

**Where Should They Sit?:
Infant and Toddler's Expectations about Third-Party Affiliation Based on Gender**

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Abstract

This paper investigates the origins of single-gender interactions and relationships, which are common starting in early childhood and extending throughout the lifespan. This paper reports two studies that seek to understand infant's and children's expectations about who will interact with each other in third-party affiliative interactions on the basis of gender. Study 1 is a looking time study in which infants ages 8 to 9 months and 12 to 13 months watch alternating videos of men and women affiliating with a same- or opposite-gender individual. We find that infants do not look different amounts of times at events in which a man or woman affiliates with either a man or a woman, suggesting that infants at these ages do not have expectations about who will affiliate on the basis of gender. Study 2 is a choice study in which young children, ages two and three years, are asked who they think individuals will affiliate with each other on the basis of gender. We find that girls at age 2 years think that individuals will affiliate with those of the opposite gender. Differentially, we find that girls at age 3 years think that individuals will affiliate with those of the same gender. Boys in both the 2 and 3-year old age groups chose at chance.

Introduction

As a thought experiment, think about your close friends. What initially drew you to them? What traits and characteristics enabled them to become your close friends? Now, think about the gender of your close friends. If the majority of your close friends are the same gender as you, then you are adhering to a gender-based friendship pattern that humans begin to follow at a young age. According to a number of studies, non-romantic social interactions rarely cross gender lines (Kalmign, 2002). Furthermore, an analysis conducted by Marsden in 1990, found that 75 percent of personal, non-kin two-person networks are of the same-sex. These own-gender interaction patterns begin at a young age. By the age of three and four years old, or preschool age, the majority of children's play interactions are with other children of the same gender (Serbin et al., 1994), and these types of interactions only increase when transitioning into later childhood (Maccoby, 1988). The prevalence of own-gender friendships at such a young age have the benefit of strengthening positive in-group feelings, but they also create the potential consequence of reinforcing negative out-group feelings. While children at this age do not yet have an understanding of traditional gender stereotypes and the role that they play in our modern society, these stereotypes could be reinforced by these single-gender interactions throughout development.

Research on the "why" of predominantly own-gender friendships is limited. However, we know that these types of friendships, while present throughout life, are most prevalent during childhood, so there is no better place to look than to the field of developmental psychology to investigate the nature and origin of these interactions. There are a few hypotheses to consider for why children choose to maintain the majority of their friendships with other children of the same gender. The first was proposed by Maccoby (1988) in which children were hypothesized to avoid

having friends of the opposite gender because boys and girls play and influence each other in different ways. Although this explanation is likely true, it fails to get at the core of why children primarily interact with their own gender. Barbu et al. raises a similar point in which gender-typed behavior and a preference for peers of the same gender occur together on the developmental timeline. Because of this, it is difficult to know whether girls' and boys' differing interactive styles mediate children to engage with peers of their own-gender, or if gender-typed behavior is a product of interacting primarily with peers of the same gender. Contrasting playing styles may be a proximate cause for why children of the same gender prefer to play with each other, something that is immediately responsible for these observed interactions, but not necessarily the ultimate cause. A second hypothesis that takes a more in-depth look into how children's preference for own-gender peers is influenced by our environment suggests that we are simply socialized to spend the majority of our time with other children of the same gender (Martin, 1994). This type of socialization at such a young age makes it more difficult to interact with the opposite-sex. Being socialized in this way feeds into the third hypothesis which states that opposite-sex friendships are avoided because they require a special set of social skills and a high-level of self-esteem (Kovacs, Parker, and Hoffman, 1996) that would not otherwise be necessary for same-sex friendships. Our society perpetuates the notion that men and women have different communication styles. Therefore, the belief that these differences make opposite-sex friendships more difficult to establish and to maintain is fostered in children even at a young age.

Even with this previous research, our understanding of why children predominantly interact with those of the same gender, why it is so pervasive, and why it continues into adolescence and even adulthood is limited. There seems to be a gap in the research in which there is a lack of understanding of children's gender-related expectations. Understanding these

expectations is important because it has the potential to affect children's decision to interact with peers of their own-gender versus peers of the other gender (Barbu, Le Maner-Idrosso, & Jouanjean, 2000). The research that I have conducted and will outline in this paper hopes to fill that gap.

The dichotomy between in-group positivity and out-group negativity when it comes to peer relations based on gender was briefly mentioned earlier in this paper. In 2011, Zosuls and colleagues delved deeper into this subject, realizing that understanding how children feel about their own gender as compared to the other gender can allow us to better predict children's own expectations, as well as, the nature of their peer relations. Classic theories of inter-group processes tell us that by simply categorizing ourselves, we perceive group differences as more drastic and display in-group favoritism (Tajfel & Turner, 1979). Gender is a particularly interesting social group. Gender is one of the most consequential social group memberships for children (Zosuls et al. 2011), and gender segregation becomes pervasive as early as pre-school. This seems to support our knowledge about inter-group relations and further proves that girls and boys not only view each other negatively but feel negatively about each other. It turns out that this is not quite the case. Their study found that children are actually more inclined to express positive feelings about their in-group than negative feelings about their out-group, in the case of gender. Furthermore, they found that gender-related expectations played an important role in their peer interactions. Children avoided other-gender peers because of concerns about norm violation rather than a dislike for the other gender.

In this paper, men and women will often be referred to as being members of different social groups. However, unlike some other social groups, such as groups due to language, men and women interact with each other frequently and likely share a number of social groups across

them that bring men and women together a significant amount. Adult, heterosexual, men and women often have an intimate interdependence between them (Glick & Fiske, 2001) because reproduction is dependent on their successful interactions, despite them occupying different social groups. Furthermore, when considering evolutionary motivations, sexual interactions between men and women are seen as much more crucial than single-sex groups. With that said, interactions between men and women are not purely driven by mating needs, and this is certainly not the case for young children. We do not often consider why platonic friendships and affiliations are evolutionarily advantageous. Even more than that, there is not extensive research on why at a young age our peer interactions and friendships are potentially mediated by gender. This is something that I plan to delve into throughout this paper.

Martin and colleagues posit that children are naturally interested in having peers of the same gender on the basis that they are of the same gender (Martin, Fabes, Hanish, Leonard, & Dinella, 2001) and share group membership (Maccoby & Jacklin, 1987). But, this begs the question of how groups are defined and why they are such a universal aspect of human nature. Being a member of a group often means that one has more interest in spending time with their in-group members, as compared to out-group members, there is increased preferential treatment of in-group members, and there is the notion that members of an in-group are more individualized and valued than members of an out-group (Tajfel, 1982). Defining groups in this way and being able to group individuals together reduces the cognitive load that is required to process information from social interactions. The expectation that people can be categorized into groups frames children's understanding of their social world. For children and adults alike, social groups allow us to make predictions and inferences about the nature of certain social interactions.

We aim to further investigate whether we are taught to affiliate with and befriend others of the same gender or if even as infants we expect those of the same gender to affiliate because they are part of the same in-group. With research in developmental psychology, it is presumed that the evidence found within this field gives us insight into our innate human nature or our evolutionary past. However, even children at preschool age are retaining a considerable amount of information about the world around them. Their limited time on the earth has not hindered them from rapidly absorbing the information that the world has to offer. In order to further tease apart whether same gendered play and interactions is innate or influenced by our environment, we are prompted to conduct research on infants even before the first year of life, and this is the case in my first study.

As young infants, we have the expectation that people's behaviors are constrained by the group that they identify with. Young children will make inferences about third-party interactions based on group membership. For example, preschoolers will reliably expect agents from one group to harm members of the other group, but expected agents to help both groups equally often (Rhodes, 2012). Furthermore, we expect that people will view their in-group more favorably than their out-group (Jin & Baillargeon, 2017). While we have the general expectation that people of the same group will affiliate with one another, it seems that infants do not expect every in-group member to always affiliate and for all out-group members to disengage. In the case of language, infants expect that those who speak the same language to affiliate with each other. In the Liberman et al. study (2016), 9 month old infants were able to attend to language and use that information to guide their expectations about third-party interactions. In their study, infants were shown videos in which there were two female actors, in the English-English condition, both actors spoke English, while in the English-Spanish condition, one spoke English and one spoke

Spanish. Infants were then shown alternating affiliation and disengagement trials. Infants looked significantly longer at disengagement interactions, as compared to affiliation interactions, when the actors spoke the same language. In addition, infants looked significantly longer at affiliation interactions, as compared to disengagement interactions, when the actors spoke different languages. From these results, it was concluded that infants expected those who spoke the same language to affiliate and those who did not speak the same language to disengage. Language is a fascinating group because language based interactions are pragmatic interactions. Language is a social group that constrains people to interacting almost exclusively with their in-group due to the practicality, or lack thereof, that characterizes these interactions. There is a lack of comprehension between two people who speak different languages, and infants seem to understand that this language barrier hinders people from interacting with each other. With this in mind, we wanted to investigate whether infants would have the same type of expectations for a social group like gender. Gender differentiates people in a number of ways, but not in the pragmatic manner that language does.

Previous studies have also shown that infants use information about others' shared and opposing evaluations to make inferences about third-party affiliation, and specifically that infants expect others to affiliate following agreement and to disengage following disagreement (Lieberman et al. 2013). In study 1, we ask whether infants will have similar expectations about affiliation and disengagement based on social group membership, specifically gender, rather than shared or opposing evaluations.

There is a considerable amount of previous research that permits us to investigate this question. In first person interactions, infants prefer to interact with people who were previously nice (Hamlin & Wynn, 2011), with people who share their preferences (Mahajan & Wynn,

2012), or with those who speak their native language (Kinzler, Dupoux & Spelke, 2007). Infant research has not been restricted to just understanding first-person interactions. It has been shown that social categories are initially recruited for first-person reasoning, but later become broad enough to support third-person inferences (Shutts et al. 2013). Infants have a basic expectation about third-person social interactions, in which they expect people to face each other during conversations and talk to people rather than objects (Augusti, Melinder & Gredebäck, 2010; Beier & Spelke, 2012; Molina, Van De Walle, Condry, & Spelke, 2004). In the first study, we chose to use participants ages 8 months old to 13 months old because there is a certain amount of information that they are able to reliably process by those ages. By 3 months of age, infants are able to attend to gender (Quinn et al., 2002). At 6 months of age, infants have demonstrated that they are able to discriminate between male and female voices (Miller, 1983). By 9 months, infants can distinguish between male and female faces (Leinbech & Fagot, 1993). Children spontaneously divide the world into groups of girls and boys and men and women, meaning that they do so without environmental input at a young age. Acquiring further knowledge about gender categories and the part that they play in the world around us is dependent on these categorizations that are made at a young age.

Study 1

Using the knowledge that gender is the first social group that babies attend to, we can hypothesize that gender would also be one of the first group distinctions that guide infants' expectations about how people should interact. In this study we are investigating whether infants at age 8 to 9 months and 12 to 13 months will attend to gender and use that information to form expectations about third-party interactions.

Based on previous research that investigated infant's preferences during first-person interactions, their understanding of third-party interactions, and their expectations about how social group membership constrains interactions, we predict that infants will expect people to interact with one another on the basis of gender when no other identifying or characteristic information is provided. Previous studies have shown that infants look longer at events that are inconsistent with their conceptual analysis of a situation (Hespos & Baillargeon, 2008). We then predict that infants will look longer at events in which an individual interacts with a member of their out-group gender, as compared to how long they look when an individual interacts with a member of their in-group because these interactions will violate their expectations of how social interactions are constrained by gender.

Methods

Participants

Thirty-two 8 to 9 month old infants (16 female; $M_{\text{age}} = 8$ months, 23 days; age range = 8;0 - 10;2) and thirty-two 12 to 13 month-old infants (16 female; $M_{\text{age}} = 13$ months, 2 days; age range = 11;29 – 14;12) participated. Eight additional infants were excluded due to looking time coding error (three), video error (two), and baby inattentiveness (three). Each of the participants was randomly assigned to the *female target* or *male target* condition. All participants were tested in the Yale Infant Cognition Center.

Procedure

During familiarization, infants watched two videos with sound effects. Videos featured two actors of different genders seated on either side of a room. The actors faced forward with neutral facial expressions, and next to each actor was an empty chair. There was also a target

actor who faced forward and stood in between the seated actors. In the *female target* condition, this target was a woman, and in the *male target* condition, this target was a man. So that the seated actors would be distinguishable only by their gender, they both wore green shirts and black pants or shorts without any other accessories. In each video, each of the seated actors turn to the target actor and say “Hi” in a positive and identical manner, and the target actor responds by turning and looking back at the actor that spoke to them. The order in which the actors said “Hi” alternated across the two videos, and which video was displayed first was counterbalanced across participants.

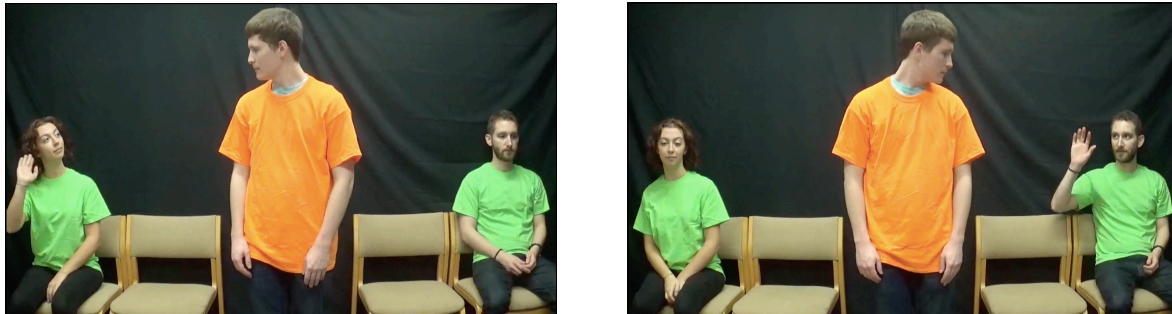


Fig. 1. Familiarization conditions. This figure displays still images from the videos in the *male target* condition. Each actor who waved also said “Hi” to the target individual.

After familiarization, infants viewed six test trials, consisting of a pair of videos that repeated three times. Each video had sound effects in order to improve infant attentiveness. In one video, the target actor sat with and turned toward the actor of the same gender (their in-group member). The video ended immediately, with a still frame of the target and in-group member looking at each other. The other video was the same, with the exception that the target actor sat with and turned toward the actor of the opposite gender (their out-group member). The side of the room where the female and male actors were sitting and the order in which the target actor

sat with the in-group or out group were counterbalanced across participants. For data analysis only the first pair of test trials were analyzed.

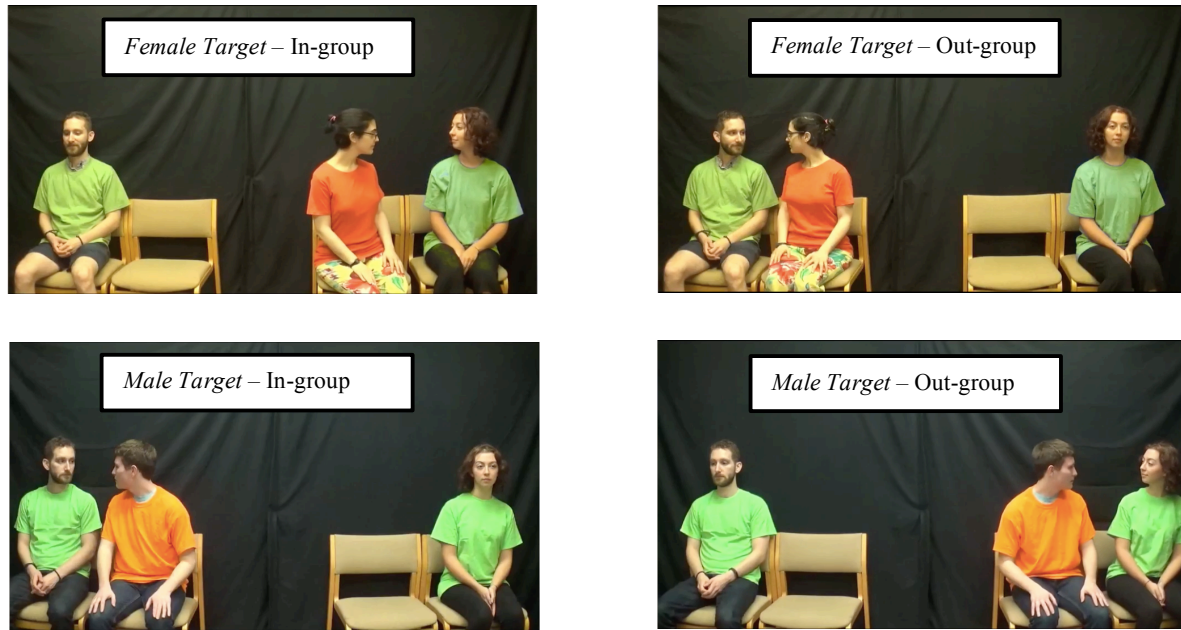


Fig. 2. Test trials. This figure displays images from the end of the *female target* condition and *male target* condition videos. Looking times were recorded to these still images.

Coding and Reliability

During the study, a trained looking time observer, who was blind to the condition, live coded infants' looking time using jHab (Casstevens 2007). Observers were unaware of participants' condition. Infants' looking time was recorded to the still images at the end of each trial. Looking time coding started immediately after the motion on the screen stopped and ended when the infant looked away from the screen for two consecutive seconds or when 30 seconds had elapsed, whichever happened first. Infants' looking time was recorded for both the familiarization trials and the test trials, however, only the looking time for the test trials was used for data analysis. This decision to run data analysis only on the first pair of test trials was settled

before data collection began. We hypothesized that the first pair of test trials would offer the most salient results that were representative of the research question that we were asking. The second and third pair of test trials were kept in the event that we wanted to discuss how infants may learn or habituate to interactions over the course of the study.

Two additional coders, who were blind to the condition of the study, recorded infants' looking time from videos of the testing sessions. One reliability coder recorded infants' looking time from the first half of participants, and the other reliability coder recorded infants' looking time from the second half of participants. Inter-observer agreement was excellent at 94%.

Results

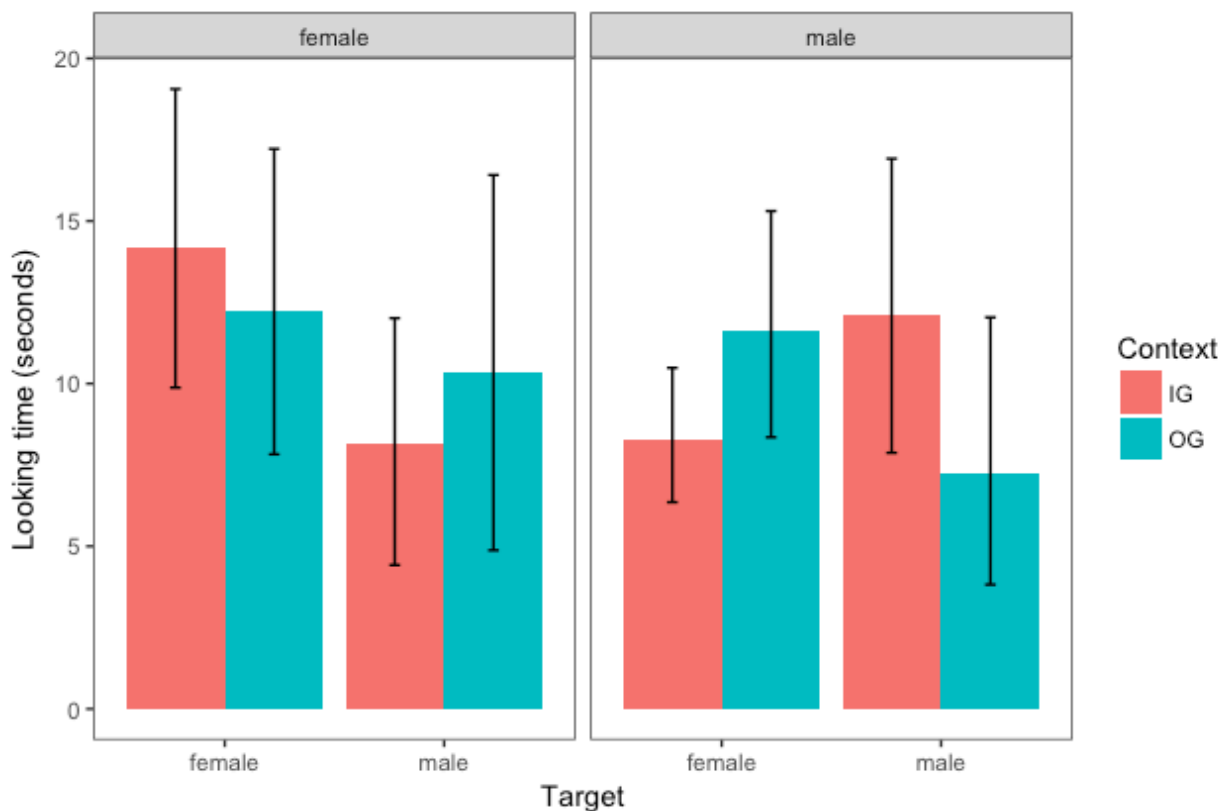


Fig. 3. Study 1 Results.

An analysis of the variance (ANOVA) was used for data analysis. The results showed that there was only one significant result. Female infants in the *female target* condition did not look significantly longer when a female sat with a female compared to when a female sat with a male ($p=0.5379$). Male infants in the *female target* condition did not look significantly longer when the female target sat with a male compared to when a female sat with another female ($p=0.1547$). Female infants in the *male target* condition did not look significantly longer when a male target sat with a female as compared to when a male target sat with another male ($p=0.4124$). Male infants in the *male target* condition looked significantly longer when a male sat with another male compared to when the male target sat with a female ($p=0.006$).

Discussion

In study 1, we predicted that infants would look longer when the target individual sat with their outgroup; however, the results showed that we failed to reject the null hypothesis. Infants did not look significantly longer at one particular in-group – in-group gender interaction compared to an in-group – out-group gender interaction. The only significant result was that male infants looked longer at two males who sat together in comparison to when a male sat with a female. These results could suggest that young infants do not have innate expectations about who should affiliate with each other on the basis of gender. The significant result for male infants could be that they do not often see males interacting with other males, which caused their expectations to be violated. Aside from the null hypothesis being true, there could be some other reasons for why we were unable to reject the null hypothesis. While 64 infants were tested total, 32 infants were run in each condition. With this sample size, the study could have been underpowered for the interaction effects that we were looking for. Additionally, we spent time

trying to ensure that our male and female stimuli were distinguishable by their faces and voices, but it is possible that our infant participants were unable to reliably distinguish between male and female in our test stimuli.

Study 2

Based on study 1, we began to speculate whether slightly older children would have the same non-expectations about third-party affiliation based on gender, or if their knowledge of gender terms and their ability to categorize people into groups with gender labels would produce different results. The social concept of gender identity may not be fully understood by young children. However, children of young ages not only know that they either belong to a group of males or a group of females, but also acknowledge that this group membership is intertwined with their identity (Tajfel, 1982).

Study 2 was run to investigate whether young children who were verbal and had a concept of gender labels had expectations about who would choose to affiliate with each other on the basis of gender. For this study, we intended to test children at an age at which children's understanding of gender labels and gender terms emerge. Therefore, we focused on two and three-year old children. While it is difficult to accurately determine when children first recognize others' gender, previous studies have shown that 24 and 30-month old children knew the gender groups that they and others belonged to during a non-verbal test (Stennes et al. 2005). Furthermore, 24 and 28-month old children selected the picture that correctly corresponded to gender labels provided by an experimenter (Campbell et al. 2002, Levy 1999) suggesting that they understood the groups within which others belonged at this age.

Methods

Participants

Forty children were included in the study. Twenty 2-year old children (10 female; $M_{\text{age}} = 2$ years; 7 months; age range = 2 years – 2 years; 9 months) and twenty 3-year old children (13 female; $M_{\text{age}} = 3$ years; 8 months; age range = 3 years; 1 month – 3 years; 11 months). Twenty-three additional 2 year-old children were excluded due to experimenter error (one), failing to meet the language requirement of hearing at least 50% English (two), participant inattentiveness or fussiness (four), and failure to pass the comprehension check (nineteen). Three additional 3-year old children were excluded due to failure to pass the comprehension check. Participants were tested in the Yale Infant Cognition Center, Kensington Nursery School, Creative Kids Learning Center, Ansonia YMCA, and West Haven Child Development Center.

Procedure

Parents that accompanied the child in the testing room were asked to be silent during the experiment and wear glasses that were taped over so that their expectations would not influence their child's choice. There were three phases in this experiment: training, test, and comprehension.

Training Phase

In the training phase, children were able to practice moving characters on the Velcro testing board. Furthermore, the training phase served as an opportunity for children to practice making inferences about affiliative interactions. In this phase the affiliative interactions were based on preference, something outside of the research question for the study. This was done so that children were not primed to make choices during the testing phase based on what they thought the experimenter wanted to know. The training phase consisted of two trials. At the

beginning of each trial, children were shown two cartoon bears. They were told that one of the two bears either had some “yummy” cookies or strawberries that they wanted to share with someone. Whether children saw a bear with cookies or strawberries first was counterbalanced across participants. Children were then introduced to a third bear that was hungry and loved either cookies or strawberries. They were then asked who they thought this third bear would want to sit with and were told to move the target bear next to that bear to indicate an affiliative interaction. If a child made an incorrect choice during the testing phase, they were corrected and asked to try again. For example, the experimenter would say “Oh, I actually think that this bear would want to sit with *this* bear because they have yummy cookies that they want to share with someone. Do you want to try again?” If children answered incorrectly after being corrected in the two trials during the training phase, they were excluded from data analysis.



Fig. 4. Training Phase. This figure displays the setup of the training phase.

Test Phase

After completing the training phase, there were two test trials. Children were shown two pictures of people, one male and one female, and were told that they wanted to sit on different

ends of the board. The side in which the male or female sat was counterbalanced across participants. During the test phase, gender labels were not used. For example, the experimenter said “Look, do you see this person? They want to sit over here”. After children were introduced to the two sitting actors, they were introduced to a third person that was either male or female, and were told that this person wanted to sit next to one of the two sitting actors. Children were then asked who they thought this third person wanted to sit next to and were told to place them next to each other to indicate an affiliative interaction. This procedure was repeated with a target person of the opposite gender. Whether children saw a target male or female first was counterbalanced across participants.

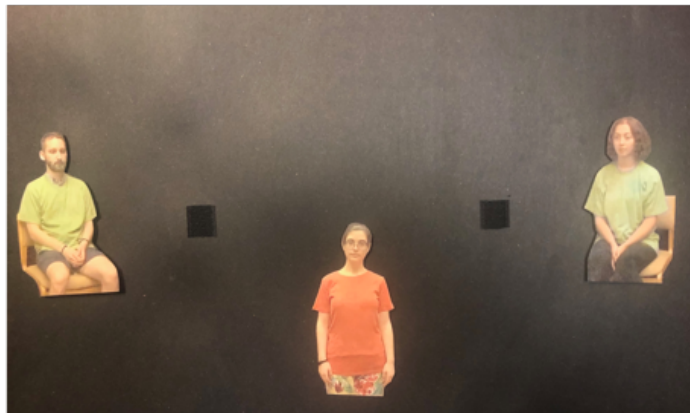


Fig. 5. Test Phase. This figure displays the setup of the test phase with a female target.

Comprehension Phase

The final part of the experiment was the comprehension phase in which children were asked to point to the picture of the sitting actor who was a boy and girl in order to confirm that they understood gender terms and could correctly match the pictures of people with the correct gender. The main question of this second study was asking whether children who had an

understanding about gender and gender labels could use that information to infer about how people should interact. It could not be concluded that participants' choices about these affiliative interactions were based on gender if they could not correctly label gender, so children who incorrectly labeled gender were excluded from data analysis.



Fig. 5. Comprehension Phase. This figure displays the setup of the comprehension phase.

Reliability

While the study was being conducted, there was a live coder recording events. In addition, there was an independent reliability coder that coded all of the videos. All participants included in data analysis had an excellent interrater agreement of 100%.

Results

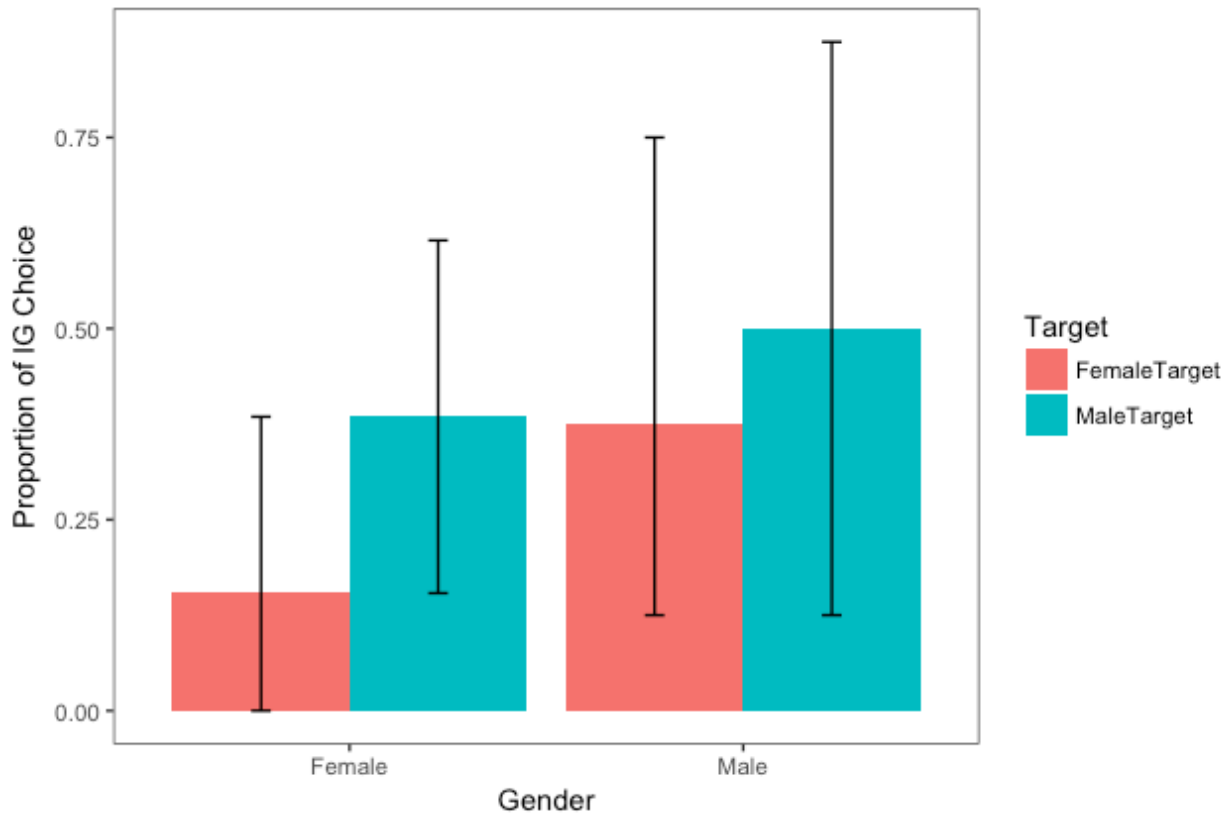


Fig. 7. Study 2 results for 2-year old participants. A binomial logistic regression was used to test for effects of gender and target.

2-year old females chose to have female targets sit with males significantly more than chance ($p = 0.027$). 2-year old females chose to have male targets sit with females slightly more often, but not significantly more than chance ($p = 0.260$). 2-year old males chose to have female targets sit with males slightly more often but not significantly more than chance ($p = 0.197$). 2-year old males chose to have male targets with males or females at chance ($p = 0.604$).

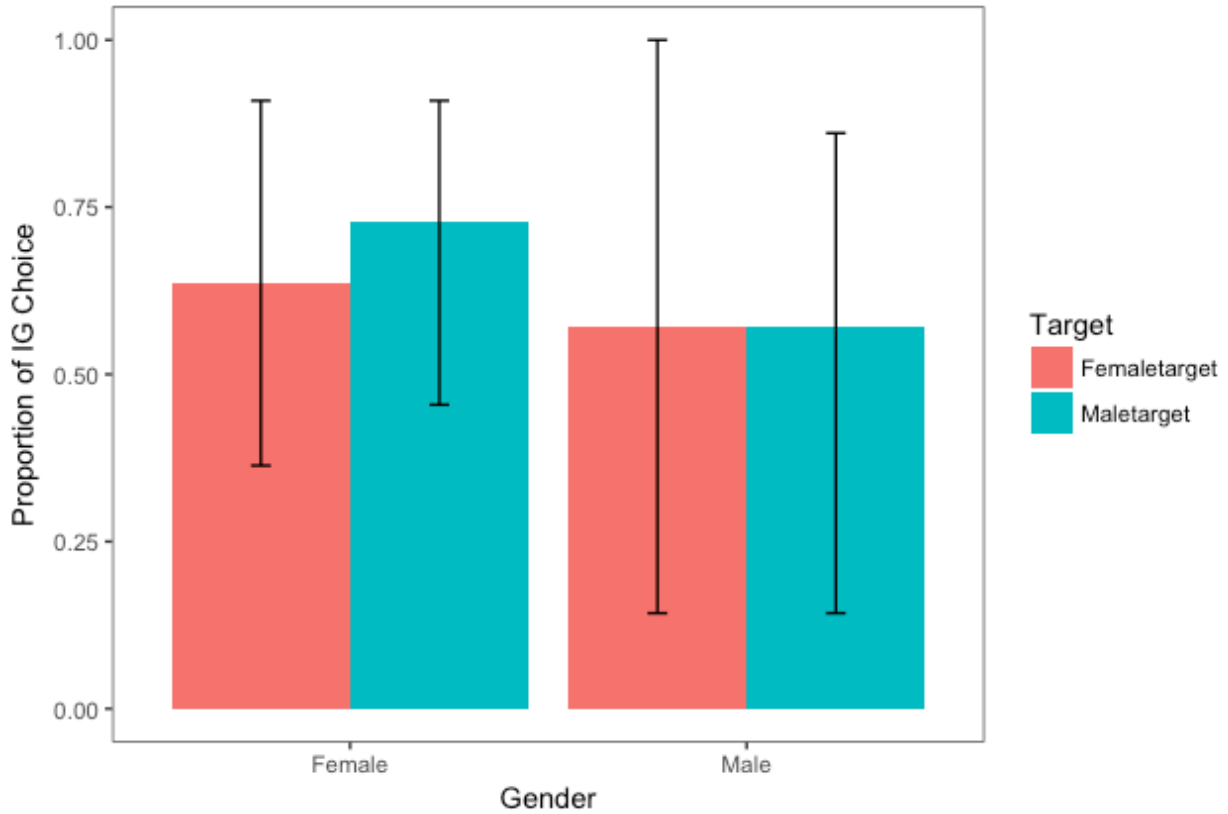


Fig. 8. Study 2 results for 3-year old participants. A binomial logistic regression was used to test for effects of gender and target.

3-year old females chose to have female targets sit with females significantly more than chance ($p = 0.014$) 3-year old females chose to have male targets sit with males significantly more than chance ($p = 0.002$). 3-year old males chose to have targets sit with their in-group gender slightly more often but not significantly more than chance [Female target ($p = 0.985$); Male target ($p = 0.066$)].

Discussion

Our prediction was that toddlers across both genders would expect in-group members to affiliate with other in-group members. This expectation of people affiliating with others on the basis of group membership would match the gender segregation that occurs in friendships and playgroups beginning in preschool aged children and continues into late childhood, adolescence, and even adulthood. Furthermore, this would have been an indication that two and three-year old's expectations about these third-party interactions are building off their prior understanding of how to interact in their own first-person interactions.

The results seem to show that girls have stronger opinions when it comes to who female target individuals should affiliate with, as compared to boys with either male or female targets. These results are not entirely surprising given that previous research findings suggest that girls have stronger inter-group bias than boys (Carver *et al.*, 2003; Egan & Perry, 2001; Kowalski, 2007; Powlishta, 1995a,b; Powlishta *et al.*, 1994; Susskind & Hodges, 2007; Verkuyten & Thijs, 2001; Yee & Brown, 1994; Zalk & Katz, 1978).

2-year old girls had the expectation that women would affiliate with men. This type of expectation steps away from interactions that are based purely on group membership and could be explained in a few different ways. It is possible that they are conceptualizing the men and women as parents, rather than simply men and women who have different gender identities and therefore, have different group memberships. It is likely that the majority of children who participated in this study were raised in heteronormative families, and therefore, may have the expectation that men and women would affiliate with each other due to their household environment and the relationship that they see between their parents. In order to further tease apart if this is the case, it would be beneficial to conduct a follow-up study that features pictures

of kids rather than adults as the sitting and target actors. If the results of this follow-up study found that children still expected girls to affiliate with boys, then it could be concluded that young children expect children and adults alike to have cross-gender affiliative interactions. This could mean that the single-gender interactions that become increasingly prevalent starting in the pre-school years are learned interactions. On the other hand, if the results of this follow-up study find that children do not expect girls and boys to affiliate in the same way that they previously expected men and women to affiliate, then it could be concluded that participants' previous expectations were virtue of the design of the study.

The 2-year old boys chose at chance, and it could be concluded that boys at this age do not have expectations about third-party affiliative interactions based on gender in a similar way to young infants. This result could also be further evidence that single-gender interactions are learned during the pre-school years, and are not expected interactions based on group membership.

Generally, two-year olds may not be old enough to have first person experiences in which they are befriending other children. In Martin et al. 1999, they found that children as young as 4 years of age use verbally conveyed information about others' gender to make inferences about likely relationships between other children. (e.g. a girl is more likely to be friends with another girl than with a boy). While we were interested in finding whether two and three-year old children had expectations about affiliative interactions, it may be the case that 2-year olds generally, but particularly 2-year old boys are unable to make these types of inferences based on gender. Also, our study looked at two-person peer interactions rather than peer group interactions. This distinction may be more important than we originally thought when creating the study design, and something to be considered as a future direction for this field of research.

The last thing that should be addressed in relation to the 2-year olds, is that nineteen participants were excluded due to failure to pass the comprehension check. Of course, we only wanted to include those who could prove that they had the capacity to properly use gender in their decision making. However, having such a high number of 2-year olds excluded could be an indication that they simply did not understand the task.

We found that there was a slight reversal of results with age. Three-year olds are just starting to have their own gendered first person interactions which can then guide their expectations about how people should act in third-party interactions based on gender. Interestingly, only the 3-year old girls chose to have targets sit with their in-group gender significantly more than chance. This could be a result of the previously mentioned finding in which girls have stronger inter-group bias than boys. It is also possible that because there were more girls run in this study, as compared to boys, that the number of girls could have been driving this significant result.

General Discussion

In both Study 1 and Study 2, the gender of the participants was used as a mediating demographic factor in data analysis. As mentioned earlier in this paper, Martin and colleagues have done considerable research on how children are socialized differently based on the child's gender. This difference in socialization may mediate their inferences about third-party interactions based on gender.

Throughout the introduction of this paper, friendships were discussed as being mediated by gender; however, both of our studies looked at affiliative interactions. This is an important distinction. With Study 1, we wanted to strip away any extraneous variables that could interfere

with studying the basic expectations that infants have about interactions based on gender. In addition, the fact that other researchers studying this age group looked at affiliation, as well as the fact that affiliation seemed to be a building block to other interactions. This was decided to be the best study design. In terms of Study 2, with the hopes of asking a similar research question in 2 and 3-year olds, we decided to continue studying affiliative interactions. These study designs may be limitations in and of themselves because affiliation may not be as salient for infants or young children as friendship.

The overall aim of this research was to better understand what expectations young infants and children have about third-party affiliative relationships based on gender, and how those initial expectations based on gender feed into the traditional interactions and friendships that we experience throughout our lives. These are complex questions that can be answered in a multitude of ways. There were potential research limitations in the two studies outlined above, so here are future research directions that would serve to chip away at these questions through methods similar to those used in this paper.

In terms of the second study conducted, it would have been beneficial to run a number of follow-up studies in which the methods were slightly altered. To begin, the majority of studies within the age group of toddlers, in this case two and three-year old children, cartoon characters and pictures of kids are used as the stimuli. It was originally decided to use the adult actors from the first study as stimuli in the second study, in order to keep the studies as consistent as possible. However, this seemingly small change may have had an effect in creating a simpler task for which the young participants could identify the gender of the characters. The second suggestion would be to run a study for toddlers in which a vocal aspect was included. In the first study with the pre-verbal infants, both of the sitting individuals said “hi” in the video. This gave

infants the opportunity to more easily distinguish between the male and female actors, as by the age of 6 months are able to discriminate between male and female voices (Miller, 1983). Adding a similar feature to the study run with two and three-year olds could have had the effect of increasing the salience of gender between the characters without using gender labels. The final future direction entails a first-person component. Although the study was primarily interested in children's expectations about third-party interactions, as children develop, they recruit their knowledge about first person interactions to infer about third-party interactions. It would be interesting to investigate whether infants and toddlers have a preference of they themselves would want sit with. It may be that children have not yet recruited their first-person preferences to infer about third-party interactions based on gender, rather than the conclusion that they do not have expectations. This would further tease apart whether the results were actually representative of the research question being asked or if they were due to methodological issues.

Conclusion

At the beginning of the paper, I introduce how children and adults both show gender bias in their personal friendships. Furthermore, I cite Shutts et al. 2013 to support the idea that first-person reasoning is recruited by children in order to make third-person inferences. Because of this research, I hypothesized that infant and children's inferences about third-party interactions would mirror their first-person interactions in which they choose to befriend those of the same gender. After data analysis, we find that this is not quite the case. Pre-school aged children and older may choose to pursue friendships with those of the same gender, but they do not necessarily expect the same of others.

Friendship is such an important part of social living in humans. The fact that it can be mediated by a social group as salient as gender is fascinating and more research will have to be done to tease apart the origins of these interactions. The hope is that the research outlined in this paper adds to the robust research in the field of developmental psychology, while raising questions and probing ideas that might not have otherwise been thought of.

Author Contributions

Study 1 was conceived and designed by Lisa Chalik. Study 2 was conceived and designed by Kiarra Alleyne with help from Chalik. Data collection for Study 1 was performed by Kiarra Alleyne and Lisa Chalik. Data collection for Study 2 was performed by Kiarra Alleyne. Data from studies 1 and 2 were analyzed by Kiarra Alleyne with guidance from Lisa Chalik. All studies were conducted under the advisement of Karen Wynn. This paper was written by Kiarra Alleyne.

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