

EXAMINING GENDER SALIENCE IN PRESCHOOLERS THROUGH A  
CATEGORY FORMATION TASK

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By

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*“Just try your best.”*

And also...

*“Stop and smell the roses.”*

**- Kenneth Robert Planke Jr.**

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## ABSTRACT

Ample evidence exists suggesting children as young as 2-years-old can successfully classify colors, various objects, and people into stereotypical male and female categories. However, it is unknown if gender categories are perceived as important and meaningful. While children have sufficient gender knowledge to categorize by gender, do they in fact perceive their environments through a gendered lens? In order to investigate gender salience, a category formation, or *free-sorting*, methodology was developed using highly gender-typed toys. The central focus of this thesis was to examine the usefulness of the free-sorting task as a measure of conceptual categorization abilities and gender salience (i.e., how gender schematic a child is). Additionally, measures of gender constancy and gender-related beliefs were expected to shed light on children's sorting behaviors. In Study 1, 44 adult participants (6 males, 38 females) completed the task as well as gender-related dispositional measures to assure the validity of the toy stimuli. Preschool-aged participants were then recruited from local preschool centers and included 12 children (7 males, 5 females) ranging in age from 3 to 5 years ( $M = 57.17$  months,  $SD = 5.47$  months). Results of the free-sorting task revealed preschool-age children are able to utilize conceptual categorizes while sorting. Moreover, through spontaneously sorting the toys by gender, the majority (2/3) of children demonstrated that gender was indeed salient while viewing the stimulus set. These findings begin to elucidate the individual variability in the perceived importance and social awareness of gender as a social category in early childhood development.

## Examining Gender Salience in Preschoolers Through a Category Formation Task

The investigation of gender development and its underlying social, cognitive, and biological influences is a theoretically compelling field of study that requires a truly integrative approach (Martin, Ruble & Szkrybalo, 2002). Uniquely, developing an understanding of gender is both a social and cognitive process. During the preschool years, children actively attend to the social norms that characterize their own culture. Children obtain gender-related knowledge through their interactions with parents, teachers, peers, and various media that saliently construe gender as an important trait (Ruble, Balaban & Cooper, 1981). As with other concepts and categories, children deftly tend to classify people and information based on gender. However, the ability to reason about complex social constructs, such as gender, is heavily constrained by children's cognitive development (Kohlberg, 1966). The relative salience of gender as a social category throughout development, and the factors that may contribute to early salience, are not yet fully understood.

Investigations of gender development are now considerably more complicated, as the concept and definition of gender itself have evolved over the decades. Therefore, an account of the modern conceptualizations of gender is first provided, followed by an overview of the foundational theories of gender development. These theories highlight the developmental processes that take place during young children's gender development and their knowledge about gender categories. Despite the abundance of research about children's awareness of gender as a social category, a central question remains: is gender salient (i.e., noticeable, important) to children themselves? Addressing this gap in knowledge was the primary objective of this thesis, and provides the rationale for

developing a task to measure gender salience. As a secondary goal of this thesis was to investigate whether gender salience is related to gender constancy and gender-related beliefs, a review of research in these areas is presented.

In light of recent progressive social movements, the concept of gender itself has evolved extensively and requires redefining. The notion that gender is an exclusively binary construct is now rejected in many Western cultures (Towle & Morgan, 2002). Assuming that sex and gender are synonymous may be an inaccurate approach, and therefore differentiating between the social construct of gender and the biological state of sex is necessary. Past literature investigating *gender* development has virtually ignored this distinction, obscuring that an individual's sex category indicates reproductive anatomy, whereas the complex social construct of gender pertains to how an individual identifies with socially and culturally defined gender norms. Other researchers have unified the concepts using a single term, gender/sex, in order to account for the dynamic interaction between these interrelated concepts (Fausto-Sterling, 2019).

Further research addressing this updated understanding of sex and gender is needed, and previous findings must be replicated given this drastic social change in how some societies and parents promote gender stereotypes in children. Some recent efforts have been made by researchers to approach the study of gender development from a socially contemporary perspective (see Martin, Andrews, England, Zosuls & Ruble, 2017). The present study deliberately abstained from using phrases such as "both genders," and using "gender" and "sex" interchangeably or inappropriately in efforts to encourage future researchers to do the same.

## **Theoretical Perspectives on Gender Development**

The development of gender has primarily been examined through two main theoretical perspectives: social-learning and cognitive-developmental (see Martin et al., 2002). Social-learning theorists view children as playing a more passive role in their gender development. This perspective emphasizes the role of environmental influences and modeling of same-sex behaviors (Mischel, 1986). In contrast, Kohlberg's (1966) cognitive-developmental model suggests that once children develop a firm gender identity, they are motivated to classify people, various objects, attributes, and activities based on gender. This theory emphasizes children's active role in their gender development and construction of an understanding of gender as a permanent trait related to biological sex for both themselves and others. Social-cognitive theory, or SCT (Bussey, 1983), attempted to integrate these theoretical perspectives, but empirical evidence supporting SCT remains weak (see Martin et al., 2002).

Gender schema theory (Bem, 1981) provides an additional cognitive account for the emergence of gender-typed behavior, such that perception is a constructive process in which incoming information is organized by the individual's evolving gender-based schematic processing systems. Children's self-concepts become assimilated into the gender schema as they learn what gender-related attributes apply to themselves. The construct of gender salience can be conceptualized as how gender schematic a child is, or how readily the child uses gender to process information from their environments. A highly gender schematic child's perception is guided by gender concepts (Bem, 1981; Serbin & Sprafkin, 1986). Thus, the theoretical approach in the present study is

cognitive-developmental. However, future research is proposed to address the influence of early socialization.

Although some researchers (e.g., Weinraub et al., 1984) have conducted comprehensive studies examining gender development, much research in this area is dated by several decades. The modern conceptualization of gender itself may now influence gender development in children, such as their understanding of gender constancy and beliefs about gender norms, and particularly the salience of gender as a *meaningful* social construct or category. Previously, the way children identify and classify gender information has been examined through categorization tasks with traditionally gender-typed toys; however, these tasks typically contain directed instruction, explicitly asking children to indicate which items are for boys and which are for girls. Due to the explicit nature of these previous categorization tasks, they are limited as an assessment of gender salience, i.e., if gender is a noticeable and important distinction to young children. A category formation, or *free-sorting*, task can assess *if* gender is a predominant and salient dimension children use to classify the world around them.

### **Gender and Categorization**

In terms of the development of general categorization abilities, infants as young as 2-months-old display early evidence of categorization through their pattern discrimination abilities (see Ionescu, 2007 for review). These abilities become increasingly complex as children reach school-age; children begin to process the object holistically, rather than solely attending to the object's parts. Researchers theorize that the emergence of conceptual categories subsequently follows an understanding of perceptual

categories, and that these skills are part of the same developmental process. Perceptual information informs our conceptual categories, such as gender, for example. Preschool-aged children already have access to multiple forms of categories, and understand conceptual categories by 2-years of age, although generally hold a preference for perceptual categorization (Morgan & Greene, 1994). By 3-years of age, most children are able to categorize using perceptual features (e.g., has legs), thematic relations (e.g., a rabbit and a carrot), and taxonomic relations (e.g., lettuce and a carrot). However, children's responses to various categorization tasks are heavily influenced by numerous internal or individual factors (e.g., attention, memory, language skills) and external factors (e.g., task type, instructions, labeling, stimuli, category type).

Capitalizing on human's cognitive tendency to classify and organize information present in their environments into functionally significant and salient categories, this study assesses the salience of gender as a social category for young children utilizing novel methodology derived from concept formation literature. The category formation, or *free-sorting* task involves presenting an entire set of stimuli to participants, and asking them to examine the items and create groups that seem natural or logical (Medin, Wattenmaker & Hampson, 1987). Natural categories are generally globally similar, sharing a large number of features with other category members without any particular feature being necessary for category membership (Medin & Smith, 1984; Rosch & Mervis, 1975). Yet, unexpectedly, adult participants repeatedly engage in single dimension sorting during this task (Ahn & Medin, 1992; Medin et al., 1987), even when the stimuli contain overwhelming family resemblance similarities (Regehr & Brooks, 1995). For example, if the stimulus set consisted of line drawings of flowers, participants

tend to form groups based on a single stimulus feature, such as the number of petals, rather than identifying the global similarities and multiple overlapping dimensions that form the family resemblance categories (e.g., the shape of the petals).

The free-sorting has been exclusively used to examine the salience of various perceptual categories, but may have potential utility for understanding the nature of conceptual and social categories as well. Since this methodology can assess what dimension of a stimulus set is spontaneously identified as most important for category membership, it therefore can serve as an indirect measure of what feature is perceived as most perceptually salient or conceptually important within the stimulus set. Shuwairi and colleagues successfully employed this categorization task with preschool-aged children to investigate their understanding of various geometric properties of shapes (manuscript in preparation, as cited in Shuwairi, Bainbridge & Murphy, 2014). The task is generally repeated up to three times in order to provide children with an opportunity to engage in flexible categorization, using categorization criteria they may have discovered upon further examination of the stimuli (Ionescu, 2007).

Gender is thought to be a fundamental social category that is spontaneously encoded by children as young as 3-years-old (Weisman, Johnson & Shutts, 2015), yet it remains unclear if young children perceive gender as a salient, personally relevant characteristic. In the present study, the stimulus set in the free-sorting task consisted of photos of traditionally gender-typed toys. Spontaneously identifying and sorting by gender over all other available dimensions indicates that gender is the most salient dimension within the toy stimulus set and suggest its importance as a social category that people use when actively processing information from their environments.

## **Gender Salience and Previous Related Research**

Past research has shown children as young as 18-months-old are able to associate gender labels with the corresponding gender category (Poulin-Dubois, Serbin & Derbyshire, 1998; Serbin, Poulin-Dubois, Colburne, Sen & Eichstedt, 2001). Using a preferential-looking paradigm, when adult faces and gender labels (boy and girl) were appropriately matched to male and female voices, children spent more time looking, compared to when they were mismatched. The findings demonstrate that by this age, they have already acquired knowledge of gender schemas. By 26-months, most children also display evidence of gender labeling, gender identity, gender-typed toy preference, and awareness of gender roles (Weinraub et al., 1984).

A study conducted by Levy (1999) used a sequential touching task with toddlers as a measure of gender-typed category awareness. Gender-typed toys (i.e., masculine and feminine items) were presented to toddlers, and patterns of sequential touching of the toys indicated that the young participants had significant category awareness, especially of their own gender-typed categories. Levy (1999) utilized age-appropriate methodology analogous to the present study. Expanding upon this previous work, the free-sort task with both a preschool-aged and adult sample goes a step further, having them freely organize the presented items into groups to elucidate not only category awareness, but also gender salience.

The construct of gender salience has typically been studied from a social psychological perspective (see Cota & Dion, 1986; Hilliard & Liben, 2010), assessing how the sex composition of groups or gendered environmental cues influences the salience of gender categories. The work of Serbin and Sprafkin (1986) sought to develop

valid measures of gender salience in order to examine the developmental patterns of gender-based categorization, as well as personal affiliation preferences. In categorization tasks with photos of adult males and females, children were asked to match the photos, which they could do using either the gender of the individual in the photo, or by another available schematic dimension (e.g., facial expression, stance, activity). Results revealed that the 3-year-olds made the most gender-based classifications; once children acquired an advanced knowledge of stereotypical sex-roles, around age 6 or 7, flexibility in sex-role attitudes increased and gender-based categorization decreased. This developmental trend has been further elucidated in more contemporary studies (see Ruble, Cyphers, Greulich, Lurye & Shrout, 2007).

Though the aim of the present study is akin to this aforementioned research, Serbin and Sprafkin's (1986) classification procedure placed a great verbal demands on particularly the younger children. Many of the children's responses were removed from the analyses because of an inability to successfully comprehend the task. Moreover, the alternative dimensions present in the task were potentially too conceptually complex for young 3-year-olds (e.g., body posture, activity), thus making gender the most conceptually accessible dimension to young participants. Findings may be more indicative of children's ability to complete a matching task, rather than reflective of gender salience per se. Utilizing toys, familiar stimuli to children, in the free-sorting task may to provide a non-directive and novel assessment of children's tendency to classify by gender, helping to reveal the importance of stereotypical gender categories throughout the preschool years.

Evidently, children do not necessarily need to have a robust understanding of gender to identify and group objects based on gender differences. However, the categorization tasks used in previous research are limited to understanding children's *knowledge* of gender stereotypes because they explicitly ask children to sort stimuli by gender, or provide cues that consequently direct children to gendered dimensions. Gender *salience* may be better understood through the free-sorting task, since children can only employ gender as a sorting method if they spontaneously identify it independently. Unlike previous methods, the liberal nature of the proposed categorization task limits the verbal demands placed on the child, avoiding problems of task difficulty. To account for the possibility that non-gendered free-sorting behaviors are actually a result of lack of gender salience, and not reflective of the ineffectiveness of the task, an explicit-sorting task immediately follows as an assessment of categorical gender knowledge. This type of directed, forced-choice task requires children to identify traditionally gender-stereotyped items as for "boys" or "girls," and has been used repeatedly in gender development research (Blakemore, Larue & Olejnik, 1979; Fagot, Leinbach & O'Boyle, 1992; Hupp, Smith, Coleman & Brunell, 2010; Weinraub et al., 1984).

The central focus of the present study was the salience of gender in young children, i.e., its importance as a cognitive schema in which incoming information is processed and classified. Do young children (and adults) in fact perceive their environments through a gendered lens? Concept formation of gender occurs during relatively rapid changes in children's development. Therefore, in addition to the categorization tasks, children's overall understanding of gender and their gender-related beliefs are also examined.

## **Gender Constancy, Rigidity in Beliefs, and Play**

Kohlberg (1966) postulated the concept of gender constancy, and since then, the construct has been redefined and assessed using various methodologies. By approximately 6-to-7 years of age, children develop a robust understanding that one's gender is a constant characteristic, conserved across various situations and changes in appearances (Leonard & Archer, 1989). Additionally, its development largely reflects changes in children's cognitive maturation, and accordingly follows a specific developmental sequence. Slaby and Frey (1975) identified the following levels of gender constancy: gender identity (labeling of own and others' genders), gender stability (over time), and gender consistency (across situations or superficial changes in appearance). Children's attention, preferences, and behaviors are then differentially guided as a result of attaining an understanding of gender constancy (Frey & Ruble, 1992; Ruble, Balaban & Cooper, 1981; Slaby & Frey, 1975; Smetana & Letourneau, 1984; Warin, 2000). For instance, during this transition, children ages 4-to-6 begin to utilize cues of sexual dimorphism (e.g., body shape) in their gender categorization processes (Johnson, Lurye & Tassinari, 2010).

*When* children reach a bona fide understanding of gender as an invariable trait may represent a critical point in their gender development, in which their role shifts from being passive recipients of gender-related information and reinforcement, to actively seeking it out themselves. Although the development of gender constancy follows a linear trajectory (Szkrybalo & Ruble, 1999), children's rigidity in gender-typed beliefs follows a different developmental timeline. Aligned with Kohlberg's (1966) cognitive theory, stereotypical gender-related beliefs are increasingly rigid during the preschool

years, but later become more flexible (Levy, Taylor & Gelman, 1995; Serbin & Sprafkin, 1986; Ulrich & Ezan, 2016). A firm understanding of constancy is perhaps associated with a decline in rigidity of beliefs because children eventually come to comprehend gender as a prescribed social construct that is applied to each sex, and thus, various appearance and behavioral differences are not critical in defining one's biological sex.

To date, only one study has tested the hypothesis that this decrease in rigidity is at least partially mediated by constancy understanding (Ruble et al., 2007), finding that rigidity begins to decrease after age 5. Preschool children have yet to reach this flexibility stage, and typically judge cross-gender behaviors as social-normative violations (Smetana, 1986). Research assessing children's reactions to gender-incongruent images (e.g., boy playing with a baby doll, girl playing with a toy car) found that 5- to 6-year-olds, who are still in a state of pseudoconstancy and rigidity about gender norms, strongly rejected these images. A secondary goal of this work was to examine if children's gender constancy stage and rigidity in gender-related beliefs is related to gender salience as assessed by the free-sorting task. Photos of toys were specially selected for the task due to their typical gender-typed nature.

**Play: Gender-typed color and toy preferences.** Although westernized societies, such as in the United States and United Kingdom, have made attempts to eradicate gender stereotyping, color alone remains to be a salient characteristic that is frequently associated with gender (Cunningham & Macrae, 2011). By two and a half years of age, girls prefer pink and boys avoid pink in various objects (LoBue & DeLoache, 2011). The color and explicit labels (i.e., "for boys" or "for girls") given to toys maintain the stereotypes about what toys are acceptable for the genders, and these factors significantly

impact young children's interests and preferences (Weisgram, Fulcher & Dinella, 2014; Wong & Hines, 2015). Infants as young as 9-months-old have demonstrated preferences for gender-stereotyped toys, and these preferences appear to strengthen with age (Blakemore et al., 1979; Todd, Barry & Thommessen, 2016; Serbin et al., 2001).

The robust evidence of sex differences in children's toy preferences raises the question of why exactly do children perceive toys in such gendered fashion? Children's gender cognitions, including their use of gender labeling and level of gender constancy, have been linked to gender-typed play behavior (Smetana & Letourneau, 1984; Warin, 2000; Zosuls, 2009). These findings support Kohlberg's (1966) theory that children's understanding of their gender serves a motivating role in directing their attention and behavior. Accordingly, the categorical distinction of gender presented in the sorting tasks with gender-typed toys may be more perceptually salient for children with relatively higher levels of gender constancy and rigidity in beliefs.

### **The Present Studies**

The present research utilized convergent measures in order to obtain an understanding of the salience and social awareness of gender as a social category in preschool-aged children and adults. As no appropriate measures of gender salience exist, a category formation, or *free-sorting*, task with traditionally gender-typed toys was developed as an indirect assessment of the salience of gender stereotypes (Medin, Wattenmaker & Hampson, 1987). To more fully assess the usefulness of this task, the first study examined adult's gender-typed personality traits and rigidity in beliefs in relation to sorting behaviors. The second study examined whether the task could be used to assess gender salience in preschool-aged children. In addition, it explored young

children's level of understanding of gender constancy and rigidity in beliefs in relation to sorting behaviors in both the free-sorting task and an explicit-sorting task.

### **Study 1**

To first examine the potential utility of the free-sorting task in the context of gender categories, an adult study was conducted to assure that gender was one of the recognizable dimensions in the stimulus set. Akin to Serbin and Sprafkin's (1986) assessment of gender salience, the stimulus sets must contain multiple recognizable schematic dimensions, with gender-typed toys being only one such dimension. Other dimensions primarily included toy type (e.g., number of parts, people/animals vs. nonliving toys) and play type (e.g., indoor play vs. outdoor/action play, imaginary/pretend play vs. realistic play). In order for the free-sorting task to serve as a meaningful measure of gender salience, it is important that the observer would be able to sort by either gender, or another available dimension within the stimulus set. Thus, given the nature of responses in the free-sorting task, the selected dimension adults and children choose to create groups is theoretically the most identifiable and important (i.e., salient) dimension for them within the stimulus set.

In addition to the free-sort task, the adult study included the Bem Sex Role Inventory (BSRI) to assess participant's gender-typed personality traits (Bem, 1974), and a short version of the Spence Attitudes Towards Women Scale (AWS) to assess how liberal or conservative participant's beliefs were regarding women's roles and behaviors (Spence, Helmreich & Stapp, 1973). It was predicted that participants with higher masculine or feminine personality traits and who hold conservative attitudes toward

women, theoretically engaging in more gender-based schematic processing (Bem, 1981), would more frequently sort by gender above all other available dimensions.

## **Method**

### **Participants**

A sample of 44 adult participants (6 males, 38 females) was recruited primarily through the Psychology Department Subject Pool at the State University of New York at New Paltz. Participants ages ranged from 18-to-42 years old ( $M = 21.77$ ,  $SD = 4.07$ ).

### **Materials**

The toy stimulus set for the gender-stereotype free-sorting task was constructed in such a way that it ostensibly did not contain gender categories, but half of the toy items were strongly feminine and the other half were strongly masculine. These toys were selected as pairs, matching each “girl” toy with a relatively similar “boy” toy, e.g., baby doll and action figure, ballerina costume and cowboy costume (Figure 1). The final stimulus set of 14 pairs (28 photos total) only included toys validated in previous studies through adult ratings as being strongly masculine or feminine (see Blakemore & Centers, 2005; Campenni, 1999; Fisher-Thompson, 1990; Levy, 1999; Miller, 1987; Zosuls et al., 2009). The types of toys within the stimulus set contain sufficient variability to allow for various alternative non-gendered dimensions that could also be used as a basis for sorting. Alternative dimensions include: toy type, which specifically relates to physical aspects of the toy (e.g., number of parts, presence of certain features such as faces and wheels, people/animals vs. nonliving toys), and play type (e.g., indoor play vs. outdoor/action play, imaginary/pretend play vs. realistic play). Observers may also

identify and sort by dimensions not strategically incorporated into the stimulus set (e.g., personal preference, familiarity, age appropriateness, etc.)

The toy photos were printed in black and white to avoid the salience of color alone activating gender-related cognitions. Each image measured approximately 5.5” x 3.5” and was affixed to card-stock paper to protect from repeated handling. Toy photos were primarily obtained from online children's toy stores. Strategically constructing the stimulus set is required to determine if the participant is independently and spontaneously sensitive to the social category of gender. See Appendix A.

***Bem Sex Role Inventory (BSRI)***. The BSRI (Bem, 1974) was used to measure how masculine, feminine, and androgynous participants are in their personality traits. This scale contains 60-items consisting of various personality traits typically associated with gender roles, and participants are asked to indicate the degree to which each trait describes themselves. See Appendix B.

***Attitudes Towards Women Scale (AWS)***. A short 25-item version of the Spence-Helmreich Attitudes Toward Women Scale (AWS) was used to assess how conservative or traditional participants are in terms of their social attitudes about the role of women in society (Spence, Helmreich & Stapp, 1973). The scale asks participants to indicate the degree to which they agree or disagree with various statements, for example, “Women should worry less about their rights and more about becoming good wives and mothers.” See Appendix C.

**Procedure.** Participants were seated at a table across from the experimenter and informed that they will be sorting photos into groups, and answering questions on the basis of their sorting strategy. The experimenter then shuffled the stimuli images, and laid

them out on the table in front of each participant. First, the participants were instructed to visually examine all of the photos, and then the experimenter asked the participant to sort the photos into groups based on whatever method seems best and logical. The experimenter observed the participant's categorization behaviors, recorded how many groups the participant formed, which items were in each group, and the participant's description of each group. If the participant did not identify and sort by the dimension of gender in his or her initial sorting attempt, the experimenter respread the stimuli on the table and asked if there are any other ways to sort the items. If the participant identified another strategy, the procedure was repeated and participants were encouraged to limit their number of groups to two. Participants were allowed to sort the stimuli up to three times, or until they identified and used gender-type as a sorting method.

Upon completion of the sorting task, participants were seated at a computer and responded to a brief online questionnaire administered via the survey software Qualtrics. This survey consisted of basic demographic questions, followed by the BSRI and AWS. Participants then read a debriefing statement describing the general purpose of the experiment once all questions were answered. At this time, participants were also asked if the gender categories were immediately recognizable in the stimulus set.

## **Results and Discussion**

**First sort.** Participants were permitted to sort the stimuli up to three times, or until they identified and sorted by the dimension of gender. In the first sort, 20.45% ( $n = 9$ ) of participants sorted by gender (i.e., “boy’s toys” vs. “girl’s toys”), and 11.36% ( $n = 5$ ) sorted by gender, but included additional subgroups segregated by toy type, or a third “neutral toy” group. Participants most commonly sorted the stimuli using a combination

of toy type and play type in the first sort (40.91%,  $n = 18$ ), creating several diverse groups (e.g., tools, dolls, outside toys, vehicles). A total of 18.18% ( $n = 8$ ) and 4.55% ( $n = 2$ ) of participants sorted by toy type (e.g., dolls, toys with wheels, number of parts) and play type (e.g., action play vs. imagination/pretend play), respectively. Lastly, 4.55% ( $n = 2$ ) sorted by personal preference or an alternative dimension.

**Second sort.** Thirty-five of the 44 participants sorted the stimuli a second time. Gender was used as the basis of sorting most frequently (37.14%,  $n = 13$ ). Since participants were encouraged to decrease the number of their groups to two in subsequent sorts, many participants resorted to utilizing this dimension. No participants sorted by gender with multiple subgroups. Toy type (28.57%,  $n = 10$ ) and play type (25.71%,  $n = 9$ ) were also common categorization responses in this round of sorting. Few participants sorted by a combination of toy and play type (2.86%,  $n = 1$ ) and personal preference/other (5.71%,  $n = 2$ ).

**Third sort.** Half ( $n = 22$ ) of the participants continued to a third sorting procedure, in which the most sorted by toy type (45.45%,  $n = 10$ ), followed by gender (40.91%,  $n = 9$ ), and play type (13.64%,  $n = 3$ ). No participants sorted the stimuli using gender subgroups, a combination of toy and play type, or personal preference/other.

**Qualitative sorting responses.** Across all sorting rounds, 75.00% ( $n = 33$ ) sorted by gender. The remaining 25.00% ( $n = 11$ ) did not choose to utilize gender as a dimension during the sorting task. Interestingly, however, 7 of those participants reported having identified the gender difference present within the stimulus set after the task was completed. Participants generally claimed that they avoided using gender as a basis of sorting because it did not align with their personal beliefs and attitudes about gender, or

that they discounted its importance based on their own childhood experience. The remaining 3 participants that did not sort by gender reported post-task not noticing the dimension or considering to use it in grouping the stimuli. Two of these participants were exchange students from East Asian countries, and one freely disclosed that her mother was a carpenter at the end of the test session. The former group of 7 participants speaks to the conceptual salience (i.e., perceived importance) of gender, whereas the latter smaller group speaks to the perceptual salience of the presented dimension.

Unexpectedly, the vast majority of participants reported actively suppressing and avoiding the tendency to use gender as a sorting method due to their personal sociocultural and political beliefs. When alternative sorting methods were exhausted, participants often exhibited reluctance and offense while sorting by gender. Given the progressive and politically liberal population sampled in this study, many participants' responses were likely heavily influenced by these social forces. To illustrate this claim, the following are several quotes from participants who reluctantly sorted by gender-type:

*"I don't go by this."*

*"I call this gender bias."*

*"Girly toys – not that that exists anymore."*

*"Societal stereotypes of boys and girls toys."*

*"The Republican outlook."*

This issue was not anticipated to arise within the younger, relatively politically-naive sample to be tested, albeit these results are interesting and call for further investigation of modern gender attitudes. Regardless, overall three-fourths of adult

participants identified gender as a salient dimension for sorting, suggesting its importance as a social category.

**Sorting behaviors in relation to BSRI and AWS scores.** Logistic regression was performed to assess the relation of participants' reported gender-typed personality characteristics and attitudes toward women with the likelihood that participants sorted by gender. The model contained four independent variables (AWS score, BSRI feminine score, BSRI masculine score, BSRI androgyny score). The model containing three of the four predictors (AWS score, BSRI femininity score, BSRI masculinity score) was statistically significant,  $X^2(3) = 8.56, p = .036$ , indicating that this model was able to distinguish between participants who sorted by gender and those who did not. The model explained between 17.7% (Cox & Snell R square) and 26.2% (Nagelkerke R square) of the variance in gender-typed sorting behaviors, correctly classifying 75.0% of cases. However, the only independent variable that made a unique statistically significant contribution to the model was participants' BSRI masculinity scores, with an odds ratio of 3.44 ( $p = .033$ ). This value indicates that participants who reported themselves having highly masculine personality traits are over three times more likely to sort by gender in the free-sorting task, controlling for all other factors in the model. Given a more diverse sample, femininity scores may have reached significance in this model. This variable was negatively skewed at  $-.83 (SE = .357)$  due to a slight ceiling effect.

The results of the adult study were as anticipated; gender was a highly salient dimension participants frequently used to sort the toy stimuli, even after many suppressed initial inclinations to sort by gender type. Additionally, aligned with previous research, how gender-typed the participant was in terms of his or her masculine personality traits

was meaningful. Participants who describe themselves as having stereotypically masculine personality traits tended to make more gender-based classifications. A larger and more diverse sample would have been beneficial, potentially expanding upon these findings.

## **Study 2**

Having access to a limited sample of preschool-aged children, the second study served first as an exploration of whether a free-sort categorization task, previously only used to assess perceptual categories, could be used to assess conceptual categories, and in particular, gender categories. In addition, the study served as a preliminary exploration of four general questions:

- (1) Is gender a salient dimension for children's categorization of toys?
- (2) Is gender salience conceptually distinct from gender knowledge?
- (3) Is gender constancy related to gender salience? Children who have reached the pseudoconstancy stage, versus lower levels of gender understanding (i.e., gender stability and gender consistency), may sort by gender-type more often. However, if children have progressed into full gender constancy (i.e., mastery), gender may decline as a salient dimension, as they may be more likely to utilize other sorting strategies (e.g., toy type, play type).
- (4) Is rigidity to gender norms related to gender salience? Children who hold rigid gender-related beliefs may sort by gender-type more often compared to children who are lower in belief rigidity.

## Method

### Participants

Participants included 12 children (7 males, 5 females) ranging in age from 3 to 5 years ( $M = 57.17$  months,  $SD = 5.47$  months; 1 3-year-old, 9 4-year-olds, 2 5-year-olds). The majority of participants were European American ( $n = 9$ ), with the remaining three children reporting to be Hispanic, African American, or mixed-race. Preschoolers were recruited from the Children's Center at the State University of New York at New Paltz, Stepping Stones Early Learning Center at the Park in Highland, and the Hyde Park Universal Preschool, both also located in New York. A parent or guardian provided written consent for those who participated, and children provided verbal assent at the time of testing.

### Materials

*The free-sorting and explicit-sorting tasks.* The toy stimulus set for the sorting tasks with preschoolers consisted of a portion (16 photos) of the stimuli used in the adult study (see Appendix D). The full set was reduced by six pairs (12 photos) in order to make the stimulus set more manageable for the younger participants in the free-sorting task. The removed toy photos were selected based on participant responses in adult testing; specifically, any toys perceived as ambiguous or frequently miscategorized were removed. Removed toys included: the vanity (3), workbench (4), dollhouse (5), firefighter gear (6), EZ-Bake Oven (7), hockey equipment (8), Barbie jeep (9), Tonka truck (10), princess costume (17), cowboy costume (18), vacuum cleaner (23), and nerf gun (24).

**Gender constancy.** Gender-related cognitions were assessed to supplement children's behavioral responses in the categorization tasks. The gender constancy interview was derived from the original procedure created by Slaby and Frey (1975), but modified in consideration of later research (see Frey & Ruble, 1992; Leonard & Archer, 1989; Ruble et al., 2007; Slaby & Frey, 1975; Smetana & Letourneau, 1984; Szkrybalo & Ruble, 1999; Warin, 2000) to improve its overall clarity and ecological validity (Appendix E). Questions such as, "when you grow up, will you be a man or woman?" assess preschoolers' understanding of gender as a consistent and stable characteristic. A photo of a young boy and a young girl were presented to the participant in part B and C of the interview (Appendix F).

Children's errors in each domain of this assessment (self, same-gender, other-gender) were used to identify their current level of gender constancy. Correct responses to question 1a (*Are you/they a boy or girl?*) indicated the obtainment of gender identity. Correct responses to 2a (*When you/they were a little baby...?*) and 2b (*Were you/they ever a little [opposite of response] baby?*) indicated an understanding of gender stability over time. Correct responses to 3a (*When you/they grow up will you be...?*) and 3b (*Could you/they ever be a [opposite of response] if you really wanted to be...?*) indicated some understanding of gender consistency. If both 4a (*If you/they got dressed in [opposite gender] clothes...?*) and 4b (*Would you really be a ... or just pretending...?*) were correctly answered, the child has a full understanding of gender constancy. These children were coded as "high" in constancy understanding. Children in a state of pseudoconstancy were coded as "medium" in constancy if they provided an incorrect response to question 4a, followed by stating in 4b this change in gender based on

appearance is just “pretend.” If numerous errors indicated a lack of understanding of gender stability and consistency, children were coded as “low.”

***Rigidity in beliefs.*** Gender-related beliefs were assessed by asking children a series of questions about what they think when one gender violates norms and engages in stereotypically cross-gendered behavior, e.g., “would you like to be friends with a boy who wears nail polish?” This assessment was created by Ruble et al. (2007), derived from previous literature examining the flexibility of children’s beliefs about gendered behavior (see Levy, Taylor & Gelman, 1995; Smetana, 1986). These questions were designed to assess children’s gender-related knowledge, gender identification, rule-based rigidity, self-rigidity, fear of changing sex, and peer and parent rigidity (Appendix G).

Children responded to four questions for each behavior assessing their knowledge, rule-based rigidity, and self-rigidity. Rule-based rigidity indicates the flexibility of children’s beliefs of gender norms, whereas self-rigidity indicates children’s attitudes about others who exhibit cross-gendered behavior. Knowledge-based questions had children identify which sex usually participates in a gender-typed behavior (e.g., Who usually wears nail polish, boys or girls?). The rule-based rigidity assessment consists of two forced-choice questions about each target behavior (e.g., Is it wrong for boys to wear nail polish? Would it be OK for a boy to wear nail polish if he didn't get into trouble and no one laughed?). Self-rigidity was also measured by two questions for each of the four target behaviors (e.g., Would you like to be friends with a boy who wears nail polish? Would you like to go to school where boys are allowed to wear nail polish?). For each question, a score of 1 indicates rigidity and a score of 0 indicates flexibility in beliefs, so higher scores are representative of more rigid gender-related beliefs.

**Procedure.** Once parents submitted a consent form, children were tested individually at a child care center or lab space. Children were seated with a female experimenter. They were informed that they would be looking at and putting together some photos, and answering some questions. To start the procedure, the experimenter asked the participant what his or her favorite toys were and recorded the response. The categorization tasks then began, followed by the administration of gender-constancy interview and assessment of gender-related beliefs. The total duration of the procedure was limited to 30-minutes total.

***Free-sorting task.*** In the category formation, or *free-sorting*, task the experimenter instructed each child to look at the entire set of toy photos first, and then asked the child to sort the toys into groups in any way that makes sense to him or her. Minimal sorting instructions were given to the child, and a script was followed to limit potential experimenter effects (See Appendix H). Any form of leading questioning or direction were not used. There was no explicit hypothesis as to the outcome of this task, also limiting experimenter effects.

The experimenter posed questions such as, “Which pictures do you think should go together?” When the child first groups the toy photos, the experimenter gradually encouraged the child to make fewer groups, with two groups being ideal. The experimenter observed and recorded on a coding sheet how many groups the child created, and which toys were included in each group (see Appendix I for coding sheet). The child was then asked to explain why they chose to group the toys together the way they did (i.e., “Why do these toys go together?” and “What is similar about the toys in this group?”). If the child formed two or more gender-typed groups, the number of

potential “errors” (i.e., including a toy in the inappropriate gender-typed category) was recorded. After the completion of an initial sorting attempt, the experimenter spread out the toy stimuli randomly on the table again and asked the child if there are any other way to group the toys. The free-sorting procedure was repeated up to three times with each child participant until they identified and used the gender-type dimension ( $\leq 2$  errors) or were unable to sort the stimuli

*Explicit-sorting task.* Only if children failed to spontaneously recognize the two distinct gender-typed groups in the stimulus set, an explicit-sorting procedure immediately followed as an assessment of gender knowledge. Toy items were presented individually at random, and the child was asked to identify if boys or girls can play with the toy. Although some instruction is provided in this task, the task is sufficiently open-ended to allow for potential neutral responses, i.e., either a boy or a girl could play with the toy. If children are able to categorize the toys by gender-type with few errors ( $\leq 2$ ), this would indicate they are aware of the sex-role stereotypes associated with the toy stimuli.

*Gender-constancy interview.* Once children completed the sorting tasks, a coloring activity followed to prevent the occurrence of any priming effects influencing responses in the constancy and rigidity measures. Children were permitted to color freely throughout the remaining of the procedure. The interview conducted with the preschoolers measuring constancy was derived from the original Slaby and Frey (1975) assessment. Leonard and Archer (1989) later modified the interview to exclude the use of props (e.g., dolls) in order to better clarify the difference between pretend and reality, and assist the children to better understand the nature of the questions themselves (see

Appendix E). The interview began with asking the child questions about him or herself, such as “Do you have a nickname?” The interview questions were then asked, starting with questions relating to the self, then relating to same-gender others, and lastly opposite-gender others. The beliefs assessment followed the constancy interview, with breaks being given to the child as needed.

***Rigidity in beliefs assessment.*** The gender-related beliefs assessment primarily followed the procedure established by Ruble et al. (2007). A series of questions were asked pertaining to four highly gender-typed behaviors: wearing nail polish and shaving one’s head (relates to physical appearance), playing with baby dolls and playing with trucks (relates to activities). After the completion of the categorization tasks, constancy interview, and rigidity assessment children were be debriefed and given a certificate of participation and small gift for their participation.

## **Results**

### **Overview of Analyses**

All twelve participants completed at least the free-sorting category formation task, with three participants being unable to complete the remaining assessments due to either lack of attention or attrition. First, descriptive statistics are provided and discussed for the categorization tasks. Second, children who displayed evidence of gender salience during the free-sorting task were compared in terms of their level of gender constancy and belief rigidity to those who did not. Forming at least two gender-typed groups construed gender salience. Third, since the unanticipated small sample size limited the ability to perform planned statistical analyses, nonparametric analyses identifying the relationship among age, gender constancy, and rigidity in beliefs are reported.

## Categorization Tasks

**Free-sorting task.** As is typical for the age group, no child sorted the stimuli more than twice or exhibited flexibility in their sorting method between sorting attempts. Those participants who continued to the second sort either chose to simply reduce their number of groups overall and/or persisted with their initial sorting inclinations. As anticipated, children utilized a variety of sorting methods in the free-sorting category formation task (see Table 1). A quarter of the sample ( $n = 3$ ) formed coherent gender-typed groups during the task, making two or less errors. Two of these children sorted by gender implicitly (i.e., they were unable to articulate the basis of their groups, or stated “*all same*”), while one child sorted by gender explicitly (i.e., “*boys’ toys*” and “*girls’ toys*”). An additional five children (41.7%) sorted by forming multiple gendered groups, typically by means of matching related toys or forming small subgroups (e.g., baby doll, stroller, Barbie vs. Spiderman, batman, transformer vs. ball, jump rope). This type of sorting is typical for this age group. The remaining fourth of the sample sorted by toy type ( $n = 3$ ), grouping items together based on similar features (e.g., wheels vs. no wheels, dolls/action figures vs. not dolls). One child formed her groups by making a story using the toy photos (i.e., unorganized).

Thus, overall,  $2/3$  ( $n = 8$ ) of the sample displayed some evidence of awareness of the gender-typed dimension within the stimulus set through their sorting behavior, suggesting gender was salient for most children in the sample. This finding demonstrates the usefulness of the free-sorting task as a measure of conceptual categories, and in particular, gender categories. By spontaneously sorting the toys by gender, the majority of children demonstrated that gender was indeed salient while viewing the stimulus set.

Commonly miscategorized toys in this task included the Barbie bike (4 times) and jump rope (3 times), both which were perceived to be “boy” toys.

**Explicit-sorting task.** Due to attrition, two children did not continue to the explicit-sorting task, and the three children who formed coherent gender categories in the free-sorting task progressed directly to the assessments. Seven out of twelve participants completed this task (see Table 1), with three children (42.86%) stating that either boys or girls could play with all of the toys. Another three children (42.86%) sorted by gender, with two of those children making a single error. One child sorted by gender with an additional neutral group which included: the car, tools, baby doll, jump rope, bike. Thus, the majority of the sample sorted by gender in this task.

A two-sided Fisher’s-exact test did not detect a significant relationship between gender salience in the explicit-sorting task and the free-sorting task,  $p = .429$  (Table 2). Interestingly, three children were able to accurately sort by gender in the explicit-sorting task, despite showing little to no evidence of gender salience in the implicit free-sorting task. One of these children sorted the toys into multiple gender-typed subgroups in the free-sorting task, the remaining two had sorted by toy type or an unorganized method. Their ability to sort by gender when prompted demonstrates their propensity to use the concept to sort toys, and so, the lack of or tenuous gender-typed sorting observed in the free-sorting task was not due to children’s inability to categorize based on gender. Rather, these findings reveal that gender was not particularly salient for these children’s view of the toys.

On the other hand, half of the children ( $n = 2$ ) who identified some or all toys as gender neutral in the explicit task had formed gender-typed subcategories in the free-

sorting task. For these children, the gender stereotyped nature of the toys was salient, but it appeared that they personally believed both boys and girls could play with the toys (see children's comments below). The remaining two children who did not use gender in either categorization task had initially sorted using dimensions of the toys themselves (e.g., dolls vs. not dolls, number of parts), and interestingly, were the only five-year-olds in the sample. Both of these children also had the lowest scores on the rigidity measures, and mastered or nearly mastered gender constancy. As has been found in the literature, once the concept is fully understood, gender as a categorical dimension appears to decrease in salience to allow for the schematic acquisition and assimilation of additional categorical distinctions.

It should be noted that "errors" in the explicit-sorting task were not typically due to lack of knowledge of stereotypical gender roles, but rather due to personal preference. One boy exclaimed, "*Boys love babies so much!*" as he placed the baby in the masculine toy group. A young 3-year-old girl identified all toys as neutral by repeatedly saying "*Me!*" in response to each toy presentation, because she would like to play with all of the toys. The tool set was miscategorized as a "girl" toy in a single instance, but this may be due to lack of attention since the picture contains multiple small parts which may have been difficult for children to accurately identify.

### **Categorization Behaviors and Gender-Related Cognitions**

The planned comparisons between children's sorting behaviors, their gender-related cognitions (see Table 3-4) were not feasible due to the limited sample size. Age differences in sorting behavior were originally predicted, but the sample contained low variability in terms of age ( $SD = 5.47$  months). Also due to the extremely low variability

in responses, children were grouped into either high, medium, or low-gender constancy groups based on their number of errors. Independent-samples *t*-tests were conducted to determine if the four children displaying no evidence of gender salience during the free-sorting task (sorting by toy type or an unorganized method) significantly differed from the eight children who exhibited gender salience (using gender in their sorting methods) in terms of their gender-related cognitions.

Children who sorted using gender were not significantly different in age ( $M = 55.38$ ,  $SD = 5.68$ ) compared to those who did not ( $M = 60.75$  months,  $SD = 2.99$ ),  $t(10) = 1.17$ ,  $p = .11$ ). Children perceiving gender as salient were not significantly higher in gender constancy levels ( $M = 2.33$ ,  $SD = .52$ ) compared to those who did not ( $M = 2.00$ ,  $SD = .82$ ),  $t(8) = -.80$ ,  $p = .45$ ). Though the group perceiving gender as salient were slightly higher in total belief rigidity ( $M = 1.75$ ,  $SD = .79$ ) than the group of children who did not ( $M = 1.00$ ,  $SD = .88$ ), this difference was also not statistically significant,  $t(7) = -1.34$ ,  $p = .22$ . However, the groups did show a significant difference for the knowledge subscale of the rigidity assessment,  $t(8) = -2.95$ ,  $p = .02$ . Children who found gender to be salient in the free-sorting task ( $M = .92$ ,  $SD = .13$ ), compared to those who did not ( $M = .44$ ,  $SD = .38$ ), were more likely to provide the rigid and stereotypical response to the gender-related knowledge questions (e.g., “Who usually plays with baby dolls, boys or girls?”).

Additionally, a median-split was used to group participants into “low” and “high” rigidity categories based on their total belief scores. revealed that three of the four children identified as “high” also displayed strong evidence of gender salience during the free-sorting task. The remaining highly-rigid child sorted using the unorganized method by telling a story using the toys. It is possible that her sorting method was a result of

difficulty comprehending the nature of the task, since she then was able to sort by gender in the explicit categorization task with only a single error – the tool set.

The other five participants classified as “low” in rigidity contained the three children who exclusively sorted by toy type (displaying no gender salience) during the free-sorting task. Two of these particular children were the aforementioned 5-year-olds who had an advanced understanding of gender constancy. Having seemingly mastered gender-typed categories, these children may be in the flexibility stage of gender development and now able to less rigidly adhere to gender norms. Both of these children actually displayed looks of humorous puzzlement to question, “*Can boys or girls play with this toy?*” before classifying all toys as neutral. In contrast, the third child “low” in rigidity that utilized toy type in the free-sorting task sorted by gender in the explicit-sorting task. This boy also had the lowest understanding of gender constancy in the sample.

Another child displaying low rigidity freely formed multiple subgroups, some but not all of which were gender-typed in nature. Interestingly, the single participant in the study that explicitly sorted by gender was also low in belief rigidity. Considering this 4-year-old also had a robust understanding of gender constancy, it may be that he had already entered into the flexibility stage of gender development. His enthusiasm in definitively sorting the toys as either “boys” or “girls” may be reflective of his knowledge of gender stereotypes, rather than belief rigidity. In all, while constancy was not clearly related to gender salience per se, rigidity in gender-related knowledge in particular may be a meaningful factor. See Table 5.

**Relationships Among Gender-Related Cognitions.** Ruble and colleagues (2007) identified a clear decrease in rigidity of gender-related beliefs around 6-years of age,

mediated by the understanding of gender consistency (i.e., constancy over appearances and situations). Spearman rank correlations were used to test for possible associations between these variables in the present study. Gender constancy and rigidity scores were not significantly related to one another in this sample,  $r(9) = .24, p = .41$ . Partially aligned with previous findings, age (in months) negatively correlated with total rigidity scores,  $r(9) = -.94, p < .001$ . Older children tended to be significantly less rigid, displaying early evidence of entering the flexibility stage of gender development.

### **Discussion**

These studies primarily sought to develop the free-sorting task derived from concept formation literature as an elucidating measure of a biosocial conceptual category: gender. The results of this preliminary examination of gender salience suggests that this type of task is applicable beyond the examination of perceptual categories. The majority of adults (75.00%) and young children (66.67%) spontaneously identified and utilized gender as a categorical distinction while grouping the toys. Gender was not salient to all observers, however, which reflects individual differences in the degree to which objects are processed through a gendered lens. In both the adult and child samples, gender-type differences were recognizable to some observers even when they were not viewed as salient. Specifically, these observers could identify the gender categories when prompted either at the end of the procedure or during the explicit-sorting task, but did not utilize this dimension in the free-sorting task.

To other observers, gender was conceptually salient in the free-sorting task, but their flexibility in gender-related beliefs may have deterred explicit gender-typed categorizations. The toys were instead identified as gender neutral by these participants.

Although some participants viewed gender as salient (or not salient) across-the-board, the concept of gender salience itself appears to be a result of dual cognitive processes (Gawronski & Creighton, 2013). The free-sorting task seems to reliably assess the implicit and unconscious process underlying gender salience. When processed explicitly, observers can consciously choose to suppress gender stereotypes, and subsequently reduce gender salience. Therefore, a more comprehensive articulation of the central question of this thesis can be framed as, do young children (and adults) perceive their environment through a gendered lens implicitly and/or explicitly? Moreover, how do these processes interact with one another and how do they relate to other gendered cognitive constructs that might give rise to the perception of gender on a daily basis?

For adults, individual differences in gender salience were related to self-described gender-typing. Specifically, high levels of masculine personality traits significantly predicted gender-based categorization behaviors. Directly aligned with gender schema theory (Bem, 1981), if individuals' self-concepts are highly gender-typed, they are more apt to engaged in gender-based schematic processing (Powlishta, Serbin & Moller, 1993). Feminine personality traits may also have been a significant predictor given a more diverse sample; this variable was negatively skewed due to a slight ceiling effect. Gender-related attitudes were not found to be significantly related to gender salience in the adult sample; however, the scale used was developed over four decades ago and may now lack validity in modern society.

Gender salience was strongly related to children's rigidity in gender-typed knowledge. Children who were aware of gender stereotyping for appearance and activities tended use gender-type while free sorting. Children scoring low on the rigidity

assessment typically opted for non-gendered sorting methods, especially if having also obtained a robust understanding of gender constancy. Past research consistently reports a cognitive-developmental trend in which the obtainment of higher levels of constancy is associated with lower levels of rigidity of gender norms (Kohlberg, 1966; Ruble et al., 2007). Children's ages (in months) were strongly correlation with rigidity ( $r = -.94$ ) in the present study. Like other category learning, as children master gender categories over time, their propensity to classify objects by gender over other available dimensions begin to decrease. Thus, these gender-related cognitions - rigidity in particular - played some role in gender salience even in this small sample of children.

As discussed, several key findings helped validate the use of the free-sorting methodology for examining gender categories. These two studies begin to address a 30-year-gap in the examination of gender salience. Serbin and Sprafkin's (1986) original categorization measure of gender salience similarly demonstrated a decrease in the use of gender-related dimensions with an increase in age and flexibility. However, the availability of alternative dimensions is crucial for a categorization task to effectively measure the salience of any cognitive schema. The free-sorting task theoretically contains an infinite number of alternative dimensions for observers to use while categorizing. In contrast, Serbin and Sprafkin's (1986) gender salience measure only presented children with three alternative dimensions and directed children to match, not categorize. Accordingly, their task was limited and measured *knowledge* of gender stereotyped rather than salience, whereas the open-ended nature of the free-sorting task permitted a more authentic assessment of true salience.

Serbin and Sprafkin (1986) also suggested gender salience contains a personal affiliation component in which individuals differ in terms of using gender to express preferences. The free-sorting procedure partially captured the influence of this component. When individual toy preferences conflicted with the gender-typed categories, some children provided justifications based on personal preference while miscategorizing the toy(s). A charming example described above was the one boy who stated “*Boys love babies so much!*” as he placed the baby in the masculine group. How gender schematic a child is in processing and classifying information evidently largely hinges upon cognitive development. The degree to which children and adults assimilate these category systems into their own self-schema instead varies based on affiliation preference. Having participants freely categorize the stimulus set in part allowed for both of these aspects of gender salience to be captured.

### **Limitations and Future Research**

Undoubtedly, the main issue in this study was an extremely small child sample due to low response rates. Additional participants may have revealed developmental trends or individual differences in gender salience, and clarified relationships between salience and gender-related cognitions. The free-sorting task itself, having originally been used with adult samples to study perceptual categories, also contained inherent limitations which must be considered. Although preschoolers can categorize stimuli using a multitude of conceptual methods, the number of features they can simultaneously process within a stimulus set is limited (Ionescu, 2007). The nature of the task requires an initial examination of all items in the stimulus set simultaneously. Moreover, a conceptual category, in comparison to a perceptual category (e.g., symmetry), is

substantially more complex. For these reasons, the stimulus set must be strategically constructed to avoid perceptually overloading children to the point where conceptual categories are not accessible. The explicit-sorting task was essential in substantiating the free-sorting behaviors and should be included in future iterations of the free-sorting task. Without the inclusion of this task in the categorization procedure, the interpretation of sorting behaviors and their relation to gender-related cognitions would have been further limited.

The utilization of the free-sorting category formation task uncovered an additional layer of complexity of social category salience, that is, that this construct is likely the result of a dual cognitive process. For instance, one's level of gender salience may be low because he or she is not processing perceptual input through gender schemas. Or, gender salience may be low because he or she is aware of the gender stereotypes and is motivated to consciously suppress the tendency to categorize through that lens. The former case is the result of implicit and automatic cognitive processes, whereas the latter results from explicit and conscious processes. Researchers have found that environmental cues appear to affect the implicit processing of gender salience. By subtly manipulating the environmental salience of gender for a 2-week period, preschool-aged children's gender stereotyping attitudes and behaviors decreased (Hilliard & Liben, 2010).

The leap from implicit to explicit processing – from automatic to controlled cognitions – is generally understood in the context of social prejudice (Gawronski & Creighton, 2013). Social biases and attitudes appear to emerge at the start of preschool, in children ages 3-to-4 years, with children first demonstrating in-group preferences (Teichman, 2016). At this age, children also hone important executive functioning

abilities allowing them to engage in more explicit-type processing (Greenbaum & Graf, 1989; Grosse Wiesmann, Friederici, Singer & Steinbeis, 2017). The child's own beliefs and attitudes, largely sculpted from experiences, may in turn serve as the motivating factor for a child to take the leap to explicit processing and suppress the urge to conform to societal stereotypes. These dual processes that give rise to an individual's level of gender salience and how they dynamically interact with the environment throughout development have yet to be investigated. Furthermore, understanding these relationships may carry substantial implications for society at-large. As discussed, reducing gender salience inadvertently lessens stereotyping behavior and biases, thus promoting social harmony.

The rapidly changing modern contention of gender as a social construct in Western cultures introduces a novel challenge for researchers in the field (Towle & Morgan, 2002). For decades, gender has been examined as an exclusively binary construct. The theories, previous research, and measures were originally formulated in highly dichotomized cultures. Under socially contemporary conditions in which gender stereotypes are outright rejected at times, these theories no longer encompass the recently adopted fluid perspective of gender (Risman, 2018). Using previous research and measures of gender-related constructs based on these dated theories within these cultures may be erroneous, and is a potential limitation of this research. Gender constancy in particular purports gender as a static characteristic. Reexamining gender development within socially progressive cultures is certainly imperative, but calls for an initial revisiting of previous theoretical and methodological considerations.

Future researchers can make iterative improvements of the free-sorting task as an indirect measure of gender and other social and/or conceptual categories. How would salience differ if different stimuli were used? Would including more or less stimulus items alter conceptual salience? Additionally, gender salience may be better understood by considering socialization factors via examining parent characteristics in relation to sorting behaviors. The inclusion of parents' attitudes about gender, as well as environmental influences such as reinforcement of gender-typed behaviors in the home, would better provide an integrative assessment of factors involved in the salience of gender as a social category.

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*Figure 1.* Examples of Gender-Typed Toys Stimuli. Highly feminine toys (left) were selected with highly masculine toys (right).

Table 1.

*Summary of Sorting Behaviors in Categorization Tasks*

<b>Free-Sorting Task</b>	<b>Sorting Behavior</b>	<b>Unorganized</b>	<b>Toy Type</b>	<b>Gender Subgroups</b>	<b>Gender Implicit</b>	<b>Gender Explicit</b>
	( <i>n</i> = 12)	8.3% ( <i>n</i> = 1)	25.0% ( <i>n</i> = 3)	41.7% ( <i>n</i> = 5)	16.7% ( <i>n</i> = 2)	8.3% ( <i>n</i> = 1)
<b>Explicit Sorting Task</b>	<b>Sorting Behavior</b>	<b>By Gender</b>	<b>By Gender with Neutral Group</b>	<b>All Neutral</b>		
	( <i>n</i> = 7)	42.86% ( <i>n</i> = 3)	14.29% ( <i>n</i> = 1)	42.86% ( <i>n</i> = 3)		

*Note.* Overall, 2/3 of the sample sorted by gender in some capacity in the free-sorting task. In the explicit sorting task, the majority of children sample all or some of the toys as gender neutral (i.e., boys or girls can play with it).

Table 2.  
*Frequency Table for Fisher's Exact Test Comparing Gender Salience and the Categorization Tasks*

		Free-Sorting Task	
		Salient	Not Salient
<b>Explicit-Sorting Task</b>	By Gender	2	2
	Neutral	3	0

*Note.* A two-sided Fisher's-exact test did not detect a significant relationship between gender salience in the explicit-sorting task and the free-sorting task,  $p = .429$

Table 3.

*Summary of Participants' Gender Constancy Levels*

<b>Constancy Level</b>	<b>Identity</b>	<b>Stability</b>	<b>Consistency</b>	<b>Constancy</b>
<i>Self</i>	-	1		9
<i>Same Gender Others</i>	-	2	-	8
<i>Opposite Gender Others</i>	-	-	2	8

*Note.* Numbers indicate the number of children at that particular gender constancy stage at each assessed level. All children surpassed the gender identity stage. The majority of children demonstrated a fairly robust understanding of gender constancy at each level.

Table 4.

*Descriptive Statistics of Rigidity in Gender-Related Beliefs*

<b>Rigidity Score</b>	<i>M(SD)</i>
<i>Knowledge</i>	.73 (.34)
<i>Rule-Based</i>	.43 (.32)
<i>Self-Rigidity</i>	.26 (.37)
<i>Total Rigidity</i>	1.42 (.87)

*Note.* all rigidity scores range from 0 to 1.

Table 5.

*Study 2 Summary*

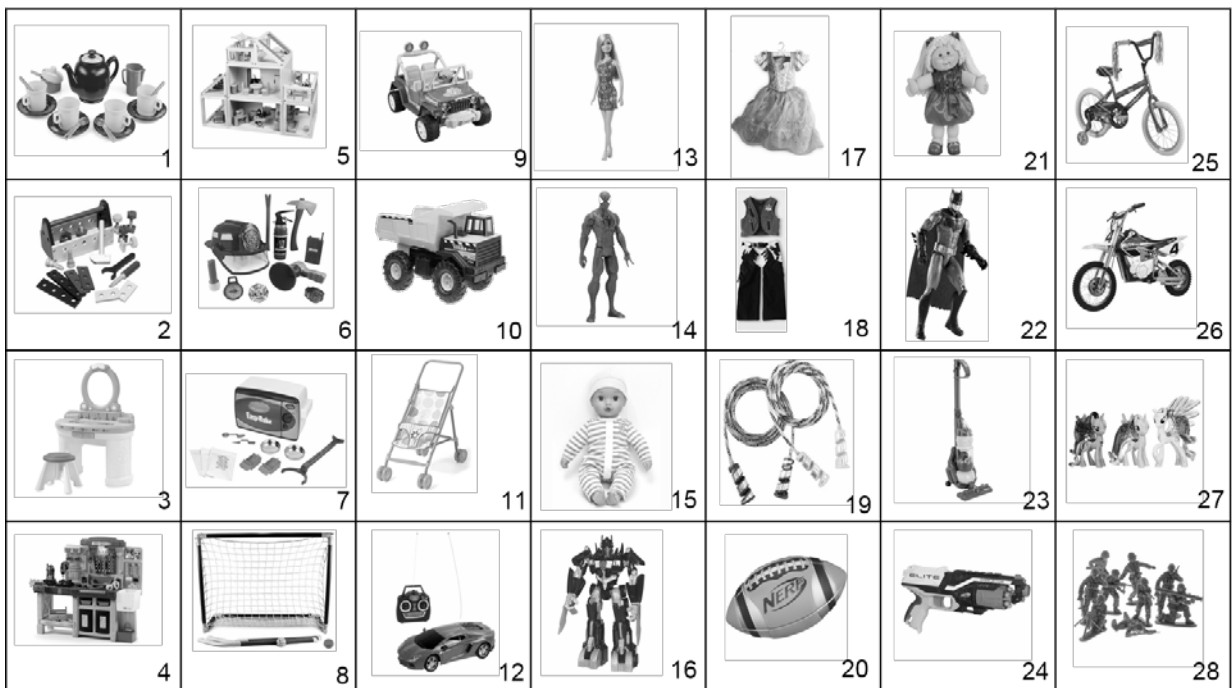
		Gender Saliency				No Gender Saliency					
Child		<i>Free-Sort</i>	<i>Explicit-Sort</i>	<i>Constancy Level</i>	<i>Rigidity Level</i>	Child		<i>Free-Sort</i>	<i>Explicit-Sort</i>	<i>Constancy Level</i>	<i>Rigidity Level</i>
1. (4 y)	Subgroups	-	-	-	-	9. (4 y)	Unorganized	By Gender	Med	High	
2. (4 y)	Subgroups	-	-	Med	Low	10. (4 y)	Toy Type	By Gender	Low	Low	
3. (4 y)	Subgroups	By Gender	By Gender	Med	-	11. (5 y)	Toy Type	Neutral	High	Low	
4. (3 y)	Subgroups	Neutral	Neutral	-	-	12. (5 y)	Toy Type	Neutral	High	Low	
5. (4 y)	Subgroups	Gender w/Neutral Group	Gender w/Neutral Group	High	High						
6. (4 y)	Implicit	-	-	High	High						
7. (4 y)	Implicit	-	-	High	High						
8. (4 y)	Explicit	-	-	High	Low						

*Note.* Summary table comparing Study 2 participants showing evidence of category awareness (i.e., gender saliency) in the free-sorting task versus those who did not. Children's ages in years are reported beside the participant number. Empty cells indicate the child did not complete that portion of the procedure.

## Appendix A

### Adult Study: Full Toy Stimulus Set

The following is the full stimulus set of the gender-typed toys used in the free-sorting task in the adult pilot study. The odd numbered toys represent stereotypically feminine, “girl” toys. The even numbered toys represent stereotypically masculine, “boys” toys.



## Appendix B

### Bem Sex Role Inventory (BSRI)

The following is the original Bem Sex Role Inventory (Bem, 1974), a measure of psychological androgyny.

Rate yourself on each item, on a scale from 1 (never or almost never true) to 7 (almost always true). When you have completed the inventory, transfer your ratings to the inventory score sheet.

- |  |   |
|--|---|
| 1. _____ self-reliant                      | 31. _____ makes decisions easily        |
| 2. _____ yielding                          | 32. _____ compassionate                 |
| 3. _____ helpful                           | 33. _____ sincere                       |
| 4. _____ defends own beliefs               | 34. _____ self-sufficient               |
| 5. _____ cheerful                          | 35. _____ eager to soothe hurt feelings |
| 6. _____ moody                             | 36. _____ conceited                     |
| 7. _____ independent                       | 37. _____ dominant                      |
| 8. _____ shy                               | 38. _____ soft-spoken                   |
| 9. _____ conscientious                     | 39. _____ likable                       |
| 10. _____ athletic                         | 40. _____ masculine                     |
| 11. _____ affectionate                     | 41. _____ warm                          |
| 12. _____ theatrical                       | 42. _____ solemn                        |
| 13. _____ assertive                        | 43. _____ willing to take a stand       |
| 14. _____ flatterable                      | 44. _____ tender                        |
| 15. _____ happy                            | 45. _____ friendly                      |
| 16. _____ strong personality               | 46. _____ aggressive                    |
| 17. _____ loyal                            | 47. _____ gullible                      |
| 18. _____ unpredictable                    | 48. _____ inefficient                   |
| 19. _____ forceful                         | 49. _____ acts as a leader              |
| 20. _____ feminine                         | 50. _____ childlike                     |
| 21. _____ reliable                         | 51. _____ adaptable                     |
| 22. _____ analytical                       | 52. _____ individualistic               |
| 23. _____ sympathetic                      | 53. _____ does not use harsh language   |
| 24. _____ jealous                          | 54. _____ unsystematic                  |
| 25. _____ has leadership abilities         | 55. _____ competitive                   |
| 26. _____ sensitive to the needs of others | 56. _____ loves children                |
| 27. _____ truthful                         | 57. _____ tactful                       |
| 28. _____ willing to take risks            | 58. _____ ambitious                     |
| 29. _____ understanding                    | 59. _____ gentle                        |
| 30. _____ secretive                        | 60. _____ conventional                  |

## Appendix C

### Spence-Helmreich Attitudes Toward Women Scale (AWS) – Short Version

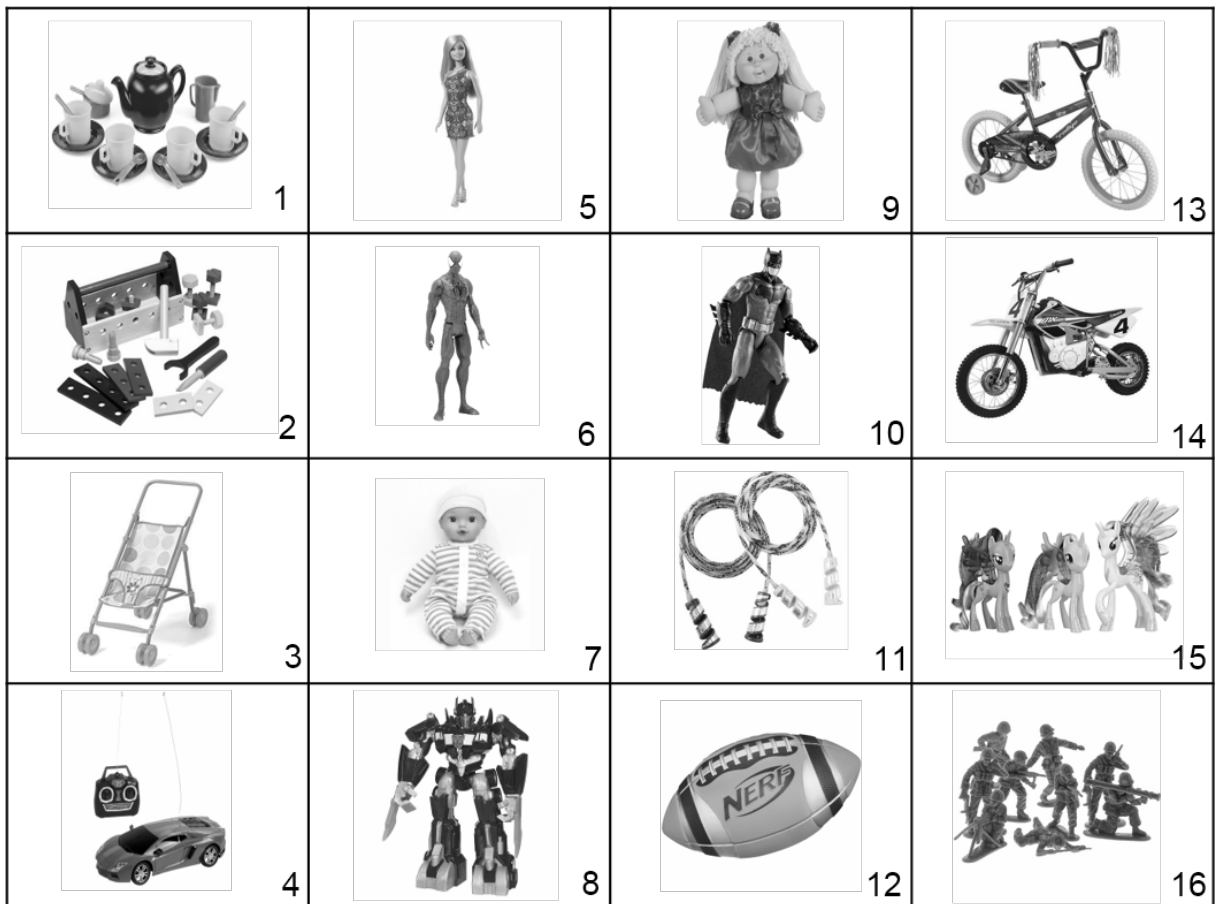
The following is a 25-item short version of the Attitudes Toward Women Scale (Spence, Helmreich & Stapp, 1973).

Instructions	
The statements listed below describe attitudes toward the role of women in society that different people have. There are no right or wrong answers, only opinions. You are asked to express your feeling about each statement by indicating whether you (A) agree strongly, (B) agree mildly, (C) disagree mildly, or (D) disagree strongly. Please indicate your opinion by blackening either A, B, C, or D on the answer sheet for each item.	
Response = 0	
AS	1 Swearing and obscenity are more repulsive in the speech of a woman than of a man.
DS	2 Women should take increasing responsibility for leadership in solving the intellectual and social problems of the day.
DS	3 Both husband and wife should be allowed the same grounds for divorce.
AS	4 Telling dirty jokes should be mostly a masculine prerogative.
AS	5 Intoxication among women is worse than intoxication among men.
DS	6 Under modern economic conditions with women being active outside the home, men should share in household tasks such as washing dishes and doing the laundry.
DS	7 It is insulting to women to have the "obey" clause remain in the marriage service.
DS	8 There should be a strict merit system in job appointment and promotion without regard to sex.
DS	9 A woman should be as free as a man to propose marriage.
AS	10 Women should worry less about their rights and more about becoming good wives and mothers.
DS	11 Women earning as much as their dates should bear equally the expense when they go out together.
DS	12 Women should assume their rightful place in business and all the professions along with men.
AS	13 A woman should not expect to go to exactly the same places or to have quite the same freedom of action as a man.
AS	14 Sons in a family should be given more encouragement to go to college than daughters.
AS	15 It is ridiculous for a woman to run a locomotive and for a man to darn socks.
AS	16 In general, the father should have greater authority than the mother in the bringing up of children.
AS	17 Women should be encouraged not to become sexually intimate with anyone before marriage, even their fiancés.
DS	18 The husband should not be favored by law over the wife in the disposal of family property or income.
AS	19 Women should be concerned with their duties of childbearing and house tending, rather than with desires for professional and business careers.
AS	20 The intellectual leadership of a community should be largely in the hands of men.
DS	21 Economic and social freedom is worth far more to women than acceptance of the ideal of femininity which has been set up by men.
AS	22 On the average, women should be regarded as less capable of contributing to economic production than are men.
AS	23 There are many jobs in which men should be given preference over women in being hired or promoted.
DS	24 Women should be given equal opportunity with men for apprenticeship in the various trades.
DS	25 The modern girl is entitled to the same freedom from regulation and control that is given to the modern boy.

## Appendix D

### Child Study: Toy Stimulus Set

The following is the reduced stimulus set of the gender-typed toys to be used in the free-sorting task with child participants. The odd numbered toys represent stereotypically feminine, “girl” toys. The even numbered toys represent stereotypically masculine, “boys” toys.



## Appendix E

### Gender Constancy Interview

The following is a derivation of the original Slaby and Frey (1975) interview designed to assess the levels of gender understanding, created by Leonard and Archer (1986) and used by Warin (2000).

#### *A. Questions relating to self*

- 1a. Are you a boy or girl?
- 2a. When you were a little baby were you a boy or a girl baby?
- 2b. Were you ever a little [opposite of response] baby?
- 3a. When you grow up will you be a woman or a man?
- 3b. Could you be a [opposite of first response] if you really wanted to be? Why? How? When would you change?
- 4a. If you got dressed in [opposite-gender] clothes would you be a boy or a girl?
- 4b. Would you really be a.... Or just pretending to be a ...?

#### *B. Questions relating to same-gender others*

- 1a. (Show photo of same-gender child) Are they a boy or girl?
- 2a. When they were a baby were they a boy baby or a girl baby?
- 2b. Were they ever a little [opposite of first response] baby?
- 3a. When they grow up, will they be a woman or a man?
- 3b. Could they be a [opposite of first response] if they really wanted to be? How/when could they change?
- 4a. If they wore [opposite-gender] clothes would they be a boy or a girl?
- 4b. Would they really be a.... Or just pretending to be a ...?

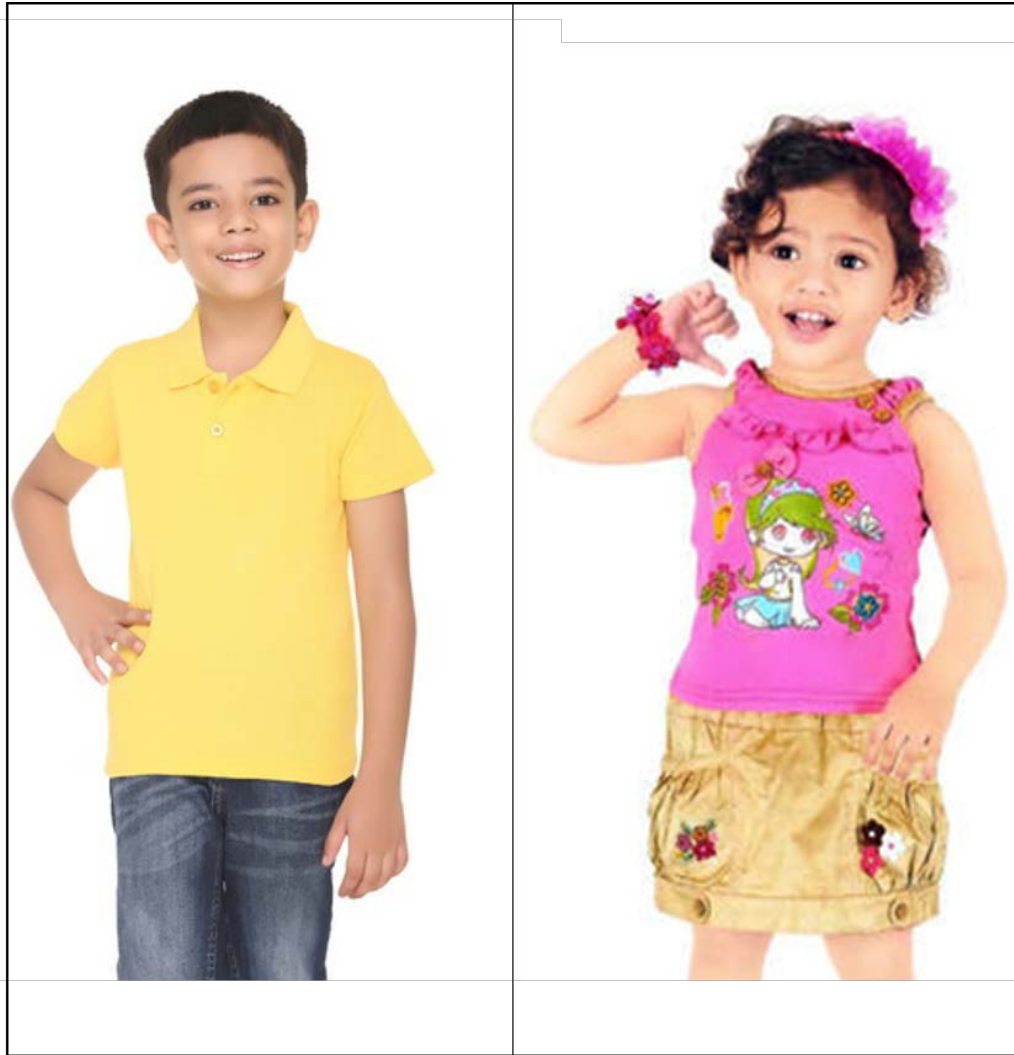
#### *C. Questions relating to opposite-gender others*

- 1a. (Show photo of opposite-gender child) Are they a boy or girl?
- 2a. When they were a baby were they a boy baby or a girl baby?
- 2b. Were they ever a little [opposite of first response] baby?
- 3a. When they grow up, will they be a woman or a man?
- 3b. Could they be a [opposite of first response] if they really wanted to be? How/when could they change?
- 4a. If they wore [opposite-gender] clothes would they be a boy or a girl?
- 4b. Would they really be a.... Or just pretending to be a ...?

Appendix F

Photos Presented in Gender Constancy Interview

The following are the photos presented to the child in part B and C of the Gender Constancy Interview.



## Appendix G

### Rigidity in Beliefs Assessment

The following is an assessment of rigidity in gender-related beliefs, derived from Ruble et al. (2007). Question #1 in each set consists of knowledge-based questions, #2 consists of the rule-based rigidity questions, #3 consists of the self-rigidity questions.

1. Who usually wears nail polish, boys or girls?
  2. Is it wrong for boys to wear nail polish?
  3. Would it be OK for a boy to wear nail polish if he didn't get into trouble and nobody laughed?
  4. Would you like to be friends with a boy who wears nail polish?
  5. Would you like to go to school where boys are allowed to wear nail polish?
- 
1. Who usually shaves their head, boys or girls?
  2. Is it wrong for girls to shave their heads?
  3. Would it be OK for a girl shave her head if she didn't get into trouble and nobody laughed?
  4. Would you like to be friends with a girl who has a shaved head?
  5. Would you like to go to school where girls are allowed to shave their heads?
- 
1. Who usually plays with baby dolls, boys or girls?
  2. Is it wrong for boys to play with baby dolls?
  3. Would it be OK for a boy to play with baby dolls if he didn't get into trouble and nobody laughed?
  4. Would you like to be friends with a boy who plays with baby dolls?
  5. Would you like to go to school where boys were allowed to play with baby dolls?
- 
1. Who usually plays with trucks, boys or girls?
  2. Is it wrong for girls to play with trucks?
  3. Would it be OK for a girl to play with trucks if she didn't get into trouble and nobody laughed?
  4. Would you like to be friends with a girl who plays with trucks?
  5. Would you like to go to school where girls are allowed to play with trucks?

## Appendix H

### Script for Categorization Tasks

The following is the general script to be followed by the experimenter during the free-sorting and explicit-sorting procedures.

#### Category Formation Task Scripts

##### Free-sorting procedure script

Experimenter lays out all stimuli photos randomly in front of the child

*"Take a good look at all of the pictures of toys here. Which toys do you think could go in a group together?"*

...

*"I wonder if any toys here can go together..."*

Child will begin to match/group the photos

Experimenter will assist with grouping as needed, avoiding any leading questions or guiding the child's behavior in any way with phrases such as:

*"What group does this toy go in?"*

*"Where would you like to put this toy?"*

*"Can you make fewer groups of toys by putting these toys here in one of your other groups?"*

*"Should any of these groups go together?"*

When the child appears to be finished grouping the stimuli, the experimenter will ask:

*"Are these your finished groups? Are you happy with these?"*

The experimenter will then ask the child about the basis of their groups with questions such as:

*"Why do these toys go together?"*

*"What is similar about the toys in this group?"*

The experimenter will record the child's verbatim responses, the number of groups, and what stimulus image is in each group.

If the child sorts by gender, the experimenter will also record the number of errors (i.e., including a toy in the inappropriate sex-typed category)

If the child did not sort by gender initially, the experimenter will respread the toy stimuli on the table, and the child will be asked:

*"Are there any other ways you could put these toys into groups?"*

*"Is there a different way these toys could go together?"*

The procedure will repeat up to 3 times until the child sorts by gender, or states there are no other ways to group the toy stimuli. If the child does not sort by gender at any point, the explicit sorting procedure will immediately follow.

##### Explicit sorting procedure script

The experimenter will present the stimulus images randomly one-by-one. The child will then be given these instructions:

*"Now I'm going to show you each toy picture one-by-one and ask you a question"*

(Shows toy photo)

*"Can boys or girls play with this toy?"*

The experimenter will then place each image in a respective pile, with the potential for a neutral pile, and record the number of errors.

