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Sex-related preferences for real and doll faces versus real and toy objects in young infants and adults

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ABSTRACT

Findings of previous studies demonstrate sex-related preferences for toys in 6-month-old infants; boys prefer nonsocial or mechanical toys such as cars, whereas girls prefer social toys such as dolls. Here, we explored the innate versus learned nature of this sex-related preferences using multiple pictures of doll and real faces (of men and women) as well as pictures of toy and real objects (cars and stoves). In total, 48 4- and 5-month-old infants (24 girls and 24 boys) and 48 young adults (24 women and 24 men) saw six trials of all relevant pairs of faces and objects, with each trial containing a different exemplar of a stimulus type. The infant results showed no sex-related preferences; infants preferred faces of men and women regardless of whether they were real or doll faces. Similarly, adults did not show sex-related preferences for social versus nonsocial stimuli, but unlike infants they preferred faces of the opposite sex over objects. These results challenge claims of an innate basis for sex-related preferences for toy real stimuli and suggest that sex-related preferences result from maturational and social development that continues into adulthood.

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Introduction

Previous studies have shown that 3-year-old boys prefer to play with transportation and construction toys, whereas girls prefer to play with dolls (Connor & Serbin, 1977; Liss, 1981), and that 3- to 10-year-old children prefer toys associated with their respective sex (Pasterski et al., 2005). Learning and cognitive theories suggest that these toy preferences arise from modeling and reinforcement of sex-typical play (Bandura, 1977; Fagot & Hagan, 1991; Langlois & Downs, 1990) and that gender identity acquired through social context leads to mental representations of gender-appropriate toys (Martin, 1999; Martin, Wood, & Little, 1990). Other studies, however, suggest that preferences for sex-typed toys could be linked to biological differences between males and females. For example, high levels of androgen were associated with male toy preference in human females (Berenbaum & Hines, 1992; Hines & Kaufman, 1994). However, this pattern could also be the result of an alteration in learning histories or of an altered cognitive development such as social encouragement or development of self-identification toward masculinity (Alexander & Hines, 2002; Fausto-Sterling, 1992; Hines, 2010). Importantly, sex-specific toy preferences are not exclusive to human children; young male monkeys were reported to spend more time interacting with and looking at "human boy toys" than were young female monkeys, and the latter preferred to interact with and look at "human girl toys" over "human boy toys," supporting a role for biological differences (Alexander & Hines, 2002; Hassett, Siebert, & Wallen, 2008).

To test whether preferences for sex-specific objects are present early in life and are perhaps innate, Alexander, Wilcox, and Woods (2009) tested 6-month-old infants, for whom social experience presumably has less impact than for the 3- to 10-year-olds mentioned earlier. They presented infants with two three-dimensional objects, namely a doll and a toy truck, which have been shown to yield sex-related preferences in 2-year-olds (Zosuls et al., 2009). Using an eye tracker, Alexander and colleagues found that, just like older children and young monkeys, infant boys were more interested in the toy truck than were infant girls, whereas infant girls were more interested in the doll, as measured by the number of gaze fixations. Although girls preferred to look at the doll more than at the toy truck, boys did not show a toy preference overall.

An independent line of research has shown that sex differences in preference are also found in neonates, with more newborn girls showing preference for a real female face over a mobile made from a scrambled face picture on a mechanical ball (36% vs. 17% of the sample) but more newborn boys showing the opposite preference (43% vs. 25%) (Connellan, Baron-Cohen, Wheelwright, Batki, & Ahluwalia, 2000). Although the largest group of newborn girls tested in this study showed no preference (47%), the authors concluded that these sex differences in attention toward social versus nonsocial stimuli have a strong innate component because they are present at birth and are then reinforced by social influences. The authors also suggested that their results are in line with the sex differences in toy preferences mentioned above.

In the current study, we asked whether pictures of social and nonsocial toys and real objects would yield similar sex differences in preference. Using a within-participant design, we presented 4- and 5-month-old infants, as well as young adults, with pictures of four types of objects, namely doll faces, human faces, toys, and real objects. To ensure the generalization of our findings, we included six exemplars of each object type and 48 trials that included all relevant comparisons (real vs. toy, toy vs. toy, and real vs. real), unlike previous studies that included a maximum of two unique stimuli per category. To test whether the sex specificity of the stimuli influenced preference, infants were presented with female faces and cars (Experiment 1a) and with male faces and stoves (Experiment 1b). We presented social versus nonsocial stimuli side by side for a better understanding of relative preferences. In addition, we also ran the same task on adults (Experiments 2a and 2b) and asked them to judge the *attractiveness* of the pictures. This allowed us to compare fixation preferences with explicitly stated preferences and to interpret the infant eye-tracking results in terms of attractiveness (cf. Quinn, Kelly, Lee, Pascalis, & Slater, 2008).

If a general biological constraint, perhaps innate to humans and other primates, underlies their preference for different objects (some of which have been associated with different sexes), both infants and adults should prefer all types of sex-specific items, either toys or real objects; that is, females