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“Only girls play with those”: An Analysis of Preschoolers’ Gender Schema Development through Gender Stereotype Knowledge and Recognition of Gendered Information

Abigail Lee Sullivan
Bard College

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by
Abigail Sullivan

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Abstract

Since Sandra Bem's introduction of Gender Schema Theory (GST), researchers have analyzed how gender schemas influence children's information processing (Signorella, Bigler, & Liben, 1993; Welch-Ross & Schmidt, 1996). These studies, however, tested schema processing using familiar gender-atypical information (e.g., "only boys play with dolls") instead of novel gender-atypical information (e.g., "only girls play with xylophones"). The present study seeks to fill this gap in the research by using novel gender-atypical information in order to test the extent to which children's schemas influence their information processing. First, I tested children's memory and preference for two picture books, one with a female main character and one with a male main character. These books included the character playing with novel gender-atypical and familiar gender-typical items. Second, I tested if boys and girls had dissimilar levels of gender stereotype knowledge (measured by a card sorting task based on Leinbach, Hort & Fagot, 1997). My first hypothesis was that children would have better memory for gender-typical than gender-atypical information. My second hypothesis was that children's memory would be correlated with their scores on the sorting task. Finally, I hypothesized that children would prefer stories starring a protagonist of their own gender. My results did not support the idea that gender schemas are biasing children's information processing. Limitations of my study include small sample size, more female than male participants, and the possible influences of children's environment on their card sorting. Finally, I consider future research on the influences media has on children's gender stereotypes.

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Overview of Project

Children's environments are full of gendered information. A question researchers face is how children process that information. One way that researchers address this question is by proposing theories of gender development. In this project, I specifically focus on gender-development theories of how children generalize sex (knowledge of who is female and male) into sex-typed characteristics (what female and male characteristics are). I conclude that Bem's Gender Schema Theory (GST), which makes use of schemas, best answers the question of how children generalize sex into sex-typed characteristics. Schemas are "naive theories that guide information processing by structuring experiences, regulating behavior, and providing bases for making inferences and interpretations" (Martin & Halverson, 1981).

This project applies GST in a novel way, by evaluating the consequences schemas have on preschoolers' memory for and knowledge of gendered information. I focus on preschoolers as the age range for my study because children consolidate their schemas during these years (Martin & Ruble, 2004; Trautner et al., 2005). Evidence for this consolidation is their increase in sex-typed beliefs (Signorella, Bigler, & Liben, 1993). I discuss possible reasons for this increase, such as preschoolers' cognitive development and interactions with peers and parents that reinforce gender polarization, which Bem's theory argues leads to sex-typing (Liben & Bigler, 2017). Due to preschoolers' susceptibility to gender stereotypes (Trautner et al., 2005), I also consider the role of media, specifically toys and picture books, in influencing preschoolers' gender stereotype development. Because of the influences of media, I used pictures books about toys to test memory for gendered information in the current study. The procedure for my study

explores the influence of gender schemas on children's memory for gendered information and their sorting of gender-stereotyped items. I conclude with the results of my study and a discussion on the limitations of my design as well as a reminder of the importance of media in combating gender stereotypes.

Use of gender and sex. Although "gender" and "sex" have a variety of meanings, this paper follows the general trend among researchers of using "sex" for biological characteristics (such as sex chromosomes) and "gender" for all other social and cultural aspects of male/female distinctions (Blakemore, Berenbaum, & Liben, 2014). I made exceptions to this guideline for terms used by authors in order to have consistency between this paper and original citations. For example, I use "sex-typing" instead of "gender-typing" because it is a term used by Bem to explain a certain phenomenon integral to her theory of gender development.

Theories of Gender Development

Theories of gender development differ in what they argue influences children's development of sex-typing and motivation to act in accordance with their sex-typing. Sex-typing is the "process by which a society transmutes male and female into masculine and feminine" (Bem, 1981, p. 354). I will be focusing on three modern theories of how children learn to sex-type: Cognitive-Developmental, Social Learning, and Gender Schema. Cognitive-Developmental Theory capitalizes on cognitive stages that a child has reached in their gender development, which makes them aware of gender differences and encourages them to sex-type. Social Learning Theory argues that society influences children's sex-typing, and that reward and punishment of behavior motivates children to behave in a way that is consistent with previously rewarded behavior. Gender Schema Theory focuses on the combined influences of children's cognitive development and societal gender differentiation on children's sex-typing. Gender

Schema Theory argues that an internal motivation to conform to societal definitions of femininity and masculinity motivates children to behave in accordance with their sex-typing. I briefly explore Cognitive-Developmental Theory and Social Learning Theory and conclude that while they have benefits, Gender Schema Theory should be preferred because it considers the influence of children's environment and cognitive development on their sex-typing.

Overview of Social Learning Theory. Social learning theory (SLT) emphasizes the role of social interactions in influencing children's sex-typing. Social interactions include the rewarding and punishment of children's behavior by adults. SLT argues that these interactions motivate children's sex-typed behavior because children replicate previously rewarded sex-typed behaviors and avoid previously punished sex-typed behaviors (Maccoby, 2000). Based on this model, parents transmit society's views of gender-appropriate behavior to their children via reward and punishment of their behavior depending on if it is societally gender-appropriate or inappropriate (Maccoby, 2000).

Parents sometimes use societal measures for appropriate behavior for men and women as a guideline for how their children should behave. A 2017 Pew Research Center Poll shows differences in what men and women report that society values for their gender. Women typically listed physical attractiveness or nurturance/empathy, and men listed honesty/morality, financial/professional success, ambition/leadership, good work ethic, and strength/toughness (Parker, Horowitz, & Stepler, 2017). These values align with prescriptive gender stereotypes. Previous research has found that adults report women should be nurturant and communicative while men should be agentic and dominant (Koenig, 2018). Adults could be using these stereotypes as metrics for gender appropriate versus inappropriate behavior. For example, in a study of preschool teachers' responses to toddlers, their rewarding or punishment of children's

behavior depended on if it was in alignment with gender-stereotypes (Fagot, Hagan, Leinbach, & Kronsberg, 1985). At the beginning of the study, children's communication styles were similar, but by the end of it boys were more aggressive and girls were more communicative. The researchers argued that this difference in communication styles was a result of teachers' responses to children's communication styles (i.e., teachers ignoring aggressive behavior by girls and giving attention to aggressive behavior by boys) (Fagot et al., 1985). This study demonstrates that older adults may be using gender stereotypes to guide their view of appropriate behavior based on the child's gender which, in turn, encourages replication of those stereotypes.

In addition to reward or punishment for their own actions, SLT argues that children's sex-typing develops via observations and modeling (Martin, Ruble, & Szkrybalo, 2002). For example, a boy may observe other boys playing a competitive game, encouraged by teachers. He could then model what the boys are doing by making up his own game that is competitive. Observations of modeling can also be less direct such as modeling of characters from TV shows, books, or movies (Maccoby, 2000). In summary, SLT explains gender development as a process of children's modeling and adapting of their behavior in alignment with what was previously rewarded or punished.

Shortcomings of Social Learning Theory. A shortcoming of this theory is that it does not distinguish how children learn to sex-type from how children learn what behavior is appropriate in other domains. Bem (1981) notes that parents/older adults reward and punish children for many behaviors, and SLT does not explain why children attune to rewards and punishments for gendered behavior more than other behaviors.

In contrast to cognitive theories of gender development, SLT views children as learning to sex-type information based on how adults sex-type, which does not take into account

children's views of sex-typing at different ages. In general, children show a developmental trend when it comes to sex-typing. During the toddler and preschool years, children learn about gendered characteristics (Martin & Ruble, 2004). They then sort and consolidate this gendered information as appropriate for males and females with peak rigidity, (i.e., information is either male or female with little grey area) between 5-7 years of age (Martin & Ruble, 2004; Trautner et al., 2005). After this time of rigidity, children typically display a pattern of flexibility about gender characteristics (Martin & Ruble, 2004). SLT, therefore, does not explain why children interpret and adhere to society's sex-typing with varying degrees of rigidity as they age.

Biological changes (such as hormone levels) influence children's gender views at different ages which, although the child may not have control over, could influence their sex-typing. For example, in a study of play behavior, girls with testosterone levels similar to boys in their first year of life were found to play with a train (male-typical toy) more than a doll (female-typical toy) at 14 months (Lamminmäki et al, 2012). Early testosterone levels, therefore, can influence children's sex-typed behaviors later on. SLT, however, does not recognize the role of children's developing cognitions about stereotypes or biological influences on how they process gendered information but instead emphasizes social influences.

Overview of Cognitive-Developmental Theory. Cognitive-Developmental Theory (CDT) focuses on the child as the agent in their acquisition of sex-typing (Maccoby, 2000). CDT argues that children begin sex-typing after reaching the developmental stage of recognizing gender constancy (Levy & Carter, 1989). Gender constancy is the belief that sex coincides with biological characteristics and does not depend on superficial features such as clothing or hairstyle. This understanding usually occurs around 6-7 years of age (Bussey & Bandura, 1999; Ruble & Stangor, 1986). CDT argues that once a child recognizes the constancy

of gender, they take note of sex-typing in society and begin to sex-type their environment because they can label information as relevant or not for their sex and adapt accordingly (Levy & Carter, 1989). For example, if a boy sees other boys playing with trucks then he will determine that he could also play with trucks. CDT also argues that children's behaviors change to reflect what they have observed in terms of what they would like to do (i.e., I have seen other boys play roughly, so I will as well) and who to do it with (with other boys) (Maccoby, 2000).

CDT identifies cognitive consistency as the thing that motivates children's adherence to sex-typed behaviors and characteristics they have observed. Cognitive consistency is the concept that individuals prefer consistency between their thoughts, beliefs, and knowledge (Brannon & Gawronski, 2018). Children, motivated by a want for cognitive consistency, behave in a way that is consistent with what they have observed other people of the same gender doing (Maccoby, 2000). Children avoid what they have labeled as not for their gender, i.e., what they have observed other people of their gender avoid because engaging with those things would lead to cognitive inconsistency. Individuals avoid cognitive inconsistency because it leads to unpleasant psychological states which prompt individuals to revise either their view of themselves or the information (Brannon & Gawronski, 2018). CDT argues that individuals would not continue with a contradiction in their behavior and what they label as not for their gender because the unpleasantness of having knowledge of how to behave incongruent with how they are actually behaving would prompt them to reevaluate (Martin et al., 2002). In summary, CDT of gender development identifies cognitive consistency as a motivational force behind children's adherence to sex-typed norms, that match their gender, once they have achieved gender constancy.

Shortcomings of Cognitive-Developmental Theory. A limitation of CDT perspectives is that they do not pinpoint why children categorize people primarily by their gender (Bem, 1983). Children may categorization people based on their gender because children tend to distinguish people based on gender, and are more accurate in this distinction, compared to other physical characteristics. For example, when asked to sort pictures of children into girl and boy piles, children more accurately sorted and labeled gender compared to when they sorted according to race (African American or Caucasian) or attractiveness (attractive or unattractive) (Rennels & Langlois, 2014). Additionally, when 3-9-year-olds described pictures of children they spontaneously described them more often in terms of gender than race or clothing (Rennels & Langlois, 2014). CDT of gender development is, therefore, insufficient in explaining gender development because it does not clarify why gender is an especially salient category. In other words, CDT does not explain why children categorize people by gender and are better at this categorization compared to other characteristics like attractiveness or race.

Gender constancy: the distinction between GST and CDT. Gender Schema Theory (GST) and CDT are similar in their acknowledgment of the influence of children's cognitions on their gender development. One crucial distinction between these two theories is that GST does not require children to reach the developmental stage of gender constancy before they begin to pay attention to sex-typing. Gender schema theorists argue that sex-typing results from children having a basic understanding of their and others' gender identities. This basic understanding of gender results in children categorizing information in order to define themselves and their relation to others (Martin & Halverson, 1981). In contrast, CDT argues that gender constancy is a prerequisite to children paying attention to gender norms and sex-typing information in accordance with those norms.

There are, however, inconsistencies between gender norm knowledge and gender constancy achievement. A study of gender role knowledge demonstrates this distinction. Half of the 3-4-year-olds in a study showed knowledge about gender norms (such as responding that "girls usually play with Barbies") (Blakemore, 2003). These children presumably haven't reached gender constancy themselves, since it usually occurs around 6-7 years of age (Bussey & Bandura, 1999; Ruble & Stangor, 1986), and yet they are able to apply gender norms. Without necessarily comprehending gender constancy, preschoolers pay attention to certain gender norms (such as Barbies are for girls, not boys).

It is not necessary for children to have achieved gender constancy to analyze the influence of gender schemas on gender stereotype knowledge, which is what this project focuses on. Past studies support a gender schema model of gender role development (Levy & Carter, 1989). In particular, accurate attributions of gender role stereotypes related to children's gender schematization, not whether they had achieved gender constancy (Levy & Carter, 1989). My study will therefore not test for children's acquisition of gender constancy but instead their knowledge of gender-stereotyped information.

Gender Schema Theory: The best of CDT and SLT. Gender Schema Theory takes the best aspects of Cognitive-Developmental and Social Learning Theories of gender development. GST argues that children actively process and change their behavior in response to their interpretation and categorization of their social environment. Their social environment can include how sex-typed their friends are, how their family talks about gender, the shows they watch, and the stories they listen to. Like CDT, Gender Schema Theory argues that children actively try to make sense of their social world via gender cues (Martin & Ruble, 2004) and that sex-typing results from active processing of the environment (Maccoby, 2000). GST argues that

a basic understanding of gender identity is all that is required to motivate children to behave in a way that is consistent with their sex-typing perceptions (Martin et al, 2002). Children pick up on gender cues from their environment through observation, and they use them to build schemas (knowledge structures) for how they and other people act (Martin & Ruble, 2004). Like SLT, Gender Schema Theory acknowledges that social interactions with parents, friends, and caregivers in addition to societal messages (through media) are what shape the child's practice of sex-typing (Maccoby, 2000). GST, however, argues that children are actively interpreting their environment and do not rely on encouragement/discouragement by adults.

GST as an explanation for sex-typing. Gender schemas develop as a result of the societal emphasis on gender differences. Bem (1981) cites men's and women's bathrooms and separating children by boys and girls in classrooms as examples of how society divides according to gender. This general division based on gender is still a challenge in our current society as researchers urge early childhood teachers to recognize that the way they divide according to gender (girls work on this task, boys on this one) communicates to children that their roles in the classroom are based on their gender (Koch, 2003). In addition to the physical division, caregiver's speech also reinforces gender differences. In a study of caregivers' interactions with infants and preschoolers, caregivers often commented on girls' physical attractiveness and boys' size (Chick, Heilman-Houser, & Hunter, 2002). These findings support Bem's idea that children's environments reflect how society divides according to gender.

Children are not only divided by gender, they also witness the differences in their parents' and other people's behaviors. People report that U.S. society values certain characteristics in a person based on their gender (Parker, et al., 2017). These values are reflected in the acceptable everyday activities that people engage in. For example, men are more likely to

care for lawns, while women are more likely to report being responsible for housework, food preparation, and cleanup (U.S. Department of Labor, Bureau of Labor Statistics, 2014). Due to how pervasive these distinctions based on gender are, children pick up on their society's associations between characteristics (such as anatomy, occupations, personality) and gender (Bem, 1981).

Bem argued that societal differences between genders are so pronounced that children categorize people's gender based on social differences rather than genitalia. This argument derives from her study in which preschoolers identified pictures of children as male or female based first on their anatomy (specifically differences in genitalia) followed by their clothing (as markers of cultural characteristics). To pass the test, children needed to have enough knowledge about the genital differences between the sexes and to prioritize genital information over cultural characteristics. Only about 40% of 3-to 5-year-olds were able to do so (Bem, 1989). A more recent study corroborated this finding in that the majority of 3- to 4- year-olds explained gender differences based on cultural characteristics like hair and clothing. None of the age groups used genital differences as a primary explanation of gender identity (Volbert, 2000). Therefore, even though children have knowledge of differences in genitalia and can label them (Volbert, 2000), they are more likely to categorize someone as male or female based on dress, hairstyle, or clothing. These studies show that children do not rely on genital differences when categorizing gender, but instead use cultural characteristics as sources of gendered information to create schemas for masculine/feminine behaviors and characteristics (see Figure 1).

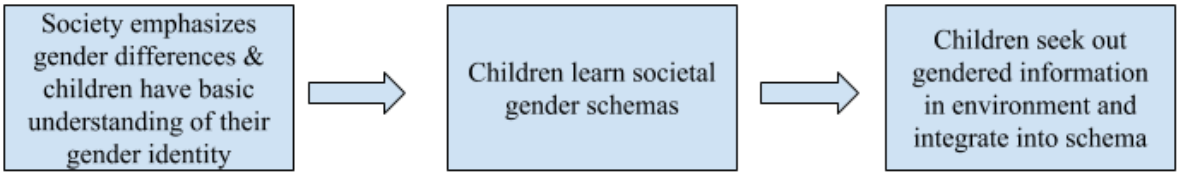

Figure 1. Gender schema development. From Bem (1981).

GST argues that children evaluate the appropriateness of their behavior in terms of their gender as a result of learning society's gender schemas. Bem (1983) gives the example of parents and other adults only using certain attributes when describing boys or girls. A parent, teacher, or caregiver may call a boy strong while they call a girl nurturing. Bem (1983) argues that as a result of having attributes ascribed to their gender, children learn what characteristics relate to them.

As children learn about applicable self-attributes, they simultaneously learn to evaluate their adequacy by comparing themselves to their gender schemas (Bem, 1981). Gender schemas then become prescriptive for children's behaviors, attitudes, and personalities, so that their characteristics are consistent with their schemas. Along with this prescription comes an internalized motivation, because the child has integrated their self into the schema, to regulate their behavior so it conforms to societal views of appropriate male/female behavior (Bem, 1981; Martin et al., 2002). The result is sex-typed behavior, which reinforces children's conception of themselves in terms of their gender because they observe their sex-typed behavior and integrate it into their schema for how girls/boys should behave (Bem, 1981), see Figure 2 for a depiction of this process.

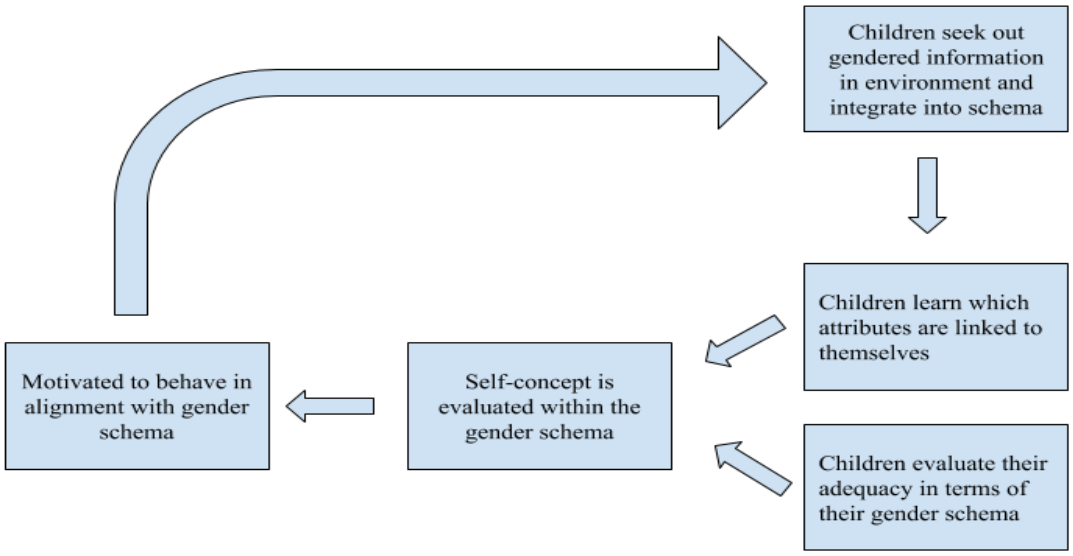

Figure 2. Integration of self-concept into the gender schema. From Bem (1981).

These schemas are not fixed, however, as children adapt them to evaluate and categorize new information as they grow up (Bem, 1983). For example, a toddler may consider high contact sports a masculine characteristic, and when they turn 4, they may use that information to evaluate themselves—e.g., "I should like to play football because I am a boy." A child's perception based on these schemas is, therefore, evolving as they incorporate new information into pre-existing schemas (Bem, 1981). Between the ages of 5- and 7- years-old children begin to consolidate information by categorizing it rigidly as masculine or feminine (Martin & Ruble, 2004; Trautner et al., 2005).

During this time of consolidation, children begin to place value on and personalize gendered information (Fitzpatrick & McPherson, 2010). An example of the effects of consolidation in this age group is children's preference for stories about main characters with the same gender as them who behave in a gender-typical way as opposed to stories about main

characters with the same gender as them who behave in gender-atypical ways (Jennings, 1975; Kropp & Halverson, 1983). If children were not making value judgments about the sex of main characters and their gendered behavior then they would not have this preference. They might instead prefer books about another character of a different sex playing with gender-atypical toys. Another example of preschoolers' valuing of same-gender information is their preference for gender-stereotyped toys. In a study of play behavior, boys played more with masculine toys than feminine toys and girls played the least with masculine toys (Weisgram, Fulcher, & Dinella, 2014). This play pattern was also be observed in other studies where adults, as well as children, could choose toys (Wood, Desmarais, & Gugula, 2002).

Children also personalize gendered information during their preschool years. In a study of the influence of adults' labeling of novel toys as "for" a child's gender or not on play behavior, researchers told children what gender liked to play with certain toys (Bradbard & Endsley, 1983). Children played significantly more with toys that were labeled as "liked more" by other children of the same gender and played significantly less with toys labeled as "liked more" by children of other genders (Bradbard & Endsley, 1983). In a similar study, experimenters labeled novel toys as toys that girls, boys, or both liked to play with. Researchers then asked children how much they liked individual toys. Children liked toys labeled as for their own sex more than those labeled as for another sex or unlabeled (Martin, Eisenbud, & Rose, 1995). Children, therefore, seem to personalize gender cues, in that their behavior and preferences line up with what adults told them children of their gender preferred.

GST should, therefore, be preferred over other explanations of sex-typing since it answers the question of why children often categorize information in terms of gender and not other characteristics. Children categorize by gender both because societal messages reinforce

gender distinctions by emphasizing characteristics according to gender (recall the 2017 Pew study) and because children are more accurate in identifying gender distinctions than race or attractiveness (Rennels & Langlois, 2014) so their schemas for gender are perhaps more readily developed. The next section discusses differences in children's development of gender schemas, specifically that boys may have stricter schemas than girls.

Gender differences in sorting gender-stereotyped items. Boys and girls differ in their sorting of gender-stereotyped items. A study tested 4-, 6-, and 8-year-olds' sex-role knowledge operationalized as the correct sorting of gender-stereotyped items. Children completed the Sex-Role Learning Inventory (SERLI) which includes line drawings of masculine- and feminine-stereotyped objects that children sort according to who the items are for. SERLI results showed that girls had less stereotyped preferences and less gender-role knowledge (correct sorting for who uses the item), and more flexibility in assigning gender roles (using the "both" category) than boys (Welch-Ross & Schmidt, 1996). A meta-analysis further supports these sorting patterns, as girls were more likely to sort items into a "both" category than boys (Signorella et al, 1993). Girls, therefore, may have less rigid gender schemas as they do not classify items as strictly "for boys" or "for girls" as boys tend to. Not only do boys have more knowledge of gender stereotypes and stronger tendencies to sort according to gender, other studies using the SERLI with 4-year-olds also found that boys had stronger preferences for masculine-stereotyped items than girls' preferences for feminine-stereotyped items (Turner & Gervai, 1995). These studies point to boys having more rigid schemas that are more in alignment with gender stereotypes than girls'.

Evidence for boys' gender socialization explains why boys have more gender-stereotyped schemas than girls. Boys (12- and 18-months-old) in an observational study received more

positive responses for male-typical toy play than girls. Fathers, in particular, gave fewer positive reactions to boys engaged in female-typical toy play than when boys engaged in male-typical toy play (Fagot & Hagan, 1991). A study on children's and parent's views of gender-stereotyped toys further supports the idea that girls are not receiving the same level of discouragement for male-typical play as boys are for female-typical play (Freeman, 2007). Parents reported less concern about their daughter being a "tomboy" and playing with blocks than their son expressing emotions (Freeman, 2007). This finding is further supported by interviews with parents about their reactions to their children's gender-nonconforming behavior (real or hypothetical). Parents responded more positively to gender-nonconforming behavior in girls than boys (Kane, 2006). One possible reason for this difference in socialization is that parents are concerned about how boys will be treated by others for behaving femininely (Kane, 2006). Boys, therefore, may pay more attention to, place more emphasis on, and have more knowledge of gender-stereotypes because their parents discourage them from engaging in female-typical play or displaying feminine characteristics.

Interviews with young boys demonstrate this pressure to abide by masculine gender norms not only from their parents but also from their peers. Three to 7-year-old boys were significantly more likely to report that their peers would react negatively to violations of gender norms, like painting their nails, than girls (Ruble et al, 2007). Girls in comparison to boys, therefore, may be paying less attention to what counts as male or female appropriate behavior and overall have less knowledge of gender stereotypes.

Schemas are beneficial in helping children make sense of their environment because they allow children to organize and interpret information (Martin et al., 2002). By grouping individuals together based on gender, and creating schemas based on their characteristics,

children are able to self-monitor, predict the behavior of others (based on past observations), and understand the social expectations linked to their gender (Martin & Halverson, 1981). Unfortunately, along with these benefits, gender stereotypes often shape schemas. Gender stereotypes influence schemas because the grouping of information according to social categories (in this instance gender) oversimplifies and generalizes information (Martin et al., 2002; Powlishta 2002).

Preschoolers' Gender Schemas and Stereotypes

The preschool years are a particularly crucial time in gender schema development because children are integrating and consolidating information into their gender schemas (Trautner et al., 2005). An increase in sex-typing is evidence for integration and consolidation of information because when children sex-type they are categorizing information into their schemas of maleness/femaleness. As mentioned previously, GST argues that the emphasis on gender distinctions in children's social environment (gender polarization) and their cognitive development influence their schema development and resulting sex-typing. Bem argued that two mechanisms in particular drive gender polarization: functional categorization (such as different aisles for girl and boy toys) and gendered language (e.g., a teacher addressing the class as "boys and girls" rather than "children") (Liben & Bigler, 2017). This next section covers ways that peers and parents use these mechanisms in interactions with preschoolers. It also discusses the way media (in particular toys and picture books) influences gender stereotype development.

Preschooler sex-typing. Preschoolers show an increase in sex-typing, which is reflected in their sorting patterns. Children's knowledge and opinions about gender stereotypes are more rigid (measured as a decrease in sorting stereotypical items into the "both boys and girls" category) during the preschool years and become more flexible in elementary school years

(increase in "both" responses) (Signorella et al., 1993). Not only are preschoolers rigid in their sex-typing, they also report that their beliefs are more in alignment with gender norms compared to older children. For example, preschoolers report that boys wearing nail polish is wrong (Ruble et al., 2007), and that toys are appropriate for boys and girls based on the toy's stereotype such as categorizing a tea set as for girls (Freeman, 2007). This inflexibility in sex-typing may be due to cognitive limitations such as weak dual classification abilities and difficulty in distinguishing between individual preference and social conventions (Trautner et al., 2005). This lack of classification skills may also hinder their ability to interpret gender atypical information (Trautner et al., 2005). For example, if researchers tell preschoolers that a boy likes to play with a kitchen set and then ask if he would like to play with a male-stereotyped or female-stereotyped item, preschoolers respond that the boy would like the male-stereotyped item even though that is inconsistent with his known preference (Martin, Wood, & Little, 1990). Preschoolers, therefore, show a lack of flexibility in their interpretation of gendered information, so research with preschoolers could shed light on their exposure to and views of gender stereotypes.

Preschoolers' sex-typed beliefs and sorting behaviors may be indicative of later patterns in sex-typing. A longitudinal 2008 study looked at children's sex-typed behaviors reported by the parents (at ages 2.5, 3.5, and 5), and at children's preferences for sex-typed items (reported by children at age 8) (Golombok et al., 2008). Parents reported their child's use of toys, items, activities, and displays of masculine and feminine characteristics. To record children's preferences for sex-typed items, researchers gave children a forced choice option from the same list of items parents responded to (Golombok et al., 2008). Importantly, this longitudinal study shows a developmental trend such that children who had high sex-typing scores when first tested (at 3.5-years-old) continued to have higher sex-typing scores (than children with lower sex-

typing scores), when tested later on (at 8-years-old) (Golombok et al., 2008). Research with preschoolers, therefore, can shed some light on early sex-typing behavior which indicates a specific developmental pattern for children through early childhood.

Peer influence. The spike in sex-typed behavior during the preschool years could be due to children's increasing socialization with same-sex peers. In an observational study of children's peer preferences in preschool and kindergarten classrooms over the course of 6.5 months, researchers found that boys and girls spent significantly more time with same-sex peers than other-sex peers (Martin & Fabes, 2001). In fact, many boys and girls in this study and another observational study played almost exclusively with same-sex peers (Martin & Fabes, 2001; Hoffman & Powlishta, 2001). Children who played more with same-sex peers than other-sex peers at the beginning of a study had an increase in sex-typed behavior (such as girls playing with dolls and boys playing with trucks) at the end of the study (Martin & Fabes, 2001). Therefore, preschoolers are playing more with same-sex peers which results in increasingly sex-typed behavior. From a GST perspective, children's play in same-sex groups could explain their increase in sex-typed behavior because children are easily able to tell what boys versus girls are doing. They could, therefore, functionally categorize behavior/toys/attributes according to gender resulting in sex-typing.

Parental influence. In addition to peers, preschoolers' interactions with their parents also encourage sex-typing of information. In interviews with parents of preschool children, parents often reported that they were responsible for molding their child's gender development. For both boys and girls, parents reported a balancing act of encouraging their children to behave in gender-atypical ways (such as a girl playing with toy cars) but not too atypically (such as a boy painting his nails) (Kane, 2006). This balancing act was stricter for parents of boys. These

parents described their son's gender-atypical behavior more negatively than girls'. Overall, these interviews show parents trying to actively influence their children's gender development (Kane, 2006). From a GST point of view, parents were functionally categorizing behaviors by encouraging/discouraging actions of children based on their gender. This functional categorization promotes children's sex-typing as they distinguish what their parents encouraged them to do versus other siblings, friends, etc.

In addition to functional categorization, parents use gendered language with preschoolers. When parents and children read picture books together parents often pointed out gender unnecessarily, i.e., when gender is not an important part of the story. For example, researchers reported parents saying "Do you see the boy pig?" instead of asking "Do you see the pig?". When researchers recorded mother's conversations with their children (ages 2, 4, or 6) about picture books, around half the time that a reference was made to a person it included explicit mention of the person's gender. In contrast to other physical differences (like age), mothers expressed gender twice as often (Gelman, Taylor, & Nguyen, 2004). Importantly, even when there is no clear gender, parents will use gendered language. In a study in which there were no clues given about the gender of animals, 95% of the animals were referred to as male by parents (DeLoache, Cassidy, Carpenter, 1987). Parents are, therefore, using gendered language which reinforces a polarized view of gender (e.g., boy pigs versus girl pigs) resulting in an increase in sex-typing.

Parents further reinforce gender polarization by acknowledging gender stereotype statements made by their children. For example, some parents said "Okay" in response to their child's generalization such as "Only boys can drive trucks" which could encourage generalizing from a book depicting a boy driving a truck, to mean that only boys drive trucks (Gelman et al.,

2004). This encouragement could explain why 4-year-olds were more likely to affirm gender stereotypes in their conversations with parents about books than negate them (Gelman, et al., 2004). Preschool years are, therefore, influential in gender development as children who were previously (and may continue to still be) susceptible to the gendered language of their parents, are now making their own gender statements which parents are confirming or denying.

Preschoolers are rigidly sex-typing due to cognitive development as well as peer and parental uses of mechanisms that reinforce gender polarization. As mentioned previously, schemas are susceptible to stereotypes (Martin et al., 2002; Powlishta, 2002). Due to preschoolers' lack of categorization skills, they have difficulty interpreting atypical information (Trautner et al., 2005) which may result in their schemas being disproportionately comprised of gender stereotype-typical information. This next section considers that, when preschoolers are actively seeking out gendered information for their schemas, they are likely to encounter gender stereotypes in their environment.

Toy influence. Preschoolers' gender development is strongly influenced by stereotypes associated with toys. As mentioned previously, preschoolers have strong preferences for gender-stereotyped toys (Weisgram et al., 2014; Wood et al., 2002). It is important to study these toy preferences in preschoolers because the majority of them play with toys, and comparatively, play with toys more than their older peers (Singer, Singer, D'Agostino, & DeLong, 2009).

Gendered toys lead to behavioral differences in play which can influence gender stereotype development. For example, traditionally masculine toys (such as trucks and action figures) promote physical activity, whereas feminine toys (such as dolls) promote nurturance, social proximity, and role play (Caldera, Huston, & O'Brien, 1989). Not only do toys encourage certain behaviors, they also result in behavioral differences. In a study of Chinese 6-year-olds,

girls had more comforting strategies (female-stereotyped behavior) for a simulated crying baby doll and were observed playing with female-stereotyped toys more than boys (Li & Wong, 2016). Based on these differences in behavior (girls communicating and boys acting) children may develop gender stereotypes about how girls and boys behave in general.

Parents' interactions with their children vary based on the toy their child is playing with, which encourages gender stereotypical communication styles in boys and girls. For example, when children played with feminine toys, parents asked more questions compared to when children played with masculine toys. Differences in toy play and the reaction from parents (such as beeping noises for cars versus conversations for dolls), therefore, lead to differences in parent-child interactions based on gender (Caldera et al., 1989). Toys, therefore, promote gender stereotype development about attributes such as nurturance in girls and strength in boys as well as gendered communication styles between parents and children.

Characteristics of certain female-oriented toys promote gender stereotypes such as what careers girls believe they can have. In a study measuring the influence of sexualized toys on girls' perceptions of what careers they could have, researchers presented 4-7-year-old girls with Barbies or Mrs. Potato Head for a period of free play. Afterward, girls were shown pictures of male-dominated, female-dominated or neutral careers, and asked if it was a job they could do when they grew up and if a boy could do the job when he grew up. Across all conditions, girls reported that boys could do more jobs than girls, although this difference was greatest when girls had played with Barbies compared to if they played with Mrs. Potato Head (Sherman & Zurbriggen, 2014). Therefore, characteristics (such as sexualization) of some girl toys, can communicate stereotypes about what type of jobs girls think that women can have.

Picture books. In addition to playing with toys, children often read or listen to picture books which contain gender stereotypes. Children absorb gendered language through a variety of mediums, but picture books are a useful means to measure how much of that information children pick up on because of how frequently children are read to. In a random sample of U.S. adults, parents read on average 44 minutes per day with their child (ages 2-4-years-old) (Rideout, 2014). Not surprisingly, children's books are doing well in terms of sales. Children's book sales continue to increase in the U.S. in 2017 compared to other book genres ("U.S. print books sales growth was slower than the previous three years", 2018). The Guardian's list of bestsellers from 2018 (gathered by Bookscan), sold cumulatively 16 million copies, nearly a third of which were children's books (Rowe, 2019).

Samples of children's books show patterns of gender stereotype depictions. An analysis of 30 Caldecott Medal award-winning and honors books from 1984-1994 show gender stereotypes in children's books. In particular, male characters were more active than female characters. Boys/men were also depicted with more masculine descriptors than feminine descriptors (fierce versus frightened) than girls/women (Turner-Bowker, 1996). An analysis of 200 award-winning and best-selling books published between 1995-2001 shows that picture books continue to contain gender stereotypes. Women were described as nurturing and mainly stayed within the home. Girls were commonly described as playing indoors with dolls whereas boys went on adventures outside of the house (Oleck, 2007). Children's picture books, therefore, have a history of containing gender stereotypes that has persisted.

This section explored developmental and social influences on preschoolers' schemas and sex-typing, and how preschoolers' social environment reinforces gender stereotypes through media (toys/picture books). These influences are important to consider because schemas shape

children's processing of information and are susceptible to stereotypes (Martin et al., 2002; Powlishta, 2002). As such, schemas could affect children's processing of their environment, especially if their media contain gender stereotypes. A common way to study how schemas influence children's processing of information, and what information sticks with them, is to test their memory for gendered information.

Impact of Gender Schemas on Memory

Gender schemas bias memory. There are downsides to children using schemas to evaluate gendered information because schemas can cause children to misremember gender-atypical information. This misremembering functions to further reinforce gender schemas because children remember gender-typical information as the appropriate behavior and do not remember counter-examples. Evidence from past studies shows this effect in young children. After being read picture books containing gender-typical, atypical, and neutral items, 6-year-olds were asked yes or no recognition questions about the items in the stories and distractor items. They had better memory for gender-typical items than gender-atypical items (Welch-Ross & Schmidt, 1996), and for gender-typical behavior than gender-atypical behavior (Liben & Signorella, 1993). Other studies also found that kindergarten and first grade children were more likely to misremember the sex of the actor in a picture if they were doing something gender-inconsistent compared to if they were performing a gender-consistent action (Drabman 1981; Gelman et al., 2004; Martin & Halverson, 1983). For example, when asked if they remembered who was performing ballet in a picture, children would incorrectly respond that it was a girl when really it had been a boy. Children of the same age will even misremember atypical gender behavior so that it becomes stereotype consistent, such as remembering a man as brave and a little girl as strong, when the opposite was depicted (Frawley, 2008).

In addition to misremembering gender of actors depicted in atypical ways, children remember information labeled as for their own gender more than information labeled as for another gender. A meta-analysis of memory for children up to college-age found that participants had better memory for pictures and words viewed by society as matching their gender (e.g., girls had better memory for feminine pictures) compared to information for other genders (Signorella, Bigler, & Liben, 1997). Preschool children show this bias in memory for information labeled as for their sex. In a study of children's memory for toys they had seen in a room and had the opportunity to play with, children remembered toys considered by the researchers to be stereotyped for their gender more than toys considered for another gender (Cherney & Ryalls, 1999). Another study found similar results with novel toys (Bradbard & Endsley, 1983) such that when researchers labeled a novel item as "for boys" boys were more likely to remember the name of the item compared to girls (Bradbard & Endsley, 1983). Schemas can, therefore, bias memory as these studies show a trend of misinterpretations and incorrect memory of gender stereotype-inconsistent information and information labeled as not for their sex. It is still up for debate; however, what stage of memory is impacted by schemas.

Schemas could worsen memory for gender-atypical information by interfering with encoding or causing issues with retrieval. A problem with encoding would be if a child was unable to initially learn the information, whereas a problem with retrieval would be if the information was successfully encoded (or learned) but could not be recovered. Researchers tested which memory process schemas impair by placing kindergarten through 3rd-grade children in label or no label conditions for gendered information. These researchers reasoned that if schemas were causing stimuli to be uninterpretable during encoding then labels for atypical information would correct for this memory deficit by providing "ready-made

interpretations" for children (Liben & Signorella, 1993, p. 142). For example, if a child is shown gender-atypical information such as a picture of a female firefighter, then they may not be able to later recall that picture because they could not encode the woman as a firefighter when initially viewing the picture. This task gave children a label such as "here is a firefighter" which could facilitate memory of atypical information (if encoding is what is impacted by schemas) by giving children a label for what they saw. In comparison, if children had worse memory for atypical information due to problems with retrieval then providing labels would not impact memory because labels only assist with encoding information. Children in both the label and non-label condition were significantly less accurate in remembering gender atypical than typical pictures of activities (Liben & Signorella, 1993). This finding contradicts the idea that problems with encoding are what impacts later recall because labels didn't improve memory for gender atypical pictures.

Results from Liben and Signorella's (1993) study suggest that the problem with remembering gender atypical information does not entirely stem from issues with the initial encoding of the information. Instead, there may be a complication with the storage or retrieval of the memory (Liben & Signorella, 1993). Perhaps due to the salience of certain schemas, information relevant to those schemas is more easily retrieved than information pertinent to other schemas. Information consistent with gender schemas could be particularly easy to retrieve perhaps due to extensive knowledge networks connecting stereotype knowledge that children are in the process of developing (Bauer, Liebl, & Stennes, 1998). Factors such as the salience of gender categories and the rich associations of gender-typical behavior schemas explain this response since they could cause easier retrieval for information consistent with gender schemas (Ruble & Stangor, 1986). Children may not remember gender-atypical information, on the other

hand, because it lacks the rich associations of gender-typical information (Ruble & Stangor, 1986). Regardless of the specific interference in memory, the current study focuses on the way that sex-typing information can cause children to distort or forget information that is inconsistent with their gender schemas. I will be focusing on children's retrieval of information because as Liben and Signorella's study suggested, the difference between recall of gender-typical or gender-atypical information is not entirely due to encoding errors.

Limitations of recall testing as a measure of preschoolers' memory. Researchers can test children's memory in a variety of ways such as free recall, cued recall, or recognition. Recall or cued recall are not developmentally appropriate measures of preschoolers' memory of stories because preschoolers report significantly less information when researchers ask them to free recall stories. For example, when asked a general question about the plotline of a story, preschoolers accurately reported fewer than half of the story events (Greenhoot, Beyer, & Curtis, 2014; Greenhoot & Semb, 2008). Even when researchers gave children pictures from the story in the order of the events, 4- and 5-year-olds' mean recall score did not exceed memory for half of the events (Jennings, 1975) which further supports the notion that preschool children are not able to accurately recall most of the information contained in a narrative. My study focuses on the impact of gender stereotypes on memory, it would be beneficial, therefore, for children to remember most of the story in order to separate memory impacted by gender stereotype depictions from memory of non-gendered events. In other words, having a high baseline level of memory allows for further analyses (such as how the type of gendered information influences recognition) while avoiding a floor effect.

Free recall as a measurement of preschoolers' memory for stories often involves prompting which complicates how to report and score memory. For example, some studies listed

prompts for children if they did not respond to "Tell me what happened in that story," (Greenhoot & Semb, 2008; Kropp & Halverson, 1983) which seems to at least shape the child's depiction of the story compared to if the child recounted the story without prompting. Prompting is problematic because researchers group children's scores together regardless of if they (1) needed no prompting and immediately detailed the story (2) needed a small amount of prompting ("What happened next?") or (3) offered up no information and only responded after being asked specific questions ("Who bought William the doll in the end?"). These three levels of prompting indicate different levels of recall, with the specific questions testing cued recall. My own study aims to avoid distinctions in prompting between children and general low recall by studying preschoolers' recognition of a story.

Recognition capabilities of preschoolers. Compared to free recall, preschoolers are more accurate in their responses to recognition tests. After being shown a box of items, then another box with half the items from before and half new items, the mean level of correct response (i.e., saying yes if an object had been shown to them in the first box and no if it wasn't shown previously) for both the 2-3-year-olds and 3-4 ½-year-olds was over 80% (Perlmutter & Myers, 1974). This high percentage of correct recognition supports the idea that preschoolers' recognition memory begins to be closer to that of an adult's as they enter elementary school (Perlmutter & Myers, 1974; Berk, 2011) which makes recognition an appropriate test of memory for this study because, as mentioned previously, high overall recollection of the story allows me to separate memory for gender-typical from gender-atypical gender information.

Recognition is an appropriate test of memory for my study because it doesn't rely on children having the verbal ability to explain a narrative. In a study measuring differences in verbal and non-verbal memory in preschoolers, 2-to 4-year-old children had worse verbal recall

than nonverbal indications of events (pointing to photographs of events). Children over the age of 2, however, accurately recognized around six (out of eight) of the object photographs involved in the event (Simcock & Hayne, 2003). Results from this study indicate that recognition could be a superior means to measure memory for this age group, compared to free recall, because preschoolers may lack the verbal capacity to explain stories or events. Their inability to verbalize events does not mean that they don't remember as children from Simcock and Hayne's (2003) study were able to both remember a majority of images from the event and to correctly reenact parts of the event.

Recognition as a test of schema influence. Recognition is not only a developmentally appropriate test of memory, it is also relevant for studying the influence of schemas. A recent study tested the influence of a newly learned schema on recognition memory for schema consistent and inconsistent stimuli. To create this schema, participants were told a certain type of flower differed from others in one respect (such as the number of petals) and they were to figure out what this distinction was. Results showed participants had higher rates of recognition for previously shown flowers from the learned category (versus previously shown flowers, not from the category) and high rates of falsely recognizing category consistent but not previously shown flowers (De Brigard, Brady, Ruzic, & Schacter, 2017). Although adults were the participants in this study, the results are pertinent to the current study because they shed light, in general, on the ability of recognition tests to measure the influence of schemas. For example, in conditions in which the participant could not learn the category due to the complexity of the task, they didn't show a memory bias for category consistent information (De Brigard et al., 2017).

The Current Study

The current study analyzed the possible impact of gender schemas on preschoolers' memory for gendered information, sorting of gender-stereotyped items, and preference for picture books (one with a male main character, the other with a female main character). Previous studies tested either memory for or sorting of gendered items (Martin & Halverson, 1983; Signorella et al., 1993; Welch-Ross & Schmidt, 1996) but did not look for a relationship between the two. The current study is unique because it tests this possible relationship, specifically in the context of gender schemas, by using a sorting task as an indicator of the content of preschoolers' schemas. I used a memory task to test the influence of children's schemas on their processing of information to see if children's schemas (i.e., their sorting behaviors) are related to their memory for different types of gendered information. I wrote picture books, a form of media that often contains gendered information (Olek, 2007; Turner-Bowker, 1996), to convey gendered information to children. Within these books, I used toys as gendered items because children are aware of gender stereotypes about toys (Martin et al., 1990). I used novel objects, labeled as toys in the picture books, to test children's use of gender schemas to categorize gendered information.

This study tests to what extent children are using schemas to interpret information. If their schemas are far-reaching and applied to novel information then children should categorize novel items labeled as appropriate for *one* gender as appropriate for *only* that gender. Previous studies have focused on children's memory of gender-typical and atypical familiar items (Cherney & Ryalls, 1999; Welch-Ross & Schmidt, 1996) but not novel items. Children's previous experience with familiar items, however, could bias their stereotype association. For example, if I used dolls instead of novel items the children might have had preconceived notions

about who can play with dolls. In comparison, using novel objects limits the possibility that children are familiar with that object, a strategy that is currently missing in children's schema literature. If children are processing gendered information through their schemas, then I would expect their memory for gender-typical information to be better than their memory for gender-atypical information.

My *first hypothesis* was that children would have better memory for items related to gender-typical information than gender-atypical information. My *second hypothesis* was that children with high scores on the gender stereotype sorting task would have better memory for gender-typical information than gender-atypical information compared to children with low scores on the sorting task. Specifically, boys would have higher combined sorting scores and better memory for gender-typical information compared to girls who would have lower combined sorting scores and better memory for gender-atypical information. Finally, based on past research on preference for own-sex information, my *third hypothesis* was that children would like stories starring a protagonist of their own gender more than stories starring a protagonist of another gender.

Method

Participants

Fifteen children (11 girls, 4 boys), 47-60 months old (M = 54.53, SD = 3.87), from a local nursery school, participated in the current study over the course of a week. After the study received IRB approval (Appendix A), I asked permission from the nursery school director (Appendix B). After getting permission from the director, I passed out permission slips (Appendix C) in cubbies prior to testing. The 15 children whose parents gave written consent (and who gave verbal assent at the time of testing) were included (see Appendix D for the script used).

Materials

Picture books. For this study, I wrote two picture books based on *William's Doll* by Charlotte Zolotow. The plots of my books were similar to *William's Doll* since they used toys to convey the message that children can behave in gender-atypical ways, and their family will still accept them. Both stories for my study also included the main character playing with gender-typical toys and neutral information (see Appendix E and F for the Yuki and Hatsu's stories). The books I wrote for this study differed from each other in title and toy used. I chose toys to convey gender-stereotypes in the books because preschoolers play with them frequently (Singer et al., 2009) so they are a familiar source of gender stereotypes. In each story a main character played with two types of toys, one typically used by their gender (gender-typical toy) and one that was new to both the character and the children listening and was described by the parents in the story as not appropriate for the main character based on their gender (gender-atypical toy). I selected the atypical toys on the basis that past research found them to be novel to young children and not differentially preferred by either gender. These toys included a mezzaluna (a type of pizza cutter) (Bradbard & Endsley, 1983) and a prism (Martin et al., 1995). In addition to the atypical items, gender-typical toys (a dollhouse and a transformer) were also included. I chose the dollhouse as the female-stereotyped item and the transformer as the male-stereotyped item because previous research shows that these items are familiar and sex-typed by children (Martin et al., 1995). See Appendix G for images of the toys used in the stories.

Sorting Task. I used an adapted version of Leinbach, Hort, and Fagot's (1997) Gender Stereotyping Test in the current study to test children's ability to sort items according to gender stereotypes. For their test, Leinbach, Hort, and Fagot asked children to sort pictures of items into

boxes labeled as for “girls” or “boys”, with pictures and words. I used the same instructions as their test so children were told that they would be shown cards with "Pictures of things people could look at, or play with, or use to work with. Some of these things are more for girls, and some things are more for boys. If you think [a card] is mostly a girl kind of thing, put it in this box, and if you think it is a boy kind of thing, put it in this one” (Leinbach, Hort, and Fagot, 1997 p. 114). In addition to the girl and boy boxes, in this current study, there was another box for if children thought it was a boy *and* girl thing (see Appendix H for a picture of the boxes I used). The Gender Stereotyping Test was the basis for my sorting task because it combines items from the SERLI (Sex Role Learning Index) known to be sex-typed by young children with more recent items, considered by adults to be sex-typed, but which researchers have not used as frequently as SERLI items with young children. For the purposes of this study, I excluded some items from the Gender Stereotyping Test from my sorting test. I did not include items utilized to test sorting of metaphorical gender stereotypes (such as the association between soft and femininity depicted in their velvet card) because my study does not focus on metaphorical manifestations of gender stereotypes. I excluded other items because they were inappropriate for a school setting (such as a knife and rifle). For the current study, there were 11 male stereotyped items, 10 neutral, and 10 female stereotyped items. For a full list of items and their pictures see Appendix I.

Procedure

Pre-phase 1: Names. I polled 19 undergraduates on how gendered they ranked a list of Japanese gender-neutral names. I did this polling to select gender-neutral main character names for my picture books so as to avoid a particular name unintentionally seeming more masculine or feminine than the other and, therefore, influencing how children viewed the character. I

distributed preliminary questionnaires to a college class listing five possible names (see Appendix J for full questionnaire). I chose the two names (Yuki and Hatsu) that students scored as the most neutral (so were either primarily scored as neutral or in-between female & neutral or male & neutral). I assigned Yuki as the female main character (a duck) and Hatsu as the male main character (a fox) in the two books.

Pre-phase 2: Main characters. After choosing the main characters' names (Yuki and Hatsu) I decided to use animals as the main characters to avoid similarities in physical appearance between the children and the main characters which could occur if the books had humans as main characters. Similarity in appearance could influence children's memory because if children look similar to the main character they may remember the story more because children may view the story as associated with the self. Previous research provides evidence for a self-reference effect influencing children's memory as preschoolers had better memory for items presented with a picture of their face compared to someone else's (Cunningham, Brebner, Quinn, & Turk, 2014).

Next, I researched animals labeled as gender-neutral in picture books or depicted as equally male or female. This research was important so that I did not choose an animal that children may have associations with as strongly male or female. Ducks and foxes were appropriate candidates for main characters (Yuki and Hatsu) in these picture books because they are equally represented as both genders in Amazon's top children's books for those animal categories. I avoided insects, large mammals, and mythical creatures because they were almost always male or female main characters with little flexibility in a 2017 study of top-selling children's books (Ferguson, 2018). Despite these measures, children may still have preconceived notions about the gender of these animals (such as viewing foxes as female or

ducks as male) which is why the number of pronouns (22) and the number of times I said their names (10) was the same in both stories I wrote.

Testing phase. First, I read children two stories. I counterbalanced the order of the stories (half of the girls listened to Yuki's story first, half listened to Hatsu's and the same was done for boys). After each story children answered comprehension questions to test their recognition of the stories. These questions and answer choices were read aloud and were accompanied by pictures. For both recognition tests there were three questions for the responses related to the atypical information (such as "What did Yuki/Hatsu want to play with?") and four neutral questions unrelated to the gender- atypical or typical information (such as "What color was Yuki/Hatsu"?) and one question about the gender-typical information ('Who played with the transformer/dollhouse?") (see Appendices K and L for the complete list of recognition questions). I asked children which story they liked better to record their preference. Finally, children sorted gender-stereotyped items (from the Gender Stereotyping Test) into boxes. I asked children if they had any questions about the books or the sorting task, and I gave them stickers and a debriefing form for their parents (see Appendix M) which we put in their cubbies.

Scoring

Recognition. Children received three recognition scores for each book: percent of correct responses to questions about atypical (out of 3), typical (out of 1), and neutral (out of 4) information. Children also received scores for total recognition of atypical, typical, and neutral questions for the two books combined. For example, if a child correctly answered all questions about neutral information for both books they would receive an 8 out of 8 or 100%. I calculated recognition scores as percents in order to compare recognition across the different types of

information. The lowest possible score for atypical, typical, and neutral information was 0% and the highest possible score was 100% correct.

Sorting. Each child received a boy, girl, and boys and girls sorting score based on the proportion of cards correctly sorted into the gender-stereotyped category. For example, if a child sorted 20 cards into the "for boys" box, 11 of which were the masculine-stereotyped cards, then they received a boy sorting score of 100% because they correctly sorted all of the male stereotyped items into the boy box. I calculated an overall sorting score for each child by summing all of their correctly sorted cards and dividing by 31. Therefore, if a child correctly sorted all cards they would receive a 31 out of 31 or a 100% total sorting score. The lowest possible sorting score for both combined and individual scores was 0% with the highest being 100%.

Preference. I recorded children's preference for either Yuki or Hatsu's book. Some children answered that they liked both books equally and I gave them a "both" score.

Results

Memory for Typical and Atypical Information

I conducted a paired-samples t-test to compare memory (using recognition scores) for typical (gender-appropriate toy) and atypical (gender-inappropriate toy) information. There was not a significant difference in scores for typical (M = 76.67, SD = 31.91) and atypical (M = 81.13, SD = 23.46) memory; $t(14) = .44$, $p = .669$. My first, hypothesis was, therefore, not supported because children did not have a significantly better memory for typical information compared to atypical information.

Gender Differences in Memory

To compare overall memory for neutral information for girls and boys, I conducted an independent-samples t-test. There was not a significant difference in the scores for girls' (M = 94.46, SD = 8.48) and boys' (M = 87.75, SD = 10.21) memory for neutral items; $t(13) = 1.29$, $p = .220$. I conducted this test in order to confirm that one gender did not have a significantly better memory for neutral information than the other because memory for neutral information is indicative of their memory ability in general.

To test my second hypothesis, that girls and boys would differ in their memory for typical and atypical information, I conducted two independent-samples t-tests. There was not a significant difference in the scores for girls' (M = 72.73, SD = 34.38) and boys' (M = 87.50, SD = 25.00) memory for typical information; $t(13) = -.78$, $p = .450$. There was also not a significant difference in the scores for girls' (M = 80.36, SD = 20.77) and boys' (M = 83.25, SD = 33.50) memory for atypical information; $t(13) = -.20$, $p = .842$. Part of my second hypothesis, that boys would have significantly higher memory scores for typical information than girls and that girls would have significantly higher memory scores for atypical information than boys was not supported.

Gender Differences in Sorting

Even though there was no significant difference in boys' and girls' memory for gendered information, there could have been gender differences in children's sorting of gender-stereotyped items. I conducted an independent-samples t-test to compare combined sorting scores for girls and boys. Due to sorting 100% of feminine-stereotyped items into the "for girl" box, one female participant's scores were significantly higher than the median so I computed results including her

score and excluding her score to see if there was a difference. With the outlier included there was not a significant difference in the scores for girls' (M = 46.73, SD = 10.57) and boys' (M = 48.50, SD = 6.03) combined sorting; $t(13) = -.31$, $p = .760$. With the outlier score excluded there was also not a significant difference in the scores for girls' (M = 44.60, SD = 8.30) and boys' (M = 48.50, SD = 6.03) combined sorting; $t(12) = -.85$, $p = .414$. Since there was no change in significance when the outlier was excluded, I did not exclude the outlier from further tests involving girls' sorting of items. The other part of my second hypothesis, that boys would have higher combined sorting scores than girls was, therefore, not supported. I did not, therefore, test the second part of my second hypothesis, since it relied on the assumption that boys and girls had significantly different memory for gendered information and differed in their sorting of gendered items which these tests show is not the case.

Picture Book Preference

I used a Chi-square test of independence to test my third and final hypothesis, that children's book preference would differ according to gender such that boys would prefer the male main character story (Hatsu) and girls would prefer the female main character story (Yuki). Girls were no more likely to prefer Yuki or Hatsu's story than boys or to like both $\chi^2(2) = 2.05$, $p = .360$ (see Figure 3). While there were no significant differences in preference, no boys preferred Yuki's story, while four of the girls preferred Hatsu's story. These results, therefore, do not support my third hypothesis, that children would prefer books with main characters of the same gender.

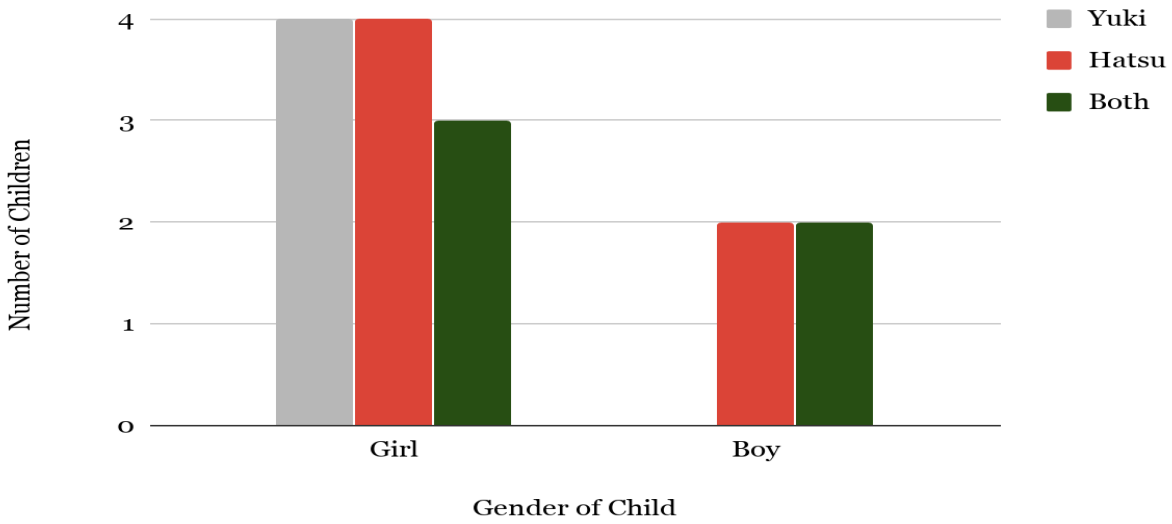

Figure 3. Picture book preference. Preference for girls and boys was measured by the number of children who said they preferred Yuki or Hatsu's story or liked them both.

Exploratory Analysis

Gender differences in recognition scores for individual stories. Although there was no difference in combined memory scores for boys and girls, their memory scores differ depending on the gender of the main character in the story. I conducted exploratory analyses because a combined memory score used in the above analyses does not differentiate based on the two stories. I conducted an independent-samples t-test to compare memory for Yuki's story for girls and boys. There was not a significant difference in the scores for girls' (M = 88.82, SD = 12.94) and boys' (M = 84.50, SD = 18.56) memory for Yuki's story; $t(13) = .51$, $p = .617$. There was also not a significant difference in the scores for girls' (M = 84.36, SD = 13.70) and boys' (M= 87.75, SD = 10.21) memory for Hatsu's story; $t(13) = -.45$, $p = .662$. Boys and girls, therefore, did not have differences in memory for Yuki or Hatsu's story.

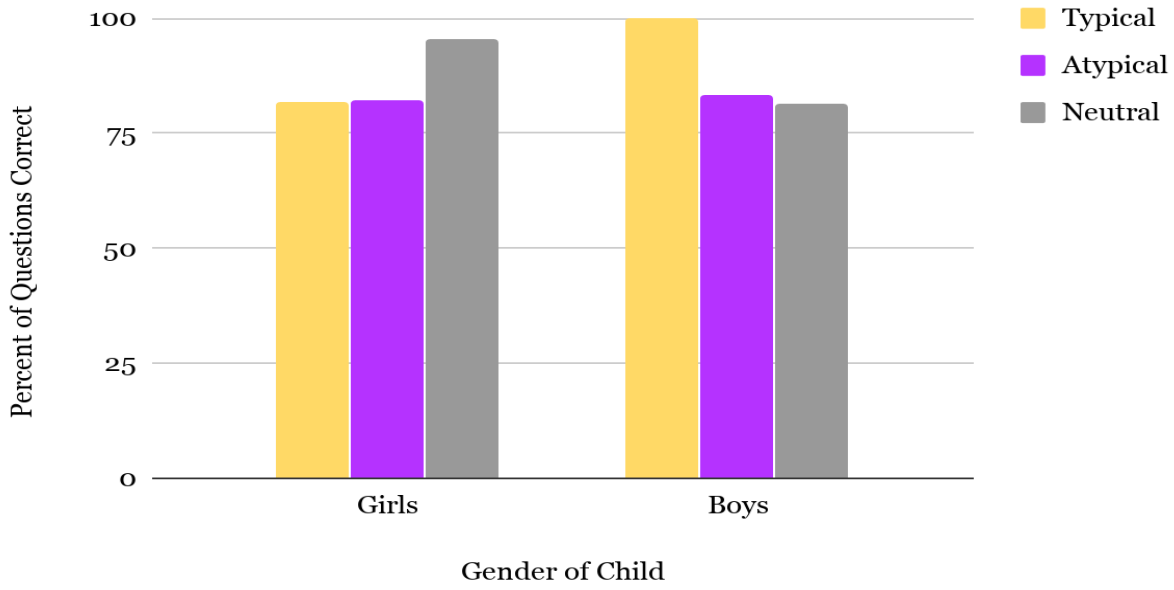

Figure 4. Memory for Yuki's Story. Memory for girls and boys was measured by percent of correct answers to questions about gendered information (typical, atypical, and neutral).

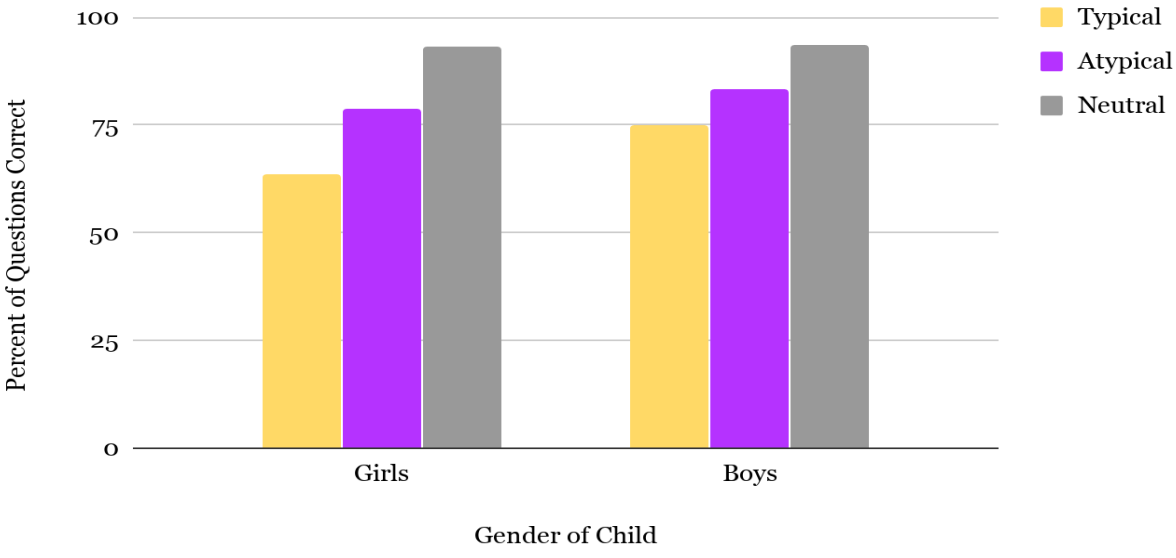

Figure 5. Memory for Hatsu's Story. Memory for girls and boys was measured by percent of correct answers to questions about gendered information (typical, atypical, and neutral).

Gender differences in sorting for feminine- and masculine-stereotyped items. I computed gender differences in the sorting of the different categories of items. I computed categories separately because the combined sorting scores used in previous tests do not pinpoint differences in children's sorting of items stereotyped as matching their own or another gender. I conducted an independent-samples t-test to compare sorting scores for feminine-stereotyped items for girls and boys. There was not a significant difference in the scores for girls' (M = 50.91, SD = 23.00) and boys' (M = 35.00, SD = 5.77) sorting scores for feminine-stereotyped items; $t(13) = 1.34$, $p = .204$. I conducted an independent-samples t-test to compare sorting scores for masculine-stereotyped items for girls and boys. There was not a significant difference in the scores for girls' (M = 31.91, SD = 14.71) and boys' (M = 51.75, SD = 26.87) sorting scores for male-stereotyped items; $t(13) = -1.86$, $p = .085$. Girls and boys, therefore, did not differ in their sorting of feminine- or masculine- stereotyped items.

Sorting task item analysis. I analyzed the individual sorting of items to test if children were sorting according to the stereotypes of the items. If children were not sorting items preferentially for the "correct" gender category then perhaps that item is outdated or considered neutral in today's society compared to when the test was first used. To conclude if sorting items were being sorted above chance into a category I conducted a Chi-square test using a corrected p-value of 0.002 (to avoid Type 1 error due to the high number of items). Children only sorted two items, ribbon $\chi^2(2) = 24.40$, $p < .002$ and toy pony $\chi^2(2) = 19.60$, $p < .002$, at above-chance levels into one category (the "for girl" category).

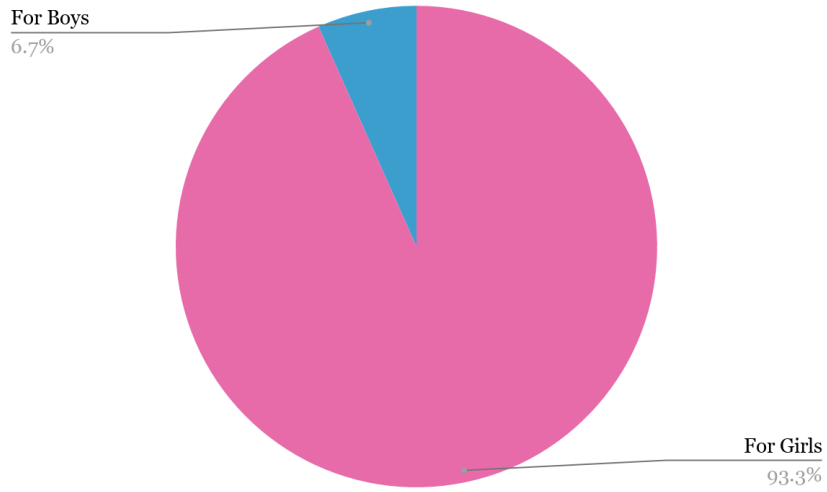

Figure 6. Sorting of ribbon. Sorting was measured by percent of children who sorted ribbon into the "for girls", "for girls and boys", or "for boys" category.

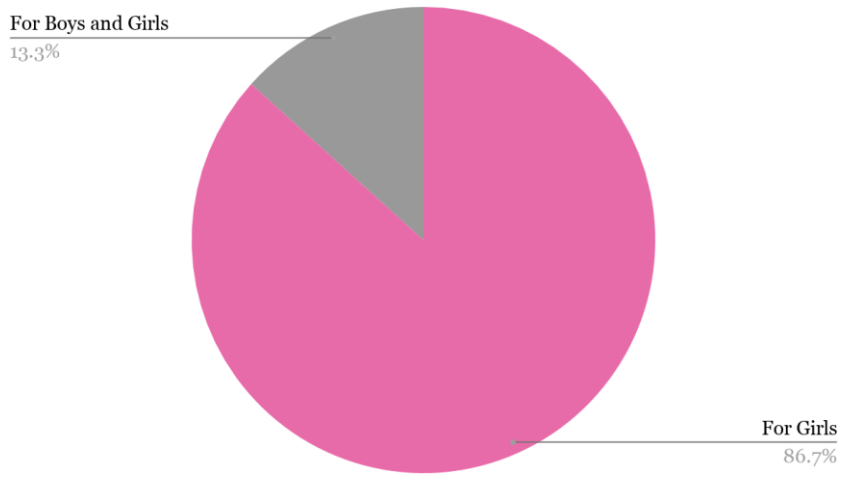

Figure 7. Sorting of toy pony. Sorting was measured by percent of children who sorted toy pony into the "for girls", "for boys and girls", or "for boys" category.

Due to the high number of sorting items excluded with this p-value, I conducted a Chi-square test again with an uncorrected p-value of .05. With a p-value of .05, children sorted 12 of the 31 items significantly into one category more than by chance (see Tables 1-3 for results of the Chi-Square divided by the stereotype of items).

Table 1
Chi-Square Sorting of Feminine-Stereotyped Items

Item	$\chi 2$	*p*
Needle and Thread	12.40	0.002*
Broom	5.20	0.074
Moon	0.40	0.819
Ribbon	24.40	<0.002**
Baby Bottle	4.80	0.091
Maple Tree	1.20	0.549
Iron	1.20	0.549
Yellow	0.40	0.819
Dishes	8.40	0.015*
Toy Pony	8.07	<0.002**

Note. df = 2 for every item
* p < 0.05
** p < 0.002

Table 2
Chi-Square Sorting of Masculine-Stereotyped Items

Item	$\chi 2$	*p*
Jeans	3.60	0.165
Airplane	1.60	0.449
Blue	0.40	0.819
Firefighter Hat	7.60	0.022*
Blocks	11.20	0.004*
Kite	6.40	0.041
Money	4.80	0.091
Hammer	4.80	0.091
Bat and Ball	2.80	0.247
Red	1.60	0.449
Truck	11.20	0.004*

Note. df = 2 for every item
* p < 0.05
** p < 0.002

Table 3
Chi-Square Sorting of Neutral-Stereotyped Items

Item	$\chi 2$	*p*
Book	11.20	0.004*
Phone	7.60	0.022*
Ice Cream Cone	7.60	0.022*
TV	5.20	0.074
Tricycle	11.20	0.004*
Camera	2.80	0.247
Glasses	2.80	0.247
Crayon	6.40	0.041*
Tape	5.20	0.074
Teddy Bear	0.40	0.819

Note. df = 2 for every item
* p < 0.05
** p < 0.002

Children sorted three of the items (blocks, kite, dishes) into a category not matching their stereotype. Children sorted these items above chance into the "for girls and boys" category even though they were stereotyped as "for boys" or "for girls." See Figures 8-10 for the sorting of these three items. Children did not sort the remaining 19 items at above-chance levels into a single category.

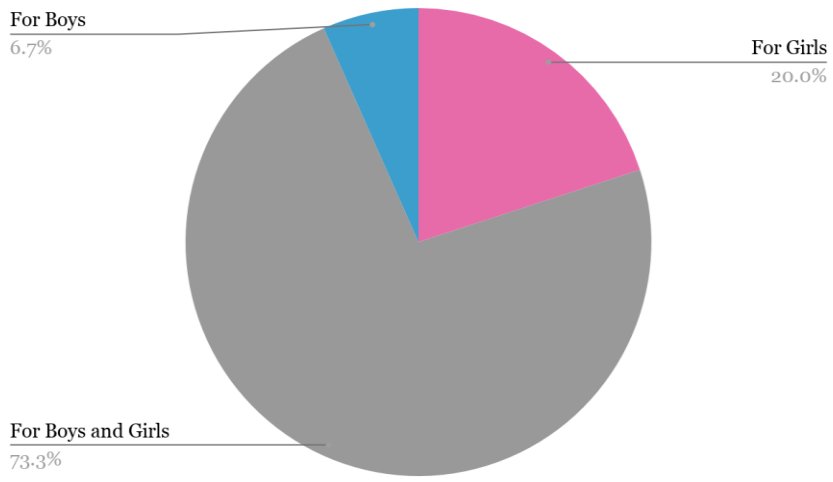

Figure 8. Sorting of blocks (masculine-stereotyped). Sorting was measured by percent of children who sorted blocks into the "for girls", "for boys and girls", or "for boys" category.

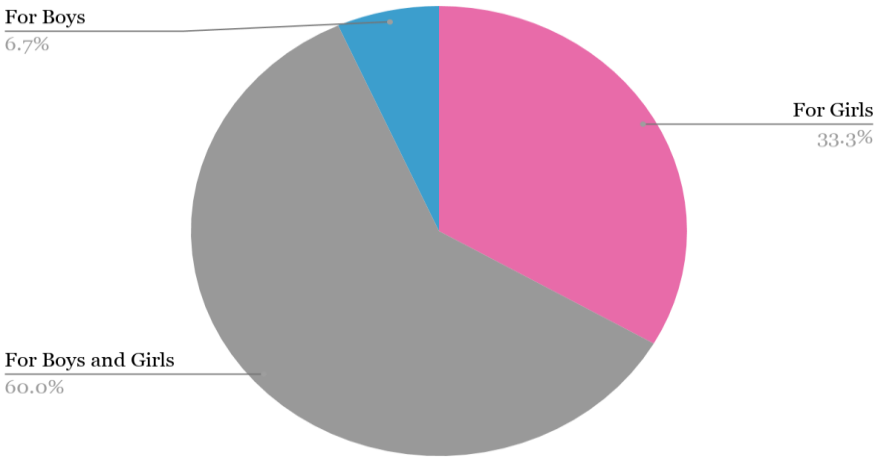

Figure 9. Sorting of kite (masculine-stereotyped). Sorting was measured by percent of children who sorted kite into the "for girls", "for boys and girls", or "for boys" category.

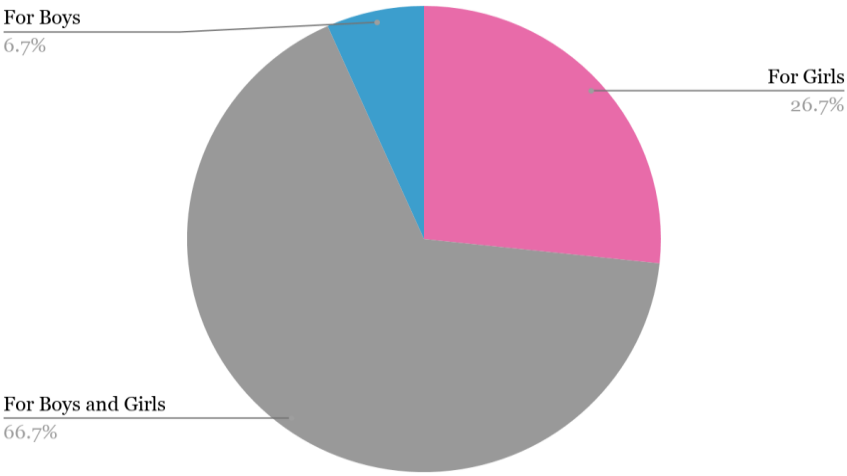

Figure 10. Sorting of dishes (feminine-stereotyped). Sorting was measured by percent of children who sorted dishes into the "for girls", "for boys and girls", or "for boys" category.

Excluded items from sorting task analysis. To test if items sorted significantly above chance into the incorrect category (blocks, kite, and dishes) and items not sorted significantly above chance into the correct category (jeans, airplane, broom, moon, blue, baby bottle, maple tree, iron, money, yellow, hammer, bat and ball, and red) were influencing children's sorting scores and tests using these sorting scores, tests were re-conducted without these items. I did not

exclude TV, camera, glasses, tape, and teddy bear for re-conducting of these tests because they were neutral items, so the insignificant results of their Chi-square tests support their status as neutral items because they were not sorted into a gender category significantly above chance. This exclusion process resulted in 14 items remaining for subsequent analyses.

Gender differences in sorting reduced set. I conducted three independent-samples t-tests to compare combined masculine, and feminine-stereotype sorting scores for girls and boys without items not sorted significantly above chance into the correct gender category. There was not a significant difference in the scores for girls' (M = 66.55, SD = 18.00) and boys' (M = 61.75, SD = 22.02) combined sorting; $t(13) = 0.43$, $p = 0.673$. There was also not a significant difference in the scores for girls' (M = 87.91, SD = 22.49) and boys' (M = 75.00, SD = 50.00) feminine-stereotyped item sorting; $t(13) = .71$, $p = .489$. Finally, there was not a significant difference in the scores for girls' (M = 72.73, SD = 26.11) and boys' (M = 62.50, SD = 47.87) masculine-stereotyped item sorting; $t(3.671) = 0.41$, $p = .707$. Excluding these items, therefore, did not change the results--there was still no significant difference in girls' and boys' sorting of items.

Sorting patterns: dichotomized or not. Overall, it seemed like children were using the "for both" category more often than previous studies suggested they would (Signorella et al., 1993). I counted how many cards children sorted into the "for both" category to test if children were sorting in non-dichotomized ways (i.e., not primarily sorting items into "for girls" or "for boys" boxes but sorting items into the "for both" category). The majority of children (ten out of 15) sorted ten or more cards into the "for both" box (which is at or above chance for sorting 30 cards into three boxes). Out of the five remaining children, only two put five or fewer cards in the "for both category." Overall, it seemed that children were comfortable sorting into the "for

both" box, but were not using it preferentially over "for girls" or "for boys" (see Table 4 for average frequencies of sorting by category). In other words, the majority of children were sorting in both dichotomized ways (by using "for girls" or "for boys" boxes) and non-dichotomized ways by using the "for both" box.

Table 4
Average Frequency of Sorting Items by Category

Sorting Box	*M*	*SD*
Girls	9.93	4.60
Girls and Boys	13.67	5.71
Boys	7	6.92

Due to the differences in the mean number of cards sorted into the three categories, I conducted a single-sample t-test to determine if a statistically significant difference existed between my sample's sorting of items by category and the chance rate of 10.33 cards per category. Participants in my study sorted a different number of cards into the "for boy" category (M = 7.40, SD = 4.60) compared to chance sorting into the "for boy" category, $t(14) = -2.47$, $p < .05$. Participants did not sort a different number of cards into the "for girl" category (M = 9.93, SD = 5.71) compared to chance sorting into the "for girl" category, $t(14) = -.27$, $p = .792$ or into the "for girls and boys" category (M= 13.67, SD = 6.92) compared to chance sorting into the "for girls and boys" category, $t(14) = 1.87$, p = .083. Participants were, therefore, sorting fewer items into the "for boy" category compared to chance, even though the most amount of items (11) were masculine-stereotyped.

Discussion

The present study examined the possible influences of gender schemas on preschoolers' information processing. More specifically, I tested preschoolers' memory for gender-stereotyped information conveyed through picture books. I also tested children's sorting of gender-stereotyped items, as a means to measure their knowledge of gender stereotypes. I examined their sorting since, in alignment with Gender Schema Theory, children with more gender stereotype knowledge could have more stereotyped gender schemas and therefore have worse memory for gender-atypical information. I asked their picture book preference because GST posits that during their preschool years children are consolidating information and placing value on same-gender characteristics (Fitzpatrick & McPherson, 2010) which for this study, could result in them preferring books about a main character with the same gender as them.

I found partial support for children's sorting of items in alignment with their gender stereotype, but my results did not replicate previous findings that children had worse memory for gender-atypical information than typical information or that they preferred picture books with same-gender main characters. Based on GST, I had three hypotheses for how children's schemas would influence their information processing. I hypothesized that children would have better memory for gender-typical information compared to gender-atypical information. Results indicated, however, no difference in memory for gender-typical versus gender-atypical information. My second hypothesis was boys would have higher combined sorting scores and recognition scores for gender-typical information compared to girls who would have lower combined sorting scores and higher recognition scores for gender-atypical information. This hypothesis assumed that boys and girls would differ in their memory for typical and atypical information and in their sorting, but this was not the case so I did not test for the correlation.

My final hypothesis was that girls and boys would prefer the picture book with the main character who was the same gender as them. While there were no significant differences in girls' and boys' preferences for the picture books, it is worth noting that four girls preferred Hatsu's story (male main character) over Yuki's (female main character) but none of the boys preferred Yuki's story over Hatsu's. Although previous studies report that preschoolers prefer stories with main characters who are the same gender as them over stories about other gender main characters (Kropp & Halverson, 1983), perhaps children in the current study viewed the characters as gender neutral. As stated in my method section, I chose gender-neutral names in order to avoid associations children may have with gendered names. I also avoided using cultural characteristics to indicate gender (such as clothing, makeup, accessories). The only indicators of gender were "girl duck" and "boy fox" and pronouns. A previous study indicates that preschoolers are able to accurately attribute pronouns to different gender characters (Arnold, Brown-Schmidt, & Trueswell, 2007). Due to the limited gender cues, however, children could have viewed Yuki and Hatsu as gender-neutral characters.

Children viewing the characters as gender-neutral could have influenced their memory for the stories. For example, viewing Yuki as a gender-neutral character would not trigger associations about what toys she should play with. Viewing the characters as gender neutral (or of an unclear gender), would result in children not registering the prohibition of Yuki and Hatsu's parents against playing with the gender-atypical toy. Children's schemas, therefore, would not have influenced their memory because children may not have viewed the toys as gender-typical or atypical. In other words, if children did not view the characters as gendered then their schemas would not impair their memory for gender-atypical information. This

alternative view of the main characters possibly explains why children's memory for typical and atypical gender information did not differ.

Another possible consequence of children not viewing the main characters as gendered is their picture book preferences. Children may not have had strong preferences for the picture book starring a main character of the same gender as them because children may not have viewed the main character as a specific gender. The lack of boys reporting that they liked Yuki's story could also have to do with how parents discourage boys' feminine-stereotyped play in comparison to girls' masculine-stereotyped play (Freeman, 2007), which could transfer to their preferences for picture books as well.

I planned to only record children's preferences for Yuki or Hatsu's stories, with no option for children to report liking both. When asked which of the two stories they preferred however, five of the 15 children reported that they liked both stories and did not change their mind even when specifically asked to choose between the two stories. These results show flexibility in children's preferences because children did not have a majority preference for the picture book with a main character with the same gender as them (e.g., girls did not overwhelmingly prefer Yuki's story). This flexibility/lack of strong preference could be a result of children not viewing the characters as male or female considering that previous studies have found that preschool children prefer books about characters with the same gender as them (Kropp & Halverson, 1983).

To test for the possibility that children did not view the characters as gendered, future research should include a question about if children believe the main character is male/female and if they act in alignment with gender-stereotypes (such as "Could Hatsu paint his nails?"). Alternatively, studies could use gendered names for the main characters in order to

emphasize the gender of the characters and possibly evoke associations children have with those genders. Gendered names could activate children's schemas more than gender-neutral names, which might lead to a stronger preference for picture books about same-gender main characters and larger differences between memory for gender-typical and atypical information.

Even though my results did not support my hypotheses, I conducted exploratory analyses in case there were differences between memory for the two stories, usage of sorting categories, and sorting patterns for individual items. Tests revealed no differences in boys' and girls' memory for Yuki or Hatsu's stories. The main character's gender, therefore, did not influence children's memory. Children's sorting of masculine-stereotyped and feminine-stereotyped items did not differ, so overall children were not more accurate in their sorting for one gender stereotype than the other.

Children sorted some of the individual items at above-chance levels into the correct categories which demonstrates children's knowledge of certain gender stereotypes. There was evidence that children were sorting ribbon and toy pony at above-chance levels. Perhaps children sorted these items correctly because they have strong associations with them. In this study, toy ponies were often met with excitement from the girls (with one girl even commenting that she felt like she was the toy pony) while boys were less enthusiastic (not commenting or saying it was "for girls"). Regardless of their comments, these two items were overwhelmingly viewed as feminine-stereotyped. Sorting of these items provides some support for GST in that children in this study may be picking up on cues in their environment for what is/is not appropriate for people based on their gender and integrating these cues into how they view certain items.

Other masculine-stereotyped items (blocks and kite) were also sorted at above-chance levels, but into the neutral category, “for boys and girls”, which could be an example of how children’s environment can influence gender norms about toys. For example, toys like blocks and kites are commonly used by all children at the nursery school these children attend which could explain why they sorted the items as gender-neutral. Children from other schools, however, may view these items as strictly for girls or boys because not all of the children play with them or are encouraged to play with them. Collection of data from other preschools and daycare centers would be useful in determining if the sorting of these items is related to the presence and usage of the items in the schools or is a general belief of children that these items are gender neutral.

Sorting of household items demonstrates the influence of children’s family and school life on children’s gender stereotypes. For example, children sorted dishes (a feminine-stereotyped item) above-chance into the “for boys and girls” category. A possible explanation for this sorting is that children at this nursery school are regularly responsible for cleaning their dishes. One boy may have been referencing this routine by responding that “Both boys and girls clean dishes,” before sorting dishes into the “for boys and girls” category. Multiple children also made remarks that their dad was responsible for household chores. For example, when asked to sort iron, a girl placed it into “for boys” while saying that “I’m putting that in the boys because my dad does a lot of ironing.” A boy also responded that an iron is for “daddies.” Other children indicated that household items are for both boys and girls. For example, when sorting broom, one girl responded: “My daddy cleans my room,” before sorting the item into the “for both boys and girls” category. Comments like these contextualize children’s sorting of some feminine-

stereotyped items because they did not sort broom or iron above chance into any of the three categories, and they sorted dishes above chance into the "for boys and girls" category.

There may not be obvious gender differences in who uses household items (like brooms, iron, and dishes) in these children's houses. Children may have sorted these items according to individual family difference, but this sorting could also reflect outdated stereotypes about toys and chores that researchers should adjust for in future tests. These comments may be reflective of changes in norms about who is responsible for household chores, at least in heterosexual couples. In a Pew Research Center study of American parents in 2015 in households where both parents work full-time, over half of the couples respond that they share chores equally (Geiger, 2016). While women are still more likely to report that they do more household chores than men (Geiger, 2016), there seems to be a change in how equally those chores are shared which indicates a possible change in gender norms, that both work outside the home and within the home should be shared. Further research should be conducted to determine if children's sorting of household items and comments during sorting is particular to my sample's immediate environment or is indicative of a larger trend in sharing household work. These comments also shed light on the influence of children's immediate environment (such as their family and school), in addition to media on their views of stereotypes, which should be examined in future studies.

Due to children's sorting of some items into the incorrect category (such as dishes), I conducted analyses without these items, creating a reduced sorting set. There were still no differences in boys' and girls' combined sorting, sorting of feminine-stereotyped items, or sorting of masculine-stereotyped items with the reduced set. I concluded, therefore, that even though 17 of the items from the original 31 were either sorted into the incorrect category or not

sorted above chance into a category, there were no gender differences in the sorting of items by category.

My final exploratory analysis was of children's sorting patterns by category. I conducted this test because based on the mean number of items sorted into the three categories, children seemed to be using the "for girls and boys" category more often than previous literature suggested is the case for preschoolers (Signorella et al., 1993). Results indicated that children were sorting items into the "for boys" category significantly less than by chance. This result is surprising because the masculine-stereotyped category had one more item than the other two categories so if children were sorting by chance they would likely have more in this category. This finding, in combination with the previous pattern of children sorting blocks, kites, and dishes into the neutral-stereotyped category, suggests that certain items viewed as masculine-stereotyped or feminine-stereotyped by previous sorting tasks such as Leinbach, Hort and Fagot's may be considered gender-neutral by my sample. Further research with children from other nursery schools is necessary to conclude if these are common views of stereotyped items or are specific to my sample.

This study tested possible results of gender schemas that have previously not been researched, specifically the use of novel information to convey atypical information, it had limitations. One limitation of this study was the number of participants. Only 15 children participated and of the 15, 11 were female. Differences in the number of participants by gender are important to consider as many of my analyses compared scores based on gender. Due to the low sample size of boys, gender comparisons made in this study may not have caught actual differences between boys and girls. My study may lack statistical power because if boys do have a better memory for typical information or higher sorting scores than girls, this difference may

not have been detected because the few boys in my study may have poor memory capacities or are not exposed to gender-stereotyped media. Future studies should, therefore, aim to have more equal samples of boys and girls in order to detect these differences if they are present.

Additionally, the nursery school where I recruited participants may not be representative of preschools in general. I recruited participants for this study from a local nursery school for children whose parents work at the university. The children who participated, therefore, do not represent a random sample of preschoolers. In particular, how parents/caregivers in this sample discuss gender stereotypes with their children likely differs from how other parents of different socio-economic classes discuss these issues. Previous research supports the idea that parents with high education levels and high income have more egalitarian gender roles (Crompton & Lyonette, 2005; Marks, Lam, & McHale, 2009), which may transfer to their children. In support of this transfer, past research has found that children of higher-income families have more egalitarian views of gender roles (Antill, Cunningham, & Cotton, 2003), which suggests that parents' behaviors may influence their children's conceptions of gender roles. When I passed out consent forms, I noticed that multiple parents seemed to be trying to surround their children with egalitarian views. For example, some parents told that they change the pronouns used in picture books with their children and actively seek out picture books about counter-stereotypical characters. Parents' attempts to present children with counter-stereotypical media could influence children's schemas because they may have more counter-stereotypical examples which could change what they consider gender-appropriate.

Future sampling should also include children's race as a demographic factor. Although my study didn't collect data on children's race, future studies should collect this data as it could influence children's gender stereotypes. Past research has found that, based on race, young

children's views of stereotypes differ (Albert & Porter, 1988). For example, Black children associated fewer stereotypes with gender e.g., they were less likely to associate being strong with males, than White children. These differences for gender stereotype associations based on a child's race may occur because stereotypes are a combination of someone's race and gender, not just either of those categories alone (Ghavami & Peplau, 2013; Wong, Horn, & Chen, 2013). Black children may also have different family dynamics, such as a higher likelihood that their mothers contribute economically to the household, which could influence what stereotypes they associate with gender in comparison to White children (Albert & Porter, 1988). Based on children's gender and race, therefore, they may be exposed to different-sex roles and expectations which could influence their gender stereotypes and resulting behaviors.

Researchers should also report the gender of children's parents since some studies have reported that same-sex couples, in particular, lesbian couples, have children who reject gender-stereotyped behavior (Biblarz & Stacey, 2001). Influences besides the child's own gender, such as their race and their parents' genders may influence what behavior children observe which, in turn, influence their schemas for what is appropriate and inappropriate for them. Future studies on gender stereotypes should collect demographic data on the race and gender of the children participating and their parents. Collection of this data would allow researchers to observe how race and family structures impact children's views of certain gender stereotypes.

Other limitations include the materials used in the current study. Items included due to Bem's (1981) theory about masculine/feminine items seemed to confuse children. One child responded "I don't know," when asked to sort maple tree, and another sorted both moon and maple tree after commenting on how many cards were already in the other boxes. These responses are consistent with the results of the test on which my sorting task was based

(Leinbach et al., 1997). Children in that study also showed a mixed sorting of Bem's items (Leinbach et al., 1997). These items, therefore, may be too abstract notions of gender stereotypes for this age group, resulting in children being confused about how to sort them or relying on other ways to sort (such as fullness of the boxes) to compensate for lack of knowledge about these items.

Another limitation in terms of materials is the unequal number of questions about gendered information. This study tested children's memory for different types of gendered information--typical, atypical, and neutral. In the current study, there were significantly fewer questions about typical information than atypical information. This difference in the number of questions could put children at a disadvantage for remembering typical information since they only had one opportunity to get the correct answer. The result is that children's recall for typical information may actually be better than reflected in my results. Future studies should include equal numbers of questions for each type of information in order to give children the same number of opportunities to correctly answer questions.

The setup of the sorting boxes and the language used in the script to prompt sorting could have confused children's sorting. Children could have interpreted the instructions in two ways. First, that they should sort items according to if they were for children of their own age or second that they should sort items for people of their gender in general. Transcripts of the sorting task indicate that "for girls" and "for boys" was not always considered by children as representative of "for females" and "for males" in general. Some children showed difficulty in combining age and gender for boxes. One child created a "for daddy" category which included items like hammers, trucks, and dishes. Other children had difficulty sorting the baby bottle item and when asked to sort it two children responded that it was for "nowhere/nobody" and two other children

responded it was “only for babies.” It may have been useful to include pictures of men and women on the boxes as well as pictures of boys and girls so that it would be clear to children that they were to sort items according to if they were for female people or male people and not just for people their own age.

Making the categories clearer could have improved sorting scores. For example, if a child viewed the boxes as categories for what is appropriate for children, then when presented with an item for an adult, they may have resorted to guessing, resulting in the random assignment of items. Adding adults, therefore, could more accurately capture stereotype knowledge (which was the goal of the sorting task) because children would not have to guess or randomly assign cards when given an item they consider “for adults.” Adding adults to the sorting box images could also reveal stereotypes that children hold about adults that are not captured in this study. For example, in the current study when asked to sort money into a box the child may have sorted it into both because both girls and boys play with fake money. If adults were on the boxes in addition to children, perhaps the child would sort according to the masculine-stereotype that money is associated with men.

A final limitation was that this study presumed the participants’ genders. I labeled children as male or female based on the child’s name and the pronouns their teachers and parents used. Some children’s gender expression may not align with their parents’ and teachers’ labeling, which could influence how they process gendered information. For example, in a study of transgender preschoolers, their responses to gender stereotypes and gendered items (clothing and toys) were in alignment with their expressed gender rather than their assigned gender (Fast & Olson, 2018). The way that I coded children’s gender in my study, however, did not account for expressed gender. If children’s expressed gender is different from their assigned gender, then

their results may differ based on what gender they were coded as. For example, if a child who expresses their gender as male but has a female name and is called "she" by their parents preferred Hatsu's story then I would have coded their response as preferring a book with a different gender main character. The implication of this coding is that my data may not accurately reflect gender differences for children whose expressed gender is different than their assigned gender. Future research should consider the child's view of their gender identity in order to account for these possible differences.

In addition to some children not identifying with their assigned gender, they also may not be sex-typed (i.e., they do not evaluate themselves in terms of gender-stereotyped characteristics). As mentioned in the introduction, sex-typing comes from gender schema processing of information and the readiness of the individual to process the information on the basis of gender differences. A part of this readiness comes from the self-concept being assimilated into the gender schema. The self-concept of sex-typed individuals is evaluated in terms of masculinity/femininity (Bem, 1981). It is important to also consider that Bem (1981) argued that non-sex-typed people do not view themselves in this way. For example, a non-sex-typed woman may view herself as nurturant, but she does not necessarily associate that trait with femininity. Although my study focused on GST as an explanation for sex-typing, if some individuals are not sex-typed then they may be interpreting gendered information differently according to Bem (1981).

It would be fruitful for future research to test children's performances on tests like the ones used in the current study between groups of children in different cultures. These differences in culture matter because GST argues that children learn to define themselves in terms of gender-appropriate behavior when their society emphasizes gender differences (Bem,

1981). As demonstrated in the introduction, the U.S. emphasizes gender in a variety of domains, including preschool classrooms (Koch, 2003). In contrast, countries like Sweden have gender-neutral preschools which are urged under state curriculum to counteract gender roles by referring to children in gender-neutral terms (such as "friends") and encouraging children to participate in all classroom activities (Barry, 2018). Comparisons between the U.S. and countries like Sweden would be useful in testing Bem's argument that societal reinforcement of gender differences sets the stage for sex-typing.

Although my results did not support my hypotheses, transcripts from the sorting task provide support for schema processing. One indicator of schema processing is children's use of past experiences and observations of others to justify their sorting. One girl, in particular, seemed to be using this process, as she reflected on how she and her brother both had bikes before sorting tricycle into the for "boys and girls" category. When sorting kite, she asked me if I used to fly a kite, and when I responded that I did as well as other people I knew, she sorted it into the "boys and girls" category. When she was sorting yellow she said: "I really like yellow....do you know any boys that like yellow?". When I responded, "I don't know, what about you?" She said, "Yep" then sorted it into the for "boys and girls" category. For the color red, she commented that her brother talks about the color red and she likes the color red before sorting it into the for "boys and girls" category.

Other children showed more gender-stereotyped sorting upon reflection about their past experiences and observations. For example, one girl said that her mom watches videos and talks on the phone all the time before sorting phone into the for "girls" category. Another indicator of schema use is children's generalizations about who items are for. Generalizations such as "boys like firefighter hats" and "girls like ribbons," which one child made, are in alignment with

gender-stereotypes, and they provide evidence that some children may have gender schemas about these items and are using them when sorting. These generalizations could be a result of the setup of the sorting task because I asked children if the items were for a certain gender. Future research could include follow-up questions, for if a child generalized, to pinpoint if children were using gender schemas to sort information. For example, questions could clarify if children were referencing their past experiences, what they have observed, or were simply using the phrasing of the task.

In terms of future interventions against gender stereotypes, researchers should consider the use of picture books. One study found that first-grade children who read stories containing gender-neutral and gender-atypical information reported that more activities (even those considered gender-stereotyped) were appropriate for men and women than children who read gender-stereotyped stories (Karnoil & Gal-Disegni, 2009). Another study supports the idea that children's books can help children translate information from stories to real-world situations, in particular by promoting discussion about social topics. For example, after reading a book on a prince marrying a prince and having a discussion, preschoolers agreed that boys can marry boys and girls can marry girls (Bentley & Souto-Manning, 2016). Books that do not conform to gender stereotypes, therefore, can foster discussion without singling children or their families out. These studies provide support for picture books as possible counter-stereotypical examples (a prince marrying a prince instead of a princess) that can have positive outcomes on children's egalitarian views of social topics and gender stereotypes in general.

Conclusion

Overall, my results did not support my three hypotheses. Results did not indicate an influence of gender schemas on children's memory of or preference for gendered information. There are several reasons why my results may not have indicated gender schema influence even if there had been one. It is possible that children considered Yuki and Hatsu as gender neutral because they have gender-neutral names and no cultural markers of gender. Without viewing Yuki or Hatsu as gendered, children's schemas would not have been activated for what toy would be gender appropriate. Children also would not register the parents' prohibitions against playing with the gender-atypical toy because they did not consider Yuki and Hatsu as female and male so they may have considered both toys to be gender-typical. If children's gender schemas were not activated, this could explain why their memory for gender-typical and gender-atypical information did not differ. My study may have also not found differences in children's preferences for the picture books because they considered the main characters gender neutral. Future research should test for children's recognition of the characters' genders and the characters' adherence to gender stereotypes. The unequal number of recognition questions could have also contributed to the lack of difference in children's memory for typical versus atypical information. Children had more opportunities to correctly or incorrectly recognize atypical information versus typical information because there were two more questions about atypical information. Future research should also include equal numbers of questions for each type of information.

Even though my hypotheses were not supported, results of my study raised questions about children's sorting patterns. Children's sorting patterns revealed a potential influence of children's school environment and family dynamics on what items are gender-

stereotyped. Children were significantly less likely to use the "for boys" category when sorting items, which is surprising considering that category had the most items. Children also sorted three gender-stereotyped items significantly above chance into the "for boys and girls" box. This sorting could indicate a possible egalitarian influence from their school and home environments on gender-stereotypes about certain items, such as those to do with housekeeping and toys. Results from my study should be interpreted cautiously, however, due to the small size of my sample and because the majority of participants were female. To further analyze these sorting patterns and account for differences in socio-economic status, future researchers should test children from a variety of school and care settings. In terms of the sorting task, children may have been confused about the instructions so changing the boxes to include adult figures, as well as children, could clarify for children how they should sort. I also propose that future researchers should consider children's view of their own gender since to label a child's gender based on their parents' language may not accurately reflect some children's gender identities. Studies should collect data on children's race and their parent's gender in order to make comparisons in children's gender schema development and resulting stereotyped views for different family dynamics.

Finally, I identify picture books as potentially contributing to children's gender stereotype development and as possible catalysts of changing gender stereotypes at a young age by containing gender-atypical characters. Gender stereotypes and their influences on young children should be further researched because of the negative limitations they impose on children. For example, play with a typically feminine-stereotyped toy like a Barbie resulted in girls reporting that they cannot have as many jobs as boys compared to girls who played with less stereotypical toys (Sherman & Zurbriggen, 2014). Stereotypes can also negatively impact

boys because in a study on children's reactions to a simulated distressed infant they had fewer comforting strategies than girls, which the researchers attributed to boy's lack of time spent with feminine-stereotyped toys that can foster these skills (Li & Wong, 2016). Stereotypes about what toys that boys and girls should play with and children's resulting play with these stereotyped toys, therefore, can limit their beliefs about their abilities and their actual abilities. The current study provides some hope that these gender stereotypes are changing. The sorting of certain stereotyped items above-chance into the neutral category and the lack of significant preference for books with same-sex main characters may be indicative of these children having egalitarian views of gender with regard to these stimuli. Hopefully, future studies will also confirm these findings.

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Wood, E., Desmarais, S., & Gugula, S. (2002). The impact of parenting experience on gender stereotyped toy play of children. *Sex Roles*, *47*(1–2), 39–49. https://doi.org/10.1023/A:1020679619728

Appendix A
IRB Approval

Bard College — Institutional Review Board

Date: November 21, 2018
To: Abigail Sullivan (as7718@bard.edu)
Cc: Sarah Dunphy-Lelii (sdl@bard.edu)
From: Sanjay DeSilva, IRB Chair

Re: The Impact of Gender Stereotypes on Children's Memory of and Preference for Picture Books

DECISION: APPROVED

Dear Abigail,

The Bard Institutional Review Board reviewed your proposal under expedited category 7,

> (i) Research activities that present no more than minimal risk to human subjects, and
>
> (ii) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Your proposal is approved through November 21, 2019. Your case number is 2018NOV21-SUL.

Please obtain written permission from the directors of the Nursery School and Children's Center before you recruit participants at these sites.

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

We wish you the best of luck with your research.

Sanjay DeSilva
desilva@bard.edu
IRB Chair

PO Box 5000, Annandale-on-Hudson, New York 12504-5000 **Phone** 845-758-6822

Appendix B
Permission from Nursery School Director

Bard
A Place to Think

Abigail Sullivan <as7718@bard.edu>

Senior Project Study Approval
2 messages

Abigail Sullivan <as7718@bard.edu> Tue, Dec 4, 2018 at 11:24 AM
To: Carol Murray <cmurray@bard.edu>

Hi Carol,
I'm emailing to update you that my study for my senior project was recently approved by the IRB. They noted that I should obtain your approval to conduct the study at the nursery school before I begin passing out permission slips. If you could respond with an email indicating that you are aware that I will come to the nursery school during winter break to conduct my study and that you approve of it, I can keep that response on file. If you need any additional information to make sure you are still on board with the study, just let me know and I can send you the materials I have so far.
All best,
Abigail

Carol Murray <cmurray@bard.edu> Wed, Dec 5, 2018 at 8:05 AM
To: Abigail Sullivan <as7718@bard.edu>

Hi Abigail,
Yes, you have my approval to conduct the study at the nursery school and to pass out permission slips.
Best,
Carol

Carol Garboden Murray

Appendix C
Permission Slips Given to Parents

Parent Consent Form for Child's Participation in Research

Researcher: Abigail Sullivan
Faculty Adviser: Sarah Dunphy-Lelii

Your child is being asked to participate in a research study about how some kinds of gender stereotypes influence children's memory of and preference for picture books.

During this study, children will be asked to pay attention to two books about toys usually played with by girls/ boys which are being played with by the opposite gender. After each book, they will be asked some questions to test their memory of the information from the book, afterwards they will be asked which book they preferred. Finally, they will be asked, with pictures, whether they think certain objects are for girls, for boys, or for girls and boys. Participation should take about 10 minutes after which your child will be returned to their class.

I would like to audio record your child as he/she answers the memory questions, to make sure that I accurately record all of the information. I will keep these recordings on a password protected phone which only I and my faculty adviser will have access to. We will only record audio if you and your child give us permission. At the bottom of this form is a separate option to check if you consent to your child's voice being recorded during the study.

All the information that your child provides will be confidential. I will use number-letter codes instead of their names or any other identifying information. Upon completion of this project, all recordings will be deleted.

Risks of participation in this study are minimal. The tasks are designed to be developmentally appropriate, but if your child becomes fatigued we can take a break or they can stop. The questions about the story are not personal, so I do not anticipate any impact on their emotional well-being, if that does occur, however, we can take a break or stop. At any point during the study, your child is free to ask questions. They can also ask to stop, I will then not use any of the information that has been collected.

A potential benefit of this study is that your child may gain a new perspective by reading about gender atypical behaviors. The stories have messages that support children's behavior even if it isn't considered typical for a boy or girl which could be encouraging. Even if participation in this study does not benefit your child personally, it may help shed some light on the impacts of exposure to gender stereotypes for children in general.

I give permission for my child to participate in the research study described above and will receive a copy of this Parental Permission form after I sign it. If I have questions about this study, I can contact the researcher at as7718@bard.edu or the faculty adviser at sdl@bard.edu . If I have questions about my child's rights as a research participant, I can contact the chair of Bard's Institutional Review Board at irb@bard.edu.

_____ Date: _____
Parent/Legal Guardian's Name

_____ Child's Name _____
Parent/Legal Guardian's Signature Child's Birthday_____

___ I consent to my child's voice being recorded during the study

_____
Parent/Legal Guardian's Signature

Appendix D
Testing Script

Script

"Hi [child's name] I have some fun games in the other room and thought you would like to play. Want to check them out?"

Then: "I am asking kids questions about stories to better understand how you learn. I'm going to read you a book and then ask you some questions. If you want to stop reading that is okay, you can just tell me. Are you ready?"

If yes: "Great! I also want to record your answers to my questions about the story. My phone will only record your voice, but I won't record if you don't want me to. Can I record you?"

I will then read the book and ask comprehension questions.

The child will be given a sharpie and told "Here are some questions about the book we just read. For each question you can put a dot on the answer you think is right."

For the comprehension questions I will ask the question, for example "What animal was Yuki?" *then I will point to each option and say what they are* "A duck, a crab, or an otter?". *If the child says an answer but doesn't put a dot on the duck, I will mark it.*

Then: "I have another book, just like the last one with some more questions. Are you ready?"

I will then read the second book and ask comprehension questions.

Then: "Which book did you like best?"

After book and comprehension questions: "It's time to play a game with these pictures. I will give you a card with a picture of things people could look at, or play with, or use to work with. Some of these things are more for girls, some things are more for boys, and some are for both. If you think it is mostly a girl kind of thing, put it in this box, if you think it is a boy kind of thing, put it in this one, and if you think it is a boy and a girl kind of thing put it in this box. Just like with reading the story, if you want to stop let me know! Ready?"

I will then give them cards, one at a time, and say what the picture is and ask which box it goes in. For example: "Here is a hammer, which box does it go in?" *If they don't respond I will prompt with* "Is a hammer for girls, for boys, or for girls and boys?".

After the sorting task: "Thank you for playing today! You helped me understand more about how kids learn! Here are some stickers and a note for your parents about what we did today."

I will then follow the child back to their cubby so that their sticker and debriefing form are put in the cubby.

Appendix E
Yuki's Story

Below are the illustrations and text of Yuki's Story in order from left to right, beginning with the front cover.

Yuki's Story

This is Yuki.

She is a duck who lives in a pond with her friends and family.

One day Yuki was bored.

She had swam around the pond many times and had eaten her fill of fish.

She was swimming around the pond yet again when she spotted a big group of girl ducks around something.

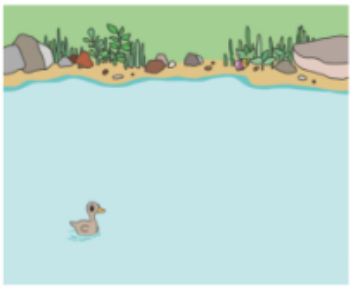
She swam over to find them all around a doll house that had fallen in their pond.

She nudged open the door of the doll house with her beak. The other girl ducks loved this house and were so excited.

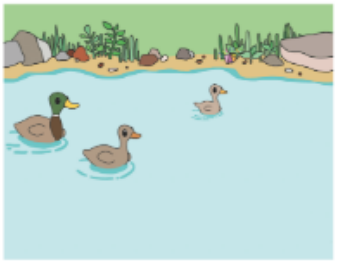
Yuki wasn't interested in the house, however, and she swam away.

On the side of the pond, near the bank she saw something shiny.

Yuki kicked her feet faster, excited about what lay ahead. When she reached the bank, she saw that it was a prism.



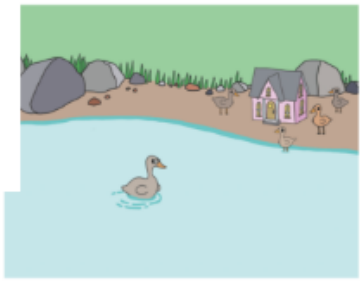
As she moved it around with her beak, her mom and dad approached. "That is a prism and only boy ducks play with those!" said her mother and father. "Why don't you play with the doll house that was found in the pond?"



"Oh but the prism catches the light in such a fun way! It even makes rainbows. The doll house is so boring!"

But she played with the doll house with the other girl ducks because her parents said that's what girl ducks do.

One day, Yuki was playing with the doll house when her grandmother came to visit.



"Yuki why do you look so sad?" asked grandma duck.

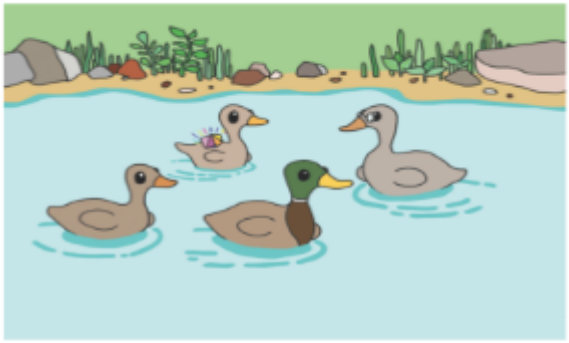
"Because I want to play with the prism but mom and dad said it's only for boys" replied Yuki.

"Nonsense" grandma duck said and she asked Yuki to take her to the prism.

When they arrived Yuki and her grandmother had a blast swimming around with the prism on their backs, which was sparkling in the light.

Yuki's mother and father heard their laughter and swam by to see.

And when they saw their daughter duck swimming so happily, they forgot all about the dollhouse.



THE END

Appendix F
Hatsu's Story

Below are the illustrations and text of Hatsu's Story in order from left to right, beginning with the front cover.

Hatsu's story

This is Hatsu

He is a fox who lives in a forest with his friends and family.

One day Hatsu was bored.

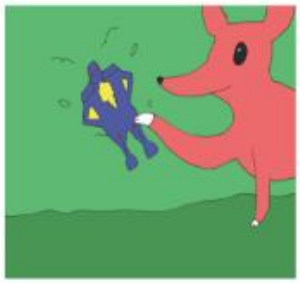
He had run around the forest many times and had eaten his fill of insects.

He was walking around the forest yet again when he spotted a big group of boy foxes around something.

He trotted over to find them all around a transformer that had gotten stuck in a bush.

Hatsu wasn't interested in the transformer, however, and he trotted away.

He nudged at the transformer with his paw. The other boy foxes loved this transformer and were so excited.



Hatsu wasn't interested in the transformer, however, and he trotted away.

As he was walking he noticed something on the ground near the edge of the forest.

Hatsu started to run faster, excited about what lay ahead. When he reached the edge of the forest he saw that it was a mezzaluna.

As he moved it around with his paw, his mom and dad walked by. "That is a mezzaluna and only girl foxes play with those!" said his mother and father. "Why don't you play with the transformer that was found in the bushes?"

But he played with the transformer with the other boy foxes because his parents said thats what boy foxes do.

"Oh but the mezzaluna is so handy and can cut things! It even sparkles in the sun. The transformer is so boring!"

One day, Hatsu was playing with the transformer when his grandmother came to visit.

"Hatsu, why do you look so sad?" asked grandma fox.

"Because I want to play with the mezzaluna but mom and dad said it's only for girls" replied Hatsu.

"Nonsense" grandma fox said and she asked Hatsu to take her to the mezzaluna.

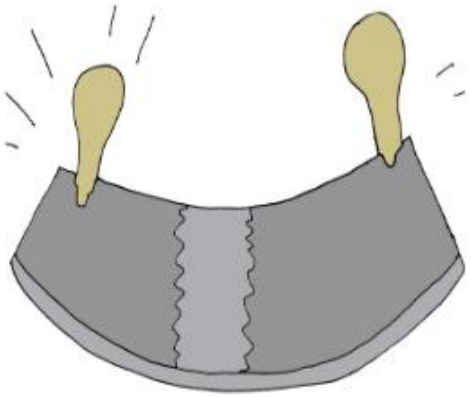
When they arrived, Hatsu and his grandmother had fun trotting around with the mezzaluna in their mouths, looking for things to chop.

Hatsu's mother and father heard their laughter and walked by to see what was happening.

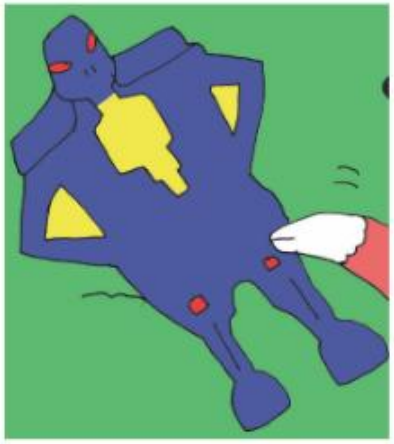
THE END

Appendix G
Toys in the Picture Books

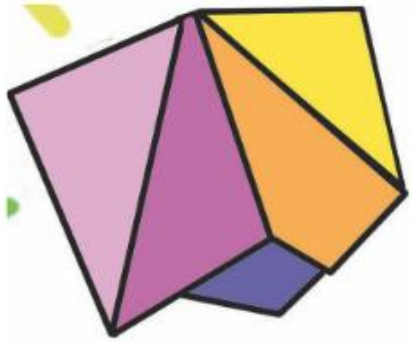
Hatsu's Atypical Toy: Mezzaluna



Hatsu's Typical Toy: Transformer



Yuki's Atypical Toy: Prism



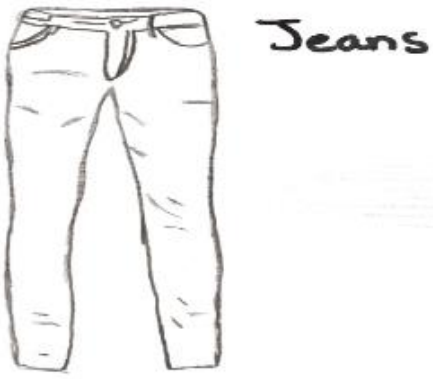
Yuki's Typical Toy: Dollhouse

Appendix H
Sorting Boxes

Appendix I
Sorting Items

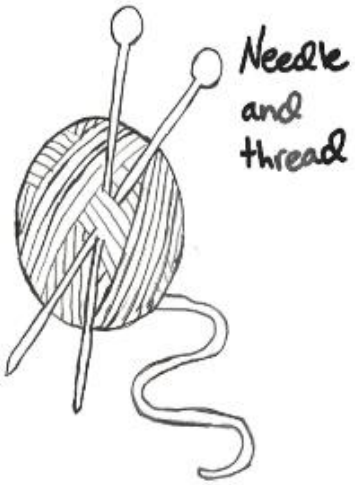
Below are images of the sorting cards used in the sorting task. They are presented in the order the cards were presented starting with jeans then going to the left (i.e., the first four items presented were jeans, book, needle and thread, and airplane). The card order was randomized using an online random list generator. After the card order was randomized, I checked if there were more than two of the same category (i.e., three feminine-stereotyped items) in a row then I rearranged them so that wasn't the case.

Jeans (masculine-stereotyped)



Book (neutral stereotyped)

Needle and Thread (feminine-stereotyped)



Airplane (masculine-stereotyped)

Phone (neutral stereotyped)

Broom (feminine-stereotyped)

Ice Cream Cone (neutral stereotyped)

Moon (feminine-stereotyped)

Blue (masculine-stereotyped)

Firefighter hat (masculine-stereotyped)

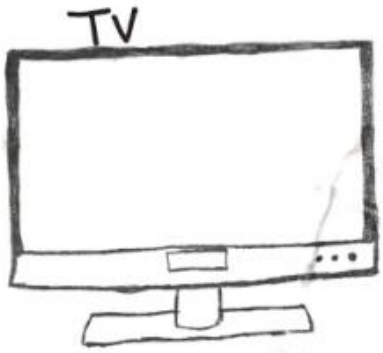
Ribbon (feminine-stereotyped)

Baby Bottle (feminine-stereotyped)

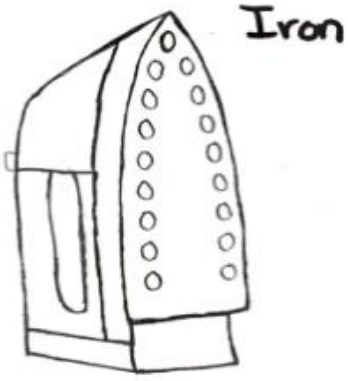
Blocks (masculine-stereotyped)

Maple Tree (feminine-stereotyped)

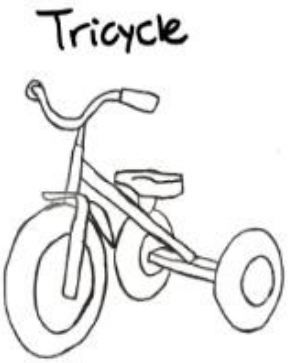
TV (neutral stereotyped)



Iron (feminine-stereotyped)



Tricycle (neutral stereotyped)



Kite (masculine-stereotyped)

Camera (neutral stereotyped)

Glasses (neutral stereotyped)

Money (masculine-stereotyped)

Crayon (neutral stereotyped)

Tape (neutral stereotyped)

Yellow (feminine-stereotyped)

Dishes (feminine-stereotyped)

Hammer (masculine-stereotyped)

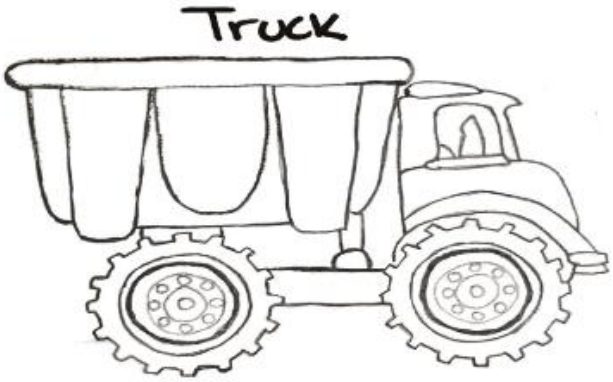
Bat and Ball (masculine-stereotyped)

Toy Pony (feminine-stereotyped)

Teddy bear (neutral stereotyped)

Red (masculine-stereotyped)

Truck (masculine-stereotyped)



Appendix J
Neutral Name Questionnaires

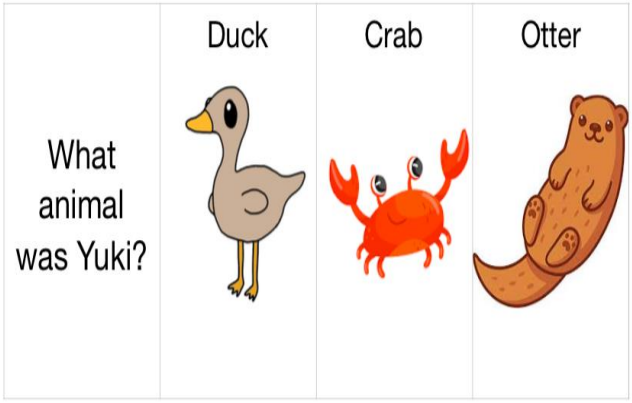
What kind of name is this?

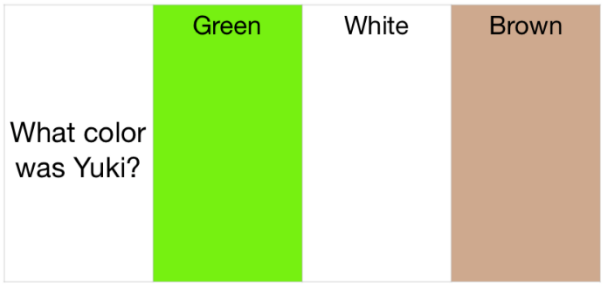
Yuki	*	*	*	*	*
	Female		Neutral		Male
Kazu	*	*	*	*	*
	Female		Neutral		Male
Sora	*	*	*	*	*
	Female		Neutral		Male
Mako	*	*	*	*	*
	Female		Neutral		Male
Hatsu	*	*	*	*	*
	Female		Neutral		Male

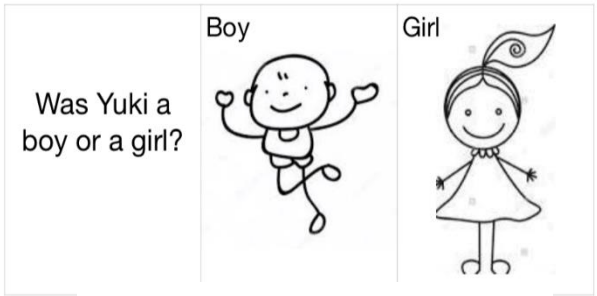
Appendix K

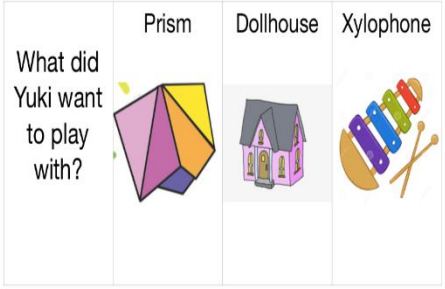
Recognition Questions for Yuki's Story

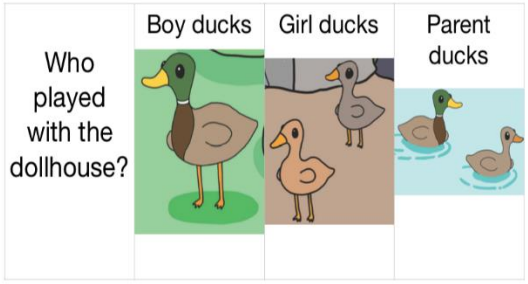
All of the images from Yuki and Hatsu's story drawn by Ava Lee. Images not from Yuki's stories were reproduced from the following websites: https://www.vectorstock.com/royalty-free-vector/cartoon-of-red-smiling-crab-funny-vector-20089180, https://www.123rf.com/photo_69186022_stock-vector-cute-cartoon-otter-swimming-on-its-back-funny-vector-animal-character-drawing-.html, https://www.vectorstock.com/royalty-free-vector/set-of-hand-drawing-abstract-happy-cute-boys-line-vector-16674530, https://www.alamy.com/stock-photo/cute-little-girl-outline-drawing.html, https://stockfresh.com/image/1695359/cartoon-beach, https://www.dreamstime.com/royalty-free-stock-photography-xylophone-cartoon-vector-illustration-image39148507, https://www.jumpfrompaper.com/products/spaceman-turquoise, http://clipart-library.com/baskets-cliparts.html

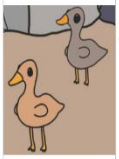










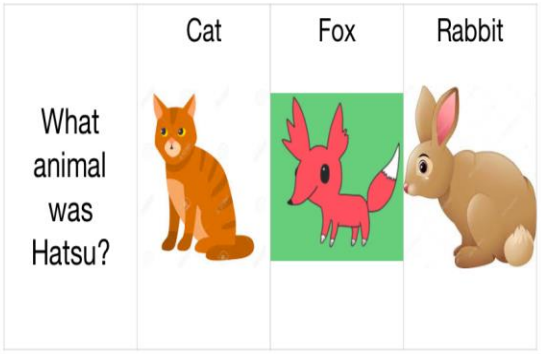
Who said "Yuki, only boys play with prisms"?	Girl ducks 	Yuki's grandma 	Yuki's parents 

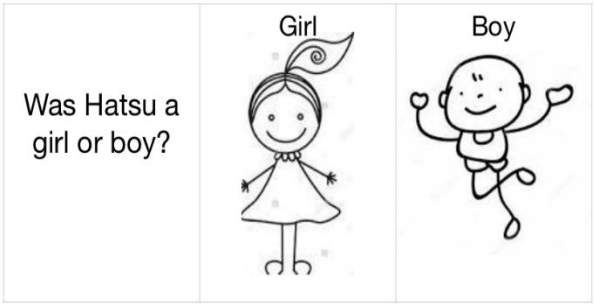
Where did Yuki carry the prism?	Backpack 	Her back 	Basket 

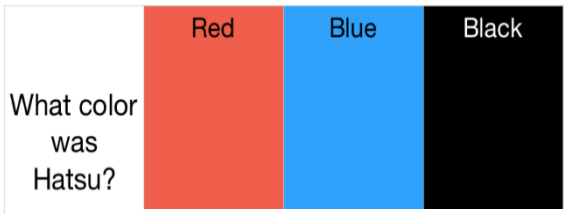
Appendix L

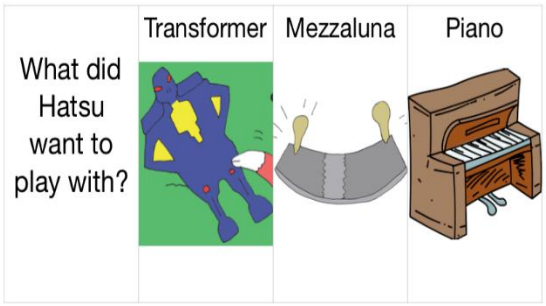
Recognition Questions for Hatsu's Story

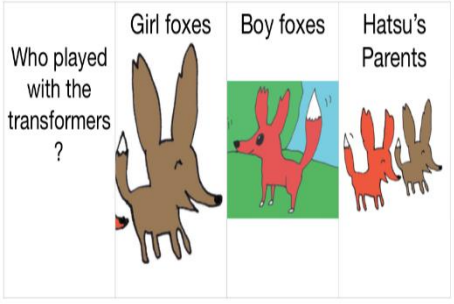
All of the images from Yuki and Hatsu's story drawn by Ava Lee. Images not from Yuki's stories were reproduced from the following websites: https://www.123rf.com/photo_62781791_stock-vector-cat-cartoon-style-vector-silhouette-cute-domestic-cat-animal-sitting-cartoon-cat-young-adorable-tail.html, https://www.shutterstock.com/image-illustration/cartoon-brown-bunny-411029143, https://www.vectorstock.com/royalty-free-vector/set-of-hand-drawing-abstract-happy-cute-boys-line-vector-16674530, https://www.alamy.com/stock-photo/cute-little-girl-outline-drawing.html, https://www.123rf.com/photo_13725100_cartoon-farm-with-barn-and-windmill.html, https://stockfresh.com/image/1695359/cartoon-beach,https://www.vectorstock.com/royalty-free-vector/piano-cartoon-hand-drawn-image-vector-17755119, https://www.how-to-draw-funny-cartoons.com/cartoon-bag.html, https://www.clipartmax.com/middle/m2i8A0d3A0A0H7K9_chest-clipart-wood-box-clipart-chest/



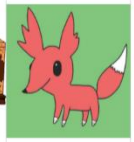








Who said “Hatsu, only girls play with mezzalunas ”?	Hatsu’s parents	Boy foxes	Hatsu’s grandma
			

Where did Hatsu carry the mezzaluna ?	Shopping bag	Box	His Mouth
			

Appendix M
Debriefing Form

Debriefing form

Researcher: Abigail Sullivan
Faculty Advisor: Sarah Dunphy-Lelli
Project Title: The Impact of Gender Stereotypes on Children's Memory of and Preference for Picture Books
Date:

Thank you for allowing your child to participate in my study!

Today we read two storybooks. One was about a family of foxes and the other about a family of ducks. One of the books had a male protagonist, and one had a female protagonist. After we read each book, I asked a couple of questions to test their memory of the story. After the second book, they were asked which book they preferred. Finally, your child was asked, with pictures, whether certain objects were for boys, girls, or boys and girls. These objects have been used in previous studies which suggested that they were thought of in gendered ways (for example a hammer and nails are usually considered masculine).

The purpose of this study was to measure how storybooks with gender typical, atypical, and neutral behavior impacts children's memory of and preference for stories. I also took into account their general knowledge of gender stereotypes with a picture sorting task. I predict that children will remember gender typical aspects of the stories (such as a girl character playing with a dollhouse) more than gender atypical aspects (a girl character playing with a toy labeled as for boys) since past research indicates this trend. I also predict that children will remember more information from stories that have main characters with the same gender as them. Their knowledge of gender stereotypes indicated from a sorting task may also be related to their answers to the memory questions. Children who have more stereotype knowledge may be more likely to remember mostly gender typical information because it is consistent with how they view situations.

Children are surrounded by picture books. If the gender of the main character and their actions influence what children remember, then it is important to consider what we are reading to kids and how the content of those stories shape their view of the world—so that we can write and read stories that support children's development!

If you would like to receive a copy of the final report of this study when it is completed, please feel to contact me at as7718@bard.edu.

Please feel free to email me if you have any questions or comments about the study.

Thank you again for allowing your child to participate!