Overhearing messages about social groups and the development and measurement of children's intergroup attitudes

By

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TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER 1

Introduction

The negative outcomes associated with experiencing intergroup bias are widespread and cumulative (Wallace, Nazroo, & Bécares, 2016). In the U.S Department of Justice's most recent report of hate crimes in the United States (defined as bias-based crimes motivated by race, religion, or sexual orientation), the total number of crimes reported in 2019 was higher than any other year in the past decade (Federal Bureau of Investigation, 2019). Preferences for members of one's own social group relative to members of other social groups emerge in children as young as 3 years of age (Aboud, 2003; Nesdale, 2004). These intergroup biases typically increase between early childhood (2 – 4 years) and middle childhood (5 – 7 years), stabilizing around 8 – 10 years of age (Raabe & Beelman, 2011). One way in which children likely learn about social groups is from messages in their social environments. For example, from others' conversations or from overhearing information on the news or radio. Past work provides evidence that direct and overheard claims about other groups of people strengthen children's biases toward those groups (e.g., Conder & Lane, in press; Lane et. al, 2020; Gonzalez, Steele, & Baron, 2017). This work also finds that messages have a stronger effect on older children's biases (7 – 10 years) compared to younger children's biases (4 – 6 years). This dissertation explores potential explanations for this age difference using novel methodologies likely to contribute to work on how children learn from others' messages and the development of their social biases.

Past work exploring children's intergroup biases typically rely on explicit questions (e.g., do you want to be friends with a group member?), behavioral measures (e.g., resource allocation

tasks) and implicit association measures (Hailey & Olson, 2013). However, these measures may not completely capture children's true intergroup attitudes. Children's drawings have been shown to provide rich information about children's social concepts (Diem-Wille, 2001; Gonzalez-Rivera & Bauermeister, 2007). Study 1 will investigate whether children's depictions of group members can capture their intergroup attitudes using drawings from a previous study (Conder & Lane, 2021), in which children overheard negative claims about a novel social group from a nearby video-chat conversation. This analysis will also explore potential differences in the influence of claims from informants of different ages (i.e., from another child versus from an adult) and will explore potential longitudinal effects of these claims. Findings may replicate previous work and reveal stronger effects of claims on the biases of older children (7 – 9 years) compared to younger children (4 – 6 years). Children's drawings could also reveal a stronger influence of claims on the younger children's biases than previously detected.

To the extent that there are indeed age differences in children's receptivity to messages about social groups, it is important to identify explanatory mechanisms for these differences. One potential mechanism is age-related differences in how children *attend* to those messages. For example, younger children may pay less attention to messages in their environment about other social groups, subsequently extracting less information from those messages. Study 2 will explore this possibility. Children's (5 – 10 years) attention to a nearby Zoom conversation about a novel social group will be examined, and age-related differences in both attention and the influence of claims on children's attitudes will be evaluated. The influence of positive (along with negative) claims about a novel social group and about a novel toy (as a point of comparison) will also be investigated.

The Development of Children's Intergroup Biases

From as young as 3 years of age, children demonstrate preferences for members of their own social groups over members of other social groups (Nesdale, 2004). For example, children (3 – 9 years) prefer to affiliate with, allocate more resources to, and "like" other children who share their own gender, race, or ethnicity when compared to children who do not (Kinzler, Shutts, DeJesus, & Spelke, 2009; Nesdale, Maass, Griffiths, & Durkin, 2003; Renno & Shutts, 2015). According to a meta-analysis of studies on children's ethnic, racial, and national intergroup bias, children's biases increased between 2-4 years and 5-7 years and were maintained between 8-10 years of age (Raabe & Beelmann, 2011). This age-related increase in children's intergroup bias is likely *partly* a result of biological development. For example, because younger children have less developed social categorization skills, they may have a more difficult time distinguishing between group members (Aboud, 1988). Evidence of this hypothesis can be seen in work with minimal group paradigms (Brewer, 1979) in which children are assigned to arbitrary 'minimal' groups (e.g., to a 'red' or 'blue' group) (Brewer, 1979). Using this paradigm, intergroup biases in children 6 years of age and older are present *immediately* after assignment, but this is *not* the case in younger children (Dunham, 2018; Dunham & Emory, 2014).

Younger children's biases (4 – 6 years) can emerge using minimal group paradigms but require additional influence. For example, in one study, preschool teachers were trained to emphasize group differences over the course of three weeks (e.g., by asking children to line-up by their group color or introducing competition between groups). Following this experience, preschoolers whose teachers highlighted group differences (in comparison to those whose teachers did not), more often reported that they would want to play with an unfamiliar child wearing their group's shirt color than with an unfamiliar child wearing the other group's color

(Patterson & Bigler, 2006). In a similar study, 6–9-year-olds whose teachers emphasized group differences over the course of four weeks, more often used positive character traits to describe unfamiliar children from their own group than they did to describe unfamiliar children from the other group (Bigler, Jones, & Lobliner, 1997). These findings support biological accounts of intergroup bias development and suggest that influences in one's environment may also be required to maintain or strengthen such biases. According to developmental intergroup theory (DIT; Bigler & Liben, 2007), we inherently put ourselves and others into social categories and form preferences for those within our own categories over those from others social categories. However, the categories that we form (e.g., based on features like skin tone or gender) depend upon features of groups that are most emphasized in our environment. Thus, biases toward other social groups are partly a result of typical biological development and partly learned from one's environment.

Past experimental and correlational work support that children's intergroup biases can be learned from others (Over & McCall, 2018; Skinner & Meltzoff, 2018). For example, children have been shown to develop biases from viewing how other people are treated. In one study, preschool-aged children who saw a video of a researcher either smiling and leaning toward another adult or scowling and leaning away from that adult, 'liked' the adult that was treated positively more than the adult who was treated negatively (Skinner, Meltzoff, & Olson, 2016). Children's biases have also been shown to change based on whether they have interacted with members of other social groups. According to intergroup contact theory (Allport, 1954), exposure to members from other social groups can decrease negative bias toward those groups. In a meta-analysis of 696 studies examining the influence of contact among many different social groups, ages, geographic locations, and contexts, intergroup contact effectively reduced biases in

almost every study (Pettigrew & Tropp, 2006). A third way that children have been shown to learn about social groups, is through racial-ethnic socialization (RES) practices. For example, in families of color in the United States, it is common for parents to practice RES through direct and indirect messages about their cultural heritage and living in a majority White society (Lloyd & Gaither, 2018). Recent attention has moved to investigating the lack of RES in White families. Pahlke, Bigler, and Suizzo (2012) found that White mothers intentionally avoided the topic of race or ethnicity with their children, even when they were asked to read books to their child that were designed to elicit talk about different social groups.

This past work suggests that the development of children's intergroup biases, between the ages of 3 and 10 years, is at least partly learned from other people. In experimental work, one way in which children have been shown to develop biases toward social groups is from overhearing what other people say about those groups (Conder & Lane, in press, Lane, Conder, & Rottman, 2020). In their daily lives, children are likely exposed to messages about social groups from hearing others' conversations or from electronic media (e.g., from TV or radio). In a recent monograph, children reported hearing and remembering negative statements about immigrants and women made by Donald Trump following the 2016 election (Patterson et al., 2019). The studies in this dissertation will focus on how children learn about new groups of people from these types of overheard messages.

Children's Learning from Others' Claims

There have only been a few studies to date (Diesendruck and Menahem, 2015; Gonzalez et al., 2017; Lane et al., 2020; Rottman, Young, & Keleman, 2017) that have investigated the influence of others' claims about social groups on children's biases. Most past work has examined how children learn about *non-social* information from others' claims (for reviews see

Harris, 2012 and Harris, Koenig, Corriveau, & Jaswal, 2018). For example, in one study, preschoolers looked for a ball being dropped into a tube in a location that was consistent with a researcher's claims (that the ball would be in a cup that was not directly below the tube), even though this claim defied their sense of gravity (Jaswal, 2010). Some work has focused on children's learning from claims about social information. Children (7 – 11 years) who were told about the importance of donating to others were more likely to donate to a needy child (Grusec, Saas-Kortsaak, & Simutis, 1978; Rushton, 1975). In more recent work, 7-year-olds rated the unfamiliar behaviors of a group of aliens as more 'wrong' if they were told that the behaviors were 'disgusting' in comparison to children who were told nothing about the group's behavior (Rottman, Young, & Keleman, 2017). Jewish-Israeli 6-year-olds who heard stories that emphasized ethnic essentialism, drew a Jewish character with more positive affect and further away from an Arab character, compared to children who did not hear these stories (Diesendruck & Menahem, 2015).

Other work has found that children are influenced by claims that are *overheard*. Toddlers (18-month-olds) and older children can learn novel labels and novel functions from overhearing nearby adults label the objects or functions in real life and on video (Akhtar et al., 2001; Akhtar, 2005; Boderé & Jaspaert, 2017; Gampe, Liebal, & Tomasello, 2012; Floor & Akhtar, 2006; O-Doherty et al., 2011; Shneidman. Woodward, 2016). Some of this past work has revealed age-graded increases in children's learning from overheard claims. For example, older children (5-year-olds) but not younger children (3-year-olds) who overheard an adult mention that a classmate was 'smart', more often copied that classmate's work than children who overheard different information (Zhao et al., 2019). In another study, 3- to 9-year-old children who

overheard that a novel animal was *not* real, later demonstrated an age-graded increase in the belief that the animal *did not* exist (Woolley, Ma, & Lopez-Mobilia, 2011).

Only two studies have examined children's learning about *social groups* from overheard claims. In these studies, 4- to 9-year-old children who overheard negative claims about a novel social group (e.g., "Gearoos are really bad people, they eat disgusting food, and they wear such weird clothes, the Gearoos language sounds so ugly"), demonstrated stronger, negative biases toward that group. Children who overheard these claims from a researcher's phone conversation were less likely to want to be friends with a group member, drew themselves further away from a member of the group, rated the group as being *less good*, and were less willing to try elements of the group's culture, compared to children who were not exposed to claims (Lane, Conder, & Rottman, 2020). Using the same negative claims as Lane, Conder and Rottman (2020), children (4 – 9 years) who overheard the claims from a nearby video-chat conversation, demonstrated stronger negative biases toward the group immediately following claims and again following a two-week delay (Conder & Lane, 2021). In both studies, older children's biases (7 – 9 years) were more strongly influenced by the claims than younger children's biases (4 – 6 years).

One limitation of this past work is that it exclusively focuses on the influence of *negative* claims about social groups on children's biases (e.g., Conder & Lane, 2021; Lane et al., 2020). Only one study has investigated the influence of *positive* claims about other social groups on children's biases. In this study, Gonzalez, Steele, and Baron (2017) read stories that emphasized the positive character traits of Black characters to 5- to 12-year-old Asian and White children (e.g., "This is James. James lives in North Vancouver where he is a fire fighter. James is an excellent fire fighter and is working hard to become fire chief"). After hearing these stories, older children (8 – 12 years) demonstrated less anti-Black bias, according to an implicit

association task, compared to children who heard the same stories about a White character. There were no such differences for younger children (5 – 7 years). There has been no past work examining whether *overheard* positive claims influence children's biases, or whether overheard, positive claims reveal similar age-related differences. Study 2 of this dissertation will explore the influence of overhearing positive or negative claims about new social groups on children's biases toward those groups.

Children Human Figure Drawings

The previously reviewed work on children's developing intergroup biases mostly rely on explicit questions (e.g., asking children whether they would want to affiliate with members of the group), behavioral measures (e.g., resource allocation tasks), and association tasks (for review see Hailey & Olson, 2013). However, these measures may not completely capture children's intergroup biases. Children's drawings of human figures may be an informative way to measure children's biases toward other social groups, potentially capturing attitudes children may be unable or hesitant to verbalize. Some past work has found that children use embellishments (or lack of embellishment) to personify human figure drawings. In one study, ten-year-old children drew themselves alongside a healthy person, a person with cancer, and a person with Autoimmune Disease. Children drew the healthy person more like the drawing of themselves (i.e., of a similar size, hairstyle, clothing, and facial expression), but the person with cancer or with AIDS was depicted as skinnier and with a sadder or angrier face than themselves (Gonzalez-Rivera & Bauermeister, 2007). Israeli-Jewish 4- to 15-year-olds drew an Arab man or woman with lower status professions than they drew a Jewish man or woman (Bar-Tal & Teichman, 2009).

Beyond embellishments, other work has found that children's biases are associated with the size (e.g., area) and with the specific colors used to draw human figures. Jewish-Israeli 4- to 15-year-olds who were shown other children's drawings of Jewish and Arab characters rated *colorful* characters as 'nice and happy', *colorless* characters as 'hostile and sad', and *smaller* characters as 'inferior and weak'. They also found that the youngest children (4-6 years) used darker colors (e.g., black, brown) to draw an Arab man or woman but lighter and brighter colors for Jewish characters (Bar-Tal & Teichman, 2009). In other work, 4- to 11-year-old children drew a 'very nice kind man' taller than a 'very nasty horrible man' (Burkitt et al., 2003). Children also used colors they previously rated as *more favorable* to draw a 'nice' man and colors rated as *less favorable* to draw a 'nasty' man (Burkitt, Barrett, & Davis, 2003). These interpretations of children's human figure drawings (e.g., embellishments, the size of the figure, and color choices) could be a useful tool in detecting children's biases toward other social group members.

Study 1 of this dissertation will investigate whether the interpretation of children's drawings of social group members can reveal negative biases toward those groups. Children's drawings were acquired from a previous study (Conder & Lane, 2021), in which children (4-9 years) either did or did not overhear negative claims about a novel social group. Depictions of the group member from children who overheard the claims were compared with depictions from children who did not overhear claims. Age-related differences in children's depictions of the group member after overhearing claims were considered. This analysis also explored differences in children's depictions of the group member when children heard claims from an adult versus child caller, and when the group member was drawn immediately following claims versus after a 2-week delay.

Children's Attention to Social Messages

From infancy, children demonstrate an awareness that to obtain certain types of knowledge (i.e., knowledge that is not possible to acquire from one's own observations) requires information from others' claims. Thus, children seek out cues during social interactions that may indicate relevant knowledge is being communicated (e.g., Csibra & Gergely, 2009; Harris & Lane, 2014; Koenig, Li, & McMyler, 2020). This idea stems from traditional socio-cultural views of learning, in which it has been established that children as young as 9 months of age use visible social cues (e.g., pointing and eye gaze) to identify a referent and to learn from that referent's claims (Tomasello, 1999). More recent work has found that children have an even more sophisticated ability to attend to relevant information; for example, from subtle linguistic cues (e.g., Akhtar & Gernsbacher, 2007; Nurmsoo & Bloom, 2008). Children's attention to social cues in *overhearing* contexts has been less studied. Some work has found that attending to overheard social cues require more cognitive resources (e.g., attending to a speaker, addressee, and the referent at once) than direct interactions, and can be more challenging for children to interpret (Akhtar and Gernsbacher, 2007; Shneidman, Buresh, Shimpi, Knight-Schwarz, & Woodward, 2009). It is plausible that children whose biases are less influenced by overheard claims about social groups may also have a more difficult time attending to these cues.

In Study 2 of this dissertation, children (5 – 10 years) will overhear a Zoom conversation between their parent and a non-present researcher. During the conversation, children's attention to the speaker on the screen and to their parent (the addressee) will be examined. In the previously reviewed work on children's learning about social groups from overheard claims (Conder & Lane, 2021; Lane et al., 2020), older children's biases (7 – 9 years) were more strongly influenced by claims than younger children's biases (4 – 6 years). One reason why

younger children were less influenced by claims is that they may have paid less attention to the overheard information. To test this possibility, age-related differences in children's attention to the overheard conversation will be investigated. Attention will be defined as the total duration of time children gaze toward the screen (i.e., the speaker), total time they gaze toward their parent (i.e., the addressee), and the amount of time they pause during a distractor task. This study will also investigate whether there are differences in children's attention to these claims when they overhear positive versus negative information about the group.

CHAPTER 2

Study 1

In a comprehensive review of past measures used to examine 4- to 10-year-old's intergroup biases (Hailey & Olson, 2013), most studies included explicit questions (e.g., do you want to be friends with a member of the group?), behavioral measures (e.g., measures of reciprocity), and measures of association (i.e., children were asked to associate positive or negative traits with photos of group members). However, these measures may not have captured the breadth of children's biases. Children's human figure drawings may uniquely capture children's attitudes toward other people and groups (Bar-Tal, & Teichman, 2009; Gonzalez-Rivera & Bauermeister, 2007). For example, children's drawings have been used to interpret stereotyped beliefs toward real-life social groups (Bar-Tal & Teichman, 2009; Diesendruck & Menaham, 2015), positive and negative attitudes toward others (Burkitt, Barrett, & Davis, 2009), and fear of others (Loxton, 2009). Drawings have also been used in clinical settings to interpret children's feelings about themselves and their family members (Goldner & Scharf, 2012). However, no work has examined whether children's depictions of novel social group members can capture children's biases toward those groups. Study 1 will investigate this question. Drawings in this study were acquired from a previous study (Conder & Lane, 2021) in which children either did or did not overhear negative claims about a novel social group from either an adult or child caller. Depictions of the group member from children who overheard claims were compared to depictions from children who did not overhear claims.

The following predictions for Study 1 are based on past work examining features of children's drawings that reveal children's attitudes toward and beliefs about other people (Bar-Tal & Teichman, 2009; Burkitt et al., 2003; Burkitt et al., 2009; Diesendruck & Menaham, 2015;

Goldner & Scharf, 2012; Golomb & Farmer, 1983; Gonzalez-Rivera & Bauermeister, 2007). If interpretations of children's drawings of the group member do indeed capture children's biases, findings may reveal similar results as those detected by Conder & Lane (2021) and in similar past work (Lane et al., 2020). In these studies, children who overheard claims about a novel social group demonstrated stronger, negative biases toward the group than children who heard no claims. In comparison to children who did not overhear claims, children who overheard claims about the group rated the group as being 'less good', were less willing to be friends with a group member, were willing to try fewer elements of the group's culture, and drew themselves further away from a group member in a drawing task. Older children's biases (7 – 9 years) were also more strongly influenced from claims than younger children's biases (4 – 6 years). Conder and Lane (2021), also found that children were equally influenced by claims from an adult and child caller, and that the detected effect of claims on children's biases were present both immediately following claims and following a 2-week delay.

If consistent with these findings, in Study 1, children who overheard the negative claims should draw the group member with more negatively valanced embellishments, depicted relations, and facial expressions compared to children who heard no claims. Children who overheard claims should also include more variability in the size of the group member relative to themselves and use fewer favorite colors and more least favorite colors to draw the group member, than children who did not overhear claims. However, if children's drawings reveal social biases not detected by previous measures, they may also reveal effects of overhearing negative claims on younger children's (4 – 6 years) biases. As children transition from the preschool years to middle and late childhood, they spend more time with their peers and less time with adults (Eccles, 1999). With age, children are also more often exposed to messages

about others from their peers than they are from adults (Eccles, 1999; Rutland, Killen, & Abrams, 2010). Thus, if there are differences in the effects of claims based on the age of the caller, it is likely that there would be an age-graded increase in the strength of claims from a child caller and an age-graded decrease in the strength of claims from an adult caller. Finally, in either case, any effects of overhearing claims on children's biases will likely maintain (but may diminish) following the 2-week delay. This prediction is consistent with both Conder and Lane (2021) and past work on longitudinal effects of claims about non-social information in preschoolers and children in middle childhood (e.g., Ronfard, Lane, Wang, & Harris, 2017; Rottman, Young, & Kelemen, 2017).

In sum, past work on children's developing intergroup biases has typically relied on explicit questions, behavioral measures, and association tasks (Hailey & Olson, 2013). However, these measures may not fully capture the extent of children's biases. Children's drawings have been shown to reveal stereotypes and children's attitudes toward others (e.g., Bar-Tal, & Teichman, 2009; Gonzalez-Rivera & Bauermeister, 2007; Diesendruck & Menaham, 2015). However, no work has examined whether children's drawings of novel social group members can reveal biases toward those groups. Drawings used in this study were acquired from a previous study (Conder and Lane, 2021) in which children either did or did not overhear negative claims about a novel social group. If children's depictions of the group member do reveal biases toward the group, children who overheard the negative claims (compared to children who did not overhear claims) should use more embellishments to depict the group as being non-human, harmful, or disgusting, more often depict negative relations between themselves and the group member, draw the group member with a more negative facial expression, more often draw the group member as larger or smaller than themselves, and use more of their least favorite colors

and fewer of their favorite colors to draw the group member. Whether biases detected in children's drawings follow the same pattern of results as Conder and Lane (2021) or reveal additional biases will be examined.

Method

Participants

Children between the ages of 3.82 and 9.13 years (N = 134; 48% female, M_{age} = 6.40 years, SD = 1.23 years) were recruited from local charter schools and private schools in Nashville, TN (n = 118) or were recruited through Tennessee state birth records and tested in a campus laboratory (n = 16). Parents of children recruited from local schools had previously completed a consent form given to them by their child's teacher, and parents of children in the campus lab completed the form when they arrived with their child for the study. Children participated in two study sessions that were approximately 2 weeks apart (14 +/- 5 days). Six children did not participate in the second study session (ages 4.70, 6.34, 6.52, 6.68, 8.16, 8.20 years), one child was eliminated from analyses because of experimenter error at the second session (6.60 years), and one child was eliminated because their parent discussed the social group with them between the two study sessions (7.98 years). An additional 5 children were excluded because the time between the two sessions was either fewer than 9 days (n = 3; 5.15, 5.16, 8.81 years) or more than 19 days (n = 2; 4.56, 6.78 years). For the drawing task, one participant was excluded for not complying with instructions (5.56 years) and another participant was excluded due to experimenter error (8.99 years). Finally, drawings for an additional participant (4.41 years) were not clear in depicting what image constituted the group member or the child (e.g., several lines were drawn across the page), so their drawing was excluded from analyses. The final sample consisted of 118 children (46% female; M_{age} = 6.39 years, SD = 1.22

years). Each participant was randomly assigned to a Message condition (Negative Message vs. No Message) and a Caller condition (Adult Caller vs. Child Caller).

After the first session, children who participated in their school were given a thank-you note to take home to their parents, which included a reminder to not discuss the purpose of the study with their child until the end of the second session. For children who participated in the lab, parents were given the same reminder on a note attached to the consent form. All parents were asked to complete a voluntary questionnaire with demographic questions. Of the parents in the final sample (n = 118), 67% identified as White, 19% Black, 3% Asian, and 11% identified with multiple races or ethnicities. Self-reported education was fairly high: 16% of parents who completed the survey had a Doctorate, 17% a Master's degree, 37% a Bachelor's degree, 24% completed some college, 3% had a high school diploma, and 3% had not completed high school. Demographic data were not collected directly from or about child participants.

Procedure

Children participated individually with a female experimenter (E) either in a college laboratory room or in a hall or room in the child's school. In the lab, sessions were video recorded using cameras hidden from view in decorative plants. In schools, sessions were video recorded with cameras hidden inside of a pencil box (22.9 cm x 6.2 cm) that had a small hole cut out for the camera lens. Only children whose parents consented were video recorded. Children ages 6 years and younger provided verbal assent to participate and children older than 6 years signed a written consent form.

At the beginning of the study, children were given a distractor task intended to enhance the ecological validity of the situation — just as in real life, children might be occupied with an activity when they overhear people comment about social groups. Children were asked to find

nine objects in a book of elaborate, colorful photographs (Wick, 2011) prior to, during, and following the video call. If children were unable to find a target object within 20 seconds, E said, "Let's move on to the next one." Six of the 9 target objects were the same for younger children (4–5 years) and older children (6–9 years), but younger children had an additional three 'easy' objects to find and older children had an additional three 'challenging' objects to find. If a child found all of the objects before the end of the allotted time, E asked the child to find items from the other age-group's list. After starting and playing the game for 90 seconds, children were asked to find, "all of the people in the picture", and to count them. To prevent children from completing this task too quickly, they were told that there were, "a bunch of people, and some are hidden." Children who finished early were prompted to keep looking for more people in the picture.

Video-chat Conversation

While introducing the child to the picture-finding game, E surreptitiously started a pre-recorded video on the laptop and moved the laptop screen so that it was facing away from the child. After 20 seconds, a pre-recorded Skype video call (embedded in the pre-recorded video) began to ring on the laptop screen. E pretended to answer the call (saying to the child, "Hold on, someone's calling me on Skype. It's my big/little sister's friend, I'll answer it quickly") and turned the computer screen so it was facing toward herself and viewable to the child. In Adult Caller conditions, E referred to the caller as their "big sister's friend", in Child Caller conditions, E referred to the caller as their "little sister's friend." Callers were two White, female child actors (M_{age} = 7 years) and two White, female adult actors (M_{age} = 27 years). All actors spoke with U.S. English accents, had medium-length dark hair (pulled back away from their face), wore a black t-shirt, and did not wear glasses or other accessories. During the call, E maintained a neutral face

and only looked toward the laptop screen, to not distract the participant or provide the participant with additional social cues.

The caller began the conversation by greeting E and saying, “Hi! I thought your sister would be using the computer, what are you doing?” E told the caller that they were playing games with the child and that they would later talk to the child about Gearoo or Flurp people (children were randomly assigned to hear about one of the two novel groups). In Negative Message conditions (n = 59) the caller responded to E, “those Flurps/Gearoos are really bad people. They eat disgusting food, and they wear such weird clothes. The Flurps’/Gearoos’ language sounds so ugly.” The caller ended the conversation by saying, “I’ll let you get back to work! Tell your sister I called!” In No Message conditions (n = 62) participants overheard the caller’s greeting, the experimenter’s reply, and the caller’s ending of the conversation, but the caller did not say anything about the novel group. At the end of the conversation, E closed the laptop and asked the child to report how many people they found in the picture. The picture-finding game was played a second time, for 90 seconds, using a different page of the picture book.

Video-chat Stimuli.

Video stimuli were constructed prior to the study. Each of the four actors called a researcher using Skype, and during their call, made negative statements using both novel group names within the same take (e.g., “The Flurps’…Gearoos’… language sounds so ugly”). The researcher screen-captured the entire conversation from the perspective of their own laptop screen. Using each of these original four recordings, eight new Negative Message videos (four about Gearoo people and four about Flurp people) were created. “Gearoo” and “Flurp” versions were created by editing out one group name from the original recording. These procedures

ensured that messages about the two novel groups were identical (in length, actors' intonation, and facial expressions). To create videos for the No Message conditions, all four original recordings were trimmed to remove the callers' claims about the group (approximately 10 seconds removed). Resulting Negative Message and No Message videos were identical, aside from differences in length and the presence of the caller's message about the group.

Measures

Immediately following the picture-finding game, children completed a social distance task based on work by Diesendruck and Menahem (2015). Children were presented with 13 sharpened Crayola-brand colored pencils (*black, gray, light brown, tan, peach, purple, sky blue, yellow-green, red, pink, red-orange, yellow,* and *white*) inside a transparent box and were asked to name their favorite and least favorite colors. Next, E placed three stapled sheets of 21.7 x 35.7 cm black construction paper on top of a 21.7 x 35.7 cm sheet of white computer paper on the table in front of the child (see Figure 1). A rectangle was cut out from the bottom, center of the first black sheet, exposing a 5.3 x 7.7 cm section of the white paper. Children were told they could use any of the 13 colored pencils to draw themselves within this section. The reason for limiting the amount of space on the white paper was to prevent children from drawing extraneous images (e.g., trees or clouds in the background) that were unrelated to the study and unnecessarily time consuming.

To limit the influence of E's presence, she pretended to check her email (on the laptop) while the child was drawing. Once the child completed the drawing of themselves, E turned the page of the apparatus to reveal the second page, of which the entire bottom 8 x 35.7 cm was removed. Children were asked to draw the group member on the exposed part of the sheet of white paper (that contained their drawing of themselves in the center of the page). If participants

seem confused about what to draw, they were told to, “draw whatever you think a Gearoo or Flurp person looks like.” Following the completion of the study session, the experimenter labeled the child’s drawing of themselves with a “C” and their drawing of the novel group member with an “F” (for Flurps) or “G” (for Gearoos). In cases where children drew more than one figure along with their drawing of themselves, the experimenter was instructed to ask the child which one was the group member.

Two-Week Delay

Approximately two weeks later, children completed the drawing task a second time; however, there was no video call and no new information about the novel group. To limit the possibility that children would simply remember and reiterate their answers across the two testing periods, a different experimenter worked with each child during the delayed session. An average delay of two weeks was chosen because longer time periods between sessions would not have been feasible, given the constraints of collecting data from and debriefing entire classrooms of children during the school year.

Debriefing

Following completion of the second study session, children who participated in the laboratory on campus were debriefed individually in the presence of their guardian(s). Children who participated in schools were debriefed at the class level once data collection was completed at the school level (in the case that children may have discussed the study with classmates). Children were told that the groups were not real groups of people but if they were real they would probably be very nice people. E also answered any questions children had about the groups or the study.

Coding

Children's drawings from the social distance task (from the immediate and delayed sessions) were analyzed using two coding systems. For each system, 20% of children's total drawings ($N = 236$) were coded by two research assistants who achieved an inter-rater reliability score of 96% (for depictions of Self and Group Member) and a score of 97% (for color usage). One of the two coders, blind to the study conditions and hypotheses, coded the remaining data for children's depictions of themselves and the group member, and the same two researchers (blind to the study conditions and hypotheses) each coded half of the remaining data. Note that data from three additional participants were acquired *after* coding for the depictions of children's drawings of themselves and the group member. Thus, the following variables (excluding Area and Proportion of Space which were recorded later by different experimenters) did *not* include those three participants.

Depictions of Self and Novel Group Member

Several aspects of children's depictions of themselves and the group member were coded, including the number of colors that were previously reported by children to be their favorite and number of those that were reported to be their least favorite. Other features that were examined included the size of figures, whether figures were drawn with positive or negative affect (according to the facial expression), and the valance of any embellishments or depicted relations between drawings. The following sections describe each coded feature in detail.

Area.

After the primary coding system was completed, a different researcher also recorded the length and width (in cm) of each figure. 'Length' was defined as the top of the figure to the bottom of the figure, including anything attached to the top of the figure (e.g., a hat) or anything

attached to the bottom of the figure (e.g., shoes). 'Width' was defined as the start of the figure's left side to the end of the figures right side. The area was calculated for each figure by multiplying the length by the width (in cm). Next, a difference score (the area of the Group Member minus the area of Self) was calculated such that the size of children's drawings of themselves served as a baseline for the size of the Group member.

Facial Expressions.

Each figure's facial expression was calculated on a scale from -2 (negative; e.g., a frown), to -1 (slightly negative), 0 (neutral or unclear), 1 (slightly positive) to 2 (positive, e.g., a smile). A difference score was calculated (the score for expression of the Group Member minus the score for expression of Self) so that childrens' depicted facial expressions for themselves served as a baseline for their choices for the group member. Resulting difference scores could range from -4 to 4.

Color Usage - Number.

Using the list of colors that children previously reported as being their favorite and least favorite, the number of favorite and least favorite colors that were used to draw each figure (the Self and the Group Member) were recorded. Difference scores were calculated individually for the number of favorite colors used and for the number of least favorite colors used (number used on the Group Member – number used on Self). However, this method of using the number of colors was limited in that it was not indicative of the *proportion* of each color used to draw the figure. Thus, the second coding system (detailed below) was used.

Color Usage – Proportion of Space.

To have a complete measure of children's use of their favorite and least favorite colors used to draw the group member, a second coding system used the computer program *Color*

Summarizer to analyze the proportion of each color used to draw each figure. Prior to coding, each drawing was scanned using a Canon Imagerunner Advance C75701 printer and sent to a password-protected desktop computer located in a campus lab. Drawings were saved onto secure campus servers as JPEG files. Using these files, the primary investigator cropped each image so that drawings of the child and of the group member were separate, there were no identifying labels, and the amount of white space in each image was as controlled as possible. For each file, the visible black construction paper (from the apparatus in which the white paper was placed for the drawing task) was cropped from the top of the image using the Adjust Size tool in the Apple program *Preview*. Next, the image was cropped so that it was approximately 7.7 cm in height (the maximum height the apparatus allowed for the child to draw on the white sheet of paper) and was split into two images — the child's drawing of themselves and their drawing of the group member. For each of the two images, the Annotate tool (matched to the color of the white paper) was used to remove any visibility of background images or colors that were around the figure. For especially difficult drawings, if children colored in *all* of the white space around the figure, the image was uploaded into the program *Pinta* and background colors and images were removed using the program's Color Replacement tool.

After the drawing was prepared for coding, it was randomly assigned into a folder labeled "A" or "B", to ensure the type of figure (i.e., drawing of Self or Group Member) was unknown to the coders. Note that this strategy was not identified until *after* researchers achieved reliability; thus, all reliability drawings were coded *a second time* along with the remaining drawings, with the type of figure (Self or Group Member) hidden from the coder. To establish inter-rater reliability, two researchers blind to the study conditions and hypotheses coded 20% of the total drawings, maintaining reliability of 96% across all color proportions recorded for each drawing.

The proportion of each color detected in the drawing had to be within 1% between coders to count as reliable. After achieving reliability, each of these researchers coded half of the remaining drawings.

Each of the cropped drawings was analyzed using the online software program, *Image Color Summarizer* (see Figures 2 & 3 for examples of this procedure), which processed each image using a precision of 200 pixels. The proportions captured in each drawing by the program were categorized based on the Crayola colored pencil names the children used for the task (*black, grey, light brown, tan, peach, purple, sky blue, yellow green, red, pink, red orange, yellow, and white*). If a color was not used in the drawing, it was given a score of 0 for that color category. Proportions for each color name was the sum of 2-3 color clusters detected by the program. For example, the proportion of *sky blue* used in the drawing would be the sum of the color clusters *blue* and *navy* detected by the program. To detect these clusters, prior to running the program, the coder counted the number of distinct colors they detected within each drawing (e.g., *black, grey, yellow* would indicate three distinct colors).

Next, based on initial testing of the software, the most accurate color proportions were detected if the researcher multiplied this initial number by two (e.g., if three distinct colors were detected by the researcher initially, the program was instructed to detect six distinct colors). Once the image was processed, if the colors identified prior to the analyses were *not* included, the number of colors the software was instructed to detect was adjusted to detect fewer distinct colors. Two sets of colors were too similar to distinguish from one another in the program (*tan/peach* and *black/grey*); thus, proportions for each set of these two colors was combined into one color category (*tanpeach* and *blackgrey*) and they were not considered separately. Finally, the proportion of the color *white* was expanded to include any uncolored space in the image, due

to the program's inability to detect differences between the white pencil color and the white paper.

Depicted Relations.

The number of negative or positive depicted relations between the two figures were also recorded. Note, such depictions were only considered if it was clear that they were drawn after the child drew *both* figures (i.e., depictions drawn within the rectangular space around children's Self drawing were not considered). For drawings that met this criterion, negative relations (e.g., a barrier or wall was drawn between the figure) were scored -1 and positive relations (e.g. a heart was drawn between figures) were scored 1; drawings with no depicted relation were given a score of 0.

Embellishments.

Embellishments that were used to draw the group member that appeared non-human or creature-like were recorded (1 = Yes; 0 = No), and any embellishments used to indicate disgust (e.g., appeared to smell or had torn clothes) or to represent harm (e.g., the figure was covered in blood or had fangs or horns) were scored (1 = Yes; 0 = No).

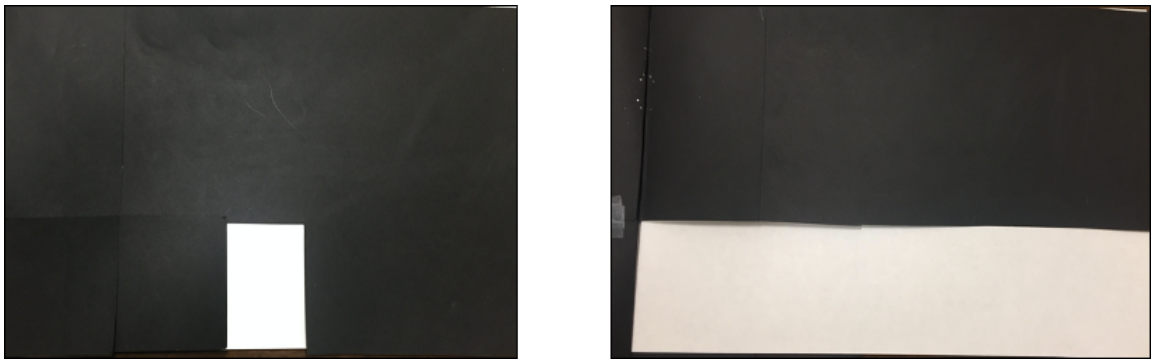
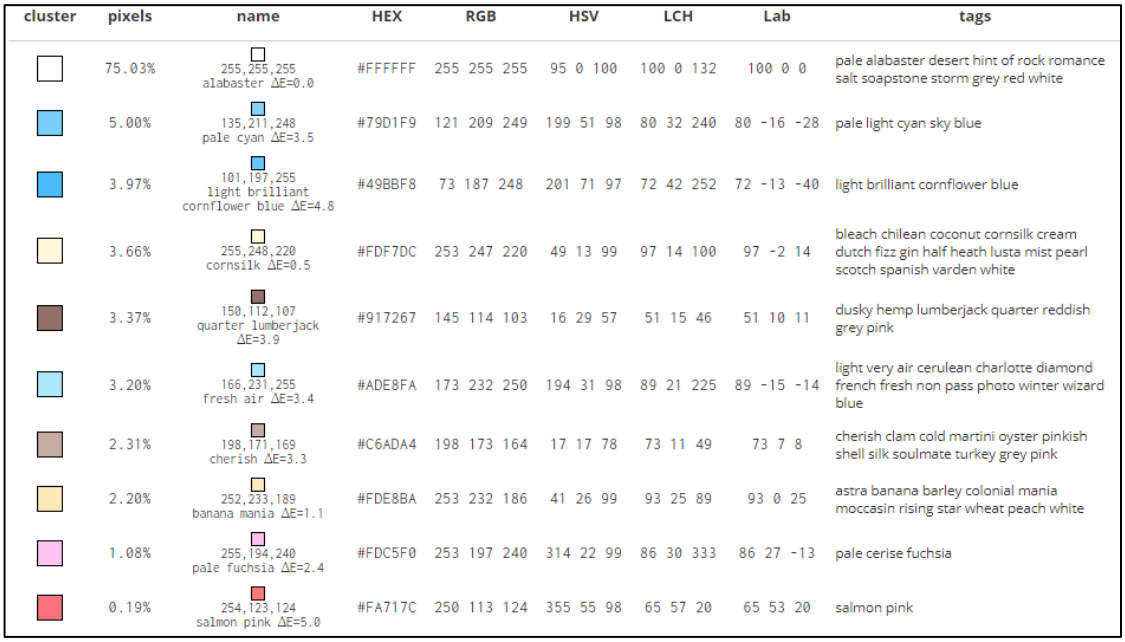


Figure 1. Example of the apparatus used to complete the drawing task. Children drew themselves in the square cut from the bottom, center of the apparatus onto white computer paper placed inside the apparatus (on the left). Next, the first page of the apparatus was flipped, revealing the entire bottom of the white paper, so children could draw the group member on either side of themselves (on the right).

Figure 2. Example output from *Image Color Summarizer* in which the program detected 10 distinct colors: *white, light blue, dark blue, tan, black, teal, brown, yellow, pink,* and *red*. The resulting color categories used would be *sky blue, yellow, blackgrey, light brown, tanpeach, pink,* and *red*.



cluster	pixels	name	HEX	RGB	HSV	LCH	Lab	tags
	75.03%	255,255,255 alabaster ΔE=0.0	#FFFFFF	255 255 255	95 0 100	100 0 132	100 0 0	pale alabaster desert hint of rock romance salt soapstone storm grey red white
	5.00%	135,211,248 pale cyan ΔE=3.5	#79D1F9	121 209 249	199 51 98	80 32 240	80 -16 -28	pale light cyan sky blue
	3.97%	101,197,255 light brilliant cornflower blue ΔE=4.8	#49BBF8	73 187 248	201 71 97	72 42 252	72 -13 -40	light brilliant cornflower blue
	3.66%	255,248,220 cornsilk ΔE=0.5	#FDF7DC	253 247 220	49 13 99	97 14 100	97 -2 14	bleach chilean coconut cornsilk cream dutch fizz gin half heath lusta mist pearl scotch spanish varden white
	3.37%	150,112,107 quarter lumberjack ΔE=3.9	#917267	145 114 103	16 29 57	51 15 46	51 10 11	dusky hemp lumberjack quarter reddish grey pink
	3.20%	166,231,255 fresh air ΔE=3.4	#ADE8FA	173 232 250	194 31 98	89 21 225	89 -15 -14	light very air cerulean charlotte diamond french fresh non pass photo winter wizard blue
	2.31%	198,171,169 cherish ΔE=3.3	#C6ADA4	198 173 164	17 17 78	73 11 49	73 7 8	cherish clam cold martini oyster pinkish shell silk soulmate turkey grey pink
	2.20%	252,233,189 banana mania ΔE=1.1	#FDE8BA	253 232 186	41 26 99	93 25 89	93 0 25	astra banana barley colonial mania moccasin rising star wheat peach white
	1.08%	255,194,240 pale fuchsia ΔE=2.4	#FDC5F0	253 197 240	314 22 99	86 30 333	86 27 -13	pale cerise fuchsia
	0.19%	254,123,124 salmon pink ΔE=5.0	#FA717C	250 113 124	355 55 98	65 57 20	65 53 20	salmon pink

Figure 3. Example of output of the proportion of color clusters produced by *Image Color Summarizer*. In this example, the proportions for the three blue clusters (*pale cyan, light brilliant cornflower blue, and fresh air*) would combine to represent *sky blue.*

Results

Statistical Approach and Model Reduction Plan

A series of repeated-measure, multilevel regression models were used to test the dependent variables (Area, Facial Expression, Number of favorite colors used, Number of least favorite colors used, Proportion of space using favorite colors, and Proportion of space using least favorite colors) for between-subjects effects of Message Type (Message vs. No Message), Caller Type (Adult vs. Child), and Child Age (as a continuous variable), within-subjects effects of Time (Immediate vs. Two-Week Delay, nested within participant), and all combinations of interactions among these variables. Children's embellishments and depicted relations were not included in these analyses. Note that the focus of these analyses was to detect interactions

involving Message Type or main effects of Message Type (i.e., whether children overheard the negative claims). Analyses were conducted using Stata 15 (Stata-Corp, College Station, TX). To fit the most parsimonious model for each variable, the following reduction plan was used.

1. Full model: Multilevel model that includes Message Type, Caller Type, Child Age (as a continuous variable), Time (nested within participant), and all interaction terms.
2. If there is no significant 4-way interaction for the full model, remove 4-way interaction term and run a new model that includes all potential 3-way and 2-way interactions and main effects.

3a. If there are significant 3-way interactions, remove any 3-way interactions that were not significant and run model. Retain all other terms.

3b. If there are *no* significant 3-way interactions, remove all 3-way interactions and run model.

3bi. Remove any non-significant 2-way interactions and run model.

4. For any final models including Message Type, pairwise comparisons will be conducted (using the post-estimation 'test' command in Stata 15) to interpret effects.

Area

To calculate the area of children's drawings of the group member, a difference score was calculated (so that children's drawing of themselves served as a baseline for the size that children typically draw human figures). To calculate each score, the area of each child's drawing of the group member (in cm) was subtracted from the area of their drawing of themselves. Larger scores indicated that the area of children's drawing of the group member was drawn larger than their drawing of themselves. Immediately following the negative claims, children drew the group member an average of 3.96 cm. larger than themselves (*SD* = 17.91 cm, *Min* = -77.18 cm, *Max* =

68.01 cm). Following the delay, children drew the group member an average of 4.43 cm. larger than themselves (*SD* = 13.69, *Min* = -25.87 cm, *Max* = 4.43 cm). A series of multilevel regression analyses were conducted on the area of children's drawings in accordance with the model reduction plan. Analyses revealed no significant interactions or main effects. The difference in children's drawings (across all child ages) of the group member (relative to themselves) did not differ whether children overheard the negative message (either immediately or following the delay) or whether they overheard from an adult or child caller.

Facial Expressions

The facial expressions of children's drawing of themselves (as a baseline) and their drawing of the group member were coded according to the following system: a score of 0 was awarded if the figure had a face but the expression was neutral or if the valence of the expression was unclear; if the expression seemed positive but was potentially neutral (e.g., in the case that there was a slightly upturned mouth), a score of 1 was awarded; similarly, if the expression seemed negative but was possibly neutral, a score of -1 was awarded, if the expression was clearly positive it was awarded a 2; if it was clearly negative it was awarded a -2; no score was awarded if there was no face or there was a face but no mouth. Several children drew themselves (*n* = 11) and the group member (*n* = 19) without a face or mouth immediately following claims and drew themselves (*n* = 10) and the group member (*n* = 20) without a face or mouth following the 2-week delay. For each participant, a difference score was calculated by subtracting the score for children's drawing of the group member from their score of their drawing of themselves. Thus, the lower the score the more negative the facial expression of the group member relative to Self. The average facial expression score immediately following claims was -.51 (*SD* = 1.31, *Min* = -4, *Max* = 2) and -.62 following the delay (*SD* = 1., *Min* = -4, *Max* = 2).

Initial multilevel regression analyses of the facial expressions of the Group Member relative to Self, using the previously described model-reduction plan, revealed no significant 4-way interactions and no significant 3-way interactions. The final model (Model 3) revealed a significant 2-way interaction of Message Type X Time (Model 3) (β = -.63, *SE* = .30, *z* = -2.12, *p* = 0.034, 95% CI [-1.20, -.05]). Post-hoc comparisons using the 'test' command in STATA (see model reduction plan) were used to compare fitted values for Message Type for children who overheard claims, to children who did not overhear claims. This analysis indicated that immediately following claims, there was a significant difference for Message Type (Time 1: $\chi^2(1) = 3.99$, $p = .046$) in which children who overheard negative claims drew the group member's facial expression more negatively than themselves. However, following the two-week delay, there was no difference (Time 2: $\chi^2(1)=.43$, $p = .51$) in how negatively children drew the group member if they overheard claims compared to those who did not overhear claims. Figure 4 depicts these effects.

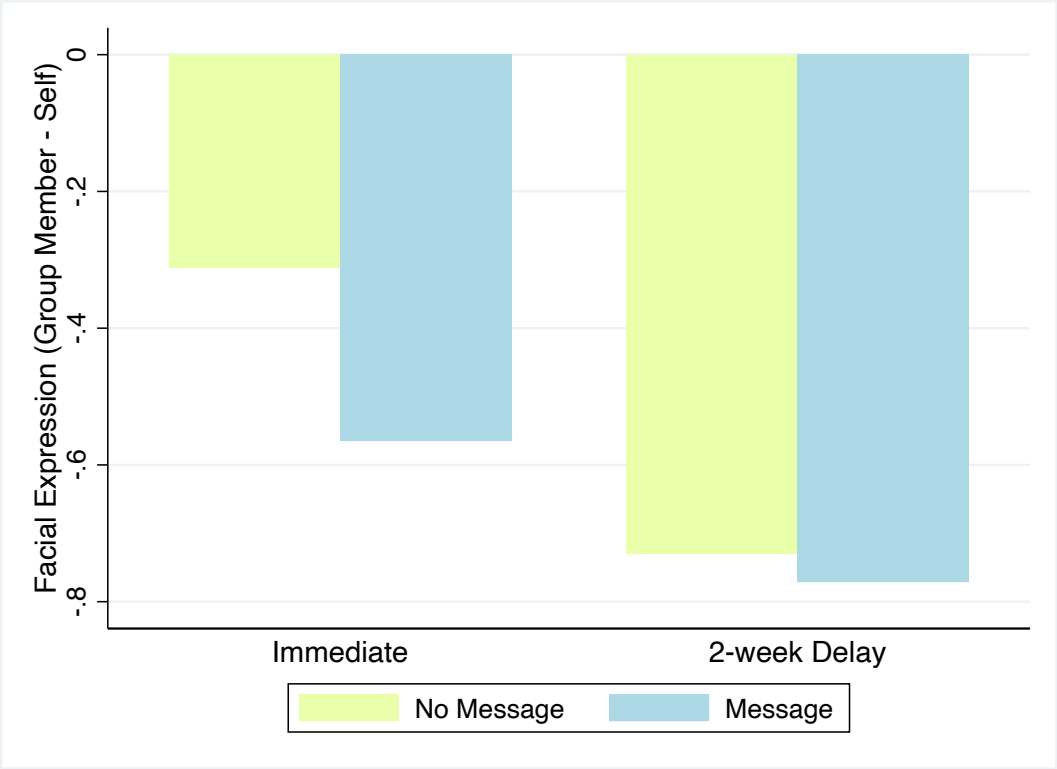


Figure 4. Average Facial Expression scores (Group Member – Self)) for children's drawings immediately following claims and following the 2-week delay. The lower the score the more negatively the Group Member's facial expression was depicted relative to Self.

Color Usage - Number

At the beginning of the drawing task, children were shown 13 Crayola colored pencils inside of a transparent box (*black, gray, light brown, tan, peach, purple, sky blue, yellow-green, red, pink, red-orange, yellow, and white*). Children were asked if any of the colored pencils were their favorite colors and if any were their least favorite colors. If children did not understand the term least favorite, they were asked, "which of the colors do you not like." In cases where children reported that they liked or disliked colors that were not shown to them, for example, if children said their favorite colors were, "all of the colors in the world", their preference was not counted. However, if children said, "all" of the colors were their favorite, referring to the colors

in the box (note: no child reported that "all" of the colors were their *least* favorite colors), they were given a score of 12 to indicate that they liked every color in the box. However, this was *only* the case if they reported that they had *no* least favorite colors. Finally, the color *white* was removed from each child's favorite or least favorite color score because it was not visible on the white computer paper children used to draw the figures. Thus, children could get a maximum score of 12 for their favorite colors and 12 for their least favorite colors.

Next, a difference score was calculated for the number of favorite or number of least favorite colors children used to draw the group member (as calculated by a trained researcher, detailed in the Method section), subtracted by the number of favorite or least favorite colors children used to draw themselves (as a baseline). Note that this measure did not capture the amount of surface area children used of each color within the figure, merely whether the color was used or not used in the drawing of the figure. A score for favorite colors and a score for least favorite colors was calculated for each participant, where larger scores indicated that children used more of their favorite colors or least favorite colors to draw the group member relative to themselves. On average, children used slightly fewer of their favorite colors to draw the group member than themselves (M=-.93 colors, SD =1.59 colors, Min= -9 colors, Max=3 colors) and roughly the same number of least favorite colors to draw the group member relative to themselves (M= -.06 colors, SD=1.19 colors, Min= -4 colors, Max=5 colors) immediately following the negative claims. The same pattern existed following the 2-week delay, for both children's favorite colors (M= -1.04 colors, SD=1.72 colors, Min= -8 colors, Max=4 colors) and least favorite colors (M=-.03 colors, SD=.95 colors, Min= -3 colors, Max=5 colors).

Like the previous analyses, the number of favorite colors and least favorite colors used to draw the group member (relative to themselves) were examined using multilevel regression

analyses. Analyses of children's use of favorite colors found no significant interaction effects and only one main effect of Caller Type in the final Model 4 (β = .58, *SE* = .25, *z* = 2.38, *p* = .018, 95% CI [.10, 1.07]). Children who were in a condition in which the researcher spoke to an adult caller used *fewer favorite colors* to draw the group member (*M*= -1.31 colors, *SD*=1.87 colors) than children in a condition in which the researcher spoke to a child caller (*M*=.70 colors, *SD*=1.38 colors). Because the effect of Caller did not interact with Message Type (i.e., whether children overheard claims or did not overhear claims), this effect did not speak to this study's research questions or hypotheses and was not interpreted further.

Initial multilevel analyses of children's use of their least favorite colors to draw the group member (relative to themselves) revealed no significant 4-way interactions but a significant 3-way interaction that included Time X Message Type X Caller Type (β = 5.62, *SE* = 2.83, *z* = 1.99, *p* = .047, 95% CI [.08, 11.17]). However, when the non-significant 4-way interaction terms were removed (per the model reduction plan), in the second model, this interaction was no longer significant (β = .59, *SE* = .50, *z* = 1.18, *p* = .239, 95% CI [-.39, 1.58)]. In the remaining analyses there were no other significant 3-way interactions or significant 2-way interactions. In the final model (Model 4), that included only main effect terms, there was a significant main effect of Message Type (β = -.37, *SE*= .15, *z* = -2.48, *p* = .013, 95% CI [-.66, .08]). Surprisingly, children who overheard the negative claims used more of their *least favorite colors* to draw themselves relative to the group member (*M*= -.23 colors, *SD*=.83 colors) than did children who did not overhear claims (*M*=.15 colors, *SD*=1.25 colors). Figure 5 illustrates this main effect.

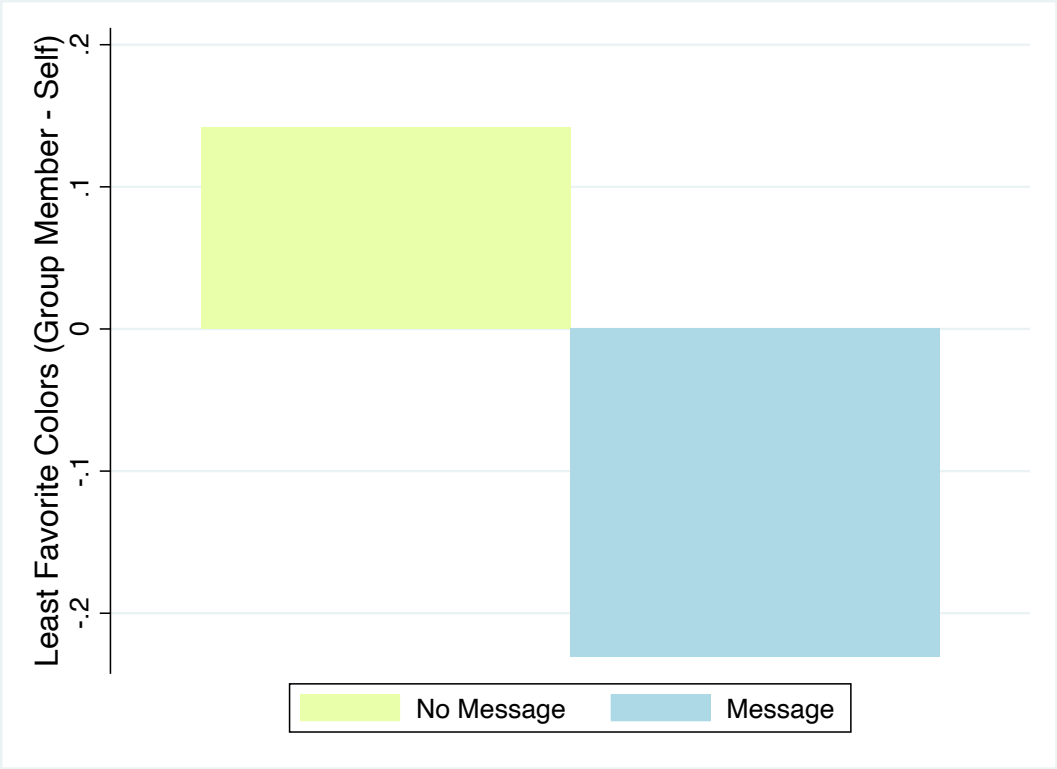


Figure 5. Average number of least favorite colors used to draw the group member relative to Self for children who overheard claims compared to children who did not overhear claims. Higher scores indicated children used more of their least favorite colors to draw themselves relative to the group member.

Color Usage - Proportion of Space

As mentioned earlier, a limitation of the previous analysis (Color Usage - Number), was that it did not provide information about the surface area of space children used to depict the group member with their favorite and least favorite colors. For example, if a child colored the skin of a group member using their least favorite colors, this could indicate a different level of bias toward the group member than a child who colored in the group member's shoes using their least favorite colors. For this analysis, each drawing was analyzed digitally using the program *Image Color Summarizer* to provide information about the proportion of space used for each color. As described in the Method section, this program was unable to distinguish between

certain color combinations: *black* and *gray* as well as *tan* and *peach*. Thus, the program was setup to detect the proportion of space used for 10 (rather than 12) colors within each drawing (combining *black/gray* as one color and *tan/peach* as one color).

After the proportion of space was calculated for all the potential colors within each drawing, data from each child's self-reported favorite and least favorite colors were used to filter out the relevant color proportions detected by the program. Scores were calculated for the total proportion of space that included children's favorite colors (total for the group member and total for themselves) and a total proportion of space that included children's least favorite colors (total for the group member and total for themselves). Next, a difference score was calculated so that the proportion of space children used with their favorite or least favorite colors on themselves served as a baseline for the proportion of space they used with the group member. Larger scores indicated that a larger proportion of space was used on the group member relative to Self. On average, immediately following claims, children used approximately the same proportion of space with their favorite colors on the group member relative to Self (*M*= -3% area, *SD*=41% area, *Min* = -100% area, *Max*=100% area) and about the same proportion of space with their least favorite colors on the group member relative to Self (*M*=5% area, *SD*=39% area*, Min*= -100% area, *Max* = 100% area). Following the delay*,* children also used about the same proportion of space with their favorite colors (*M*= -2% area, *SD*=46% area*, Min*= -100% area, *Max*=100% area) and least favorite colors (*M*= -6% area, *SD*=38% area, *Min*= -100% area, *Max*=100% area) on the group member relative to Self.

The initial multilevel regression model for the proportion of space with children's favorite colors revealed no significant 4-way interactions. After removing the 4-way interaction terms and running the next model, there was a significant 3-way interaction among the variables

Caller Type X Time X Child Age (β = -.25, *SE*=.09, z = -2.70, p = .007, 95% CI [-.44, -.07]) and a significant 2-way interaction of Caller Type X Time (β= -1.66, *SE*=.61, z= -2.71, p=.007, 95% CI [-2.87, -.46]). After removing the nonsignificant 3-way interaction terms (per the analysis plan), the final model (Model 3) maintained both the significant 3-way interaction of Caller Type X Time X Child Age (β = -.25, *SE* =.09, z =-2.66, p = .008, 95% CI [-.43, -.07]) and significant 2-way interaction between Caller Type X Time (β = -.63, *SE* = .61, z = -2.68, p = .007, 95% CI [-2.82, -.44]). This final model also revealed a significant 2-way interaction between Time X Child Age (β =.16, *SE* =.07, z =2.25, p = .024, 95% CI [.02, .30]). There were also several significant main effects in the final model: Child Age (β = -.12, *SE* =.06, z = -2.07, p = .038, 95% CI [-.23, -.01]), Caller Type (β =1.06, *SE*=*.44*, z = 2.43, p = .015, 95% CI [.21, 1.92]) and Time (β = -1.05, *SE* =.46, z = -2.31, p = .021, 95% CI [-1.94, -.16]). However, because none of the significant interactions or main effects involved Message Type (i.e., whether children overheard claims or did not overhear claims about the group), these effects did not speak to this study's research questions or hypotheses and was not interpreted further.

For the proportion of space with children's least favorite colors, the initial multilevel regression model revealed no significant 4-way interactions, but did detect a significant 3-way interaction among Caller Type X Time X Child Age (β =.26, *SE* =.12, z =2.15, p = .031, 95% CI [.02, .50]), a marginally significant interaction between Caller Type X Child Age (β = -.16, *SE* =.08, z = -1.90, p = .057, 95% CI [-.33, .00]), and significant Time X Child Age interaction (β = -1.65, *SE* =.76, z = -2.16, p = .031, 95% CI [-3.15, -.16]). After removing the nonsignificant 4-way interaction terms, Model 2 revealed that all the previously detected interaction effects remained significant. The 3-way interaction among Caller Type X Time X Child Age (β =.21, *SE* =.08, z =2.54, p = .011, 95% CI [.05, .36]), interaction between Caller Type X Child Age (β = -

.14, *SE* =.07, *z* = -1.87, *p* = .062, 95% CI [-.28, .01]), and interaction between Time X Child Age (*β* =1.33, *SE* =.53, *z* = 2.52, *p* = .012, 95% CI [.29, 2.37]). In the final model (Model 3) the 3-way interaction of Caller Type X Time X Child Age remained significant (*β* =.20, *SE* =.08, *z* =2.44, *p* = .015, 95% CI [.04, .36]), but the interaction between Time X Child Age was no longer significant (*β* = -.09, *SE* =.06, *z* = -1.43, *p* = .154, 95% CI [-.21, .03]). There was also a significant interaction between Caller Type X Child Age (*β* = 1.37, *SE* =.53, *z* = 2.60, *p* = .009, 95% CI [.34, 2.41]) and a marginally significant main effect of Age (*β* = .09, *SE* =.05, *z* = 1.87, *p* = .061, 95% CI [-.00, .19]). Because the significant 3-way interaction among Caller Type X Time X Child Age and significant interaction between Caller Type X Child Age did not interact with Message Type (i.e., whether children overheard claims about the group or heard no claims), it was not informative to the study's research questions or hypotheses and was not interpreted further.

Depicted Relations

The depicted relation between children's drawings of themselves and the group member were coded as being negative (and given a score of -1) if there was a barrier or wall between the two drawings. Depicted relations were coded as being 'positive' (and given a score of 1) if children included a positive image (e.g., a heart) between the drawings. If there was no depicted relation between the drawings a score of 0 was awarded. Initial analyses for this variable determined that not enough children included negative or positive relations in their drawings to detect meaningful differences. Specifically, immediately following claims, only seven children depicted negative relations and only two depicted positive relations, and for the delayed session, only one child depicted a negative relation and two children depicted positive relations. Subsequently, additional analyses were not performed.

Embellishments

The number of embellishments children used to depict the group member was coded according to the following criterion. If children depicted the group member as being non-human (e.g., with ears, tail, or machine parts) they were awarded a score of 1, if they included embellishments that indicated disgust (e.g., smell, torn clothes) they were awarded a score of 1, and if they included embellishments that indicated harm (e.g., blood, fangs, horns) they were awarded a score of 1. A score of 0 was awarded if the drawing did not contain any of these embellishments. However, additional analyses were not performed on these data because children's drawings did not include enough of these embellishments to detect meaningful differences. For the immediate session, 23 children used embellishments to indicate that the group member was non-human, two children used embellishments to indicate disgust, and three children depicted the group as harmful. Following the delay, 22 children used embellishments to depict the group as non-human, two children to indicate disgust, and one child depicted the group as being harmful.

Discussion

Study 1 investigated whether interpretations of children's (4 – 9 years) drawings of a novel social group member could reveal biases toward that group, and whether they could capture additional biases not detected by measures used in similar past work. Drawings were acquired from a previous study (Conder & Lane, 2021), in which children in experimental conditions overheard a nearby video-chat conversation between a researcher and either an adult or child caller who made negative claims about a novel social group. In control conditions children did not overhear claims from the caller. Children's drawings were obtained immediately following claims and again two weeks later. It was predicted that, if consistent with findings

from Conder & Lane (2021), drawings from children who overheard the negative claims would reveal stronger negative biases toward the group than drawings from children who did not overhear claims. It was also predicted that any detected effects would maintain (but may diminish) following the 2-week delay.

The ways in which children might depict negative biases were based on past work on children's drawings of other people and groups (e.g., Bar-Tal, & Teichman, 2009; Burkitt et al., 2003; Burkitt et al., 2009; Diesendruck & Menaham, 2015; Golomb & Farmer, 1983; Goldner & Scharf, 2012; & Gonzalez-Rivera & Bauermeister, 2007). If children's drawings did indeed capture their negative biases toward the group, children who overheard the message may have drawn the group member larger or smaller than themselves, more often depicted the group member with negative facial expressions, used more of their least favorite colors and fewer of their favorite colors to draw the group member, used a larger proportion of space with their least favorite colors and smaller proportion of space with their favorite colors on the group member, used more negative embellishments to depict the group member, and more often depicted negative relations (and fewer positive relations) between themselves and the group member.

According to past work, children's drawings have been shown to capture social group representations *more thoroughly* than other measures of children's biases (Bar-Tal & Teichman, 2009). If this was the case in children's drawings of the novel group member, children's drawings may reveal additional biases not detected in past work (Conder & Lane, 2021; Lane et al., 2020). Specifically, drawings from the youngest children (4 – 6 years) may reveal effects of hearing the negative claims to the same extent as drawings from older children (7 – 9 years). Children's drawings may also detect an age-graded increase in the effect of claims from a child caller and an age-graded decrease in the effect of claims from an adult caller. However, if

children's drawings do not capture additional biases than those detected by past measures, findings should reveal the same pattern of results as past work (Conder & Lane, 2021; Lane et al., 2020). There should be evidence of a stronger influence of claims on older children's biases (7 – 9 years) than younger children's biases (4 – 6 years), and children's drawings should indicate that they were equally influenced by claims from an adult and child caller. Any detected effects should also maintain following the 2-week delay.

Results from Study 1 revealed *some* evidence that children's drawings captured negative biases toward the novel group. Children who overheard the negative claims drew the group member with a more negative facial expression (i.e., with more negative affect) relative to themselves than children who did not overhear claims. However, this effect was not maintained following the 2-week delay. There were no age-related differences in the effect of claims on the way in which children depicted the group's facial expressions, and no difference in the effect of claims whether children heard from an adult or child caller. These findings suggest that children's drawings of the group member did capture some additional biases not detected in past work: There appeared to be no age-related differences in the strength of overhearing claims on children's immediate biases. However, children's drawings did not seem to capture lasting negative biases that were detected in past work (i.e., Conder & Lane, 2021). Importantly, this pattern of results was not replicated according to any other features of children's drawings. Differences in the total area (in cm) of children's drawings of the group member relative to the total area (in cm) of themselves were equal whether children overheard the negative claims or did not overhear claims. This was also the case according to the number and proportion of favorite and least favorite colors children used to draw the group member related to themselves.

It is possible that limitations in how these data were collected and/or interpreted could explain these null effects. For example, for measures of children's color usage, children's favorite and least favorite colors they chose to draw the group member may not have reflected their *true* attitudes toward the group. One way to amend this limitation would be to survey children, prior to the study, about which of the colors they felt represented their positive feelings and which colors represented their negative feelings toward others (see Bar-Tal & Teichman, 2009). Another limitation was that the first measure of color usage (i.e., the *number* of favorite and least favorite colors) was calculated by a researcher, but the second measure (i.e., the *proportion* of space used with children's favorite and least favorite colors) was calculated by a computer program and interpreted by a researcher. Thus, the two measures were not necessarily comparable. For example, the colors *black* and *gray* were distinguishable by the researcher's human eye in the first measure, but not by the computer program in the second measure. The first analysis also had more room for human error than the second analysis. Future work should incorporate more distinguishable colored pencil colors (to decrease the possibility of human error) or have children depict the group member digitally, to detect the colors more accurately in children's drawings.

In sum, Study 1 provided evidence that children's drawings of novel social group members can capture children's biases toward those groups, and that they may capture additional biases not detected by other types of measures (i.e., used by Conder & Lane, 2021; & Lane et al., 2020). Children who overheard negative claims about a novel social group drew a member of that group with a more negative facial expression than themselves compared to children who did not overhear claims. Unlike the age differences found in past work (Conder & Lane, 2021; Lane et al., 2020), this difference was present across children of all ages (4 – 9 years). This finding

was also consistent with work by Diesendruck and Menahem (2015), who found that Jewish-Israeli 6-year-olds who heard a story emphasizing ethnic essentialism, drew an Arab character with more negative affect than a Jewish character than children who did not hear the story. Thus, based on this work, drawings of group members could be a rich source of information for detecting biases acquired from hearing claims about a new social group. However, drawings might only be useful for detecting biases that are present *immediately* following claims (i.e., Study 1 did not detect any biases that were maintained following the two-week delay).

There were also many null effects detected in Study 1. None of the other features examined in children's drawings detected biases toward the group after overhearing the negative claims. One possibility for these null effects could be because these features did not capture children's social biases. These null effects could also be a result of the general variability in children's depictions of human figures. A benefit of asking children to 'draw a group member', is that the features children choose to include in their drawings are limitless. However, this method may also produce too much variability to detect consistent patterns. For instance, there were not enough children who spontaneously included depicted relations (between themselves and the group member, or who included embellishments (i.e., that indicated the group was non-human, harmful, or disgusting), to determine whether these elements could capture children's biases. Although anecdotally, for children who did include these details, there seemed to be rich information about children's attitudes toward the group. For example, children who overheard the negative claims sometimes drew the group member with fangs or holding weapons. In Conder and Lane (2021), children were given no instructions for *how* to draw the group member or about what the group member might look like. Thus, future work might include clear instructions about what to include (or not include) in children's drawings.

Study 1 provided information about the use of children's (4 – 9 years) human figure drawings to capture biases acquired from overheard claims about novel social groups. This study also examined potential age-related differences detected in past work (Conder & Lane, 2021; Gonzalez et al., 2017; Lane et al., 2020); that younger children's (4 – 6 years) biases were less influenced by claims than older children's biases (7 – 10 years). Results revealed that children's drawings uniquely captured the negative biases of children across all ages, but only according to one measure and only immediately following claims (i.e., the effects did not persist following a 2-week delay). Study 2 will expand on this work in several ways. Children's (5 – 10 years) *attention* to a nearby Zoom conversation about a novel social group will be investigated. Age-related differences in children's attention to the conversation, as well as their attention to either positive or negative claims about the group will be explored.

CHAPTER 3

Study 2

One way in which children likely learn about new social groups is from what others tell them. From infancy, children are aware that to learn about things they cannot observe requires acquiring information from others' claims (for review see Harris, 2012). Thus, children have been shown to attend to social cues (e.g., eye gaze, facial expressions) that indicate such information is being communicated and that it is relevant (e.g., Tomasello, 1999). Previous work on the influence of others' claims about social groups on children's intergroup biases, has found that younger children's (4 – 6 years) biases are less influenced by claims than older children's (7 – 10 years) biases (Conder & Lane, 2021; Gonzalez et al., 2017; Lane et al., 2020). This study explores one potential explanation for this age difference: That younger children are less attentive to social cues in the presence of such claims, subsequently extracting less information from claims than older children. This may especially be the case for overheard claims, that require more sophisticated attention skills than attending to direct claims (Akhtar and Gernsbacher, 2007; Shneidman et al., 2009).

In Study 2, children's attention during an overheard conversation about a novel social group was explored. The conversation, between children's parent and an experimenter, was conducted remotely using Zoom and while children completed a distractor task. Children's attention was measured according to three variables: the duration of time children spent attending to the experimenter, the duration of time they spent attending to their parent, and the duration of time they spent pausing during the distractor task. Children's attention to positive versus negative information about the group as well as the influence of claims on children's

biases were explored. The following sections review previous research on children's attention to others' positive and negative claims. This work motivates the hypotheses for the current study.

Attention to Social Information

To obtain information from others' claims effectively, from a very young age, children seek out social cues (e.g., pointing, eye gaze, linguistic cues) during social interactions that may indicate relevant knowledge is being communicated (e.g., Csibra & Gergely, 2009; Harris & Lane, 2014; Koenig, Li, & McMyler, 2020; Tomasello, 1999). In one study, 16- to 19-month-olds correctly associated a novel object label with the object a researcher was gazing toward, rather than choosing to associate the label with an object that was in their own visual field (Baldwin, 1991). In other work, preschoolers who had visual access to *two* novel objects, but knew an adult could only see *one* of those objects, correctly chose the object only they could see when asked 'where' the object was and the object both themselves *and* the adult could see when asked for the object that was 'there' (Nurmsoo and Bloom, 2008).

Children have also been shown to attend to cues that indicate whether an informant is trustworthy or knowledgeable. For example, 4-year-olds (but not 3-year-olds) were more likely to accept information about a novel object's function from an informant who was knowledgeable (i.e., made the object themselves) rather than ignorant (i.e., a friend made the object) (Sabbagh & Baldwin, 2001). Children (3 - 8 years) also make choices about their trust in others' claims based on the expertise of the informant (Lane & Harris, 2015). In one study, 5- to 6-year-olds (but not 3- to 4-year-olds) were *less likely* to leave their playground with an unfamiliar adult if that adult provided information that the child knew was untrue, as opposed to information the child knew was true (Li, Zhang, Heyman, Compton, & Lee, 2020).

Another cue children use to evaluate others' claims is by attending to bystander's reactions to such claims. According to work on 'social referencing', children use others' facial and vocal expressions to make evaluations about events starting as young as 6 months of age (Clément & Dukes, 2017; Klinnert, Campos, Sorce, Emde, & Svejda, 1983). In a recent study, 12-month-old infants who saw an adult react either positively or negatively toward clips of classical music, demonstrated greater pupil dilation (a sign of arousal) to music that had been reacted to negatively, more often than toward music reacted toward positively (Fawcett & Kreutz, in press). In their seminal study, Campos et al., 1978 used a visual cliff, originally developed by Gibson and Walk (1960), to examine this tendency. The visual cliff was created using a sheet of Plexiglas in which part of the glass was covered so that the part *not* covered would give the illusion of falling. Mothers typically stood on the other side of the cliff and maintained eye contact with their child while they crawled across. Campos et al. (1978) found that infants as young as 12 months of age crawled across the cliff if their mother expressed positive affect (e.g., smiled or expressed excitement), but they did not crawl across if their mother expressed negative affect (e.g., frowned or expressed fear). In sum, children have been shown to demonstrate a sophisticated ability to attend to social cues that allow them to learn effectively from others' claims.

According to past work, learning from *overheard* claims may require children to monitor these types of cues even more closely than in contexts in which they are told information directly (Akhtar and Gernsbacher, 2007; Shneidman, Buresh, Shimpi, Knight-Schwarz, & Woodward, 2009). For example, Mayan children who traditionally learn new words almost exclusively from overhearing, are also more skilled at attending to multiple sources at once in comparison to American children, who are typically taught new words directly (Akhtar and Gernsbacher,

2007). Children's ability to attend to cues in overheard contexts also likely improves with age. For example, past work suggests that children are better at *extracting information* from overheard claims with age (e.g., Woolley & Lopez-Mobilia, 2011; Zhao et al., 2019). In Study 2, age-related differences in children's attention to overheard claims about a novel social group will be investigated.

Valence of Others' Claims

Children's attention to others' claims has also been shown to vary depending on the valence of that information. For example, infants (6 – 12 months) typically show a positivity bias in social referencing paradigms, looking more often toward positive facial expressions than negative facial expressions (Walden & Baxter, 1989). In other work, preschoolers prefer positive claims over negative claims about others' characteristics (Boseovski, 2012; Boseovski & Lee, 2008). In one study, 3- to 6-year-olds witnessed an adult either share a toy or not share a toy, then they were told by an experimenter that the adult who shared was 'mean' or that the adult who did not share was 'nice.' Children were more likely to change their opinion of the adult when they were told they were 'nice' rather than 'mean', and 3- to 4-year-olds did this more often than 5- to 6-year-olds (Lapan, Boseovski, & Blincoe, 2016). In another study, children (4 – 6 years) who witnessed two researchers gossip that a non-present adult was either 'honest' or 'not honest', later trusted that adult's labeling of a novel object more often if they were described as 'honest' rather than 'not honest' (Harper & Ma, 2019). This past work suggests that children may demonstrate a positivity bias for claims about others. However, recent work has found that this positivity bias is less pronounced when combined with children's intergroup bias. In one study (Alden & Soley, 2019), Turkish 6–7-year-olds overheard an adult with a Turkish accent gossip about an adult with a French accent, and an adult with a French accent gossip about an

adult with a Turkish accent (that the adult from the other social group was either 'nice' or 'mean'). Later, children were more likely to endorse positive information (i.e., that the adult was 'nice' rather than 'mean') about the adult from their own social group (i.e., the adult with the Turkish accent) than about the adult from the other social group (i.e., the adult with the French accent). This work suggests that children's biases toward another social group may influence whether they prefer positive or negative information about members of that group.

Some work has investigated the role of positive or negative claims about other social groups on children's biases towards those groups. For example, using a minimal group paradigm, children (5 – 6 years) who read a story that favored their own group over another group, demonstrated stronger, negative biases toward the other group than they did prior to reading the story (Over, Eggleston, Bell, & Dunham, 2018). In another study, Asian and White Canadian children (8 – 12 years) who read positive vignettes about a Black character (e.g., "This is James. James lives in North Vancouver where he is a fire fighter. James is an excellent fire fighter and is working hard to become fire chief.") demonstrated less anti-Black bias according to the child implicit bias measure (IAT), but the biases of younger children in the study (5 – 7 years) were not influenced by these claims (Gonzalez, Steele, & Baron, 2017). In other work, children (4 – 9 years) who were either told directly or who overheard negative claims about a novel social group demonstrated stronger, negative biases toward that group following claims; however, the youngest children (4 – 6 years) were minimally influenced by the *overheard* claims (Conder & Lane, in press; Lane et al., 2020). In Study 2, age-related differences in children's attention to positive and negative overheard claims about a novel social group will be examined. In addition, the influence of these claims on children's biases will be considered.

The Current Study

In Study 2, children (5 – 10 years) overheard a nearby Zoom conversation about a novel social group and novel toy (as a point of comparison) while completing a distractor task. This study was conducted remotely, so the conversation was between the child's parent (who was given a script to read) and a non-present experimenter. Children's attention was examined according to three variables: the duration of time children looked toward the screen, the duration of time they looked toward their parent, and duration of time they paused during the distractor task. If findings are consistent with past work on children's tendency to prefer *positive* information about others (as opposed to negative information) (e.g, Boseovski, 2012; Boseovski & Lee, 2008; Lapan et al., 2016), children (especially the youngest children) should spend more time attending to the positively valenced conversation than to the negatively valenced conversation. However, because children are hearing information about new social groups, children may *not* prefer positive information to negative information about the group (e.g., Alden & Soley, 2018). If children's attention to overheard conversations is related to their ability to extract information from overhearing (which improves with age), there should also be an age-graded increase in children's attention to the conversations (e.g., Woolley & Lopez-Mobilia, 2011; Zhao et al., 2019). Finally, the relation between children's attention to the conversation and children's preferences for the group and toy will also be explored.

Method

Participants

Children between the ages of 5.06 and 9.79 years (N = 46, 46% female, M_{age} = 7.42 years, SD = 1.41 years) were recruited using a department-wide database. A target sample size (N = 80) was calculated by conducting two power analyses in G*Power (Faul, Erdfelder, Lang, & Buchner, 2007). One power analysis was for a 2 X 2 Mixed-effects ANCOVA with one covariate (*Age*, as a continuous variable) and the second power analysis was a 2 X 2 X 2 Mixed-

effects ANOVA. Both analyses were designed to detect main effects and interaction effects that were 'large' (Cohen, 1992) at alpha = .0167 and Power = .8. Of those analyses, the larger recommended sample size ($N = 72$) was used as the minimum target sample size. To ensure more adequate counterbalancing of conditions and interview versions across the sample, the target sample size was adjusted to N=80 (to recruit 16 children at ages 5, 6, 7, 8, and 9 years). *This dissertation only includes a subset* ($N = 46$) *of these data*.

Of these first 46 participants, 15 were excluded, largely because of the learning curve that the research team required to adapt to conducting online research during a new era of COVID-19. Of these 15 children, eight were excluded due to experimenter error ($M_{age} = 7.58$ years), one was excluded because the parent volunteered that the child was not typically developing (age 9.88 years), two were excluded because the parent did not have all study materials ($M_{age} = 8.92$ years), one was excluded because the parent did not read their part of the script during the conversation (age 8.60 years), one was excluded (age 7.84 years) because the child was sitting in their parent's lap (impeding our ability to measure the child's attention to their parent), and two were excluded because their sibling or pet distracted them during the conversation (M_{age}= 6.45 years). The final sample included 31 children (45% female, $M_{age} = 7.35$ years, $SD = 1.48$ years); of these children, roughly half were siblings (55%; $n = 17$; one household had three siblings). Parents of siblings were asked that the other children not be in the room during the study, and all parents complied to this request.

At the beginning of each video, coders also indicated how much each child had to turn their head to look toward their parent's face during the conversation. This was established by examining the alignment of the child's and parent's shoulders. If the parent was to the front-left of their child they were given a score of 1, if the parent was to the left of child (within about +/-

22.5 degrees of 90 degrees) they received a score of 2, back-left of child was scored 3, directly behind child was scored 4, back-right of child was scored 5, right of child (within about +/- 22.5 degrees of 90 degrees) was scored 6, or if they were to the front-right of child, they received a score of 7 (M = 4.16, SD = 1.96). Prior to the study, caregivers completed an online consent form (on Qualtrics.com) for themselves and their child. Caregivers (M_{age} = 40.9 years; SD = 7.85 years) consisted of 28 mothers, two fathers, and one grandparent.

During the study session, parents verbally consented (for themselves and their child) to both video recording of the session and participation in the study. The experimenter also requested that each child assent to participate, reminding them that they could stop participation at any time. Parents and their children were randomly assigned to a conversation script to be used with the experimenter during the study. The script contained either *positive* (n = 16) or *negative* (n = 15) information about a novel social group and novel toy. The order of the conversation was counterbalanced, such that information about the group was uttered either before (n = 14) or after (n = 17) information about the toy. The name of the group Gearoos (n = 15) or Flurps (n = 16) and the name of the toy, Daxes (n = 15) or Blickets (n = 16) was also counterbalanced across participants (children either overheard about Gearoos/Daxes or Flurps/Blickets). At the end of the study session, parents were asked to complete a voluntary questionnaire with demographic questions, questions about their family's use of video-chat applications, and questions about changes in their families' social environments or routines due to COVID-19. All parents (N = 31) completed this questionnaire.

According to the questionnaire, most parents (94%) believed it was 'very important' to teach their child about other social groups (e.g., religious, cultural, political) and 6% reported that this was 'moderately important'. *Prior* to COVID-19, 48% of parents reported that their

child was ‘rarely’ exposed to video chat applications used by others in their household (e.g., Skype, Facetime, Google Chat), 23% reported their child was exposed ‘monthly’, 13% ‘weekly’, 10% ‘daily’, and 6% were ‘never’ exposed. *Since COVID-19 began*, 48% of parents reported that their child was exposed to video-chat applications ‘daily’, 29% ‘weekly’, 10% ‘monthly’, and 13% were ‘rarely’ exposed. Most parents (77%) responded that *prior to COVID-19* their child *did not* attend online school, but 23% responded that their child had attended online school in the past. When asked whether their child was *currently* attending school online, 52% responded ‘yes’ and 48% responded ‘no’. Demographic information (note that these were not collected directly from or about child participants), indicated that 90% of parents identified as being White and 10% as Black or African American. Of the reported information about the child’s other caregiver (if this was applicable), 74% were reported as being White, 16% Black or African American, 3% Asian, and 7% of parents did not respond to this question. For the parent’s highest level of education, 39% reported having a Master’s degree, 29% had a Bachelor’s degree, 16% a doctorate, 13% reported completing ‘some college’, and 3% of parents did not respond to this question. The highest education levels for children’s other caregiver (if applicable) were slightly lower than that of the parent: 32% had a Bachelor’s degree, 26% had a Master’s degree, 23% completed ‘some college’, 10% had a high school diploma, 6% had a doctorate, and 3% of parents did not complete this question. Politically, 29% of parents identified as ‘liberal’, 26% as ‘very liberal’, 23% as ‘conservative’, 3% as ‘very conservative’, and 19% identified as ‘moderate’. Of children’s other caregivers (if applicable), 39% identified as ‘liberal’, 13% as ‘very liberal’, 26% as ‘conservative’, 9% as ‘very conservative’, and 13% as ‘moderate’.

Materials

All materials for the study session were mailed (using USPS Priority Mail) to each family's home address prior to the study. Inside each package was the child's prize, the parent's conversation script on US letter size (22 cm x 28 cm) computer paper and rolled-up like a poster reading, "An interesting article for [Name of Parent]" on the outside, the distractor task (a maze) printed on US letter size computer paper and placed in a 10.4 cm x 24.0 cm envelope (with the word "Maze" written on the front and a colorful sticker on the back), a BIC Ecolutions ballpoint pen (1.0 mm) with black ink, a thank you note printed on 13.5 x 5.1 cm cardstock paper that read, "Thank you for participating in our study!", and a "Junior Scientist" certificate printed on 21.5 x 14.8 cm cardstock paper. On the outside of each package was the message, "Please do not open until study session ☺", to prevent the child from seeing or engaging with the distractor task or seeing their parent's conversation script. In some cases, for example, if there were mailing issues (e.g., due to weather or unforeseen delays) or if the study was scheduled too early for the materials to arrive on time, some families printed the script and distractor task from their home printer (n = 8). In these cases, the child's prize, the thank you note, and junior scientist certificate were mailed to the family following the study session.

Procedure

All study sessions were completed using the program Zoom on the same Windows desktop computer with the same Logitech HD Webcam, located in a university laboratory. The experimenter's face was centered in the view of the camera afront a beige wall with a partial view of a corkboard, dry erase calendar, and printer. During the study, all parents' and children's verbal responses were recorded using Google Forms and saved to a lab Google account with no identifying information. At the beginning of the study, the experimenter logged into Zoom using a university-wide account, and waited for the parent to call in from their personal computer or

tablet (parents were sent an invitation to the Zoom call prior to the study). After greeting the parent and child, the experimenter asked the parent questions about the type of device they were using. Most parents (87%) used a laptop, 7% used a desktop computer, 3% used a phone, and 3% used a tablet. The average screen size reported was 13.88 inches (*SD* = 3.60 in). Most parents (91%) used an internal webcam, and the remainder of parents used external webcams (9%).

The experimenter requested that the parent mute or adjust the volume for any notifications or sounds (e.g., that could potentially come from their phones or televisions), and to adjust the volume on their device so they could hear the experimenter at a comfortable, audible level. Next, the parent was asked to adjust their device so that the camera captured the parent, the child's face, and the area where the child would be completing the distractor task (i.e., so that the child's hand movement was captured while they were completing the task). Finally, the experimenter asked the parent to put their video into full screen mode, so that they only saw the experimenter's face on the screen. In some cases, due to variability across versions of Zoom and electronic devices, the experimenter's face was in full screen and the parent and child's screen was very small (and was moved toward the bottom of the screen). After calibration, the experimenter confirmed that the parent and child had the experimenter's camera in full screen, and that they could only see the experimenter's face (or, in some cases, participants could also see their own face in a very small window bordering the screen).

To begin the activities, the experimenter asked the parent to find the package that was mailed to them containing the study materials and the child's prize. The parent was asked to give the child the distractor task (the maze; see Appendix C), a pen, and to locate the "article about the economy" (the script; see Appendices A - B). Next, the child was instructed to complete the maze (the distractor task) while the researcher initiated a conversation with the parent. The

duration of time (in ms) children looked toward the experimenter (the screen), the time they looked toward their parent, and the duration of time that they paused while completing the maze, served as indices of the child's attention to the conversation. After the conversation, the child played an unrelated game on the computer and answered questions about the group and the toy.

Distractor Task (Maze)

In their daily lives, children are likely engaged in activities while others nearby have conversations. Thus, to enhance the external validity of the current study, children were given a distractor task (a maze) to engage them during their parent's conversation with the researcher about the group and the toy (see Appendix C). The maze was created using the program *Inkscape* and was designed so that it took long enough to last during the conversation (approximately 90 seconds) but required very little thought in completing (i.e., so that children did not need to pause to plan how to complete the maze).

Prior to the conversation, the child was asked not to open the maze until the experimenter instructed them to. Children were instructed to use a pen that was sent to them by the experimenter and included with the maze. If children used their own pen or pencil (e.g., in the case that the parent had to print the maze), they were instructed not to use an eraser. The experimenter told the child, "To open the maze, you'll start at the hamster and then draw a line to get to the cheese. Remember you have to stay inside all of the lines. When you're all done, you can show me the maze on the camera. Okay?" Based on piloting of the maze with children who were not a part of the study, children who were 7 years and older sometimes completed the maze in less than 90 seconds. Thus, children who were 7 years and older were additionally told, "You don't have to go fast, but if you finish quick, try to go backwards, from the cheese to the hamster." To test that the pen was working, the experimenter asked the child to write their name

on the back of the maze. The child was told they could begin the maze and that the experimenter was, “gonna chat with your mom/dad/guardian and set up the next activity.”

Following the conversation, and after the child completed the maze (the child was given time to complete the maze if they did not finish during the conversation), the experimenter asked the child whether they thought the maze was ‘easy’ (n=18) or ‘hard’ (n=13). Children were also asked whether they went both forward *and* backward to complete the maze (four children reported that they had), and whether they had trouble spots where they had to stop and think while completing the maze (nine children reported having 1 – 2 trouble spots, and five reported having 3 – 5 trouble spots).

Parent-Experimenter Conversation

Once the child began the maze, the experimenter asked the parent, “So, have you been paying attention to the economy lately?” Using their script, the parent responded, “Ohhh yeah”. Next, the experimenter said, “I was talking with my friend, and she said the unemployment rate was supposed to have gotten better, but right now it’s almost as high as during the Great Depression”. The parent responded, “Wow”, and the experimenter stated, “I think the government is supposed to get a recovery package together”. The parent said, “Oh okay”. Next, the experimenter and parent continued the conversation focusing on either positive or negative information about a novel group and novel toy. The conversation ended by the experimenter stating, “..but we should stop chatting now, and let (Name of Child) focus on the maze”.

The claims about the social group (and toy) that were included in the conversation were based on past work examining children’s spontaneous questions about social groups (Nasie & Diesendruck, 2020), children’s ratings of how positively or negatively they felt about different personality characteristics (Nesdale & Brown, 2004), and on claims about social groups that

have been shown to elicit intergroup biases (Lane et al., 2020, Rottman et al., 2020). Additional information was acquired from open-ended response questions from a previous study in which children overheard negative claims about a novel social group (Conder & Lane, 2021). The two versions of the conversation script — positive and negative — are included in Appendixes A and B. To prevent children from realizing their parent was reading a script during the Zoom call, these scripts were formatted to appear as if it were a newspaper article about the economy. Three participants who participated early in data collection received scripts that were *not* disguised to look like a newspaper article.

Post-Conversation Game

Following the conversation, children played a game with the experimenter using Google Slides that was unrelated to the study. The purpose of the game was to meet the expectations of the child, who was told earlier that the experimenter was setting up a second activity while they completed the maze. Three age-appropriate versions of the game were created (5 – 6 years; 7 – 8 years; and 9 – 10 years). The game was copied into Google Slides from *Slidesgo* and included icons by *Flaticon* and infographics and images by *Freepik*. Children were asked to spell different words, choose puzzle pieces to complete a puzzle, and to answer basic math problems. To play the game, the experimenter shared their screen with the child, who was told, "This game isn't touch-screen so you're gonna see each activity on the screen and I will read the instructions to you". Then children were asked, to, "tell me what you think the answer is." The experimenter went through each slide with the child who verbally responded with their response until they completed the game.

Direct Questions about the Group and Toy

Following the game, children were asked questions about the novel group and the novel toy. The order of these questions was counterbalanced so that 45% of children were asked about the group first and 55% were asked about the toy first. Children were told that, "There are no right or wrong answers to any of these questions, I just want to know what you really think. Okay?" Children were first asked whether they had ever heard of the novel group or whether they had ever heard of the novel toy (children could answer 'Yes' or 'No'). Next, children were asked the following questions about the group: "Have you ever heard of Gearoo/Flurp people?" and "Would you want to be friends with a Gearoo/Flurp person?" If children responded "Yes" to the second question, their response was confirmed and they were asked, "would you *really* want to be friends or *just a little* want to be friends?" If the children responded "No" to the question, the experimenter confirmed their response and asked, "would you *really not* want to be friends or *just a little not* want to be friends?" Questions about the toy were: "Have you ever heard of things called Daxes/Blickets?" and "Would you want to have a Dax?" If children responded "Yes" to the second question, their response was confirmed and they were asked, "would you *really* want to have a Dax/Blicket or *just a little* want to have a Dax/Blicket?" If they responded "No" to the initial question, their response was confirmed, and they were asked, "would you really not want to have a Dax/Blicket or *just a little not* want to have a Dax/Blicket?" For any of these questions, if children did not respond or if they responded with, "I don't know", they were prompted, "if you had to say something, what would you say?" If they did not respond or give an answer a second time, the experimenter said, "there are no right or wrong answers, I just want to know what you really think." If the child did not respond a third time, the experimenter moved on to the next question.

Debriefing

Following these questions, the experimenter debriefed the child by telling them that both the group and the toy were not real, but if they were real, that they would probably be really nice people and really cool toys. The experimenter also answered any questions children had about the groups, toys, or the study. At the end of the study, parents were asked to rate the sound quality and the video quality on a scale from 1 'poor' to 5 'excellent'. The average sound quality rating was 4.8 and the average video quality rating was 4.8. Finally, parents were asked to complete the voluntary parent questionnaire while the experimenter remained available online to answer questions or help with technical issues.

Attention Coding

Video recordings of each parent-experimenter conversation were coded by two trained researchers. At the beginning of each video, coders indicated the position of the child relative to their parent. Specifically, the coders indicated whether the parent was to the *front-left* of their child (scored 1), *directly to the left* (within about +/- 22.5 degrees of 90 degrees) of their child (scored 2), to the *back-left* of their child (scored 3), *directly behind* their child (scored 4), to the *back-right* of their child (scored 5), *directly to the right* (within about +/- 22.5 degrees of 90 degrees) of their child (scored 6), or to the *front-right* of their child (scored 7). Most parents were positioned either *directly to the right* of their child (n=11) or *directly to the left* of their child (n=9) during the conversation.

Children's attention to the conversation (i.e., the duration of time they looked toward the researcher, the duration of time they looked toward their parent, and the duration of time they paused while completing the distractor task), was also coded. The first two variables, children's attention to the computer screen and to their parent, were measured as the amount of time

children gazed toward each location during the conversation. The third variable, the amount of time children paused during the task, was measured as the amount of time the child stopped moving their pen while completing the maze. Note that the third variable was included to account for situations in which children *were paying attention* to the conversation but were aware of the social consequences of eavesdropping and actively trying to prevent eye gaze movement. To calculate each of these variables, trained coders used the program *Open Shot Video Editor* to record each duration on a frame-by-frame basis (30 frames p/second). This hand-coding method has been shown to effectively capture children's eye gaze changes and behaviors from recorded video (Nilsen & Graham, 2012; Ronfard, Wei, & Rowe, 2021; Sekerina, Fernández, & Clahsen, 2008). For ease of calculation, each duration (reported as minutes, seconds, and frames) was later converted into milliseconds by multiplying the number of minutes by 60,000, the number of seconds by 1,000, and the number of frames by 33.33, and summing these three values. Importantly, if the parent or experimenter acknowledged the child during the conversation, or if there was an abnormal break during the conversation (e.g., someone lost their place in the conversation script or if there were technical difficulties), that part of the conversation was removed from the duration of time.

To ensure the coders were blind to the study conditions, all coding was completed without audio. Prior to coding, the primary investigator watched each video recording using *Open Shot Video Editor* and reported the time stamps for the start and stop times for the entire conversation, the conversation segment about the novel group, and the conversation segment about the novel toy. The start time of each conversation segment began at the first sound, for example the "/s/" in "so, have you been paying attention to the economy lately?". The stop time of each segment ended at the last sound of that part of the conversation. On average, the entire

conversation duration was 80,048 ms ($SD_{duration}$ = 6,512 ms), the conversation segment that was about the novel group was 26,230 ms ($SD_{duration}$ = 2,280 ms), and the conversation segment that was about the novel toy was 26,500 ms ($SD_{duration}$ = 2,400 ms).

To establish inter-rater reliability, 20% of the videos were coded independently by each of the two coders. Inter-rater reliability was achieved if the coders reported durations of time that were within 8 frames of one another (approximately .25 seconds, as the video was recorded at 30 frames per second). Because the coders were unable to establish reliability for the duration of time children paused during the distractor task if it was for less than 1 second, only the duration of time that children paused over 1 second was recorded. Total inter-rater reliability for the position of the child relative to their parent was 100%. Reliability for the duration of time children gazed toward the experimenter (i.e., the screen) when the conversation was about the novel group was 100% and when the conversation was about the novel toy it was 93%. Reliability for children's attention to their parent when the conversation was about the group *and* when the conversation was about the toy was 100%. Finally, for the duration of time children paused during the distractor task, reliability was 66% when the conversation was about the group and 60% when the conversation was about the toy. After establishing reliability, both coders coded all of the remaining data, and their recorded times were averaged for each variable.

Results

Three 2 X 2 Mixed-Effects ANOVAs were used to test for between-subjects effects of Valence (Positive or Negative) and for within-subjects effects of Topic (Group or Toy) on the total duration of time children gazed toward the experimenter, the total duration of time children gazed toward their parent, and total duration of time children paused (i.e., stopped moving their pen) during the distractor task. Note that because the sample size was too small to detect enough

statistical power, children's age was not included in the primary analyses. However, children's age was evaluated in the exploratory analyses described in this section.

Attention to Experimenter

On average, children gazed toward the experimenter for 220 ms (*SD* = 360 ms) during the conversation. According to a 2 (Valence: Positive or Negative) X 2 (Topic: Group or Toy) Mixed-Effects ANOVA, there were no significant interactions or significant main effects involving Valence or Topic and children's attention to the experimenter. Children gazed toward the experimenter for the same amount of time whether the conversation was Positive (*M*= 160 ms, *SD* = 370 ms) or Negative (*M*= 290 ms, *SD*= 590 ms), $F(1,29)=1.06$, $p=.312$, and whether claims were about the Group (*M*= 190 ms, *SD*= 440 ms) or about the Toy (*M*= 260 ms, *SD*= 530 ms), $F(1,29)=.050$, $p=.825$.

Attention to Parent

Children attended to their *parent* for an average of 100 ms (*SD* = 360 ms) during the conversation. The same 2 X 2 Mixed-Effects ANOVA, testing for between-subjects effects of Valence and within-subjects effects of Topic, found no significant interactions or significant main effects for either variable. Children gazed at their parent for an equal amount of time whether the conversation was Positive (*M*= 100 ms, *SD*= 340 ms) or Negative (*M*= 90 ms, *SD*= 340 ms), $F(1,29)=.022$, $p=.882$, or whether it was about the Group (*M*= 200 ms, *SD*=130 ms) or about the Toy (*M*= 170 ms, *SD*=590 ms), $F(1,29)=.319$, $p=.576$.

Pauses during the Distractor Task

The duration of time children paused during the distractor task was also examined using the same 2 X 2 Mixed-Effects ANOVA. On average, children paused for 4,240 ms (*SD* = 4,590 ms) during the conversation. According to the ANOVA, there were no significant interactions or

significant main effects for the Valence of the conversation or the conversation Topic on the amount of time children spent pausing. The duration of time children paused during the task was no different whether the conversation was Positive (*M*= 4,260 ms, *SD*= 5,470 ms) or Negative (*M*=4,220 ms, *SD*=3,580 ms), $F(1,29)=.001$, $p=.98$, or whether it was about the Group (*M*=4,190 ms, *SD*=5,220 ms) or about the Toy (*M*=4,300 ms, *SD*=3,960 ms), $F(1,29)=.199$, $p=.659$.

Exploratory Analyses

Age-Related Differences

Exploratory Pearson correlational analyses were calculated between each dependent variable (Attention to Experimenter, Attention to Parent, Pauses during Distractor Task, and Child Age) by each independent variable (Valence: Negative or Positive, and Topic: Group or Toy). Results found that when the conversation was Negative, there were several age-related *trends* where, with age, children seemed to spent more time attending to the Experimenter when there were negative claims about the Group ($r(13)=.39$, $p=.16$) and negative claims about the Toy ($r(13)=.39$, $p=.15$). They also spent more time attending to the Parent during claims about the Toy ($r(13)=.36$, $p=.19$) but not about the Group ($r(13)=.03$, $p=.92$). However, when the conversation was Positive, there was only a trend toward an age-related decrease in the duration of time children attended to their Parent when claims were about the Toy ($r(14)=.42$, $p=.103$).

Children's Preferences

Following the conversation, as detailed in the study Method, the experimenter asked the child questions about the group and the toy. First, children were asked if they had ever heard of the novel group or the novel toy. For this question, almost all children (97%) reported that they had *not* heard about the group or the toy. Next, as a measure of children's preferences for the group and the toy, they were asked if they would *want to be friends* with a member of the group

or if they would *want to have one* of the toys. If children responded "Yes" to these questions, they were asked if they *really* or *just a little* wanted to be friends with a group member or wanted to have one of the toys. If they responded "No" to these questions, they were asked if they *really* or *just a little* did *not* want to be friends with a group member or have one of the toys. Most children (n = 30) responded to these questions.

Two preference scores were calculated for each child — one for their willingness to be friends with a group member and one for their desire to have one of the toys. For each score, if children reported that they *would really want* to be friends with a group member/have one of the toys they were given a score of 1, if they reported that they *wanted* to be friends/to have a toy (but *just a little*) they were given a score of .67, if they *did not want* to be friends/want a toy (but *just a little*) they received a score of .33, and if they *really did not* want to be friends/to have a toy they received a score of 0. On average, children's friendship preference score was .4 (SD = .37) and their toy preference score was .45 (SD = .40). To explore potential effects of overhearing the conversation about the group and the toy on children's preferences for the group and the toy, a Mixed-Effects ANOVA was conducted to test for between-subjects effects of Valence (Positive or Negative) and within-subjects effects of Topic (Group or Toy) on children's preferences. This analysis revealed a significant interaction between Valence and Topic ($F(1,28)=73.51$, $p <.001$), where children had higher preferences scores for both the group and the toy if the conversation was Positive (M=.58, SE=.07) as opposed to Negative (M=.27, SE = .07). There were no other significant interactions or main effects.

Discussion

In Study 2, children's (5 – 10 years) attention to overheard claims about a novel social group were examined. One aim of this work was to investigate age-related differences in

children's attention to these claims, as a potential explanation for differences found in past work on the influence of overheard claims about social groups on children's biases (Conder & Lane, 2021; Lane et al., 2020). Based on this past work, and other work examining children's ability to extract information from overheard claims (e.g., Akhtar and Gernsbacher, 2007; Shneidman et al., 2009), an age-graded increase in children's attention to the overheard claims was expected. A second aim of this study was to investigate children's preference for positive versus negative information about a novel social group. According to past work on direct claims about others' characteristics, children typically believe positive rather than negative claims about other people (e.g., Boseovski, 2012; Boseovski & Lee, 2008; Harper & Ma, 2019; Lapan et al., 2016). Thus, children (especially the youngest children, who more often exhibit this positivity bias) should pay more attention to positive, overheard claims about the group than to negative, overheard claims about the group. However, recent evidence suggests that this positivity bias may conflict with children's intergroup biases (Alden & Soley, 2019). If this is the case, since children in this study heard claims about a novel *social group*, they may not necessarily prefer positive to negative claims about the group; rather, they may attend more often to negative claims or attend to both negative and positive claims equally.

To test these predictions, while completing a distractor task (a maze), children overheard their parent discuss either positive or negative information about a novel social group and a novel toy (as a point of comparison). Later, children's attention to the overheard conversation (defined as the duration of time children gazed toward the experimenter, time they gazed toward their parent, and amount of time they paused while completing the maze) was measured. Importantly, the primary analyses could not provide information about age-related differences in children's attention to the overheard claims due to the small sample size (data for this study were

a subset of data from a larger, ongoing study). The primary analyses *could* examine differences in children's attention to positive or negative claims, and to claims about the group and about the toy. However, these analyses did not detect differences in children's attention to the conversation according to any of the measures (duration of time children gazed toward the experimenter, time they gazed toward their parent, or amount of time children paused during the maze). To explore potential trends in these variables based on children's age, exploratory correlational analyses were performed. Although findings from these analyses were not conclusive, when the claims were *negative*, there were potential age-related increases in children's attention to the *experimenter* for claims about the group *and* about the toy. These analyses also detected trends for children's attention to *their parent* when the claims were negative — an increase in attention to claims about *the toy* with age (but not about the group). There was also a trend toward an age-related *decrease* in children's attention to their parent when the claims were *positive* about the toy (but not about the group).

For children's attention to *the experimenter* about *the group*, these trends supported the prediction that children's attention to overheard, *negative* claims about social groups may increase with age. If future work could confirm this trend, these age-related differences in attention could explain why the influence of overhearing negative claims about social groups is more influential on older children's biases than on younger children's biases (Conder & Lane, 2021; Lane et al., 2020). This trend is also consistent with the prediction that children's biases toward social groups may weaken their tendency to prefer positive rather than negative claims about others (Alden & Soley, 2019). However, they may also indicate that, with age, children may just be more interested in overheard, negative claims in general (i.e., children attended more often to negative information about *the group* and about *the toy*). These trends do not support

children's tendency to prefer positive over negative information, or to demonstrate a positivity bias in their attention to claims about the group or about the toy (e.g., Boseovski, 2012; Boseovski & Lee, 2008; Harper & Ma, 2019; Lapan et al., 2016).

Interestingly, the only trends for children's attention to *their parent* were for claims about *the toy* but not about *the group*. One reason for this finding may be that children associated their parent with *buying* the toy, and they may be assessing their parent's reaction to see if they might later obtain one of the toys. Finally, this analysis did not detect any age-related trends for the duration of time children *paused* during the distractor task. It is possible the duration of pauses during the task was a poor measure of children's attention, or it could be a result of the difficulty coders had recording children's pauses (i.e., they achieved the lowest inter-rater reliability score for this measure). To understand all of these detected trends more fully, an exploratory analysis of the relationship between the valence of claims (positive or negative) and children's preferences for members of the group and for the toy were examined. This analysis found that children were more likely to want to be friends with a group member and more strongly wanted to have one of the toys, if they overheard *positive* claims about the group and toy rather than *negative* claims about the group and toy. This finding replicates previous work on the influence of overhearing negative claims about social groups on children's biases (Conder & Lane, 2021; Lane et al., 2020). It also provided a novel finding, that children's biases toward novel social groups can be influenced by overhearing *positive* claims.

Beyond these interesting results and detected trends, there were also several limitations of the study. As previously mentioned, data were from a subset of a larger, ongoing study that included a pre-registered analysis plan and an *a priori* power analysis using G*Power (Faul et al., 2007). According to this power analysis, to have enough power to detect large effects

(Cohen, 1992) at alpha = .0167 and Power = .8, a final sample size of at least 72 participants was required. In this study there were only 31 participants. Thus, the current analyses could not include children's age as a factor without being underpowered. Fortunately, to fix this problem merely requires obtaining a large enough sample size to detect effects with adequate statistical power. Another limitation of this study was that the method used to measure children's attention to the overheard claims produced very large variability, according to the standard deviations for each measure. This variability was likely a consequence of ecological validity — the parent and child were in their own home and using their own devices during the conversation. Although this method allowed for the study to occur within a context similar to how children might overhear claims in real life, there was much less control of extraneous variables. For example, there was little control over the noises in the background, the setup of the room, the speed of the device, or the placement of child relative to their parent. Future work should replicate this study in a more controlled setting to rule out differences in children's environment on their attention to claims. Another methodological change that could decrease this variability could be to add a neutral condition in which children hear no claims about the group or toy.

In sum, the current study examined children's (5 – 10 years) attention to an overheard conversation between their parent and a non-present researcher that included either positive or negative claims about a novel social group. One goal of the study was to explain previous findings (Conder & Lane, 2021; Lane et al., 2020) that younger children's biases (4 – 6 years) were less influenced by overheard claims about social groups than older children's biases (7 – 10 years). Based on exploratory analyses from the current study, these effects *may* be explained by age-related differences in children's attention to overheard claims. Findings detected *trends* toward an age-related increase in children's attention to negative (but not positive) claims about

the social group. These findings are consistent with the hypothesis that claims about social groups may lessen children's tendency to prefer positive (rather than negative) information about others (Alden & Soley, 2019). In general, the current study introduced a novel study design implemented due to the constraints of COVID-19, in which an experimenter called into a family's home remotely (using video-chat). This study also provided a foundation for continued work on children's learning about others from electronic media use.

CHAPTER 4

General Discussion

The studies in this dissertation explored ways in which children may learn about new social groups from overhearing claims about those groups. These studies also implemented novel methodologies aimed to mimic how children might learn about social groups in their daily lives. Study 1 was a secondary analysis of children's (4 – 9 years) drawings acquired from a previous study in which children either did or did not overhear negative claims about a novel social group from a video-chat conversation. Results found that children drew a group member's face with more negative affect (relative to themselves) if they overheard negative claims about the group in comparison to children who did not overhear claims. However, this finding did not maintain following a 2-week delay. Study 2 investigated children's (5 – 10 years) attention to a nearby Zoom conversation between their parent and a non-present researcher who made either positive or negative claims about a novel social group and novel toy (as a point of comparison). Findings detected *trends* toward an age-related increase in children's attention to negative (but not positive) claims about the social group (and about the toy).

One purpose for this set of studies was to provide potential explanations for age-related differences detected in past work on the influence of overheard claims on children's social biases. In these studies (Conder & Lane, 2021; Lane et al., 2020) negative claims about a novel social group more strongly influenced older children's biases (7 – 9 years) compared to younger children's biases (4 – 6 years). Study 1's analysis of children's drawings provided evidence that biases of the youngest children may not have been completely captured by past measures. In this study, children (4 – 9 years) drew the facial expression of the group member more negatively (e.g., with a frown rather than a smile) if they overheard negative claims about the group

compared to children who did not overhear claims, but these effects were only present immediately following claims (and did not maintain after a 2-week delay). Study 2 provided evidence that younger children may extract less information from overheard claims than older children because they attend less often to overheard conversations. Trends detected in this study suggested that there were age-related increases in children's attention to negative information about social groups (and about toys). Thus, the current studies did provide some information about why 4- to 6-year-olds's biases may be less susceptible to messages about social groups compared to 7- to 10-year-olds' biases.

Findings from these studies also provided some interesting new ideas for future exploration. For example, unlike the lasting effects detected for the oldest children (7 – 9 years) in Conder and Lane (2021), the effects detected from children's (4 – 9 years) drawings in Study 1 did not maintain following the 2-week delay. This suggests that the biases detected in children's depictions of the group member's facial expressions may be more fleeting. Perhaps the way in which children depicted the group member's facial expression was more representative of the information children *heard* (i.e., negative information about the group) than of children's generalized attitudes toward the group. If this is the case, it may also explain why there were no other detected effects according to any of the other measures in Study 1 (i.e., the size of the drawing and the colors used to depict the group member). These measures required children to extrapolate the information they overheard into generalized, negative sentiment toward the group. Future work should investigate these different levels of children's intergroup bias (i.e., fleeting versus more stable biases) and how these types of bias are acquired and expressed.

Both studies in this dissertation examined children's learning from others' conversations using video-chat platforms commonly used by families across the U.S. Thus, the use of experimental paradigms (such as these) that mimic the lifestyles of children and their families may be especially informative for future work on how children develop intergroup biases. This may especially be the case since the start of the COVID-19 era. According to the parent survey used in Study 2, *prior* to COVID-19, 48% of parents reported that their children were *rarely* exposed to video chat applications (e.g., Skype, Facetime, Google Chat). Since COVID-19, 48% reported that their children were exposed to these applications *daily.* Future work should investigate how often children are currently exposed to other's messages about social groups, including information about the type of messages (direct or overheard) and from what sources.

In general, this dissertation informs work on the influence of overhearing others' claims about social groups on children's developing intergroup biases. According to this work, children's biases seem to partly result from an interaction of their developing social cognitive skills (e.g., their ability to attend to social cues) and from ambient messages in their social environment (e.g., others' video-chat conversations). In their daily lives, children are likely exposed to messages about social groups from others' conversations (in real life or online) or from others' electronic media use (e.g., from TV or radio). According to Wagner and Raudsepp (2021), how we represent others in our minds is a result of the history of our conversations and interactions with electronic and social media. This dissertation offers new information about the ways in which children may acquire negative biases toward other groups and may also inform work on the prevention or attenuation of the consequences of these biases (i.e, prejudicial attitudes, discrimination, and stereotypes).

REFERENCES

Aboud, F. E. (2003). The formation of in-group favoritism and out-group prejudice in young children: Are they distinct attitudes? *Developmental Psychology*, *39*, 48–60. doi: 10.1037/0012-1649.39.1.48

Akhtar, N. (2005). The robustness of learning through overhearing. *Developmental Science*, *8*, 199–209. doi: 10.1111/j.1467-7687.2005.00406.x

Akhtar, N., & Gernsbacher, M. A. (2007). Joint attention and vocabulary development: A critical look. *Language and Linguistics Compass*, *1*, 195–207. doi: 10.1111/j.1749-818X.2007.00014.x

Akhtar, N., Jipson, J., & Callanan, M. A. (2001). Learning words through overhearing. *Child Development*, *72*, 416–430. doi: 10.1111/1467-8624.00287

Aldan, P., & Soley, G. (2019). The role of intergroup biases in children's endorsement of information about novel individuals. *Journal of Experimental Child Psychology*, *179*, 291–307. doi: 10.1016/j.jecp.2018.11.007

Allport, G. W. (1954). *The nature of prejudice*. Cambridge, MA: Addison-Wesley.

Baldwin, D. A. (1991). Infants' contribution to the achievement of joint reference. *Child Development*, *62*, 874-890. doi: 10.1111/j.1467-8624.1991.tb01577.x

Bar-Tal, D., & Teichman, Y. (2009). The reflection of social images in human figure drawing. In D. Bar-Tal & Y. Teichman (Eds.), *Stereotypes and prejudice in conflict: Representations of Arabs in Israeli Jewish society*, (pp. 324-374). New York, NY: Cambridge University Press.

Bigler, R. S., Jones, L. C., & Lobliner, D. B. (1997). Social categorization and the formation of

intergroup attitudes in children. *Child Development*, *68*, 530–543. doi: 10.1111/j.1467-8624.1997.tb01956.x

Bigler, R. S., & Liben, L. S. (1993). A cognitive-developmental approach to racial stereotyping and reconstructive memory in euro-american children. *Child Development*, *64*, 1507. doi: 10.2307/1131549

Bigler, R. S., & Liben, L. S. (2007). Developmental intergroup theory: Explaining and reducing children's social stereotyping and prejudice. *Current Directions in Psychological Science*, *16*, 162–166. doi: 10.1111/j.1467-8721.2007.00496.x

Boderé, A., & Jaspaert, K. (2017). Six-year-olds' learning of novel words through addressed and overheard speech. *Journal of Child Language*, *44*, 1163–1191. doi: 10.1017/S0305000916000465

Boseovski, J. J. (2012). Trust in testimony about strangers: Young children prefer reliable informants who make positive attributions. *Journal of Experimental Child Psychology*, *111*, 543–551. doi: 10.1016/j.jecp.2011.10.008

Boseovski, J. J., & Lee, K. (2008). Seeing the world through rose-colored glasses? Neglect of consensus information in young children's personality judgments. *Social Development*, *17*, 399–416. doi: 10.1111/j.1467-9507.2007.00431

Burkitt, E., Barrett, M., & Davis, A. (2003). The effect of affective characterizations on the size of children's drawings. *British Journal of Developmental Psychology*, *21*, 565–583. https://doi.org/10.1348/026151003322535228

Burkitt, E., Barrett, M., & Davis, A. (2009). Effects of different emotion terms on the size and

colour of children's drawings. *International Journal of Art Therapy*, 14, 74-84. Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*, 155-159. doi: 10.1037/0033-2909.112.1.155

Campos, J. J., Hiatt, S., Ramsay, D., Henderson, C., & Svejda, M. (1978). The emergence of fear on the visual cliff. In *The development of affect* (pp. 149-182). Boston, MA: Springer.

Clément, F., & Dukes, D. (2017). Social appraisal and social referencing: Two components of affective social learning. *Emotion Review*, *9*, 253–261. doi: 10.1177/1754073916661634

Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112*, 155–159.

Conder, E. B. & Lane, J. D. (in press). Overhearing brief negative messages has lasting effects on children's attitudes toward novel social groups. *Child Development.* 1-17. doi: 10.1111/cdev.13547

Croce, R. C., & Boseovski, J. J. (2020). Trait or testimony? Children's preferences for positive informants. *Journal of Experimental Child Psychology*, *190*. doi: 10.1016/j.jecp.2019.104726

Csibra, G., & Gergely, G. (2009). Natural pedagogy. *Trends in Cognitive Sciences*, *13*, 148–153. doi: 10.1016/j.tics.2009.01.005

Diem-Wille, G. (2001). A therapeutic perspective: The use of drawings in child psychoanalysis and social science. In C. Jewitt & T. V. Leeuwen (Eds.) *Handbook of visual analysis*, (pp. 119-133). New York, NY: Sage.

Diesendruck, G., & Menahem, R. (2015). Essentialism promotes children's inter-ethnic bias. *Frontiers in Psychology*, *6*. doi: 10.3389/fpsyg.2015.01180

Dunham, Y. (2018). Mere membership. *Trends in Cognitive Sciences*, *22*, 780–793. doi: 10.1016/j.tics.2018.06.004

Dunham, Y., & Emory, J. (2014). Of affect and ambiguity: The emergence of preference for arbitrary ingroups. *Journal of Social Issues*, *70*, 81–98. doi: 10.1111/josi.12048

Eccles, J. S. (1999). The Development of children ages 6 to 14. *The Future of Children*, *9*, 30–44. doi: 10.2307/1602703

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*, 175-191. doi: 10.3758/BF03193146

Fawcett, C., & Kreutz, G. (in press). Twelve-month-old infants' physiological responses to music are affected by others' positive and negative reactions. *Infancy*. doi: 10.1111/infa.12415

Federal Bureau of Investigation. (2019). *Hate Crime Statistics, 2019*. Retrieved from ucr.fbi.gov/hate-crime/2019

Fernald, A., Zangl, R., Portillo, A.L., & Marchman, V. A. (2008). Looking while listening: Using eye movements to monitor spoken language comprehension in infants and young children. In I. A. Sekerina, E. M. Fernández, & H. Clahsen, H. (Eds.), *Developmental Psycholinguistics: On-line Methods in Children's Language Processing*, (pp. 97–136). Philadelphia, PA: John Benjamins Publishing.

Floor, P., & Akhtar, N. (2006). Can 18-month-old infants learn words by listening in on conversations? *Infancy*, *9*, 327–339. doi: 10.1207/s15327078in0903_4

Gampe, A., Liebal, K., & Tomasello, M. (2012). Eighteen-month-olds learn novel words through overhearing. *First Language*, *32*, 385–397. doi: 10.1177/0142723711433584

Gibson, E. J., & Walk, R. D. (1960). The" visual cliff". *Scientific American*, *202*, 64-71.

Gonzalez, A. M., Steele, J. R., & Baron, A. S. (2017). Reducing children's implicit racial bias

through exposure to positive out-group exemplars. *Child Development*, *88*, 123–130. doi: 10.1111/cdev.12582

González-Rivera, M., & Bauermeister, J. A. (2007). Children's attitudes toward people with AIDS in Puerto Rico: Exploring stigma through drawings and stories. *Qualitative Health Research*, *17*, 250–263. doi: 10.1177/1049732306297758

Grusec, J. E., Saas-Kortsaak, P., & Simutis, Z. M. (1978). The role of example and moral exhortation in the training of altruism. *Child Development*, *49*, 920–923. doi: 10.2307/1128273

Harris, P. L. (2012). *Trusting what you're told: How children learn from others*. Cambridge, MA: Harvard University Press.

Lane, J. D., & Harris, P. L. (2014). Confronting, representing, and believing counterintuitive concepts: Navigating the natural and the supernatural. *Perspectives on Psychological Science*, *9*, 144-160. doi: 10.1177/1745691613518078

Harper, K. & Ma, L. (2019). *Name of study Children's use of reputational information shared via gossip to selectively learn from others* [Poster presentation]. Society for Research in Child Development (SRCD) Biennial Meeting. Baltimore, MD.

Harris, P. L., Koenig, M. A., Corriveau, K. H., & Jaswal, V. K. (2018). Cognitive foundations of learning from testimony. *Annual Review of Psychology*, *69*. doi: 10.1146/annurev-psych-122216-011710

Hailey, S. E., & Olson, K. R. (2013). A social psychologist's guide to the development of racial attitudes. *Social and Personality Psychology Compass*, *7*, 457–469. doi: 10.1111/spc3.12038

Jaswal, V. K. (2010). Believing what you're told: Young children's trust in unexpected testimony about the physical world. *Cognitive Psychology*, *61*, 248–272. doi: 10.1016/j.cogpsych.2010.06.002

Johnson, P. J., & Aboud, F. E. (2017). Evaluation of an intervention using cross-race friend storybooks to reduce prejudice among majority race young children. *Early Childhood Research Quarterly*, *40*, 110–122. doi: 10.1016/j.ecresq.2017.02.003

Kinzler, K. D., Shutts, K., DeJesus, J., & Spelke, E. S. (2009). Accent trumps race in guiding children's social preferences. *Social Cognition*, *27*, 623–634. doi: 10.1521/soco.2009.27.4.623

Klinnert, M. D., Campos, J. J., Sorce, J. F., Emde, R. N., & Svejda, M. (1983). Emotions as behavior regulators: Social referencing in infancy. In R. Plutchik & H. Kellerman (Eds.), *Emotions in Early Development* (pp. 57–86). Cambridge, MA: Academic Press. doi: 10.1016/B978-0-12-558702-0.50009-1

Koenig, M. A., Li, P. H., & McMyler, B. (2021). Interpersonal trust in children's testimonial learning. *Mind & Language*. doi: 10.1111/mila.12361

Lane, J. D., & Harris, P. L. (2015). The roles of intuition and informants' expertise in children's epistemic trust. *Child Development*, *86*, 919-926. doi: 10.1111/cdev.12324

Lane, J. D., Conder, E. B., & Rottman, J. (2020). The influence of direct and overheard messages on children's attitudes toward novel social groups. *Child Development, 91,* 829-845. doi: 10.1111/cdev.13238

Lapan, C., Boseovski, J. J., & Blincoe, S. (2016). "Can I Believe My Eyes?" Three- to six-year-olds' willingness to accept contradictory trait labels. *Merrill-Palmer Quarterly*, *62*, 22–47. doi: 10.13110/merrpalmquar1982.62.1.0022

Li, Q., Zhang, W., Heyman, G. D., Compton, B. J., & Lee, K. (2020). Susceptibility to being lured away by a stranger: A real-world field test of selective trust in early childhood. Psychological Science. 1-9. doi: 10.1177/0956797620966526

Loyd, A. B., & Gaither, S. E. (2018). Racial/ethnic socialization for White youth: What we know and future directions. *Journal of Applied Developmental Psychology*, *59*, 54-64. doi: 10.1016/j.appdev.2018.05.004

Loxton, H. (2009). Monsters in the dark and other scary things: Preschoolers' self-reports. *Journal of Child & Adolescent Mental Health*, *21*, 47–60. doi: 10.2989/JCAMH.2009.21.1.7.809

Nasie, M., & Diesendruck, G. (2020). What children want to know about in- and out-groups, and how knowledge affects their intergroup attitudes. *Social Development*, *29*(2), 443–460. doi: 10.1111/sode.12408

Nesdale, D. (2004). Social identity processes and children's ethnic prejudice. In M. Bennett & F. Sani (Eds.), *The development of the social self*, (pp. 219-245). New York, NY: Psychology Press.

Nesdale, D., & Brown, K. (2004). Children's attitudes towards an atypical member of an ethnic in-group. *International Journal of Behavioral Development*, *28*, 328–335. doi: 10.1080/01650250444000018

Nesdale, D., Maass, A., Griffiths, J., & Durkin, K. (2003). Effects of in-group and out-group ethnicity on children's attitudes towards members of the in-group and out-group. *The British Journal of Developmental Psychology*, *21*, 177-192.

Nurmsoo, E. & Bloom, P. (2008). Preschoolers' perspective taking in word learning: Do they

blindly follow eye gaze? *Psychological Science, 19,* 211-215. doi: 10.1111/j.1467-9280.2008.02069.x

O'Doherty, K., Troseth, G. L., Shimpi, P. M., Goldenberg, E., Akhtar, N., & Saylor, M. M. (2011). Third-party social interaction and word learning from video. *Child Development*, *82*, 902–915. doi: 10.1111/j.1467-8624.2011.01579.x

Over, H., & McCall, C. (2018). Becoming us and them: Social learning and intergroup bias. *Social and Personality Psychology Compass*, *12*, e12384. doi: 10.1111/spc3.12384

Over, H., Eggleston, A., Bell, J., & Dunham, Y. (2018). Young children seek out biased information about social groups. *Developmental Science*, *21*, e12580. doi: 10.1111/desc.12580

Paolini, S., White, F. A., Tropp, L. R., Turner, R. N., Page-Gould, E., Barlow, F. K., & Gómez, Á. (2021). Intergroup contact research in the 21st century: Lessons learned and forward progress if we remain open. *Journal of Social Issues*, *77*, 11–37. doi: 10.1111/josi.12427

Patterson, M. M., & Bigler, R. S. (2006). Preschool children's attention to environmental messages about groups: Social categorization and the origins of intergroup bias. *Child Development*, *77*, 847–860. doi: 10.1111/j.1467-8624.2006.00906.x

Patterson, M. M., Bigler, R. S., Pahlke, E., Brown, C. S., Hayes, A. R., Ramirez, M. C., & Nelson, A. (2019). Toward a developmental science of politics. *Monographs of the Society for Research in Child Development*, *84*, 7–185. doi: 10.1111/mono.12410

Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. *Journal of Personality and Social Psychology*, *90*, 751–783. doi: 10.1037/0022-3514.90.5.751

Raabe, T., & Beelmann, A. (2011). Development of ethnic, racial, and national prejudice in

childhood and adolescence: A multinational meta-analysis of age differences. *Child Development*, *82*, 1715–1737. doi: 10.1111/j.1467-8624.2011.01668.x

Renno, M. P., & Shutts, K. (2015). Children's social category-based giving and its correlates: Expectations and preferences. *Developmental Psychology*, *51*, 533–543. doi: 10.1037/a0038819

Ronfard, S., Lane, J. D., Wang, M., & Harris, P. L. (2017). The impact of counter-perceptual testimony on children's categorization after a delay. *Journal of Experimental Child Psychology*, *163*, 151–158. doi: 10.1016/j.jecp.2017.06.006

Ronfard, S., Wei, R., & Rowe, M. L. (2021). Exploring the linguistic, cognitive, and social skills underlying lexical processing efficiency as measured by the looking-while-listening paradigm. *Journal of Child Language*, 1–24. doi: 10.1017/S0305000921000106

Rottman, J., Johnston, A. M., Bierhoff, S., Pelletier, T., Grigoreva, A. D., & Benitez, J. (2020). In sickness and in filth: Developing a disdain for dirty people. *Journal of Experimental Child Psychology*, *196*, 104858. doi: 10.1016/j.jecp.2020.104858

Rottman, J., Young, L., & Kelemen, D. (2017). The impact of testimony on children's moralization of novel actions. *Emotion*, *17*, 811-827. doi: 10.1037/emo0000276

Rushton, J. P. (1975). Generosity in children: Immediate and long-term effects of modeling, preaching, and moral judgment. *Journal of Personality and Social Psychology*, *31*, 459-466. doi: 10.1037/h0076466

Rutland, A., Killen, M., & Abrams, D. (2010). A new social-cognitive developmental perspective on prejudice: The interplay between morality and group identity. *Perspectives on Psychological Science*, *5*, 279–291. doi: 10.1177/1745691610369468

Sekerina, I. A., Fernández, E. M., & Clahsen, H. (2008). *Developmental Psycholinguistics: On-*

line Methods in Children's Language Processing. Amsterdam, NL: John Benjamins Publishing.

Tomasello, M. (1999b). Joint attention and cultural learning. In *The cultural origins of human cognition* (pp. 56 – 93). Cambridge, MA. Harvard University Press.

Trueswell (2008). Using eye movements as a developmental measure within psycholinguistics. In I. A. Sekerina, E. M. Fernández, & H. Clahsen, H. (Eds.), *Developmental Psycholinguistics: On-line Methods in Children's Language Processing*, (pp. 73–96). Philadelphia, PA: John Benjamins Publishing.

Sabbagh, M. A. & Baldwin, D. A. (2001). Learning words from knowledgeable versus ignorant speakers: Links between preschoolers' theory of mind and semantic development. *Child Development*, *72*, 1054-1070. doi: 10.1111/1467-8624.00334

Shneidman, L., & Woodward, A. L. (2016). Are child-directed interactions the cradle of social learning? *Psychological Bulletin*, *142*, 1–17. doi: 10.1037/bul0000023

Shneidman, L. A., Buresh, J. S., Shimpi, P. M., Knight-Schwarz, J., & Woodward, A. L. (2009). Social experience, social attention and word learning in an overhearing paradigm. *Language Learning and Development*, *5*, 266–281. doi: 10.1080/15475440903001115

Skinner, A. L., & Meltzoff, A. N. (2018). Childhood experiences and intergroup biases among children. *Social Issues and Policy Review, 13,* 211–240. doi: 10.1111/sipr.12054

Skinner, A. L., Meltzoff, A. N., & Olson, K. R. (2017). "Catching" social bias: Exposure to biased nonverbal signals creates social biases in preschool children. *Psychological Science*, *28*, 216–224. doi: 10.1177/0956797616678930

Wagner, W., & Raudsepp, M. (2021). Representations in intergroup relations: Reflexivity,

meta-representations, and interobjectivity. *RUDN Journal of Psychology and Pedagogics*, *18*, 332–345. doi: 10.22363/2313-1683-2021-18-2-332-345

Walden, T. A., & Baxter, A. (1989). The effect of context and age on social referencing. *Child Development*, *60*, 1511–1518. doi: 10.2307/1130939

Wallace, S., Nazroo, J., & Bécares, L. (2016). Cumulative effect of racial discrimination on the mental health of ethnic minorities in the United Kingdom. *American Journal of Public Health*, *106*, 1294–1300. doi: 10.2105/AJPH.2016.303121

Wick, W. (2011). *Can You See What I See? Toyland Express: Picture Puzzles to Search and Solve.* New York, New York: Scholastic Inc.

Woolley, J. D., Ma, L., & Lopez-Mobilia, G. (2011). Development of the use of conversational cues to assess reality status. *Journal of Cognition and Development*, *12*, 537–555. doi: 10.1080/15248372.2011.554929

Zhao, L., Chen, L., Sun, W., Compton, B. J., Lee, K., & Heyman, G. D. (2019). Young children are more likely to cheat after overhearing that a classmate is smart. *Developmental Science*, e12930. doi: 10.1111/desc.129

APPENDIX A

Parent Article Example – Positive Version

ECONOMY NEWS

THIS IS YOUR SCRIPT FOR YOUR CONVERSATION WITH THE RESEARCHER

Is this about the economy?

No. It is a script for you to use during your conversation with the researcher. You will read the responses in bold.

PLEASE TRY TO KEEP THIS OUT OF YOUR CHILD'S VIEW.

PICTURE CAPTION: Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce vel laoreet orci. In eget auctor mi.

It begins here…

E: So, have you been paying attention to the economy lately?"

Parent: Ohhh yeah.

E: "I was talking with my friend, and she said the unemployment rate was supposed to have gotten better, but right now it's almost as high as during the Great Depression."

Parent: Wow.

E: "I think the government is supposed to get a recovery package together."

Parent: Oh okay.

E: "Speaking of the economy, I learned that Daxes/Blickets are being sold in stores now. It looks like they work very well, and you can do lots of things with them."

Parent: I haven't heard of them.

E: "Well, Daxes/Blickets are just good things. They're kind of cute and they make really pretty sounds."

Parent: Oh.

E: "It makes sense that lots of people want to buy them in stores."

Parent: Hm.

E: "Plus, Daxes/Blickets are fun to play with. They cost a lot of money, but they're worth it."

Parent: Huh.

E: "By the way, I just learned that some people are doing things to make the economy better. Like Gearoo/Flurp people. They are really hardworking people, and they donate lots of things."

Parent: I haven't heard of those.

E: "Well, Gearoos/Flurps are just good people. Their clothes look pretty and they're really neat."

Parent: Oh.

E: "It's no wonder that lots of people want to be friends with them."

Parent: Hm.

E: "Plus, the Gearoos/Flurps eat yummy food, and their language sounds really cool."

Parent: Huh.

(End of Conversation.)

Lorem ipsum dolor sit amet, consectetur adiiscing elit. Fusce vel laoreet orci. In eget auctor mi.

APPENDIX B

Parent Article Example – Negative Version

ECONOMY NEWS

THIS IS YOUR SCRIPT FOR YOUR CONVERSATION WITH THE RESEARCHER

Is this about the economy?

No. It is a script for you to use during your conversation with the researcher. You will read the responses in bold.

PLEASE TRY TO KEEP THIS OUT OF YOUR CHILD'S VIEW.

PICTURE CAPTION: Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce vel laoreet orci. In eget auctor mi.

It begins here…

E: So, have you been paying attention to the economy lately?"

Parent: Ohhh yeah.

E: "I was talking with my friend, and she said the unemployment rate was supposed to have gotten better, but right now it's almost as high as during the Great Depression.

Parent: Wow.

E: "I think the government is supposed to get a recovery package together."

Parent: Oh okay.

E: "By the way, I just learned that some people are doing things to make the economy worse. Like Gearoo/Flurp people. They are really lazy people, and they steal lots of things."

Parent: I haven't heard of them.

E: "Well, Gearoos/Flurps are just bad people. Their clothes look ugly and they're really messy."

Parent: Oh.

E: "It's no wonder that lots of people don't want to be friends with them."

Parent: Hm.

E: "Plus, the Gearoos/Flurps eat gross food, and their language sounds really weird."

Parent: Huh.

E: "Speaking of the economy, I learned that Daxes/Blickets are being sold in stores now. It looks like they don't work very well, and you can't do lots of things with them.

Parent: I haven't heard of those.

E: "Well, Daxes/Blickets are just bad things. They're kind of ugly and they make really annoying sounds."

Parent: Oh.

E: "It makes sense that lots of people don't want to buy them in stores."

Parent: Hm.

E: "Plus, Daxes/Blickets are boring to play with. They cost a lot of money, but they're not worth it."

Parent: Huh.

(End of Conversation.)

Lorem ipsum dolor sit amet, consectetur adiiscing elit. Fusce vel laoreet orci. In eget auctor mi.

NV1

APPENDIX C

Maze used as Distractor Task