Gender and Theory of Mind:
The Complex Relationships Between the Depiction of Emotion in Preschool Age Children and Moderating Variables

Senior Project Submitted to

The Division of Science, Math, and Computing

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by

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Dedication

I dedicate my senior project to the students of the Abigail Lundquist Botstein Nursery School and Children's Center. During my time at Bard, they have continually reminded me to be inquisitive, to appreciate how the leaves change in the fall and grow again in the spring, and to laugh often. I'd also like to thank my advisor, Sarah Dunphy-Lelii, for inspiring me to research child development and supporting me through a year of many big decisions.

Contents

Abstract

As children grow, their artistic depictions of emotions become more accurate; however, these depictions become more influenced by gender roles and social expectations. Research shows that though gender does not influence the ability to depict emotion, it does have an effect on the style used to artistically depict emotion (Vendeville et al., 2018). A majority of the research on this topic is done on grade school children, because of both physical and cognitive development that occurs between the ages of five and ten. The goal of this study is to see if these results can generalize to a younger population of preschoolers. Participants are children from the Abigail Lundquist Botstein Nursery School and Children's Center. I read short stories about a character who experiences a target emotion that is not explicitly stated (e.g. sadness, happiness, anger). I then asked participants to depict the emotion of the character on a printed image of a blank face, and naive coders used a rating scale to distinguish gender differences in the drawings and whether or not they depict the target emotion. I hypothesized that the older age group will produce a larger percentage of drawings that depict the target emotion from the story. This is the main dependent variable in the study. I also hypothesized that the older children will show a larger gender difference in their drawings than the younger age group.

Keywords: Gender roles, emotions, target emotion

Societal expectations have influenced, and even defined, the way that people act beginning at a surprisingly young age. Social interactions are kept in order by what children are taught, and what they deduce is appropriate behavior. In order to sort behavior into categories, humans have created expectations for the ways in which different types of people should behave. A good example of this type of categorization is gender roles. There is a normalized social assumption that women are emotional and men are angry, and these ideas are deeply rooted in our culture (Shu-Tsen Kuo, 2019). There is a large library of research on this topic as gender studies and social psychology have become main players in the realm of psychological science.

One of the biggest topics within gender roles are emotions: who is "allowed" to have them, how they should be expressed, and in what contexts they are deemed appropriate. Emotions are a main part of the individual human experience, and additionally, research shows that the socialization of emotional expressions may begin before an infant's first birthday (Malatesta & Haviland, 1982). This means that while a child's understanding of emotion is still in its early development, they are already learning social expectations for how their emotions are supposed to look, among myriad other rules that they are expected to follow. Due to the nature of human development, infants heavily rely on their caregivers to learn how to live. Adults have been exposed to gender norms and other social expectations for the majority of their lives to a degree that children are not yet capable of understanding; however, the seemingly minute details of gender differences in the way that parents raise their young children may begin to engrain gender norms from infancy. For example, research shows that the facial expressions that mothers give their children at only three months of age differs based on the infant's gender (Malatesta & Haviland, 1982). This means that children have received differential information from an

extremely young age, which may affect their drawings, motor skills, and emotional development. This type of discovery is a big reason why so much of the literature regarding emotions and gender norms involves children.

The interesting thing about gender norms in children is that by the time they are three years old, they are able to recognize and apply gender stereotypes (Skočajić et al., 2019). While there has been a positive change in the general population's opinions towards gender equality in recent years, there are still implicit gender biases that will take a more critical eye to undo. These types of biases do not go unnoticed by young children, and though they are subtle, they are what make gendered parenting so common. This can take the form of gendered toys for children, differential reactions to children's behavior, or even, "gendered evaluations of others' behaviors in the child's presence" (Mesman & Groeneveld, 2017). Examples of this could be a parent disciplining a son and a daughter differently after they express anger, or a parent making negative comments about a stranger in regards to their gender. As seen in the Malatesta study, gendered parenting can occur even when the child is still an infant. Reaching past psychological research, there is a growing social understanding that gender roles are enforced before a child is even born. For example, "Gender reveal parties are one of the most socially acceptable ways to encourage a gender binary. This is done by reinforcing the idea that blue (quite literally) means boy, and pink means a girl" (Perry, 2020). Even walking into a children's clothing store can exemplify this idea, as blue and pink are so embedded in society as gendered colors, specifically aimed at young children and infants.

With an understanding that these gender differences exist and are present from the early stages of a child's life, it is important to investigate how these roles affect children and their development of self image and place in society. One study investigated how young children

process gendered colors, objects, and toys by asking them to categorize different examples as better suited for boys or girls. The task for the children was to look at pictures of toys, colors, and other objects and place them into a box with a picture of a boy face, a girl face, or a box with a boy and a girl face on it. They tested three, four, six, and seven year olds, and found that all three categories were stereotyped by both boys and girls, as well as the younger and older children. Interestingly, the researchers found that toys were stereotyped by gender the most, and older children followed gender stereotypes more in their overall categorization of the toys, objects, and colors (Skočajić, Radosavljević, and Okicic, 2020). The results of this study implicate that young children are aware of gender roles and stereotypes, and can apply them as well. The study also suggests that with age, gender stereotypes become more concrete and influential. With the establishment that young children can grasp and apply direct and tangible gender stereotypes comes the question of whether they would show the same recognition for more abstract applications of gender roles that are more in line with the task in this present study. A recent study investigated this question by interviewing over a hundred children from the ages of 3-11, and asking them who should come to the rescue, as well as who should receive special treatment in scenarios where someone is hurt. The results of this study showed that boys across all ages responded that boys should come to the rescue; however, children chose their own gender to receive special treatment in the same scenario, though this second bias decreased with age. This means that boys were aware of the stereotype that they are responsible for coming to the rescue, but that they did not believe that girls were supposed to receive special treatment. With these results, the researchers suggest that, "stereotypical attitudes regarding roles for one's own gender may be present in early childhood, but attitudes regarding roles for the other gender may develop later" (Gutierrez et al., 2019). This implies that children can recognize gender roles

in a more abstract and situational setting, in addition to the material application of the first study. Both of these studies give insight into how children internalize and apply gender roles once they are exposed to them.

The reason that these ideas are so prevalent in an early childhood *setting* is because this is where children are likely first interacting with each other regularly and are being taught a curriculum that likely includes a gender bias, even if it is unintentional (*Gender identity and expression in the early childhood classroom: Influences on development within sociocultural contexts (voices)* 2016). Examples of this are themes that are deeply rooted in history and tradition, like classic stories that are read to children before bedtime with a damsel in distress and a prince to save the day (Gutierrez et al., 2019). Due to this idea, much of the research on gender norms during this time is focused on what is being taught to the children, rather than what they inherently believe. I imagine that this is a hard subject to get to the root of, because as soon as children are really able to give an account of their gender norm beliefs, they have already been taught gender biased material. Similarly to gender roles, emotional development in early childhood is generally studied in a social sense. The preschool setting is a big hot spot for this kind of research because emotional development is greatly influenced and catalyzed by social interaction, and preschool and nursery care are some of the earliest social settings for children outside of the home. This is where children see emotional expression from others and start to categorize it (Widen, 2013). Additionally, Theory of Mind is tied into this complex because children need to see other people experience their own emotions in order to understand that their personal experiences are not universal. This is why, for instance, children with siblings often develop theory of mind faster than only children (Frith & Frith, 2005).

Emotions are the other primary topic within this study, in addition to the larger research world of child development. Interestingly, facial expressions and their place and meaning in emotional development is an area of research that is still disagreed upon among early childhood researchers. The previously universally accepted concept was the basic emotions theory, which suggests that emotions are separated into discrete categories because their development came about in order to adapt to a specific situation. A simple example of this is that, "the discrete emotion of fear developed as a mechanism to avoid danger and enhance the survival of our genes" (Yarwood). One of the problems with this theory is the idea that emotions are separate, and able to be categorized. Any person who has gone through a difficult situation may argue that emotions are not necessarily separate from each other and may work in tandem. In line with this theory, however, facial expressions are categorizable just like the emotions they represent, and are believed to be universally recognized. Additionally, some researchers even suggest that these expressions are innately recognizable (Yarwood). If one were to believe this theory, then they would have to also believe that facial expressions are the basis for knowledge for preverbal children; however, many researchers do not believe that this is true. For instance, Sherri Widen produced a theory that younger children categorize facial expressions by valence, and slowly develop more discrete categories for these expressions over a longer period of time (Widen, 2013). Later in her paper, she asserts that emotional development comes from behavioral antecedents and consequences before facial expressions shape and further categorize these already existing schemas (Widen, 2013). With this research in mind, we can deduce that while young children are able to grasp facial expressions as representations of emotions from a fairly young age, it is not the most accurate methodology to target their emotional understanding. It is,

however, one of the best options when working with young children due to some of their other limitations such as vocabulary.

Methodologically, it is extremely difficult to design a study that investigates emotional development individually because of the social nature of developing emotions. Additionally, the interaction between emotional development and gender roles is something that cannot easily be separated from a social setting for the same reason. We know that children develop emotional understanding in an environment that is almost certainly gendered, which raises the question, why do we have this idea that girls express emotion earlier and more accurately than boys? What exactly is the rationale behind the hypothesis for this study? There is no concrete answer to this question; however, the background research that supports the concepts in this study suggests that there are both physical and psychological reasons. We know that girls develop fine motor skills more quickly than boys do. This means that we may implicitly assume that girls develop emotional understanding quicker than boys because they are able to depict it more precisely at an earlier age. We also know that boys develop gross motor skills more quickly than girls do, which suggests that we expect boys to be more aggressive than girls at a younger age. Following this reasoning, we societally accept that aggression is equated with anger, and that boys possess more of these attributes than girls do (Picard & Boulhais, 2011). Due to this understanding, adults in early childhood settings are likely to implicitly push these narratives onto children to further separate the groups from each other. This comes out in the “boys will be boys” narrative, the nurturing little girls narrative, and the separation of boys and girls as groups for different activities throughout the day. Further research is needed to understand the impact of these concepts in early childhood settings; however, at a base level we know that it occurs and that the idea of gender is not lost on children. All of this is suffice to say that these settings are gendered -

whether intentionally or not, and these ideals that may root from gender differences in physical development.

There are a few more generalized reasons that this research involved young children. Firstly, the idea is that as children grow, they are exposed to more examples of, and pressure to conform to, gender roles. Secondly, children have less understanding of systemic gender norms when they are young, meaning that their interpretations are based on what they see in real life, rather than what they are taught explicitly. Thirdly, emotions naturally and visibly develop in children at four months of age (*Emotional Development*), meaning that the intersection between gender norms and emotion is a feasible facet of research to conduct among this population. With this reasoning in mind, it follows that researchers would want to get as close to the source of human development as possible. Researching gender norms with young children can give insight into when these concepts start to take root, how they develop, and even possible interventions. Due to the ever changing nature of human development, it can be difficult to define what age the 'sweet spot' for this type of research is. At what age is it most appropriate and insightful to study children's understanding of emotions in relation to gender norms? Researchers have landed on grade school children as a good population to focus on (e.g., Brechet et al., 2009; McGuire et al., 2021; Picard & Boulhais 2011). If the purpose is to research children as they are learning about emotions and gender norms, it would be ideal to begin research with infants. As can be seen in the Malatesta article, among others, children begin to experience gender norms before they are toddlers; however, this type of research is extremely difficult methodologically because infants cannot communicate the same way older children can. Preschoolers, then, are a great population in theory to conduct this research with because they are able to carry out the task, but they are still less exposed and molded by gender norms than grade school children.

Upon finding many studies that focused on grade school children, it became clear that concepts like Theory of Mind might support the choice to study older children rather than preschoolers. Much of the literature looking at gender norms in children study emotions in particular because this is a topic that children naturally understand, while still being closely related to societal gender roles. For this reason, older children are preferable to younger children because of the development of Theory of Mind, which is an important key to collecting meaningful data about emotional understanding (Frith & Frith, 2005). Theory of mind is the ability for a person to ascribe mental states to another person and use that information to understand another person's actions. It is also the ability to understand that personal thoughts, whether their own or someone else's, drive behavior in the world. (Frith & Frith, 2005). When the development of theory of mind occurs, a person is able to understand that other people have emotions and thoughts that differ from their own, which is crucial in understanding social structures and society. The reason that this theory is important to choosing age groups in studies regarding gender and emotion is because the parts of theory of mind that allow children to understand that their thoughts differ from others does not develop until between four and five years of age (Frith & Frith, 2005). Without this development, children do not yet understand how emotions are important in a social realm, but rather, they know that they feel emotions and act based off of them in a solely individual context. With this information, many psychologists are not interested in researching gender norms in preschoolers because they lack the social piece of emotional understanding; however, this denies the importance of emotional understanding in its more innate forms: this population may be able to show how innate or societal the gender differences in emotions are. This directly relates to the idea of working with the youngest children possible for the task, and reinstates the value of utilizing this population.

The second main reason that researchers do not use preschoolers in this type of research is the more literal barrier: physical development. Many of these studies have children depict their understanding of emotion through drawing, writing, or even speaking. Documentation of this nature is difficult with a population like preschoolers because they are still learning to do these things independently. There have been multiple studies that looked specifically at children's artistic depiction of emotions in order to get a very direct and simplistic view of the gender difference (e.g., Cherney et al., 2007; Picard & Boulhais 2011). These studies predominantly use grade school children and adolescents; however, a few studies have shown that preschoolers may also be capable of categorization and free labeling of artistic depictions of emotion (e.g., Russell, 1990; Widen & Russell, 2003). Specifically, in the Widen & Russell study, there is evidence that by the age of three years old, children are able to identify and label basic human emotions through facial expressions. The issue is that though these children are able to categorize emotions effectively, they may not be able to accurately depict this categorization on their own accord. With this dichotomy in mind, it can be said that there are many unknowns in the realm of emotional research on preschool children. While they are limited in both a cognitive and physical capacity, preschool children have less exposure to what emotions are 'supposed' to look like and how this connects to gender norms in a societal context. While asking a preschooler to draw an emotion may produce results that have a much different meaning than asking an adult to do the same task, it does not mean that this data is useless, but the structure and categorization of the data requires a more complex methodology.

There are many studies (Vendeville et al., 2018) that suggest that the depiction of emotions is in fact different between boys and girls. There is also research that says that this difference is closely related to social expectations and gender norms (Skočajić et al., 2019). As

stated before, these studies tend to focus on grade school children and even adolescence. With that being said, there seems to be a lack of literature on how these ideas and results might look in a younger population. While there are both simple and complex reasons as to why researchers may not be as focused on a preschool population, there is valuable information and possibly a different scope through which we can understand the gender difference in children's depictions of emotions and how gender norms and theory of mind play a role in this difference. Additionally, this research is necessary to produce future directions for research and come to a more in depth understanding of emotional development.

When working with a younger age group, there are factors to keep in mind when designing a study. Given that preschool children have less ability to give a nuanced account of their understanding of emotions and how gender norms play into this, it is necessary to use a medium through which children can most effectively convey their understanding of what emotion looks like on a face. Additionally, it is imperative that the children are not explicitly given an emotion to depict, so that they do not base their depictions off of their knowledge of what certain emotions are supposed to look like, as explained by a teacher or another adult. Specifically, it is important to avoid memorized associations with particular vocabulary words, like the names of emotions. For all of these reasons, I plan to ask children to listen to a short story and have them draw the emotion that they feel the main character is experiencing in the story. In order to take theory of mind into account, children were split up into groups of three to four year olds and four to five year olds. Though I did not test for Theory of Mind, it is a part of my independent variable, which is age. Additionally, the stories included the emotions that are the most easily recognizable: happiness, sadness, and anger (Widen & Russell, 2003). The

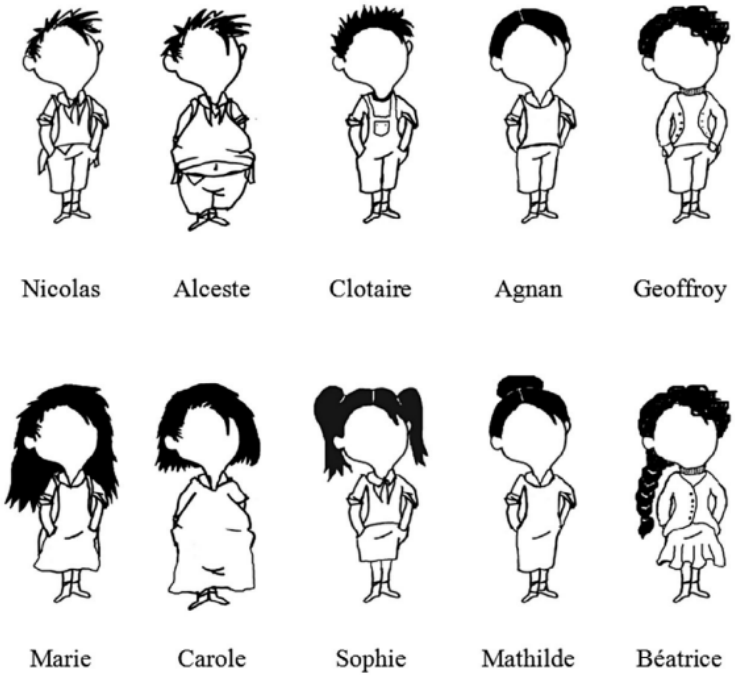
children were also given a face shape to draw in, to ensure that their drawings are as uniform as possible.

Prior research uses similar methods and reasoning to investigate gender differences in grade school children's depictions of basic human emotions. The researchers investigated the gender difference in children's drawings of anger and sadness (Vendeville et al., 2018). There were 91 children from the ages of seven to eight and 89 children from the ages of nine to ten.

This study asked how boys and girls would depict emotions differently in their drawings, based on implicitly emotionally charged stories that the children listened to (Vendeville et al., 2018). Researchers read stories with both male and female characters to question whether or not there was an interaction between character and gender. There were eight stories and the researchers asked children to draw a face for the main character that showed that character's emotion (see figure 1 below). Naive adults rated the participants' drawings. They had a list of seven emotions to choose from: happiness, sadness, anger, fear, surprise, other, or neutral; the researchers only focused on sadness and anger (Vendeville et al., 2018). Drawings were given a rating of 1 when the judges agreed on the emotion and the drawing depicted the target emotion, and were given a 0 when either of these components were absent. Boys produced more drawings that depicted the target emotion than girls in the angry emotion conditions. There was no significant difference between boys and girls in the sad condition. Lastly, there was also no significant difference between the male and female characters in depicting the target emotion for sadness or anger.

Figure 1

Example Premade Facial Models



Note. These were the exact facial models used in the study (Vendeville et al., 2018).

For further analysis, the drawings that depicted the target emotions were separated into groups of sadness and anger.Two naive judges created lists of facial cues for each emotion, and then discussed their lists together to create a shared pool of facial cues for sadness and anger. For the depictions of sadness, the shared list consisted of, “eyes (straight, circular, other), eyebrows (outward, curved, other), mouth (downturned, straight, other), number of tears (0, 1 to 2, more than 2) and size of tears (small vs. large, i.e. inferior/equal or superior to three millimeters)” (Vendeville et al., 2018, p. 934). The list for the depictions of anger consisted of, “eyes (straight, circular, other), eyebrows (inward, curved, other), mouth (downturned, straight, other), number of teeth (0, 1 to 13, more than 13) and other (i.e. cheeks and outgoing lines of the head or ears)” (Vendeville et al., 2018, p. 935).

The judges then noted the number of drawings that represented each facial cue, and whether this differed between age, the child's gender, and the character's gender (Vendeville et al., 2018). They found that in the sadness condition, girls produced more facial cues than boys. Additionally, they also found that there was a significant interaction between age group and the child's gender, suggesting that the gender difference was only significantly different in the older age group (Vendeville et al., 2018). Due to this finding, we may be able to see that with increasing age, there is an increased understanding of gender roles. Will there be a gender difference in younger children that do not have this understanding of gender roles for emotional expression? Interestingly, in the anger condition, the only significant result was an interaction between age group and gender, such that younger boys produced more facial cues than older boys to depict anger (Vendeville et al., 2018). This suggests that boys are less socialized as they age. In terms of the overall results for the number of facial cues, girls (especially in the older age group) produced more facial cues for sadness than boys, and younger boys produced more facial cues for anger than older boys and girls.

In the anger condition, more girls depicted straight eyes, while more boys produced circular eyes. These results are significant across age groups and character gender. More girls produced eyebrows that fell into the "other" category than boys, but only when the character was a female. Interestingly, there were no significant differences between children's gender in terms of the mouth shape for the anger condition. There was, however, a significant difference for the depiction of teeth. Girls were more likely to not depict teeth at all, except for the younger age group when the character was a girl. Younger boys were more likely to depict a large amount of teeth than younger girls, regardless of the character's gender. To address the "other" category, girls were more likely to add depictions of an abstract nature, such as lines coming out of the

character's head, than boys were. It is possible that these findings can be partially explained by differences between boys and girls that are not related to emotion, but because of the coding system, they get labeled as such.

In summary, there was no significant effect of children's gender on the depiction of sadness; however, boys were more likely than girls to correctly depict anger (Vendeville et al., 2018). Girls also used a higher number of facial cues and a larger number of tears to represent sadness than boys did. For anger, boys more often depicted teeth in their drawings than girls did; however, girls used more abstract additions to the drawing to depict anger. The results also showed that the character's gender did not have an overall significant effect, meaning that the children's gender was the most important component driving the results. The children in the study displayed this idea, especially through the pattern that the character's gender did not have a significant effect, being that the emotion reflects the drawer more than the drawing. The discussion section of this study actively discusses gender-emotion stereotypes as a main rationale for the gender differences that they could see presented in their study.

Method

Participants

The participants in this study are preschool aged children from both the Abigail Lundquist Botstein Nursery School and Children's Center. They are divided into age groups of three to four year olds and four to five year olds. This is important for the theory of mind covariate in this study, but it is also because these are the age groups that are set for each of the schools. Due to the fact that I cannot test each student for theory of mind, I am only assuming that the five year olds have developed this cognitive understanding. The schools that these children attend are a part of the Bard College campus, meaning that a large majority of

participants have a similar daily schedule and routine and they are mostly children of higher education faculty and staff at a rural liberal arts college. The final sample included sixteen participants. Each participant produced three drawings, totalling in 48 drawings. All participants had a consent form filled out by a parent before participating in the study. The full consent form can be seen in Appendix B. The breakdown of age and gender can be seen in the table below.

Table 1

Gender and Age of Sample Population

	3 Years	4 Years	5 Years	Total
Male	4	3	3	10
Female	0	5	1	6
Total	4	8	4	16

Materials

The main materials for this experiment are the stories that I read to the children and the facial models that they drew on. I personally wrote the stories, but they were heavily influenced by the stories used in the Vendeville study. Due to the young age group in the present study, the stories were modified to be more age appropriate, while still conveying the target emotion. The exact stories can be seen in Appendix D. The facial models were also influenced by the Vendeville study, but in order to help the child understand the task better, I drew a circular face shape on a half piece of paper, instead of giving them a premade facial model. The participants then used the same black marker to draw their picture in the face shape. The only other materials for the study are the small fidget toys that were given to all of the children at each of the schools.

Procedures

The experimenter read stories about specific emotions to each child. There are three stories for the three emotions: anger, sadness, and happiness. After hearing the story, children were asked to draw the emotion depicted in the story onto a blank face shape that I drew in front of them on a half of an 8x11 piece of paper. Before they started their drawing, I asked the participant to tell me when they were done with their drawing. If they visibly seemed done, but had not verbally told me that this is the case, I asked them if they were done with their drawing. The exact script is as follows: "Hello! We are going to do an activity together and I want you to let me know if you don't want to do the activity anymore. I am going to read you a story, and I want to know how the child, Hollis, is feeling during the story, ok? {Read story} Now that you've heard this story, I want you to draw how you think Hollis was feeling during the story. Tell me when you are done drawing. {draw face shape on paper} Can you draw Hollis' face here? {allow child to draw and if they don't say they are done, ask} Are you done with your drawing?" I also had a piece of paper with the child's coded name where I wrote any commentary from the child that may be helpful to understanding their drawing. In order to collect a baseline of commentary from each child, I asked each child to simply tell me about their drawing once they were finished and I wrote down the information that they chose to tell me. All of the drawings can be seen in Appendix E. After data collection, I sent out debriefing forms to parents to further explain the study and provide a chance for further questions to be answered. The debriefing forms can be seen in Appendix C. I also went to each school to give small fidget toys to all of the children, even if they did not participate in the study. This occurred during circle time, which is a daily routine for the children at each school. Children were given the opportunity to ask me questions after their participation and during circle time when I asked

them if they had any questions. All materials, procedures, and forms were approved by the Bard IRB, as can be seen in Appendix A.

Coding

The coding process was completed by two undergraduate students on the same campus as the two preschools who are familiar with children, one of whom had taken a child development course. The coders were not naive to the hypothesis, but they were not aware of the methods, they did not know the participants, and they were not present for data collection. The coders completed a practice round in which they observed 12 drawings that were not a real part of the data set. Consistent with the Vendeville study, the coders did not receive training prior to the practice round. Their coding decisions were based on their base understanding of drawings of facial expressions. There were three drawings that clearly demonstrated the emotion for each of the target emotions, according to training material, as well as three drawings that were harder to code and were based off of some of the surprising trends from the data. For example, one of the harder drawings included a zigzag mouth to denote anger, as this was seen repeatedly in the real data set. In this practice round, they viewed the drawings and reported the emotion that they thought was most representative of the drawing in a spreadsheet. After they both finished this process, they discussed any drawings that they disagreed on and came to a final decision together. When this was complete, they repeated the same process with the real data. The drawings were printed uniformly onto standard printer paper and were given to the coders in packets. After the first five drawings, the coders discussed their singular disagreement with each other and came to a mutual decision; they completed the rest of the coding alone. Cohen's Kappa was run on the coders' individual datasets in order to gauge interrater reliability. For happiness, $\kappa = 0.63$, for sadness, $\kappa = 0.74$, for anger $\kappa = 0.64$. Visual inspection of the Kappa table showed

that coder A had a tendency to score happy at a higher rate than coder B, who scored those same pictures as angry, as can be seen in the table below.

Table 2

Kappa Results

		Coder A		
		Happiness	Sadness	Anger
Coder B	Happiness	17	0	1
	Sadness	5	15	0
	Anger	3	1	6

Note. This table is a visual representation of trends found in the coding.

The coders came together at the very end to discuss their disagreements and come to a mutual decision for the final time. They disagreed on 11 of the 48 drawings.

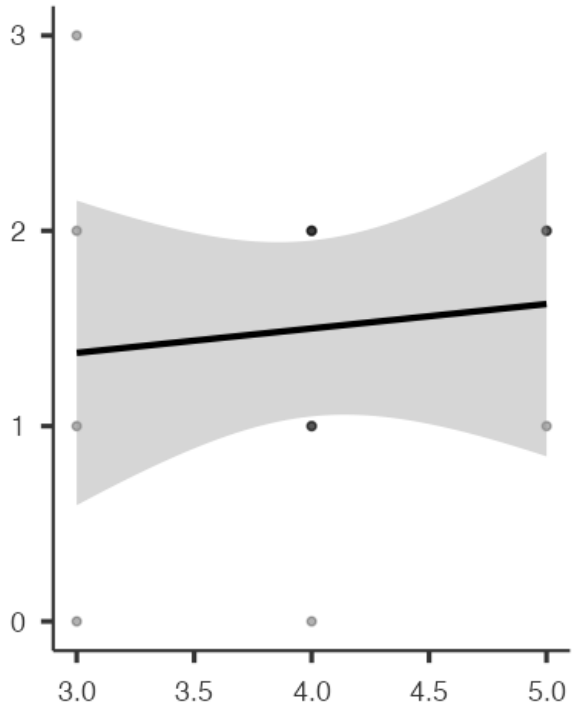
Results

At the beginning of the study I had two main hypotheses. The first hypothesis is that the older age group would produce a larger amount of drawings that depict the target emotion from the story. The second hypothesis was that the older children would show a larger gender difference in their drawings than the younger age group. Beginning with the first hypothesis, I ran two separate tests in order to analyze age as a categorical variable and a continuous variable. Age group, meaning which school the child attends, is the categorical variable for age, while the number of days since the child's birthday is the continuous variable for age. The other variable for this first hypothesis is the cumulative score, which means the number of drawings that the coders decided depicted the target emotion. The lowest possible score is a 0, while the highest

score is a 3. I ran an independent samples t-test with categorical age as the grouping variable and the cumulative score as the dependent variable. This test did not produce significant results, $t(14) = 0.69$, $p = .546$. The second test that I ran for this hypothesis was a correlation matrix, with the continuous child age variable and the cumulative score. This did not produce significant results, $r(14) = 0.112$, $p = .68$. For visual purposes, the correlation matrix can be seen in the figure below.

Figure 2

Correlation Matrix



My second hypothesis was that the older children would show a larger gender difference than the younger children. In order to test this, I ran an ANOVA with cumulative score as the dependent variable and both child gender and child group as the fixed factors. Child group signifies the age group of the child, either older or younger depending on which of the two schools they attend. The interaction between child gender and child group produced the following results, $F(1,12) = 0.626$, $p = .444$. These results are not statistically significant.

Post Hoc Analyses

Once the data was collected, there were many tests that I ran in order to get a more detailed view of the results. Firstly, I ran an independent samples t-test for each emotion. The dependent variable for these tests was the continuous child age, while the grouping variable was the target emotion. The purpose of running these tests was to see if there was a significant age difference for any of the specific target emotions. None of these tests produced statistically significant results, $t(14) = -0.695$, $p = .499$ for sadness, $t(14) = 1.54$, $p = .145$ for anger, and $t(14) = -1.90$, $p = .078$ for happiness. Additionally, I ran another independent samples t-test to see if there was a gender difference for the overall sample population. For this test, the cumulative score was the dependent variable and child gender was the grouping variable. The results for this test were not statistically significant, $t(14) = 0.00$, $p = 1.00$.

Discussion

The original goal for this study was to take the concept of gender differences in children's expressions of emotions, and test a younger age group to see if these differences would be present. I based my methods off of the Vendeville study that was laid out in the introduction of this study. In addition to the gender differences in children's expressive drawings, a main goal of

this study was to see if there would be an age difference between the children because of the development of Theory of Mind. There was a plethora of studies that looked at the gender differences in children's expressive drawings for older children; however, there was little available research on this topic in preschool children. This was the main rationale for conducting this study. My original hypotheses were that the older age group would produce a larger percentage of drawings that depict the target emotion from the story, and that the older children would show a larger gender difference in their drawings than the younger age group. As seen in the results, the data did not support these hypotheses; however, there were many ideas and concepts that came about despite these statistically insignificant results.

Anger and Sadness

The younger children consistently communicated that their drawings were representative of sadness in the anger condition. This could mean a few different things. Firstly, it could mean that the story was not clearly displaying anger, and could be identified as sadness. Secondly, it could mean that the younger children were not able to differentiate sadness from anger because anger is one of the later developments of the basic emotions in children (Denham & Couchoud, 1990).

Kappa and Coding

While Kappa is usually used for interrater reliability, I additionally ran a Kappa test to evaluate the reliability of the final coding decision in comparison to the target emotion of the story. The results produced a Kappa of $\kappa = 0.45$ for happiness, $\kappa = 0.095$ for sadness, and $\kappa = 0.172$ for anger. This shows a very poor agreement for sadness and anger, and a moderate level of agreement for happiness. Though the use of this test in this context is slightly unusual, the results bring up a few interesting ideas. First, it suggests that there might be a problem with the

coding system, because the coders decided upon the target emotion at marginally above a chance level for sadness and anger. The coding system used in this study was directly modeled after that of the Vendeville study; however, this did not take into account the age difference in the samples of the studies. It is true that preschool drawings may be more difficult to code than a grade school drawing, meaning that these low Kappa statistics could reflect something missing in the coding procedure that would have accounted for this. Possible corrections for this are explored in the future directions section of this study. Second, these statistics could mean that the children were not grasping the emotions in the stories because they do not have the cognitive ability to accurately complete the task at their young ages. An alternative approach to this idea is that the participants did understand the task, but do not represent emotions the same way that adults do in their drawings. In other words, what may clearly be a sad face to a young child might be indistinguishable from other emotions for the coders. This is likely a result of the challenges of collecting this kind of data with young children that were discussed in the introduction of this study. Young children have likely not grasped the idea that they need to explain what their drawings mean because it may not be obvious to everyone else in the same way that it is obvious to them.

Theory of Mind is a big part of this because the children may not understand that those around them are not having the same thought process as them, and that verbal explanation may be necessary to reach a common understanding. It is also possible that this is partly because their motor skills have not caught up to their conceptual skills. This disparity is accounted for by the written accounts of what the children said when I asked them to explain their drawings to me; however, during the actual drawing process, it is possible that this concept led to a larger number of indiscernible drawings, even though the children grasped the cognitive task. Lastly, there is a

possibility that these Kappa statistics are reflective of the difficulty of distinguishing sadness from anger for young children. This is a possibility because of the idea that anger is the emotion that develops the latest out of the three investigated in this study (Denham & Couchoud, 1990). If it is the case that children in the study were having a harder time accurately depicting anger because they are less familiar with it than the other emotions, then it follows that the coders would match their decision with the target emotion less frequently. In order to test this post hoc hypothesis, I used another Kappa test using only positive and negative valence. This produced a value of $\kappa = 0.7053$. This shows that interrater reliability was high when there was no distinction between sadness and anger, which suggests that this is where most of the disagreements in coding occurred.

Potential Confound

The biggest potential confounding variable is the order in which the stories were read to the children. Because of the way that data was collected, the stories were read to the children on the same day. It is possible that the child might lose focus over the course of the experiment, meaning that the drawings produced by the child might lose detail and effort according to the order in which they were read. The order of the stories was not counterbalanced; however, happiness was the subject of the last story and it also had the highest accuracy for the target emotion. This suggests that there was not a loss of focus over the course of the experiment, because the last emotion was the most accurate.

Another possible confounding variable is that the environments in which the data was collected differed between the schools. The children in the younger group were each read to individually and did not have other children around them when completing their drawings. The older children, however, sat at a table in groups of four when listening to the stories and doing

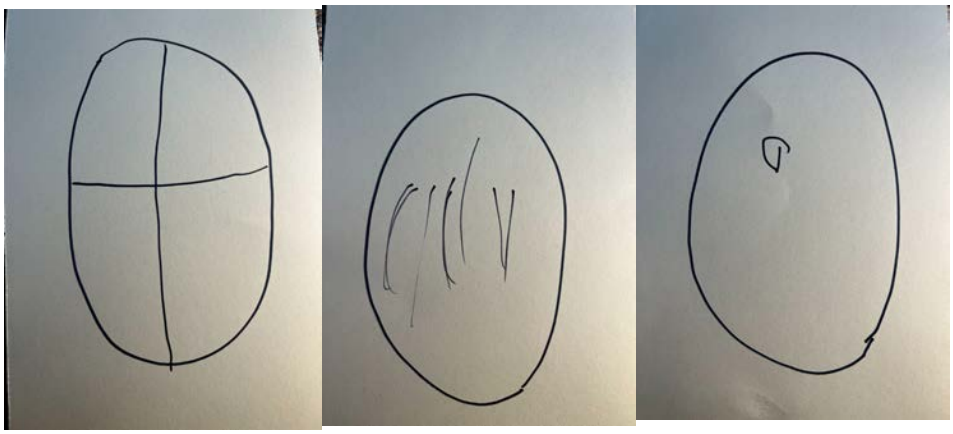
their drawings. This was not a purposeful change on a methodological level, but rather the method that the teachers at the school preferred and allowed. The children did not talk to each other during the experiment, nor were they able to see each other's drawings; however, the idea that they were in a group might have impacted their focus during the study. It is possible that the children felt more obliged to focus and listen during the study when they were in groups because it followed a similar structure to other activities that they do during the school day; however, it could also be true that having the children in groups could have lessened their focus. From observation, I am confident that this was not a confounding variable because the children were not speaking to each other or looking at other children's drawings during the experiment.

Case Study 1

In collecting data with young children, there is an added level of variability due to the unique nature and cognition of kids. In this particular study, there were a few case studies that brought up ideas that had not previously been accounted for in the introduction. The first case study is a four year old female. To protect this participant's identity, she will be referred to as case study 4F. From past experience working with the children at the school, this child continuously produces drawings that clearly express emotion and display impressive fine motor skills for her age. When she participated in this study, she produced the following drawings:

Figure 3

Case Study 4F Happiness, Sadness, and Anger



As can be seen in these drawings, this child's depiction of the target emotions is much more abstract than some of the other more straightforward drawings in the data set. With the contextual knowledge that this child is capable of drawing a happy, sad, and angry face, these drawings suggest that there is something significant happening here. The Picard study from the introduction comes into play here because its findings suggested that girls are more likely to use abstract methods in expressive drawings than boys are. This study was performed with much older kids, ranging from nine to fifteen years of age because the researchers aligned the age of the children with the cognitive development necessary for detailed expressive drawing. The Vendeville study does talk about this idea and shares the hypothesis that girls use more abstract depictions of emotions than boys do; however, this study also uses an older sample population than is used in this study (Vendeville et al., 2018). While it would take future studies to investigate whether or not preschool children are able to meaningfully use abstract depictions of emotion in their drawings, and even more so if girls are able to do this earlier than boys, this case study suggests that children may be able to use abstract ideas in their drawings at a younger age than previously expected.

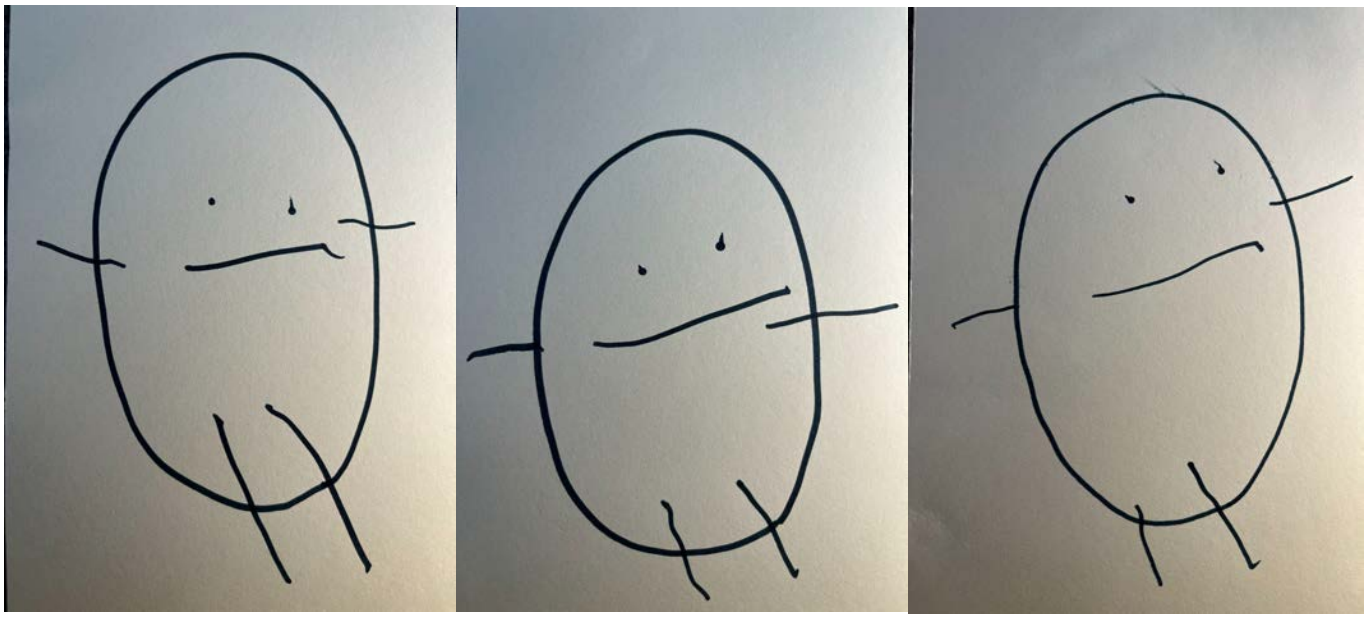
Additionally, this case study is also a good example of how the coding system is flawed. In consistency with the Vendeville study, the coders did not receive prior training, aside from the practice round of 12 drawings. This, in theory, avoided any bias in the coders; however, this decision also means that drawings with very abstract depictions of emotion were not accounted for. In the practice round, there were three drawings that were meant to prepare the coders for less straightforward drawings, but I failed to include abstract depictions of emotion in this practice round. In future experiments, it is important to include this aspect.

Case Study 2

The second case study is a three year old male, who will be referred to as case study 3M in order to protect the child's identity. This child participated in the study on two different days, meaning that the drawings were not all produced during the same session. This is important because the drawings that he produced are strikingly similar to each other:

Figure 4

Case Study 3M - Happiness, Sadness, and Anger



These drawings suggest that some children may rely on drawing conventions in a situation like this, rather than producing a drawing that they believe uniquely represents the target emotion. This is a concept that produces a few specific questions to be answered in future studies. One question is whether this is a phenomenon that mostly affects younger children *because* they do not yet understand how to express emotions in a drawing, or if they simply start drawing and forget the specificities of the task because of the familiarity of drawing a face. It is possible that the physical process of drawing a face is methodical for young children because it is

one of the first things that they learn to draw, resulting in a repetitive process each time that they go to draw a face, based on the way that they were taught. This reasoning is supported by the fact that these drawings were created on different days because it suggests that each time this participant sat down to draw a face, their process was extremely similar, regardless of the story that was read to them.

Another possible reason for repetitive drawings is that the child does hear and understand the story being read to them, and they believe that their picture represents the emotion in the story, but only because they assigned meaning to the drawing after they finished it. This differs slightly from the previous rationale because rather than understanding the task and then getting distracted by the familiarity of drawing a face, the child doesn't retain the task at all and only applies an emotion to their drawing once the researcher asks them about what it means. This brings into question whether a different methodology should be used in future studies with a similar age range of participants in order to avoid this phenomenon.

Drawing Conventions

During data collection, it became apparent that some of the children drew a very similar face for each one of the stories. For example, this participant's drawings look extremely similar. The difficulty with this is deciphering whether this participant understood the differences in emotion for each story, but this understanding was overpowered by the routine of drawing a face, or if the child did not understand the differences in emotion between the stories. This is one of the major limitations of this study, which goes hand in hand with the rationale behind running this experiment. There is a lack of research on this topic because it is difficult to operationalize children's understanding of emotion when their motor skills and communication are more limited than older children. This is a great example of these limitations. This participant heard the

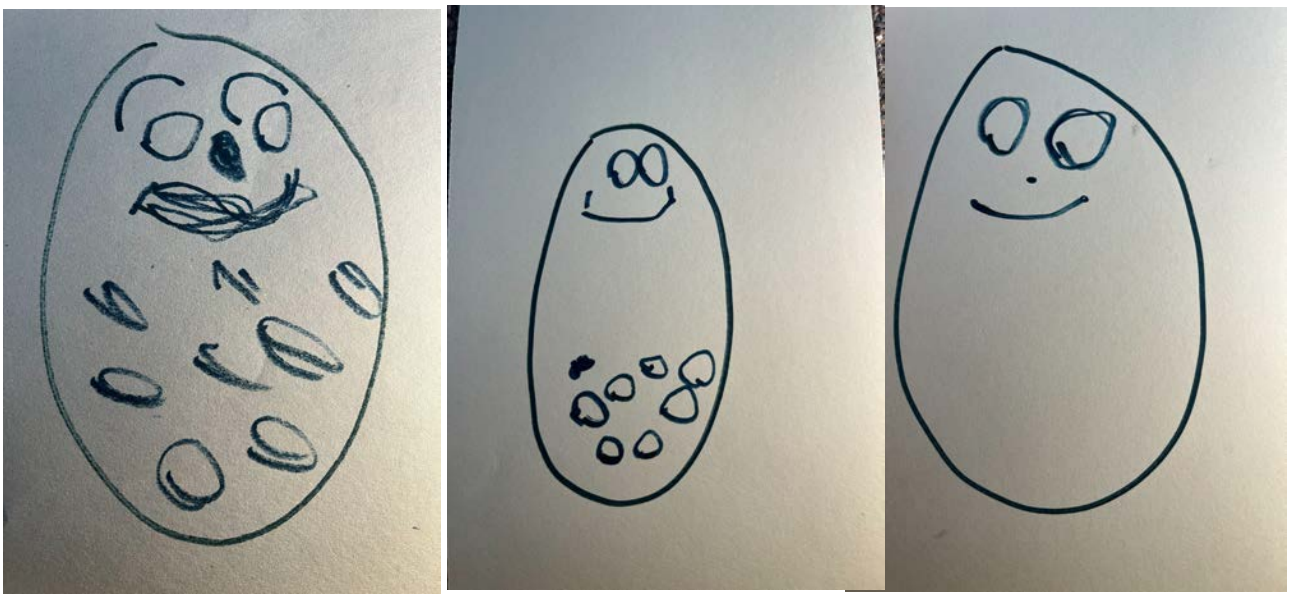
stories, drew three separate pictures for the stories, and yet the drawings look very similar. How, then, can we know if the child understood the differences in emotion or not?

Participant Commentary

As can be seen in the methods, I asked participants to explain their drawing to me after they completed it, as well as writing down any commentary that they offered while they were in the process of completing their drawings. While this commentary did not affect the statistics or coding for the study, it brought forth a great deal of ideas for future directions, as well as a look into the thought process behind some of the drawings. One of the most interesting series of drawings that can be found in the sample can be seen in the figure below.

Figure 5

Abstract Drawing Method

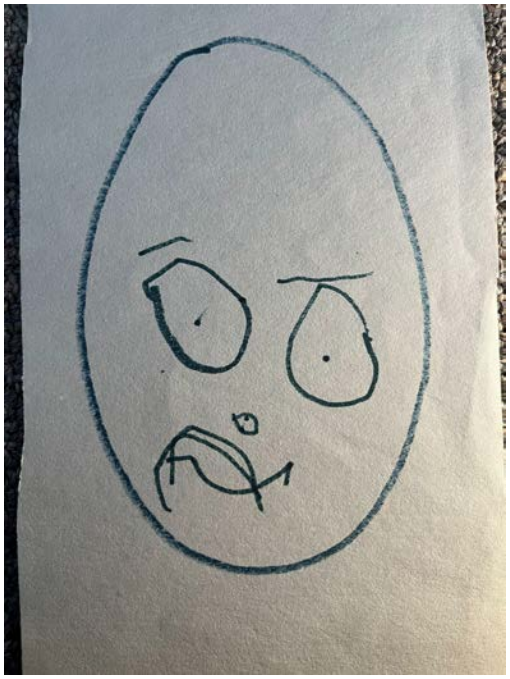


The leftmost photo is this child's happiness drawing, the middle photo is the angry drawing, and the right photo is the sadness drawing. The child noted during and after the happiness and anger drawings that the circles on the character are "food in the belly". Interestingly, the sadness

drawing does not have any food in the belly. The mouths on the three drawings do not greatly differ from each other, leaving the circles as more of a depictor of emotion than the usual facial expressions. The biggest question that this leads to is how can researchers decode abstract depictions of emotions and come up with a coding system that accounts for unexpected methods, as can be seen in this series of drawings? The placement of the "food" in the drawings was certainly not random, as the child even left the space for the food in the sadness drawing, but chose not to put it there. With the coding system used in this study, this thought process was not accounted for and the drawings were coded as not depicting the target emotion, aside from the happiness drawing which uses conventional happy facial expressions.

Figure 6

Happiness, Sadness, and Anger



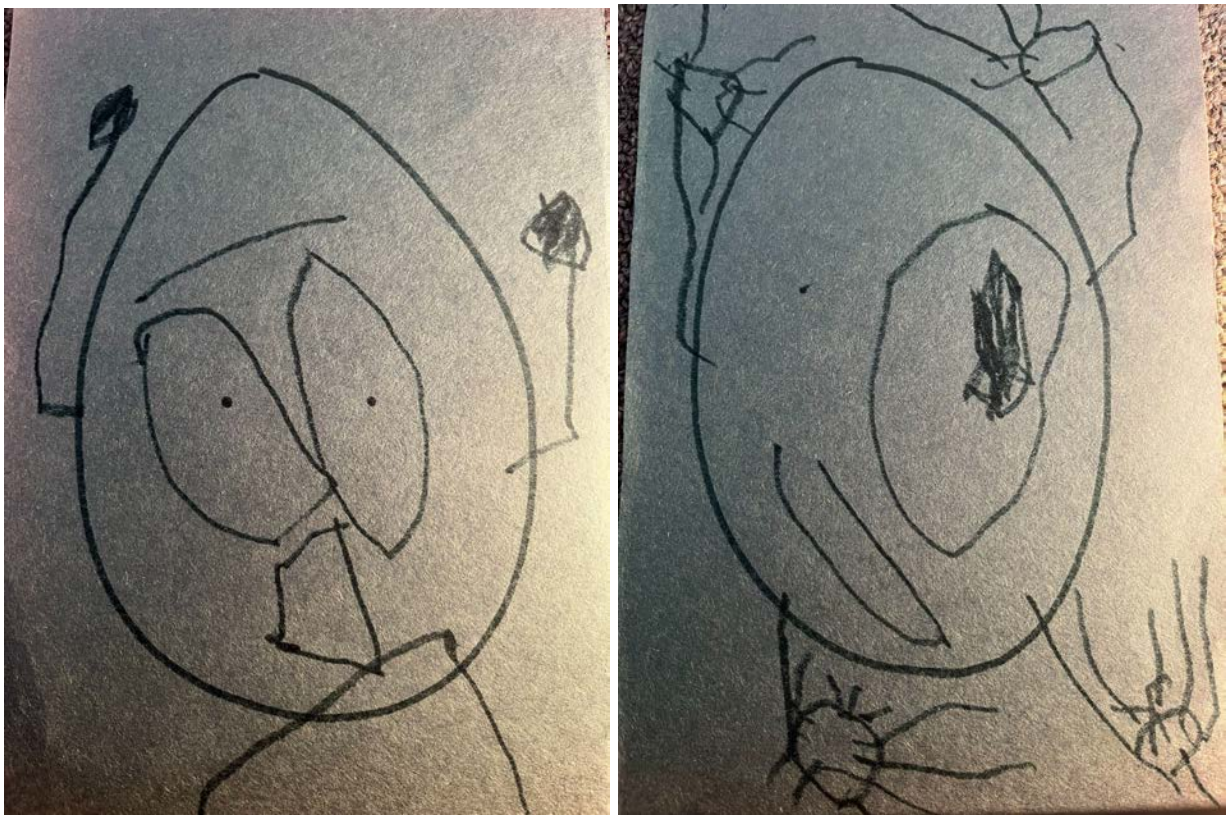
On the other hand, there were some drawings that the coders decided did depict the target emotion, while the child actually stated a different emotion in their commentary or explanation of the drawing. An example of this can be seen in the figure on the left. This drawing was for the anger story, but the child said that "this is a sad face" after completing the drawing. In addition to the fact that there is both a smile and a frown in this drawing, there are also conventionally angry eyebrows, as well as the child stating that the face is meant to be sad. There are so many levels to this drawing that coding is yet again brought into question. The drawing was coded as angry because of the eyebrows; however, it is unclear

whether the child drew the eyebrows this way with the intent of expressing anger, or if this is simply how they chose to draw them in the moment.

There are two more drawings that have commentary with important implications, and they can be seen in the figure below.

Figure 7

Intent in Drawings



These final two drawings were done by the same child. The one on the left is their sadness drawing and the one on the right is their happiness drawing. For the sad drawing, the child stated that the character had “fists up shouting”, while for the happy drawing, the character is “jumping up and down because he’s excited”. This is a great example of two drawings that look rather similar, but are categorizable by the commentary that goes with them. The current study did not give the commentary to the coders, so as to avoid biases; however, there are a few different

examples in the data set of drawings that would have likely been coded as depicting the target emotion if they were accompanied by their commentary.

Limitations

One of the biggest limitations in this study is the sample size. There were only 16 participants, which not only limits what can be done statistically, but it also limits the ability to generalize the results of the study. Another potential limitation is that the children in the study are all from the same general population, as both of the schools are a part of Bard College. This is a limitation because the structure and teaching philosophy of the schools have such an immense impact on the emotional development of the children that attend them. If there were children from many different schools and even in different geographical locations, there may be more variability in the emotional cognition and taught gender norms of the participants. This would also increase the generalizability of the results from the study. Additionally, I think that it would have been beneficial to test each child individually for Theory of Mind because then there would be more information on whether or not the child conceptually understands other people's emotions that differ from their own and if their drawings are representative of that. This would potentially clear up some of the uncertainty about how much of the task the younger children are really capable of conceptualizing, rather than relying on general age benchmarks for the development of Theory of Mind. This leads directly into the next limitation: it takes a lot of practice and training to conduct research with preschoolers because of their unique traits and tendencies. While I do have prior work experience with young children, it is a much different experience to conduct research with them, which is a challenge that I was not fully prepared for. Lastly, I think the biggest limitation in this study is the coding system that was used. It was

designed for grade school children to use in the Vendeville study and did not take into account the different types of drawings that would be seen in this study with preschool age children.

Future Directions

While conducting this study, though the results were not statistically significant, I believe that some important distinctions were made for future research. One of the main questions in my introduction was why this type of study had not been conducted before on preschool age children. I reviewed a few reasons that this type of study would be difficult with a young sample population, including the main idea that the methodology is more difficult to apply to preschoolers. Not only do preschoolers have a more difficult time grasping the ideas of emotions and translating them into drawings, but they also have a disadvantage at physically doing the drawings because of their limited motor skills. The purpose of this study was to see if preschoolers could produce similar results to the Vendeville study that had a very similar setup, but tested grade school children. It became apparent through data collection that it is extremely difficult to test a set of hypotheses, and also test the efficacy of a certain methodology simultaneously. While I do think that these hypotheses are plausible, they were not supported by the data produced in this study, which leads me to believe that there needs to be a change in the methods used with younger children. In reviewing the limitations from this study, I produced a plan for a future study that I believe would account for them. Firstly, there should be a different sampling technique in which a few different preschools across different geographical regions will participate in the experiment. This takes into account differences in the population, as well as the different teaching philosophies that may be used at different schools. Next, the children should first be tested for Theory of Mind and then participate in the task after that data is collected. More specifically, the children should be tested for false beliefs so that researchers can

gauge whether or not they will understand that others do not possess the same information that they do (Frith & Frith, 2005). An easy and efficient way to test for this is to show the child that there is something else in a container than one might expect, and then ask them what another child would think is in the container. For example, show the child that there are coins in a crayon box and then ask them what another child might expect would be in the box. This is an important step because then the researchers are able to definitively say whether or not the child has the cognitive ability to understand the task, and the data can be analyzed more thoughtfully. Additionally, this is a great opportunity to see how children who have not developed Theory of Mind complete the task and make inferences about why this may be the case. After this, the task should be similar to the one seen in this study. The children are read a story with a target emotion that is not explicitly stated, and are then asked to draw how the main character was feeling in the story. The researcher should draw the face shape on the paper before handing it to the child, as was done in this study, because it encourages the younger children to stay on task. The researcher should ask the children if they are done with their drawings, and write down any commentary during the drawing process. They should also ask the child to explain their drawing when they are finished, to pad the data with more information to post hoc. The biggest difference in this proposed study is that after the child is done with their drawing, there should be a checkpoint to see if the child is connecting their drawing to the story or not. A good way to do this is to have a premade drawing for each target emotion that clearly depicts that emotion, and show the children these drawings side by side after and ask them to pick which one matches their drawing. This method is helpful in a few different ways. First, it allows children with less developed fine motor skills to communicate their understanding of the task, even if their drawing does not reflect the emotion clearly. Second, it allows researchers to understand the child's headspace if they seem to

get lost in the task or distracted by the physical act of drawing. If they are still able to match their drawing to the drawing of the correct target emotion, it suggests that they understood the task and lost focus along the way. Lastly, it adds another layer of research to the children that did not show that they have developed Theory of Mind, so that researchers can better understand what parts of emotional development may occur earlier than others.

In addition to this proposed methodology, I think one of the biggest necessary changes for future research is a different approach to coding. The coding system that was used in this study was directly inspired by the system used in the Vendeville study. The issue with this is that this system does not work as well for a preschool sample, because it is made for drawings that are more straightforward to interpret. As can be seen in the case studies from this study, there are drawings that are extremely difficult to interpret, and the coders for this study were not aware of the information that the child gave about their drawing because they were not present during data collection, and I chose to withhold this information to avoid biases. In retrospect, I think that for a preschool age group, the coders should have access to the drawings themselves, as well as the commentary that the child gave during and after their drawing. This accounts for the limited motor skills that were not a challenge in the Vendeville study, as well as preschooler's differing methods of communication. Giving the child two separate ways of communicating their understanding of the emotion is helpful for the coders to better understand what their drawing means, as it is more difficult to code on the visual aspect alone.

With this proposal for a future study, there still remains a few questions that arose in this study that will need to be researched further. The biggest question is how can a researcher decide that the child understands the task? It is difficult to know what exactly the child is grasping about the topic and what the child knows to do from previous training in drawing faces. A good

example of this is case study 3M. All of the drawings that this child produced were very similar. Where can the line be drawn between following drawing conventions and completing the task with understanding? This will take a deeper knowledge of what *understanding* is, as well as a methodological approach that captures this phenomenon. The other big remaining question is how to analyze drawings that do not fit into any sort of drawing conventions at all. For example, case study 4F is a good example of a set of drawings that do not clearly fit into any of the target emotions. With the contextual knowledge that this child is capable of producing drawings that clearly communicate emotion through facial expressions, how can a researcher code something like this? What do these drawings mean? Abstract depictions of emotions are discussed in the introduction of this study; however, further research is needed to better understand abstract depictions of emotions in preschool children. This study began with the intentions of replicating the Vendeville study with a younger sample population; however, throughout the process of collecting data, it became apparent that the concepts involved in this study are part of a much bigger and developing network of emotional development.

References

Brechet, C., Baldy, R., & Picard, D. (2009). How does Sam Feel?: Children's labelling and drawing of basic emotions. *British Journal of Developmental Psychology*, *27*(3), 587–606. https://doi.org/10.1348/026151008x345564

This study looks at grade school children's ability to freely label emotions based on detailed scenarios, and also their ability to depict basic human emotions in human stick figure drawings. Results show that these tactics are accurate measures of a child's understanding of basic emotions, but not more complex emotions. This was one of the first studies that used drawing as a measure of a child's emotional understanding.

Browne, C. A., & Woolley, J. D. (2009). Theory of mind in children's naming of drawings. *Journal of Cognition and Development*, *2*(4), 389–412. https://doi.org/10.1207/s15327647jcd0204_3

This study looks at preschoolers, grade school children, and adults, and their use of theory of mind to name drawings. They did this by asking participants to name an artist's drawing, either based on the artist's intention or the piece's resemblance to an object. The results showed that when the artist's intention was ambiguous, participants named the drawing based on intention, but when the resemblance conflicted with intention, participants chose to name the drawing based on resemblance.

Cherney, I. D., Seiwert, C. S., Dickey, T. M., & Flichtbeil, J. D. (2007). Children's drawings: A mirror to their minds. *Educational Psychology*, *26*(1), 127–142. https://doi.org/10.1080/01443410500344167

This study looked into the concept that as children grow, their drawings become more complex, symbolic, and differentiated by gender. The researchers collected drawings from three different age groups of children. They found that the older children depicted more detail in their drawings, as well as significant gender differences that conformed to gender stereotypes.

Deconti, K. A., & Dickerson, D. J. (2008). Preschool children's understanding of the situational determinants of others' emotions. *Cognition & Emotion*, *8*(5), 453–472. https://doi.org/10.1080/02699939408408952

This study looked at preschoolers' ability to make judgements about a story character's emotional reaction based on situational factors. The children were asked to choose between two facial expressions to depict how they thought the character would react to an emotional situation in a story. The researchers found that three year olds could infer outcome based judgments, but the four and five year olds could make attribution based judgements at above a chance level.

Denham, S. A., & Couchoud, E. A. (1990). Young preschoolers' understanding of emotions. Child Study Journal, 20, 171–192.

This study investigated toddlers' understanding of emotion, and their ability to name and recognize emotions. The researchers found that happy emotions were easier for participants to name and recognize than for negative emotions. They also found that happy and sad emotions were the easiest to interpret.

Frith, C., & Frith, U. (2005). Theory of mind. *Current Biology*, *15*(17), 644–645. https://doi.org/10.1016/j.cub.2005.08.041

This source explains theory of mind in a concise and digestible way. In basic terms, theory of mind is the cognitive ability to understand that other people make decisions based on their own beliefs and emotions.

Gender identity and expression in the early childhood classroom: Influences on development within sociocultural contexts (voices). NAEYC. (2016, July). Retrieved April 29, 2023, from https://www.naeyc.org/resources/pubs/yc/jul2016/gender-identity

This source is a literature review of different studies regarding gender roles in early childhood settings. It emphasizes the idea that gender roles are important specifically in early childhood settings because of their social aspect.

Gutierrez, B. C., Halim, M. L., Martinez, M. A., & Arredondo, M. (2019). The heroes and the helpless: The development of benevolent sexism in children. *Sex Roles*, *82*(9-10), 558–569. https://doi.org/10.1007/s11199-019-01074-4

This study looked at abstract applications of gender roles in young children. The results of this study showed that boys across all ages responded that boys should come to the rescue; however, children chose their own gender to receive special treatment in the same scenario, though this second bias decreased with age. This means that boys were aware of the stereotype that they are responsible for coming to the rescue, but that they did not believe that girls were supposed to receive special treatment.

Malatesta, C. Z., & Haviland, J. M. (1982). Learning display rules: The socialization of emotion expression in infancy. *Child Development*, *53*(4), 991–1003. https://doi.org/10.2307/1129139

This study looked at three and six month infants, and the changes in type and frequency of facial expressions. The researchers filmed mother-infant dyads to look at the social interaction between mother and child in regards to facial expressions and display rules in infant learning. The results showed that there was a dyadic similarity between mother and child in the type of facial expressions most commonly used. This supports the idea that socialization of affect expression occurs during infancy, and even before the first birthday.

McGuire, L., Palmer, S. B., & Rutland, A. (2021). Children's and adolescents' evaluations of peers who challenge their group: The role of gender norms and identity. *Social Development*, *31*(2), 423–437. https://doi.org/10.1111/sode.12546

This article looks at grade school children and adolescents' perception of peers who challenge group norms. Specifically, the participants each evaluated a peer who challenged a group norm who was either cisgender or transgender. The researchers found that the gender identity of the challenger peer was insignificant. They did, however, find that adolescent girls evaluated the challenger peer more positively than they thought that their group would, and boys of both age groups evaluated the challenger peer more negatively and thought that their group would do the same.

Mesman, J., & Groeneveld, M. G. (2017). Gendered parenting in early childhood: Subtle but unmistakable if you know where to look. *Child Development Perspectives*, *12*(1), 22–27. https://doi.org/10.1111/cdep.12250

This article reviewed gendered parenting, and the change from explicit to implicit gendered parenting practices. The researchers reviewed direct messages like biases in product choices, as well as indirect messages like biases towards other people.

Perry, C. (2020, September 15). *How gender reveal parties reinforce a harmful binary*. Verywell Family. Retrieved April 25, 2023, from https://www.verywellfamily.com/how-gender-reveal-parties-reinforce-a-harmful-binary-5077547

This article talks about gender reveal parties and how they are harmful in several different ways, including their negative effect on the environment and their reinforcement of a gender binary. It also discusses the idea that gender roles are reinforced by the pink and blue, boy and girl, divide in these parties.

Picard, D., & Boulhais, M. (2011). Sex differences in expressive drawing. *Personality and Individual Differences*, *51*(7), 850–855. https://doi.org/10.1016/j.paid.2011.07.017

This study investigated the sex differences in grade school children's expressive drawings. The researchers looked at the strategy used in the drawing (abstract or literal) and also included a task to gauge divergent thinking. They found that girls relied less on literal strategies than boys did and girls also scored higher overall on expressive drawing. They also found that there was a linear relationship between expressive drawing and the scores on the divergent thinking task.

Russell, J. A. (1990). The preschooler's understanding of the causes and consequences of emotion. *Child Development*, *61*(6), 1872–1881. https://doi.org/10.2307/1130843

This study looks at preschool age children's understanding of the causes and consequences of emotions, as well as the power of a facial expression versus a word to evoke that understanding. The researchers read stories to children and asked them why the protagonist felt that way and what they did when they felt the target emotion. The results showed that children were able to distinguish between cause and consequence, and that children were no more accurate when shown a facial expression of an emotion rather than a word.

Rutgers Robert Wood Johnson Medical School . (n.d.). *Emotional Development*. Institute for the Study of Child Development. Retrieved April 25, 2023, from https://rwjms.rutgers.edu/departments/pediatrics/divisions/institute-for-the-study-of-child-development/research/emotional-development#:~:text=These%20studies%20confirm%20that%20basic,between%204%20and%2012%20months

This page discusses several different aspects of emotion development in young children. The page covers facial expressions, self awareness, self consciousness, and lying. The piece that was pertinent in this study was the finding that children begin to make emotionally motivated and meaningful facial expressions by the age of 4 months.

Shu-Tsen Kuo Author Profile. (2019, January 8). *Gendered emotions: Raging men and weeping women: Lead read Today*. https://fisher.osu.edu/blogs/leadreadtoday/blog/gendered-emotions-raging-men-and-weeping-women

This study looked at expressions of anger in the workplace. They found that women who showed anger were seen as emotional, and that their rationale was less valid than the men

that showed anger in the same position. They also found that employers would pay a woman who expressed anger substantially less than a man who did the same thing.

Skočajić, M. M., Radosavljević, J. G., Okičić, M. G., Janković, I. O., & Žeželj, I. L. (2019). Boys just don't! gender stereotyping and sanctioning of counter-stereotypical behavior in preschoolers. *Sex Roles*, *82*(3-4), 163–172. https://doi.org/10.1007/s11199-019-01051-x

This study found that preschoolers are aware of gender roles and are able to sanction other children who are violating them. The researchers found that boys are more likely to stereotype colors, items, and toys according to gender. They also found that boys are more likely to be sanctioned for violating gender norms.

Vendeville, N., Blanc, N., & Brechet, C. (2018). Tears for girls and teeth for boys: The influence of gender on children's depiction of sadness and anger in their drawings. *Educational Psychology*, *38*(7), 927–944. https://doi.org/10.1080/01443410.2018.1461810

This article investigates the gender difference in children's drawings of anger and sadness on premade facial models based upon a story that was read to them. The researchers found that grade school boys and girls depicted sadness with a similar accuracy; however, boys were more likely than girls to correctly depict anger, according to the scale that the researchers created. There was, however, a significant difference in the way that boys and girls depicted both emotions - girls tended to use a larger number of facial cues to express emotions than boys did.

Widen, S. C., & Russell, J. A. (2003). A closer look at preschoolers' freely produced labels for facial expressions. *Developmental Psychology*, *39*(1), 114–128. https://doi.org/10.1037/0012-1649.39.1.114

This study investigated young children's ability to free label prototypical facial expressions of basic emotions at the ages of two, three and four. The researchers found that the two year olds were largely incapable of completing this task; however, they believe that these children do understand emotion, but their categorization is not connected to vocabulary such as happy, sad, or angry. They found that beginning at the age of three years old, children began to categorize happy, angry, and sad correctly, though they may overgeneralize these terms as their schemas are still developing.

Widen, S. C. (2013). Children's interpretation of facial expressions: The Long Path from valence-based to specific discrete categories. *Emotion Review*, *5*(1), 72–77. https://doi.org/10.1177/1754073912451492

This review challenges the basic emotion theory and asserts that children learn how to interpret facial expressions and emotions much slower than the basic emotion theory states. Additionally, this review suggests that children divide facial expressions by valence first, and then into more discrete categories much later.

Yarwood, M. (n.d.). *Basic emotion perspective*. Psychology of Human Emotion An Open Access Textbook. Retrieved April 25, 2023, from https://psu.pb.unizin.org/psych425/chapter/basic-emotion-perspective/

This article explains the basic emotion perspective. It asserts that children categorize emotions in discrete categories because each emotion was developed as a response to a specific stimulus in the environment. It also asserts that emotions and facial expressions are innately ingrained and are understood naturally.

Appendix A

IRB Approval Letter

Bard College Institutional Review Board

Date: 3/5/2023
To: Anna Skamser
Cc: Justin Dainer-Best; Nazir Nazari
From: Ziad M. Abu-Rish, IRB Chair
Re: Gender and Theory of mind: The Complex Relationships Between the Depiction of Emotion in Preschool Age Children and Moderating Variables.

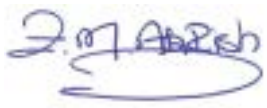
DECISION: APPROVED

Dear Anna Skamser:

The Bard IRB committee has reviewed your revised proposal. Your application is approved through March 5, 2024. Your case number is 2023MAR5-SKA.

Please notify the IRB if your methodology changes or unexpected events arise. We

wish you the best of luck with your research.



Ziad M. Abu-Rish, Ph.D.
IRB Chair
Associate Professor of Human Rights and Middle Eastern Studies
Bard College
zaburish@bard.edu

Appendix B

Consent Forms

Parental or Guardian Permission Form for Research Involving a Minor

Title of Project: Gender and Theory of Mind: The Complex Relationships Between the Depiction of Emotion in Preschool Age Children and Moderating Variables.

Researcher: Anna Skamser, Psychology student at Bard College, advised by Psychology faculty Justin Dainer-Best and Sarah Dunphy-Lelii

Your permission is being sought to have your child participate in this study. Please read the following information carefully before you decide whether or not to give your permission.

Purpose of Research: The purpose of this project is to investigate how age, the presence of theory of mind, and gender influence the depiction of emotions in preschool-aged children. Theory of mind is the ability to understand and take into account another person's state of mind.

Procedure to be Followed: The experimenter will read stories about specific emotions to your child. After hearing the story, children will be asked to draw the emotion depicted in the story on half sheets of paper with a circle face shape. There will be three stories. After data collection, I will be sending out debriefing forms to you to further explain the study and provide a chance for further questions to be answered. I will also give your child an opportunity to ask me questions after they participate.

Benefits / Risks: There are no known risks involved in this study. The activities are similar to those commonly carried out during the day in school settings. The emotional stories relate to emotions that your child will be familiar with. There are no tangible benefits involved, other than the fact that the child will receive a small gift for their participation in the study.

Time Duration: Participation in the study will not exceed 30 minutes.

Statement of Confidentiality: There is no identifying information being collected in this study. The only data that will be recorded is a photo of the drawing that your child produces, as well as anything they say about the target emotion that I will write down as they are drawing. All records are kept confidential and will be available only to researchers and nursery school staff. The results will be published as a part of my senior project and data will be presented in group form and individual children will only be identified by their gender and a pseudonym or not at all.

Voluntary Participation: Your child's participation in this study is voluntary. They may refuse to participate and you may choose not to consent to their participation.

Termination of Participation: If at any point during the study you or your child wishes to terminate the session, you or they are able to do so.

Questions regarding participation or the research can be directed to Anna Skamser (as6487@bard.edu), advisors Justin Dainer-Best (jdainerbest@bard.edu) and Sarah Dunphy-Lelii (sdl@bard.edu), or the Bard IRB (IRB@bard.edu).

This research has been reviewed and approved by Bard College's Institutional Review Board. If at any time before, during or after the experiment your child experiences any discomfort that is a result of his/her participation, or if you have any questions about the study or its outcomes, please feel free to contact us.

SIGNING THE FORM BELOW WILL ALLOW YOUR CHILD TO PARTICIPATE IN THE STUDY DURING SCHOOL HOURS WITHOUT YOUR PRESENCE.

Please return by [date here]. If you do not sign and return this form, the researchers will understand that you do not wish to allow your child to participate.

I, the parent or guardian of _____, a minor _____ years of age, permit their participation in a program of research named above and being conducted by Anna Skamser.

_____ Signature of Parent or Guardian

Date _____

_____
Please print your name here.

Signature of Investigator _____

Date_____

Appendix C

Debriefing Form

Debriefing Form

The purpose of this project is to investigate how age, the presence of theory of mind, and gender influence the depiction of emotions in preschool-aged children. For clarity, theory of mind is the ability to understand and take into account another person's state of mind. In this study, I read stories to children including your child. These stories were oriented towards specific emotions (happiness, anger, and sadness). After listening to the stories, your child was asked to draw the emotion depicted in the story on the outlines of faces. I am looking to see how age, theory of mind, and gender might explain differences in how children depict the target emotions differently.

Past research studied the difference in emotional depictions by gender in grade-school-aged children, but no such research exists in younger children. Differences may come from the ability of young children to draw a holistic picture of the human face, as well as the development of theory of mind. Theory of mind is usually believed to develop around 4-5 years old and allows children to understand that other people make decisions based on emotions that they are having. To look into how children perform differently on this emotion-drawing task by age, I am conducting this study with both the Children's Center and the Nursery School.

This project is ongoing, but I am available at as6487@bard.edu to answer any questions about the study or your child's participation in the study.

Thank you for participating!

Appendix D

Collection of Short Stories

Anger:

There was a child named Hollis that went to school just like you do. Hollis brought a stuffed bunny to school everyday named Oscar. Hollis liked to bring Oscar to playtime, snack time, and even nap time. One day, Hollis was playing with Oscar at the art table when another child came up to draw a picture. Hollis was holding Oscar when the other child took Oscar right out of Hollis' hands without asking. Hollis did not like this because Hollis was in the middle of playing with Oscar and the other child did not ask if it was ok to take Oscar. Can you draw how Hollis felt when the other child took Oscar without asking?

Sadness:

As you might remember, there was a child named Hollis that brought a stuffed bunny named Oscar to school everyday. Oscar was Hollis' nap buddy and was there to help Hollis fall asleep everyday. One day, Hollis arrived at school and put Oscar in the cubby. Hollis played with the other children, had snacks, and even raced bikes outside. When nap time came around, Hollis went to the cubbies to look for Oscar. Hollis looked all around but could not find Oscar anywhere. When it was time to get to get on the nap mat and go to sleep, Hollis had to take a nap without Oscar. Hollis did not like this and really wished that Oscar was there. Can you draw how Hollis felt when they had to nap without Oscar?

Happiness:

As you might remember, there was a child named Hollis that brought a stuffed bunny named Oscar to school everyday. A little while ago, Hollis lost Oscar and could not find him anywhere. They did everything together and Hollis really missed Oscar. When Hollis went to school one day, Oscar was sitting right on top of the cubbies where he usually sat. Hollis ran over and hugged Oscar so tightly and started to tell him about all of the adventures that happened while he was gone. Hollis told all of the teachers that Oscar was back and everyone was very glad. Can you draw how Hollis felt when they found Oscar?

Appendix E

Complete Data Set