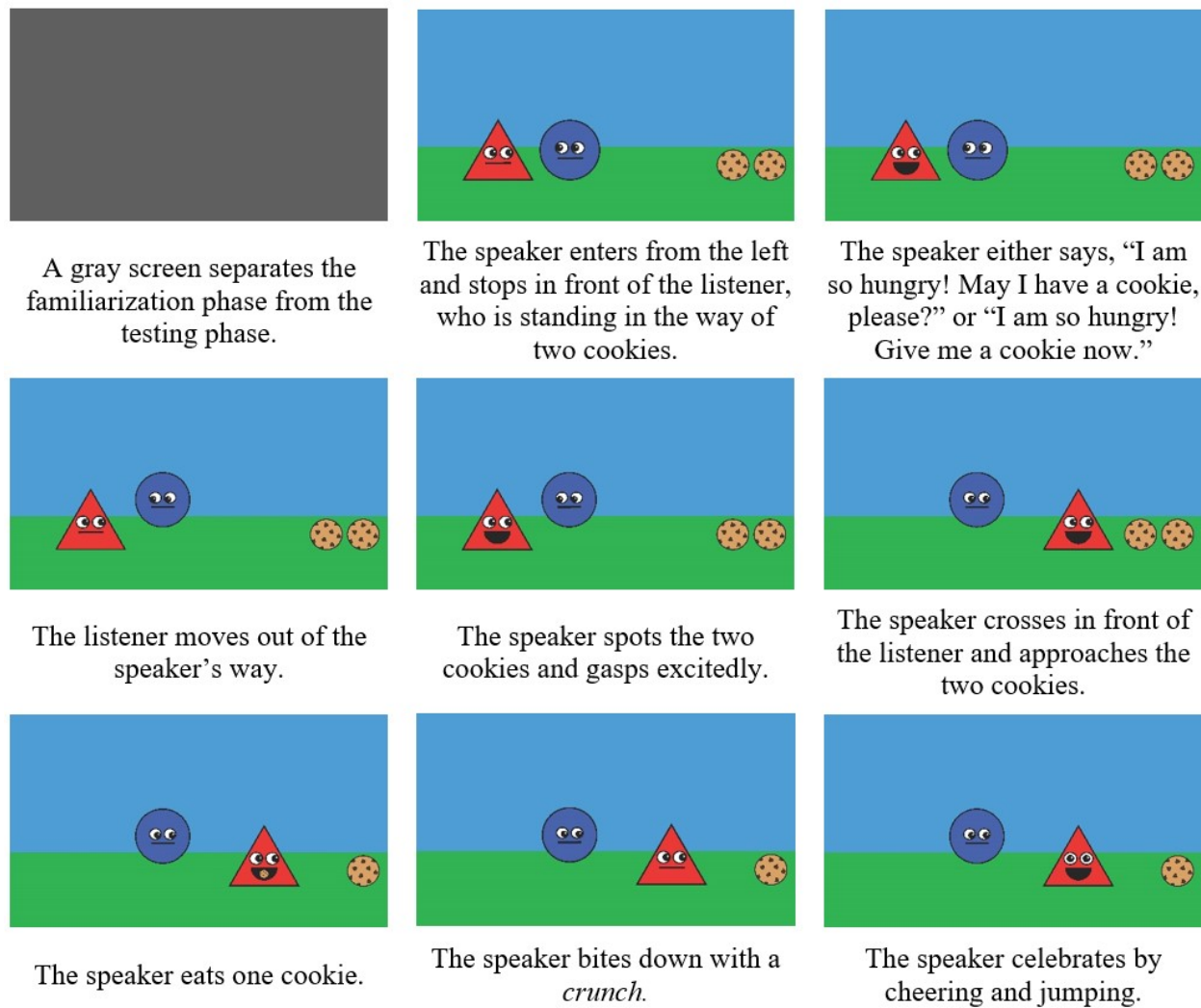
A gray screen separates the familiarization phase from the testing phase.

The speaker enters from the left and stops in front of the listener, who is standing in the way of two cookies.

The speaker either says, "I am so hungry! May I have a cookie, please?" or "I am so hungry! Give me a cookie now."

The listener moves out of the speaker's way.

The speaker spots the two cookies and gasps excitedly.

The speaker crosses in front of the listener and approaches the two cookies.

The speaker eats one cookie.

The speaker bites down with a *crunch*.

The speaker celebrates by cheering and jumping.

Figure 6. Testing phase.

243 generic list randomizer was used to assign the remaining 4 participants in each age

244 category to one of the 16 animations (without repeats).

Procedure

246   Children completed the study in their family's home on personal computers with an

247 experimenter online via Zoom (a videotelephony software). A parent provided either

248 written consent via email or verbal consent prior to testing. The attending parent was

249 notified that they or their child may stop participation at any time. Testing sessions were

250 recorded with parental consent. Each session began by testing audio quality and

251 calibrating the participant's screen settings.

252   The experimenter began with a warm-up activity to build rapport with the child.

253 The experimenter played a short "I-Spy" game with the child, during which a black and

254 white dog emerged from behind a pile of leaves, then a brown squirrel emerged from the

255 same pile. To avoid inducing side bias, the animals were front-facing and centered, and the

256 pile of leaves was symmetrical.

257   Next, in the primary familiarization, the experimenter introduced the child to a green

258 pentagon, which had eyes and a mouth to indicate animacy. The experimenter then showed

259 the child what the character looks like when it "feels very sad" (downturned mouth), "feels

260 normal" (flat-line mouth), and "feels very happy" (upturned, open mouth). The purpose of

261 this primary phase was to introduce shapes as animate characters and to accustom the

262 participant to facial expressions that would be seen in the upcoming animation.

263   After the primary familiarization phase, the animation was played. Each participant

264 saw both the polite condition and the impolite condition as detailed above. The

265 experimenter was not blind to condition but bared a blank expression and looked down

266 while the animation was playing. At the end of the animation, the caregiver attending to

267 the child was asked to close their eyes before the child's preference and reasoning were

268 assessed.

269   We measured preference between a polite speaker and an impolite speaker by

270 presenting a forced-choice in which the speakers appeared on opposite sides of the screen

271 (counterbalanced) and the participant was asked, "Which friend do you want to play

272 with?" (DV1, our key dependent variable measure).

273   Pointing, reaching, and verbal answers were coded equivalently as indication of

274 preference. If a child did not answer, the child was prompted three more times with

275 analogous wording. If the child did not provide an answer after four prompts, the session

was concluded. If the child provided an answer, the child was then asked, "Why do you

want to play with that friend?" (DV2, a supplementary dependent variable measure). If

the child did not provide an answer, the child was prompted twice more.

Including screen setup and debriefing, each session took approximately 10 to 15

minutes to complete. Following the session, parents were emailed a certificate of

participation for their child; children nor parents were financially compensated.

Coding and Inferences

Age category was coded to consist of three levels:

- 2-year-old children (2 years, 0 months $\leqslant$ x < 3 years, 0 months)

- 3-year-old children (3 years, 0 months $\leqslant$ x < 4 years, 0 months)

- 4-year-old children (4 years, 0 months $\leqslant$ x < 5 years, 0 months)

DV1 was dummy coded with preference for the polite speaker as 1 and preference for

the impolite speaker as 0. DV2 was coded to include:

- No reasoning: no explanation after a third prompt (e.g., silence, shrugging, or "I
  don't know").

- Superficial reasoning: any explanation regarding elements besides speaker utterance
  (e.g., "I like him," "He's red," "Triangles are my favorite").

- Logical reasoning: any explanation that refers to speaker utterance and is consistent
  with the animation (e.g., describing the polite speaker as "nice" or "polite").

- Other reasoning: any explanation that does not fall under classifications $1 - 3$ (e.g.,
  an intelligible response).

297 Our study used pairwise deletion: If a child did not complete DV2, their DV1 data

298 was still included in analyses.

299 Two-tailed tests were used for each of our analyses. We made inferences based on

300 credible intervals, using a 95% credible interval criterion for success.

<center>**Results**</center>

302 We assessed whether the proportion of children in our sample who indicated

303 preference for a polite speaker differed from chance using a Bayesian binomial test. 57% of

304 our entire sample indicated preference for a polite speaker. The probability that 2- to

305 4-year-old children indicate preference for a polite speaker above chance level is 0.859.

306 A logistic regression predicting speaker preference from age showed a slightly

307 positive–but not particularly strong–overall effect of age: Every 12-month increase in age

308 predicted an increase of 0.1 in the probability that a child would indicate preference for a

309 polite speaker (see Figure 7).

310 To ensure we were able to characterize any variation than was not captured by our

311 logistic regression, we faceted our data by age category (2-year-old, 3-year-old, and

312 4-year-old children). We then assessed whether the proportion of children in each age

313 category who indicated preference for a polite speaker differed from chance, once again

314 using Bayesian binomial tests.

315 We observed an unexpected result in which (1) 3-year-old children performed more

316 poorly on the task than originally hypothesized and (2) there was a substantial drop in the

317 developmental trajectory of performance on this task, as seen in 3-year-old children (see

318 Figure 8). 66% of 2-year-old children indicated preference for a polite speaker. The

319 probability that 2-year-old children indicate preference for a polite speaker *above* chance

320 level is 0.920. 34% of 3-year-old children indicated preference for a polite speaker. The

321 probability that 3-year-old children indicate preference for a polite speaker *below* chance

322 level is 0.914. 69% of 4-year-old children indicated preference for a polite speaker. The

323 probability that 4-year-old children indicate preference for a polite speaker *above* chance
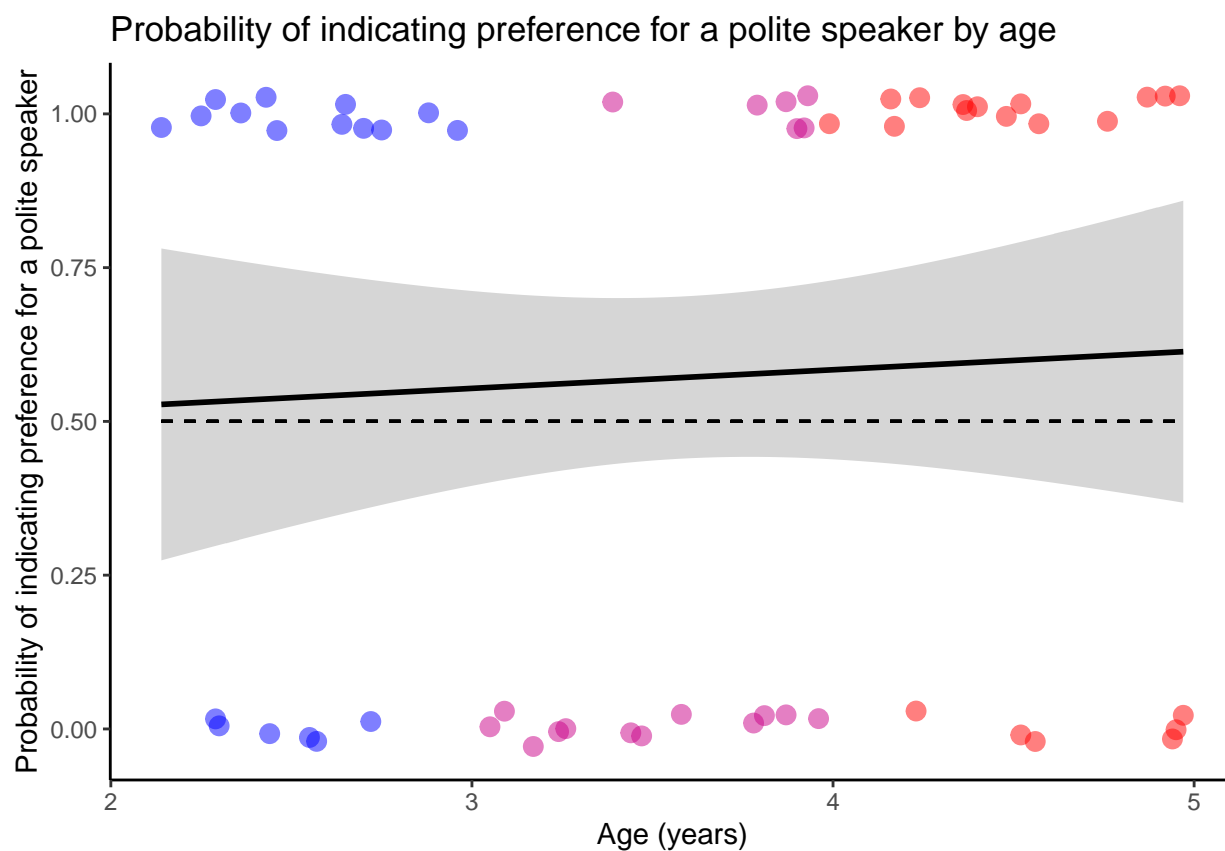
324 level is 0.959.

Figure 7. Each point represents an individual observation. Points have been jittered vertically for readability. Dotted, black line denotes chance performance. Solid, black line represents a logistic regression. Ribbons represent pointwise 95% confidence intervals on the model.

Probability of indicating preference for a polite speaker by age category
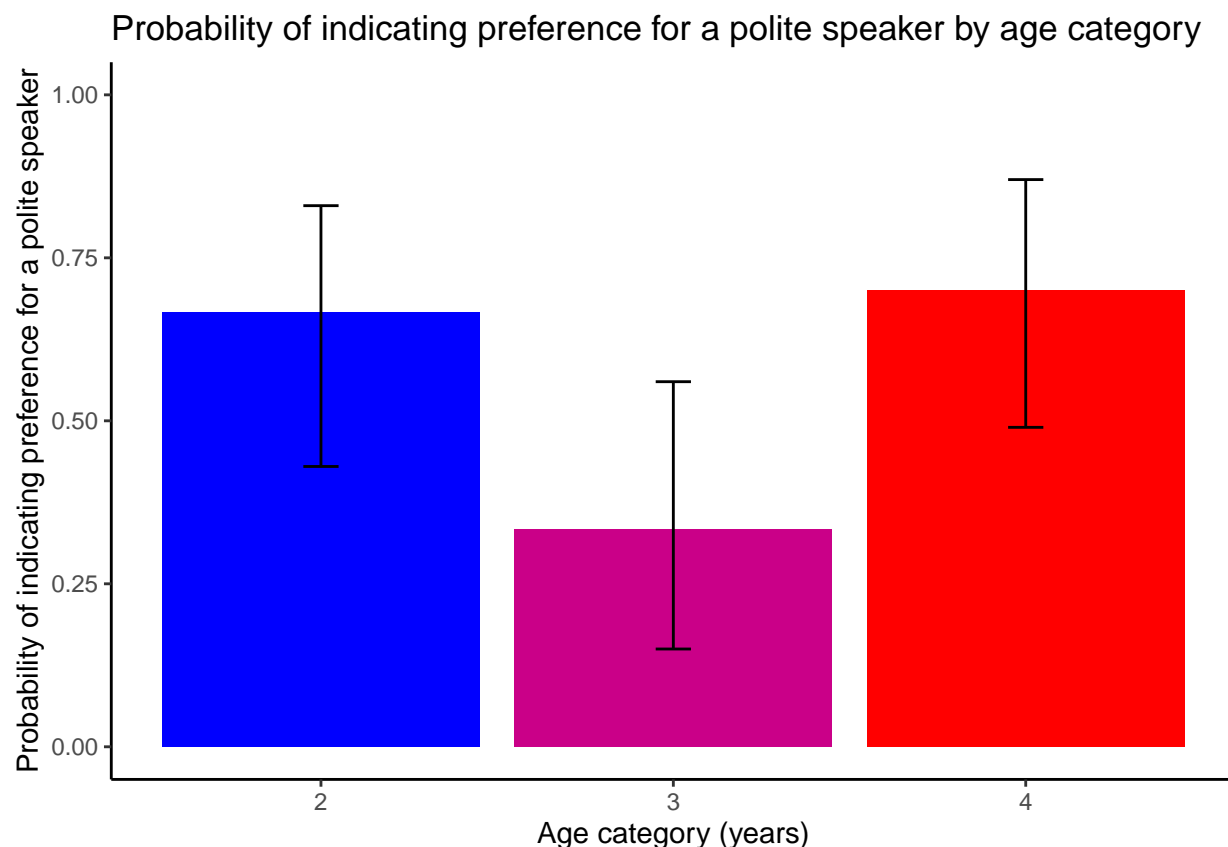
Figure 8. Each bar illustrates the mean response of participants in each age category, which is representative of the probability of indicating preference for a polite speaker. Error bars represent 95% credible intervals based on Bayesian binomial tests.

Discussion

In this study, we sought to determine whether children younger than 4 years possess a preference for a polite speaker over an impolite speaker. We replicated prior research which suggested that 4-year-old children reliably indicate preference for a polite speaker, whereas 3-year-old children do not (Yoon & Frank, 2019); however, our data suggest that this is not indicative of the onset of this preference. By employing a shape-preference paradigm with fewer experimental task demands than in prior studies, we were able to show that 2-year-old children also reliably indicate preference for a polite speaker over an impolite speaker. These findings suggest that the onset of an implicit comprehension of

334 linguistic politeness may occur as early as or before 2 years.

Preference for a Polite Speaker in Children Younger Than 4 Years

336 Consistent with existing literature, our study confirmed that 4-year-old children

337 reliably indicate preference for a polite speaker (Yoon & Frank, 2019).

338 In contrast to prior literature, our combined sample of 2-year-old, 3-year-old, and

339 4-year-old children indicated preference for a polite speaker above chance level. Our logistic

340 regression revealed a slightly positive overall effect of age on the probability that a child

341 would indicate preference for a polite speaker (see Figure 7). Our results offer evidence in

342 support of our second hypothesis: Considering evidence for graded comprehension of

343 politeness in young children (Yoon & Frank, 2019), we predicted that children would

344 indicate preference for a polite speaker over an impolite speaker more reliably with

345 increasing age.

346 Further, the intercept of our model revealed performance above chance as early as 2

347 years. This finding suggests that socio-pragmatic competence–specifically implicit

348 comprehension of linguistic politeness as indicated by preference for a polite speaker–is

349 established as early as 2 years: 2 years earlier than alleged by prior research.

350 The performance of 2-year-old children in our task is comparable to the performance

351 of 4-year-old children, indicating that there is not a substantial increase in the probability

352 of indicating preference for a polite speaker between 2 and 4 years: All of the cognitive

353 capacities that are necessary for identifying politeness markers, forming an opinion about

354 the speaker based on these markers, and indicating a preference is present at 2 years old.

355 There is strong evidence that infants as young as 6 months are capable of social

356 evaluation and prefer prosocial others to antisocial others (Hamlin, Wynn, & Bloom, 2007).

357 Children begin producing polite language as early as 2 years old (Bates & Silvern, 1977;

358 Read & Cherry, 1978), and children understand language prior to producing it. Reconciling

359 this existing literature with our data suggests that by 2 years, children recognize polite

360 language as prosocial, which motivates them to prefer polite speakers over impolite

361 speakers. This understanding of polite language as an indicator of prosociality may be due

362 in part to children recognizing the co-occurence of politeness markers and other positive

363 words, for example, "You should be nice and say please" (Yoon & Frank, 2019).

364 As an alternative to this preference for prosocial language, children may prefer polite

365 speakers due to the reinforcement they receive from adults early on in development.

366 English-speaking children are often explicitly taught and prompted to use politeness

367 markers in their requests from early on (Gleason & Weintraub, 1976). Adults often praise

368 polite language and good manners in children. Further, adults are more likely to grant the

369 requests of children who speak politely.

370 **Unexpected Performance of 3-Year-Old Children**

371 Our sample of 3-year-old children performed much differently than expected:

372 3-year-old children performed *below* chance, indicating preference for the impolite speaker.

373 While we observed a numerical dip in the probability of 3-year-old children indicating

374 preference for a polite speaker, our intuition is that this is not indicative of a true declivity.

375 It is unusual for developmental trajectories to be characterized by a temporary slump;

376 therefore, our data may under-estimate the true probability of 3-year-old children

377 indicating preference for a polite speaker. Unfortunately, our sample size was not large

378 enough to assuredly discern the difference between a chance deviation and a true deviation

379 from our hypothesized developmental trajectory. In order to make this distinction, our

380 results will have to be replicated.

381 It is, however, possible that the numerical dip we observed in 3-year-old children is

382 indicative of a true developmental trend. If replicated, this finding would be meaningful

383 because it would demonstrate that, contrary to prior belief, preference for a polite

speaker–and perhaps comprehension and acquisition of linguistic politeness more broadly–does not develop as a smooth, upward trend across development.

At 3 years, most children enter preschool, at which point they experience a sudden increase in their amount of social interaction with peers. In this socially rich environment, children may be more interested in *exploring* the social world and thus select the character whose utterance is the least expected as opposed to the character whose utterance is the most prosocial. By 4 years, children have gained significant experience with the social world and consequences of prosocial and antisocial behavior, which may cause them to revert back to preferring prosocial others.

Limitations

While preference for a polite speaker, itself, is a meaningful measure of socio-pragmatic competence, preference for a polite speaker may not sufficiently capture children's implicit comprehension of linguistic politeness. In this study, we use preference for a polite speaker as an operationalization of implicit comprehension of linguistic politeness; however, this measurement masks comprehension of linguistic politeness that manifests as preference for an impolite speaker.

Some children may prefer an impolite speaker due to the unexpected nature of the speaker's language. There is compelling evidence that young children prefer–and choose to engage with–toys which function unexpectedly (Bonawitz, Schijndel, Friel, & Schulz, 2012; Gweon & Schulz, 2008; Schulz & Bonawitz, 2007). The context that is presented in our animation is foreign to many children: From a very young age, if a child asks nicely, their wished are granted, and if they ask rudely, they are corrected by an adult (e.g., "What do you say?" or "What's the magic word?"). In our animation, the request of both the polite and impolite characters were granted. The unexpected response to the impolite speaker may motivate some children to prefer the impolite speaker.

It is also worth noting that multiple children in our sample distinctly giggled after the impolite speaker made its utterance. In response to DV2, some children even credited their choice of the impolite speaker to their perception of the speaker as "funny" or "silly." Humor, as a component of social interaction, may contribute to some children's interest in and preference for impolite speakers.

Politeness is extremely broad and is used across several contexts (see Figure 1). As such, this study was only able to examine children's preference for a polite speaker in a very specific scenario which represents only a very small portion of the landscape in which linguistic politeness is usually employed. Children's preference for a polite speaker may vary across contexts. Likewise, there is myriad evidence that children hone their contextual use of politeness as they age (Axia & Baroni, 1985; Bates & Silvern, 1977; Becker & Smenner, 1986; Ervin-Tripp, 1977; Gleason & Weintraub, 1976; James, 1978; Wood, 1980); thus, young children may only possess preference for a polite speaker or, more broadly, comprehension of linguistic politeness in a limited number of social contexts.

Conclusion

In sum, through this study, we developed and demonstrated the effectiveness of a more accessible paradigm for studying politeness in young children. We discovered that children younger that 4 years are able to reliably indicate preference for a polite speaker; however, we unexpectedly observed a dip in the developmental trajectory of this preference, as seen in 3-year-old children. This dip may be an artifact of the paradigm, a chance result, or indicative of a true change in preference. In order to confirm our findings, they must be replicated. Once replicated, our shape-preference paradigm can be used to study other aspects of linguistic politeness and further untangle the question of how to characterize young children's acquisition and conceptualization of polite language.

References

Audacity Team. (2020). GTS: GNU Triangulated Surface library.
https://audacityteam.org/.

Axia, G., & Baroni, M. R. (1985). Linguistic politeness at different age levels. *Child Development*, 918–927.

Bates, E., & Silvern, L. (1977). Social adjustment and politeness in preschoolers. *Journal of Communication*.

Becker, J. A., & Smenner, P. C. (1986). The spontaneous use of thank you by preschoolers as a function of sex, socioeconomic status, and listener status. *Language in Society*, 537–545.

Bock, J. K., & Hornsby, M. E. (1981). The development of directives: How children ask and tell. *Journal of Child Language*, *8*(1), 151–163.

Boersman, P., & Weenink, D. (2020). GTS: GNU Triangulated Surface library. http://www.praat.org/.

Bonawitz, E. B., Schijndel, T. J. van, Friel, D., & Schulz, L. (2012). Children balance theories and evidence in exploration, explanation, and learning. *Cognitive Psychology*, *64*(4), 215–234.

Brown, P., & Levinson, S. C. (1978). Universals in language usage: Politeness phenomena. In *Questions and politeness: Strategies in social interaction* (pp. 56–311). Cambridge University Press.

Clark, E. V., & Hecht, B. F. (1983). Comprehension, production, and language acquisition. *Annual Review of Psychology*, *34*(1), 325–349.

Eisenberg, A. R. (1982). Understanding components of a situation: Spontaneous use of politeness routines by mexicano 2-year-olds.

Ervin-Tripp, S. (1977). Wait for me, roller skate! In *Child discourse* (pp. 165–188). Elsevier.

Frank, M. C., & Goodman, N. D. (2012). Predicting pragmatic reasoning in language games. *Science*, *336*(6084), 998–998.

Gleason, J. B., & Weintraub, S. (1976). The acquisition of routines in child language. *Language in Society*, 129–136.

Grice, H. P. (1975). Logic and conversation. In *Speech acts* (pp. 41–58). Brill.

Gweon, H., & Schulz, L. (2008). Stretching to learn: Ambiguous evidence and variability in preschoolers' exploratory play. In *Proceedings of the 30th annual meeting of the cognitive science society* (pp. 570–574).

Haidt, J., & Joseph, C. (2004). Intuitive ethics: How innately prepared intuitions generate culturally variable virtues. *Daedalus*, *133*(4), 55–66.

Hamlin, J. K., Wynn, K., & Bloom, P. (2007). Social evaluation by preverbal infants. *Nature*, *450*(7169), 557–559.

Hauser, M. (2006). *Moral minds: How nature designed our universal sense of right and wrong.* Ecco/HarperCollins Publishers.

James, S. L. (1978). Effect of listener age and situation on the politeness of children's directives. *Journal of Psycholinguistic Research*, *7*(4), 307–317.

Labov, W., & Fanshel, D. (1977). *Therapeutic discourse: Psychotherapy as conversation.* Academic Press.

Lakoff, R. (1973). The logic of politeness; or, minding your p's and q's. In *Ninth regional meeting of the chicago linguistic society* (Vol. 8, pp. 292–305). 292J305. Chicago: Chicago Linguistic Society.

Newcombe, N., & Zaslow, M. (1981). Do 21/2-year-olds hint? A study of directive forms in the speech of 21/2-year-old children to adults. *Discourse Processes*,

4(3), 239–252.

Pedlow, R., Wales, R., & Sanson, A. (2001). Children's production and comprehension of politeness in requests: Relationships to behavioral adjustment in middle childhood. *Journal of Language and Social Psychology*, *20*(1-2), 23–60.

Pinker, S. (2003). Language as an adaptation to the cognitive niche. *Studies in the Evolution of Language*, *3*, 16–37.

Read, B. K., & Cherry, L. J. (1978). Preschool children's production of directive forms. *Discourse Processes*, *1*(3), 233–245.

Ryabova, M. (2015). Politeness strategy in everyday communication. *Procedia-Social and Behavioral Sciences*, *206*, 90–95.

Schulz, L. E., & Bonawitz, E. B. (2007). Serious fun: Preschoolers engage in more exploratory play when evidence is confounded. *Developmental Psychology*, *43*(4), 1045.

Thomas, A. J., & Sarnecka, B. W. (2019). Infants choose those who defer in conflicts. *Current Biology*, *29*(13), 2183–2189.

Vergis, N., & Pell, M. D. (2020). Factors in the perception of speaker politeness: The effect of linguistic structure, imposition and prosody. *Journal of Politeness Research*, *16*(1), 45–84.

Wood, B. S. (1980). How children "get their way";: Directives in communication. *Communication Education*, *29*(3), 264–272.

Yoon, E. J., & Frank, M. C. (2019). Preschool children's understanding of polite requests. In *CogSci* (pp. 3179–3185).

Yoon, E. J., Tessler, M. H., Goodman, N. D., & Frank, M. C. (2020). Polite speech emerges from competing social goals. *Open Mind*, *4*, 71–87.