18- and 24-month-olds’ discrimination of gender-consistent and inconsistent activities

Sara E. Hill, Ross Flom

Department of Psychology, Brigham Young University, UT, United States

Received 3 April 2006; received in revised form 3 August 2006; accepted 9 August 2006

Abstract

18- and 24-month-olds’ ability to discriminate gender-stereotyped activities was assessed. Using a preferential looking paradigm, toddlers viewed male and female actors performing masculine and feminine-stereotyped activities. Consistent with our predictions, and previous research, 24-month-olds, but not 18-month-olds, looked longer at the gender-inconsistent activities than the gender-consistent activities. Results are discussed in terms of toddlers emerging gender stereotypes and perception of everyday events.

Keywords: Gender; Gender-stereotypes; Infant perception

Gender, and gender-stereotyped, behaviors have been topics of interest at least since the 1960s (e.g., Huston, 1983; Mischel, 1966; Ruble & Martin, 1998). Historically, many of the procedures used in examining the development of toddlers’ knowledge of gender stereotypes require the participant to point toward, select, or sort pictures as an indication of their knowledge of gender stereotypes (Etaugh, Grinnell, & Etaugh, 1989; Kuhn, Nash, & Bruken, 1978). More recently, research examining the emergence of gender stereotypes has made use of the preferential looking procedure.

Using a preferential looking procedure, 6-month-olds are able to match an adult’s dynamic face and voice on the basis of gender (Walker-Andrews, Bahrick, Raglioni, & Diaz, 1991) but 6-month-olds are not able to do so when the face is static (Lasky, Klein, & Martinez, 1974). Other studies using this procedure demonstrate that between 18- and 24-months of age, toddlers can match pictures of male and female children with gender-stereotyped toys and toddlers of the same age range can match the labels “girl” and “boy” with static male and female faces (Poulin-Dubois, Serbin, & Derbyshire, 1998; Serbin, Poulin-Dubois, Colburne, Sen, & Eichstedt, 2001). A more recent investigation of 2-year-olds’ emerging knowledge of gender-stereotyped activities presented toddlers with a pairs of male and female actors performing an activity such as hammering, putting on make-up, or a gender-neutral activity such as turning on a light (Serbin, Poulin-Dubois, & Eichstedt, 2002). Results revealed that toddlers looked longer when the male actor performed a feminine activity (putting on lipstick) and no preference was found when the male or female actor performed a masculine activity (hammering). In addition, these researchers found a significant preference for the female actor when the male and female actor performed a neutral activity (turning on a light). On the basis of this, and related experiments, Serbin and co-workers (e.g., Eichstedt, Serbin, Poulin-Dubois, & Sen, 2002; Poulin-Dubois,
Serbin, Eichstedt, Sen, & Beissel, 2002) conclude that, by 24-months of age, toddlers possess an emerging knowledge of gender-stereotyped activities.

While the results of Serbin et al. (2002) support their overall conclusions, two issues may have attenuated their results. One issue is toddlers’ significant preference for the female actor during the neutral activities. Given this preference during the neutral activities, it is ambiguous as to whether this preference affected toddlers’ looking behavior during the gender-stereotyped activities, in particular, the masculine activities. A second factor that may have affected the results of Serbin et al. is the fact that the activities were presented statically.

A growing body of research demonstrates that motion promotes adults, as well as infants’ ability to discriminate faces (Lander, Christie, & Bruce, 1999; Schiff, Banka, & Bordes Galdi, 1986), and infants are better able to perceive information about object composition and substance when provided dynamic compared to static information (Bahrick, 1983, 1992). Moreover, Bahrick, Gogate, and Ruiz (2002) found that 5.5-month-olds could discriminate and remember an activity/event (an adult blowing bubbles) when the infant was provided dynamic stimulation but not when the infant was provided static stimulation. Given that dynamic displays promote infants’ perception and discrimination of objects, events, and persons; we assessed 18- and 24-month-olds’ discrimination of gender-stereotyped activities when provided dynamic displays. We also tried to reduce any potential confound associated with toddlers’ preference for a female actor by presenting participants, on each trial, two male or female actors as they performed the various activities rather than simultaneously presenting a male and a female actor.

Based on the results of Serbin et al., we predicted that toddlers would look longer at the gender inconsistent actor–activity pairing compared to the consistent pairing and toddlers’ looking times would not reliably differ for male and female actors performing gender-neutral activities. Finally, because dynamic displays promote infants’ perception of various events, we wanted to assess whether slightly younger infants (i.e., 18-month-olds) would show a preference for gender consistent or inconsistent activities.

1. Method

1.1. Participants

Eighteen toddlers at 18- and 24-months of age participated. The mean age of the 18-month-olds was 17 months and 22 days and the mean age of the 24-month-olds was 24 months and 17 days. All of the participants were Caucasian and were healthy, normal, and full term (>35 weeks gestation). Nine additional toddlers participated but were excluded from the final analysis. Two were excluded at 24-months due to computer failure, two at 18-months and one at 24-months of age for experimental error, two at 18- and one at 24-months of age for fussiness, and one toddler at 24-months of age because of side bias. Side bias was defined as spending 95% or more of the total looking time, on any one trial, toward either the left or right monitor.

1.2. Stimulus and apparatus

Dynamic color video displays of two actors, one male and one female, performing six activities were created. Each actor was filmed performing two masculine, two feminine and two gender-neutral activities. Masculine activities consisted of shaving and tying a necktie. Feminine activities consisted of putting on lipstick and nail polish. Gender-neutral activities consisted of drinking water and eating a bagel.

In determining the activities to use in this experiment, we recruited (N = 32) parents of 24-month-olds whose children were participants in another study to complete a questionnaire assessing their toddlers’ familiarity in observing various household activities. Parents indicated whether their child had observed various activities and whether their child observed this activity being performed primarily by the mother, father, or performed equally by both mother and father. Those activities receiving the highest nominations, and being performed primarily by the mother or father, were chosen as one event pairing (putting on lipstick/shaving) and those receiving the second highest ratings (putting on nail polish/neck tie) were chosen as the other event pairing. The parents of the participants in the current study completed a similar questionnaire and their results are presented below.

Stimulus events were videotaped with a Sony digital video camera and edited using Apple’s iMovie digital editing system. Events were presented using Panasonic (VHS NV-A500) edit controller connected to four Panasonic video decks (AG-6300 and AG-7500) and these were connected to two 19 in (48 cm) color monitors (Sony KV-
A computer connected to two videogame controllers was used in recording children’s looking times to each event. Each child was seated in an infant chair on top of a table or on the parent’s lap depending on the size and preference of the child. The child sat facing two video screens from a distance of 100 cm. The two video monitors were surrounded by a three-panel display covered in black cloth. Video monitors were separated by 50 cm and two slots were cut into the black cloth surrounding the monitors allowing observers to record the children’s visual fixations. A small toy with a bell attached was hung between the two monitors and could be rattled by the observers to focus the child’s visual attention between the displays.

### 1.3. Procedure

Each testing session began with two warm-up trials that consisted of a moving toy frog on the left screen for 7 s and on the right screen for 7 s. Warm-up trials were used to alert the child of stimuli appearing on both screens. Following the warm-up trials, each child received 12 test trials and each trial was 15 s. The first three test trials consisted of a male or female actor performing the three activity pairings (putting on lipstick/shaving; eating a bagel/drinking; putting on nail polish/tying a necktie) in a random order. The second block of three trials were identical to the first three trials with the exception that other actor was seen performing the activities. The last six trials were identical to the first six trials with the exception that the left/right position of the activity was switched. The order of trial blocks was counterbalanced across participants.

Observers blind to the hypotheses of the experiment, recorded the duration of time (in seconds) that the toddlers looked toward each event. Observations of the primary observer were used in the data analyses and the observations of the secondary observers were used in the computation of interobserver reliability. A secondary observer recorded looking times for 68% of the toddlers. Interobserver reliability was expressed as a Pearson product–moment correlation between the looking proportions of the primary and secondary observers and was .95 (S.D. = .06).

### 2. Results

Toddlers’ looking time to each actor–activity pairing was recorded as a proportion of total looking time (PTLT). Proportions were derived for each trial separately by dividing the time spent looking to the gender inconsistent and consistent event by the total time spent looking at both events. Toddlers’ looking behavior to the consistent and inconsistent event was compared against chance (i.e., 50%), where chance is equivalent looking to both activities. See Figs. 1 and 2 for 18- and 24-month-olds, respectively.

Using a single-sample $t$-test, results indicate the 18-month-olds showed no significant preference for a male actor performing a feminine activity compared to masculine activity ($t(17) = .203, \ p = .482$) or a female actor performing a masculine activity ($t(17) = -.406, \ p = .690$). The results for the 2-year-olds, however, indicate they looked longer toward a male actor performing a feminine activity compared to a masculine activity ($t(17) = 4.82, \ p = .001$, Cohen’s $d$ effect size = .63) as well as a female actor performing a masculine activity compared to a feminine activity ($t(17) = 2.57, \ p = .020, \ d = .42$).

In order to more carefully examine the 24-month-olds’ preference for gender-inconsistent events, a $2 \times 3 \times 2$ mixed model analysis of variance (ANOVA) using 24-month-olds’ proportion of total looking time (PTLT) as the dependent variable was performed. The between subjects factor was gender of the subject (male and female). The within subjects factors were activity (masculine, feminine, and neutral) and actor (male and female). The results revealed a non-significant effect of subject gender ($F(1, 16) = .211, \ p = .653$), a non-significant effect of activity ($F(2, 15) = .278, \ p = .761$), and a non-significant effect of actor ($F(1, 16) = .111, \ p = .744$). Important to our hypotheses, however, the results of this ANOVA revealed a significant actor by activity interaction ($F(2, 15) = 9.55, \ p = .002$, Partial eta-squared $\eta^2_p = .56$). No other interactions approached significance (all $p’ s > .1$).

The results of this interaction indicate that 24-month-olds look preferentially longer toward a male actor performing a feminine activity compared to a masculine activity ($t(17) = 4.6, \ p < .001$), and a female actor performing a masculine activity compared to a feminine activity ($t(17) = 2.67, \ p = .016$). Thus, 24-month-olds’ preference for an actor performing a gender inconsistent activity, as assessed by single sample $t$-tests, was confirmed by the results of the mixed-model ANOVA.
Secondary analyses examined whether 24-month-olds’ proportions differed as a function of activity pairing (i.e., lipstick/shaving and tying a tie/nail polish) and did not reach significance ($t(34) = .314, p > .1$). Thus, 24-month-olds’ preference for the gender inconsistent activity is not likely due to a preference for a particular activity pairing. A non-parametric binomial test was also conducted to determine whether a few 24-month-olds who exhibited large preferences are carrying the significant results. Of the 18 two-year-olds, 14 looked longer (>50%) to the gender-inconsistent event (8 females and 6 males; two-tailed binomial test, $p = .031$). Thus, it seems unlikely the results of the 24-month-olds are carried by a few toddlers with strong dichotomous looking times.

Because toddlers at each age saw a male actor performing two neutral activities side by side and a female actor performing the same activities side by side, we initially examined and found no evidence of a preference for eating or drinking at 18- or 24-months of age (all $p$’s > .1). Given no significant preference for eating or drinking was found
for either male or female actors, we collapsed the activities of eating and drinking for the male and female actors. We then examined whether 18- or 24-month-olds looked longer toward a male or female actor performing the neutral activities. The results revealed no significant evidence of a preference for males or females performing neutral activities at 18-months of age (t(17) = .327, p = .612) or at 24-months of age (t(17) = .591, p = .56).

Across all ages, the results of the questionnaire revealed that 85–100% of the children had observed the gender-stereotyped and neutral activities chosen for this experiment. For the event of putting on nail polish, however, only 41% of the children had observed this activity. Of this 41%, all infants, however, were reported having seen this activity performed only by mothers. The feminine-stereotyped activity of putting on lipstick was seen by 85% of all participants and being performed 97% of the time by the mother. The masculine activities of shaving and putting on a necktie were seen by 94 and 87% of all participants, respectively, and the father was seen performing these activities 100% of the time.

2.1. Discussion

Our results demonstrate that by 24-months of age, children will look longer at a male actor performing a feminine activity thus replicating Serbin et al. (2002). Unlike Serbin et al., however, our results also indicate that 24-month-olds will look significantly longer toward a female actor performing a masculine activity. As predicted, no significant preference was found for a male or female actor performing gender-neutral activities (i.e., eating or drinking).

One possible reason why we were able to find a significant preference for a female actor performing a masculine activity may be a result of the activities used in the current experiment compared to those of Serbin et al. Specifically, the masculine activities in the current study were seen by 87–94% of all participants and were rated as being more strongly gender-stereotyped as they were seen being performed 100% of the time by males (i.e., fathers). In Serbin et al., however, 72% of the participants primarily saw the father pound a nail, 34% primarily saw their father take out the garbage, and 31% saw their father fix an object. The remaining percentages (28, 66, and 69% for each activity, respectively) indicate that the toddlers either saw their mothers perform the activity or that they saw both parents perform the activity with equal frequency.

A second factor that may have contributed to finding a significant effect for both the masculine and feminine events is the fact that the activities in the current experiment were presented dynamically rather than statically. We believe that by presenting infants with dynamic displays we were better able to recruit toddlers’ visual attention to the activity and thus elicit a visual preference. Previous research in the area of gender and infant perception has shown that 6-month-olds are able to perceive the auditory and visual correspondence between a face and voice when the display is presented dynamically but not when it is presented statically (Lasky et al., 1974; Walker-Andrews et al., 1991). Thus, it is not surprising that toddlers’ preference for gender inconsistent activities is more robust when provided dynamic displays relative to static displays.

From a developmental perspective, the fact that 18-month-olds failed to show a significant preference for either the gender consistent or inconsistent activity is largely congruent with other studies assessing the emergence of toddlers’ knowledge of gender stereotypes. For example, by 18-months of age, girls but not boys are able to “match” the faces of girls with dolls and the faces of boys with vehicles (Serbin et al., 2001). Between 24- and 31-months of age, toddlers show an increasing knowledge of gender-stereotyped activities within an elicited imitation procedure (Poulin-Dubois et al., 2002), and using an intermodal matching procedure a perceptual awareness of gender stereotypes is present by 2 years of age (Serbin et al., 2002).

From a theoretical perspective, it is traditionally assumed that the development of gender stereotypes has a somewhat lengthy and stage-like developmental sequence (Kohlberg, 1966; Martin & Halverson, 1981). However, the current results and those of others (e.g., Poulin-Dubois et al., 2002; Serbin et al., 2001, 2002) suggest that children may have acquired some conceptual knowledge of gender categories and stereotyped activities earlier than is traditionally assumed. While this developmental discrepancy is partially a function of the method used to examine gender stereotypes (e.g., preferential looking), it does, however, underscore the fact that children are perceiving and learning about gender stereotypes from a very young age.

Finally, the activities and behaviors of others provide, arguably, an important source of stimulation for infant attention, perception, learning, and memory about gender stereotypes. The present research adds to our growing knowledge about how the nature of information affects what infants’ abstract, learn, and remember from interactions with others. It also highlights the importance of investigating infant attention, learning, and memory for various
social events, including toddlers’ emerging awareness of gender-stereotyped behaviors, within the context of dynamic stimulation.

Acknowledgements

This research was supported by the Brigham Young University Family Studies Center and a BYU undergraduate mentoring grant awarded to the second author. These data were submitted by the first author in partial fulfillment of the requirements for the degree of MS in Psychology. We acknowledge Christie McConnell and Trevor Peterson for serving as actors. We acknowledge Heather Whipple, Joe Schmutz, Christie McConnell, and Trevor Peterson for their assistance in data collection, Lisa Serbin, Diane Poulin-Dubois, and two anonymous reviewers for comments on an earlier draft of this paper.

References


