Brief Report

Detection of Gender-Related Categories by 10-Month-Old Infants

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Thirty-two 10-month-olds completed an habituation procedure where a male or female face was paired with a specific object. Results reveal 10-month-olds can form categories based on correlations among attributes of social information. Basic processes involved in gender role formation are present in 10-month-olds.

A category may be understood as a group of correlated features or attributes which are perceived as associated with one another (Younger & Cohen, 1986). Gender roles are categories of social information in which certain characteristics are perceived to be more strongly associated with a particular social group (Hamilton, 1981). The category “masculine items” might be conceptualized as articles which are highly correlated with males, whereas “feminine items” could be viewed as those features closely associated with females.

Researchers have noted similarities between basic categorization processes in young children and stereotype development; notably gender role stereotypes (e.g., Martin & Halverson, 1987). In fact, basic cognitive processes similar to those which underlie infants’ categorization of visual patterns have also been implicated in the formation and maintenance of social stereotypes in children and adults. For instance, Martin and Halverson (1987), and others, have discussed gender roles in terms of perceptions of correlated features among social information.

Results from a comprehensive research program by Younger provide clear support for the notion that 10-month-old infants can detect contrived correlations among attributes of artificial (Younger, 1993; Younger & Cohen, 1983, 1986) and natural-like (Younger, 1992) stimuli. In this paradigm, infants are repeatedly shown stimuli which establish associations among several attributes. For instance, Younger and Cohen (1983, 1986) examined the abilities of 4-, 7-, and 10-month-old infants to perceive correlations among attributes. Infants were first habituated to black-and-white schematic line drawings of artificial animals composed of five attributes (e.g., body, ears). Each attribute had three values (e.g., ears could be rounded, humanlike, or antlers). Infants viewed two unique categories of contrived animal figures. Three attributes were correlated within each category. Younger and Cohen (1983, 1986) maintained that if infants perceive correlations among attributes (that are categories) established during habituation, then looking times to test stimuli which violate those correlations should be significantly higher than looking times to test stimuli which maintain the correlations among attributes. Results from this study, and a number of others, indicate that 10-month-old infants are sensitive to correlations of attributes and are able to form categories of information around clusters of correlated attributes (Younger, 1993; Younger & Cohen, 1983, 1986).

The latter results naturally lead to the additional question: Can infants comprehend categories comprised of stimuli which are more...
perceptually complex, realistic, and socially relevant (e.g., gender role stereotypes). This study examined infants’ abilities to detect correlations among attributes of social, gender-related information. We examined capabilities of 10-month-olds to detect correlations among attributes of social information, where one of those attributes was sex. Thirty-two healthy full-term 10-month-old infants (16 males, 16 females; age 310 days ± 7 days; M age = 309 days) completed the procedure. In addition, 11 10-month-olds did not complete the procedure due to fussiness, drowsiness, or procedural error.

Each infant was tested individually. Infants were seated on a parent’s lap facing a video screen approximately 30 cm from the infant’s face. Fixation times were recorded by an observer, who observed infant’s eyes on a second video screen. Trial onset was under infant control, and timing of each trial began when the infant fixated the stimulus on the screen. Trial duration was 5 s after the onset of the infant’s first fixation. Two s after the preceding stimulus went off the video screen, the next stimulus was presented. Observers were trained on a separate videotape of an adult executing a series of on- and off-stimulus fixations across 15 20-s trials. Agreement between pairs of observers was sampled at 500-ms intervals during training. Mean interrater reliability of training trials was 97%.

Habituation stimuli consisted of pictures of three male and three female faces, each paired with a specific object (hammer, football, shoe, blow dryer, scarf, frying pan). Infants were habituated to two categories each containing three pictures. One category included objects associated with females’ faces (feminine pairs), whereas the other category included objects associated with males’ faces (masculine items).

Habituation stimuli were presented in blocks of six stimuli, until infants’ looking times decreased to the criterion level (40% of total looking time on the six baseline trials). After infants reached criterion for the set of six habituation stimuli, four test stimuli were presented.

The control test stimulus contained a person–object pair from the habituation set. The generalized test stimulus contained a person–object pair which maintained the pattern of features established in the six habituation stimuli (e.g., a female’s face paired with an object previously paired with another female’s face). The novel test stimulus was a person–object pair which violated the pattern of features established in the six habituation stimuli (e.g., a male’s face paired with an object previously paired with a female’s face). The unique test stimulus was a picture unrelated to the habituation stimuli and was always presented as the last test stimulus to control against fatigue across the experimental session. The control test stimulus was always presented first within the test block, whereas the unique test stimulus was always presented fourth. Order of presentation of the generalized and novel test stimuli was randomized within the test block.

Eight male and eight female infants (n = 16) received test stimuli containing male faces. Eight male and eight female infants (n = 16) received test stimuli containing female faces. Analyses were performed on log transformations of fixation times to the four test stimuli (Younger, 1992). Results of a 2 (sex of infant) × 2 (sex of the face in test stimuli) × 4 (test stimulus) mixed design repeated measures analysis of variance revealed a significant effect for test stimulus, F(3, 84) = 6.03, p < .0001. No other significant main effects or interactions emerged. Mean looking times to the test stimuli are shown in Table 1. Further simple effects analyses indicated that fixation to the generalized test stimulus was not significantly greater than the control stimulus, nor did the novel and the unique test stimuli differ from one another significantly. In contrast, fixation times to the novel and the unique test stimuli were significantly greater than either of the two other test stimuli (control and generalized; all ps < .05).

The generalized and the novel test stimuli each contained a familiar face and a familiar object, even though the components (face and object) had not been paired together during habituation. What determined whether these stimulus pairs were seen as novel during test was the familiarity of the categorical, sex–object association rather than the familiarity of the components per se. The generalized stimulus, which maintained a familiar sex–object association, was seen as no more novel than a sex–object pair that had been viewed during habituation (the control test stimulus). Last, the
novel stimulus, which violated the sex-based association, was treated as no less novel than the completely unique test stimulus.

Results confirm that 10-month-olds are able to detect correlations among attributes of social information and are able to form gender-related categories of social information. These data do not suggest that infants have already formed categories of masculine and feminine gender roles. However, our results do indicate that 10-month-olds can use basic cognitive abilities to categorize social information, and the resultant categories could be precursors to the acquisition of gender-typed categories. Clearly, this study addresses only one important social cognitive process involved in gender role stereotype formation, namely social categorization. However, gender role development is a multifaceted and varied phenomenon, not reducible to any single process.

These data add to a growing body of gender role development literature which suggests that early foundations of children’s gender role categories are established well before the preschool years (e.g., Leinbach & Fagot, 1993; Levy & Fivush, 1993; Serbin, Poulin-Dubois, Derbyshire, Kenyon, & Colborne, 1993). Future research addressing gender-based categorization in preverbal children might examine the emergence of infants’ growing associations of gender-related information using a variety of visual attention paradigms.

REFERENCES


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