

Children's Implicit Gender–Toy Association Development Varies Across Cultures

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Gender-stereotyped beliefs develop early in childhood and are thought to increase with age based on prior research that was primarily carried out in Western cultures. Little research, however, has examined cross-cultural (in)consistencies in the developmental trajectory of gender-stereotyped beliefs. The present study examined implicit gender–toy stereotypes among 4- to 9-year-olds ($N = 1,013$; 49.70% girls) in Canada, China, and Thailand. Children from all three cultures evidenced implicit gender–toy stereotypes over this developmental period, but cultural differences in the developmental pattern and strength of these stereotypes were apparent. Gender–toy stereotypes were relatively strong and stable across age groups among Thai children and relatively weak and stable across age groups among Chinese children. Canadian 4- to 5-year-old children displayed weaker stereotypes, whereas 6- to 9-year-olds displayed stronger stereotypes. These findings highlight the contribution of culture to children's gender stereotype development. Although gender–toy stereotypes were found among 4- to 9-year-olds in all three cultures examined here, the strength of these stereotypes varies by culture. Furthermore, the previously described increase in gender stereotyping over this developmental period appears to not apply across cultures, thus challenging the conventional view on development in this domain based on prior, mainly Western, research.

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Public Significance Statement

Children from three cultures, Canada, China, and Thailand, evidenced implicit gender–toy stereotypes from ages 4 to 9 years, but cultural differences in the developmental pattern and strength of these stereotypes were apparent. Our findings provide valuable data from two underrepresented non-Western cultures that challenge conventional wisdom—which has been predicated on Western samples—about the developmental course of gender stereotyping.

Keywords: gender stereotypes, cross-cultural, children, development, implicit association

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Gender stereotypes refer to the associations between certain attributes or behaviors and members of a gender category (Bigler & Liben, 2006). Gender stereotypes exist in many domains and often exert negative impacts (e.g., biased interpersonal judgments; Cook et al., 2019; Ellemers, 2018), making it critical to understand how gender stereotypes develop. In Western societies, from ages 3 to 11 years, gender stereotypes expand from concrete items (e.g., toys, appearances; M. L. D. Halim et al., 2018; Martin & Ruble, 2010; Todd et al., 2017) to more abstract domains (e.g., personalities, abilities, interests, traits; Bian et al., 2017; Cvencek et al., 2011; Giles & Heyman, 2005). Over this period, children recognize more nuanced associations related to gender stereotypes, provide more gender-stereotyped responses, and use gender stereotypes more often in descriptions of girls and boys (Leaper, 2015; Miller et al., 2009).

Age-related increases in children's gender stereotyping are often hypothesized to reflect developmental changes in cognitive ability (Martin & Cook, 2018). For example, with age, children are able to obtain gender constancy (Leaper, 2015; Ruble et al., 2007), endorse gender essentialist attitudes (Meyer & Gelman, 2016), categorize people or objects along gender dimensions (Bigler & Liben, 2006), gain knowledge about stereotypes across various domains (Leaper, 2015), and are motivated to describe gender-stereotyped targets and behaviors (Martin & Cook, 2018). Because prior research on gender stereotyping has primarily been limited to Western cultures, it is difficult to determine how the developmental trajectory might be affected by culture (Gibbons, 2000; Wong & VanderLaan, 2020).

From an ecological model of human development perspective (Bronfenbrenner & Morris, 2006), children's gender stereotypes reflect cultural values and beliefs. Supporting evidence for this assertion comes from several studies comparing gender stereotyping in Western and Eastern cultures. For example, Western and Eastern cultures differ in their values regarding masculinity. In East Asian cultures, such as China, Confucian ideology emphasized a *wen-wu* balance in conceptualizing masculinity (Louie, 2014). *Wen* centers on qualities such as being civil and gentle, whereas *wu* centers on having physical skills and power. In contrast, American media often depicts masculinity as having a muscular appearance and strength (Levant et al., 2010). Empirical evidence supports this argument. Gutierrez et al. (2020) sampled 4-year-olds in Hong Kong and the United States and examined their appearance rigidity—that is, their desire to wear gender-stereotypical clothing. Although appearance rigidity was observed among boys in both cultures, Hong Kong boys displayed less rigidity than boys in the United States. Thus, boys in both cultures adhere to gender stereotypes regarding

appearance, but boys in Hong Kong show less strict adherence. These findings could suggest weaker gender stereotyping among boys in Hong Kong than in the United States.

In contrast, other research suggests different patterns when examining Western and Eastern cultures. For example, when 4- to 5- and 8- to 9-year-olds in Hong Kong (Kwan et al., 2020) and Canada (Nabbijohn et al., 2020) appraised hypothetical peers who displayed either gender-conforming or nonconforming behaviors, children from both cultures rated gender-conforming peers more favorably; however, Hong Kong children showed less positive appraisals of peer gender nonconformity than Canadian children. In light of evidence that more significant gender stereotyping is associated with a lesser interest in having gender-nonconforming peers as playmates (Sims et al., 2022), the studies by Kwan et al. (2020) and Nabbijohn et al. (2020) seem to suggest that children in Hong Kong and Canada are both aware of gender stereotypes, but gender stereotyping may be more pronounced among the former. The West–East similarities and differences could reflect the impact of gender salience on gender stereotypes. For example, parents and teachers in both Eastern and Western cultures frequently make gender salient by using explicit gender labels (Epstein & Ward, 2011; Gelman et al., 2004) and responding differently toward boys and girls (Blaise & Andrew, 2005; E. S. L. Chen & Rao, 2011). At a broader level, media transmits certain gender beliefs and stereotypes by using, for example, gendered toys and portrayals in commercials and textbook materials, and these tendencies are perhaps more prevalent in Eastern cultures (Collins, 2011; Furnham et al., 2000; Lee & Collins, 2008).

Moving beyond a simple Western–Eastern dichotomy, Thai culture has the potential to inform the generalizability of gender stereotyping development. Whereas gender has long been conceptualized as binary in China and Western societies like the United States and Canada (Paterson, 2010; Yun, 2013), Thai culture has long recognized gender categories beyond the gender binary (Ocha, 2012; Sinnott, 2004). For decades, if not centuries, Thai culture has recognized categories of *pheet thii saam* (translated literally as “third sex/gender”; Sinnott, 2004) that are distinguished conceptually from female/girl/woman and male/boy/man. Such gender conceptualization might relate to less salience of the gender binary in Thai culture. More diverse gender categories might result in less gendered thinking in viewing the social world (Bigler & Liben, 2006). For example, Wang et al. (2022) found that Chinese, but not Thai, 4- to 9-year-olds were less accepting of gender-nonconforming (relative to gender-conforming) peers as friends. Alternatively, the visibility of *pheet thii saam* may not indicate a relaxation of gender stereotypes. Rather, the concept of *pheet thii saam* may reflect the heightened

salience of gender categories as particularly meaningful within Thai culture. Sinnott (2004) posited that Thai gender-nonconforming individuals are viewed by others and themselves as a third or nonbinary sex/gender because their gender expression does not align with stereotypes for members of their birth-assigned sex. In line with this possibility, media portrayals of gender roles differ between Thai culture, on the one hand, and Chinese and North American cultures, on the other hand. For example, women were more often portrayed as professionals in Chinese and U.S. advertisements than in Thai advertisements (Zhang et al., 2009).

To investigate cross-cultural patterns in children's gender stereotyping, whereas previous Western studies relied on explicit verbal reports (M. L. Halim & Ruble, 2010; Martin & Ruble, 2010), implicit measures may be especially valuable. Implicit gender stereotypes refer to automatic associations between gender and gender-typed domains (Greenwald et al., 1998; Nosek et al., 2009); come to mind unintentionally and can be held even by individuals who explicitly reject endorsing stereotypical ideology (Greenwald & Banaji, 1995); precede the emergence of explicit stereotypes (Galdi et al., 2014; Gawronski & Bodenhausen, 2006); and reduce social desirability biases and impression management on self-report measures that might vary across different cultures (Fisher, 1993). Thus, if distinct cultures vary in the strength of the associations between gender concepts (e.g., boys) and attributes or objects (e.g., masculine and boy-typed toys), implicit stereotypes could capture such cross-cultural differences.

The Present Study

We investigated implicit gender stereotype development in 4- to 9-year-olds from a Western country, Canada, and two Eastern countries, China and Thailand. Implicit gender stereotypes were conceptualized as the tendency to associate boy-typed toys with boys and girl-typed toys with girls. We examined the toy domain as it is ideal for several reasons. Toys are a salient part of children's early learning and play environments, and children are motivated to play with toys. Gender stereotyping of toys is evident by the age of 3 years, and children's gendered toy choice is relevant to other domains such as spatial cognition (Weisgram & Dinella, 2018) and friendship preference (Nabbijohn et al., 2020; M. Qian et al., 2021; Wang et al., 2022). Furthermore, gender-stereotypical toy preferences are found among young children in multiple industrialized nations, and the toys stereotyped in one country tend to be similarly stereotyped in countries in ways that appear to transcend both Western and Eastern societies (Davis & Hines, 2020; Todd et al., 2017; L. Yu et al., 2010). As such, toy stimuli appear suitable for a cross-cultural investigation of gender stereotyping.

Following prior studies, we had six hypotheses. Given the existing cross-national, mainly Western work on the widespread pattern of

gender stereotypes about toys, Hypothesis 1 was that implicit gender-toy associations would be present in early childhood (i.e., by 4–5 years old) across cultures. Hypothesis 2 was that implicit gender-toy associations should increase in strength with age.

Given previous work suggesting that Hong Kong boys displayed less masculine appearance rigidity than boys in the United States (Gutierrez et al., 2020), Hypothesis 3 was that Chinese children might show weaker implicit gender-toy associations than Canadian children. Alternatively, Hypothesis 4 was that Chinese children might show stronger implicit gender-toy associations than Canadian children, given previous evidence that compared with Canadians, Chinese children display more explicit bias against peer gender nonconformity (Kwan et al., 2020; Nabbijohn et al., 2020).

In addition, given the difference in gender conceptualization between Thai culture (where gender is conceived in a nonbinary fashion) and Chinese and Canadian cultures (where gender is conceived in a binary fashion), we had two competing hypotheses. Following the possibility that more fluid gender conceptualization might relate to more flexible beliefs and thoughts about gender (Bigler & Liben, 2006), Hypothesis 5 was that Chinese and Canadian, when compared with Thai, children would show stronger implicit gender-toy associations. Alternatively, in line with the notion that the social visibility of *phet thii saam* does not necessarily indicate a relaxation of gender stereotypes but rather a strengthening of them (Sinnott, 2004), Hypothesis 6 was that Thai children would show stronger implicit gender-toy associations than Chinese and Canadian children.

Method

Participants

Participants were 4- to 9-year-olds from Canada ($n = 565$; 50.10% girls; $Mdn_{age} = 6.42$ years), China ($n = 259$; 50.19% girls; $Mdn_{age} = 7.03$ years), and Thailand ($n = 189$; 48.68% girls; $Mdn_{age} = 6.84$ years), with a total sample of 1,013 (see Table 1 for more detailed information regarding the sample). Canadian data were collected from September 2017 to October 2019. Chinese data were collected from May 2017 to June 2019. Thai data were collected from May to July 2018.

The Canadian sample was collected from the Greater Toronto Area in Ontario, Canada. Participants came from middle- to upper-class families with an average annual income between 65,000 and 100,000 CAD, with over 74% of parents having obtained a bachelor's degree or higher. Canadian children were 37.9% White, 21.3% mixed-race, 16.0% South Asian, 14.2% East Asian, 3.4% Caribbean, 1.6% Latino, 1.2% Arab, 1.1% Black, 0.4% Indigenous, 2.8% Other, and 0.4% unidentified.

Chinese data were collected in Wuhan and Jinhua, two urban cities in Eastern China. Participants were ethnically Han Chinese and

Table 1
The Distribution of Participants Across Cultures and Age Groups

| Age group | Canada | | China | | Thailand | |
|-------------------|------------------|---------------------------------------|----------|---------------------------------------|----------|---------------------------------------|
| | <i>n</i> (girls) | <i>M</i> _{age} (<i>SD</i>) | <i>n</i> | <i>M</i> _{age} (<i>SD</i>) | <i>n</i> | <i>M</i> _{age} (<i>SD</i>) |
| 4- to 5-year-olds | 264 (128) | 5.05 (0.52) | 116 (61) | 5.14 (0.38) | 68 (34) | 4.95 (0.61) |
| 6- to 7-year-olds | 111 (61) | 7.01 (0.56) | 56 (26) | 7.26 (0.39) | 62 (28) | 7.02 (0.59) |
| 8- to 9-year-olds | 190 (94) | 9.00 (0.54) | 87 (43) | 9.00 (0.53) | 59 (30) | 8.93 (0.60) |

spoke Mandarin. According to school records, the children were from middle- to upper-class families. Parental educational levels ranged from Grade 9 to postgraduate, with a median of Grade 12.

The Thai sample was collected in the northern city of Chiang Mai and the surrounding area, with participant recruitment taking place via flyers and snowball sampling. All participants were ethnically Thai, and 30% lived in a rural area surrounding the city, with the remaining 41.1% urban and 28.9% suburban. Participants came from middle- and middle- to upper-class families with a median monthly household income from 20,000 to 24,999 Thai Baht; the mode was 30,000 or more Thai Baht. Parental education levels ranged from less than high school to postgraduate, with a median of a college diploma or trade school certificate.

The study received ethical approval from Zhejiang Normal University, Hangzhou Normal University, and Central China Normal University for the Chinese samples and the University of Toronto for the Canadian and Thai samples. Informed consent was obtained from participants' parents or guardians, and verbal assent was obtained from all participants.

Procedures and Measures

Participants were tested individually in a quiet space. Eleven Canadian women tested Canadian children in English; seven Chinese women tested Chinese children in Mandarin; three Thai women tested Thai children in Thai. All instructions were translated and back-translated from English to Chinese and Thai by two individuals fluent in the respective languages.

Implicit Gender Association Test (IGAT)

The IGAT was administered to measure children's implicit gender associations in the toy domain. The IGAT was adapted after the Implicit Racial Bias Test (M. K. Qian et al., 2016), which has been used in various countries to assess children's implicit racial attitudes (M. K. Qian et al., 2016). Thanks; Setoh et al., 2019). The IGAT assesses how accurately and quickly children associate boy-typed toys (e.g., truck) and girl-typed toys (e.g., barbie doll) with boys' and girls' faces. Measuring accuracy and response latency minimizes error variance caused by individuals' extreme or modest responses (Cheung & Rensvold, 2000). It involves only a minimum verbal component, thus ruling out language-specific effects related to self-report (Mellor & Moore, 2014). These features facilitate methodological equivalence and are particularly valuable for studies including broad age groups and diverse cross-cultural samples.

The IGAT was developed using E-prime 2.0 (Psychology Software Tools, Sharpsburg, Pennsylvania, United States) and conducted on a 17-in. Microsoft Surface Pro computer with a touchscreen. Participants were instructed to touch a boy's or girl's face depending on the toy they saw in the middle of the screen. There were eight practice trials for familiarization and 20 test trials for each "congruent" and "incongruent" pairing. For "congruent" pairings, participants were told to touch the boy's face when they saw a boy-typed toy and the girl's face when they saw a girl-typed toy; for "incongruent" pairings, they were told to do the opposite, touch the girl face when they saw a boy-typed toy and the boy's face when they saw a girl-typed toy (see detailed instructions in the [online supplemental materials](#)). Given the instructions to child participants, the method can best be characterized as measuring gender-toy

stereotype knowledge. Approximately half of the participants were randomly assigned to start with congruent pairings (52% for Canadians, 53% for Thais, and 50% for Chinese).

Photos of 20 gender-typed toys (10 boy-typed and 10 girl-typed) were presented in the middle of the screen. The toys were considered strongly stereotypically feminine and strongly stereotypically masculine based on prior research in Western and Eastern cultures (Blakemore & Centers, 2005; Du & Su, 2005; Todd et al., 2017). Also, prior work indicated a similar pattern of more positive friendship preference for peers who played with same-gender-typed toys (e.g., boys prefer peers who play with cars, girls prefer peers who play with a Barbie doll) among 6- to 9-year-old children in Canada, China, and Thailand (Kwan et al., 2020; Nabbijohn et al., 2020; Wang et al., 2022). Photos of boy-typed and girl-typed toys used as stimuli in this study were also chosen in consultation with the authors and informants, who together had extensive lived experience in each of the cultures investigated (see sample toy stimuli in [Figure S1 in the online supplemental materials](#)). The informants included two graduate students in China who majored in Developmental Psychology and three field assistants in Thailand who had parenting/caregiving or work experience with children. Doing so ensured that the toys selected as stimuli for this research were applicable and appropriate for investigating gender-toy associations across the three cultures examined.

Photos of boys and girls were preschool-age children of similar skin tones as participants, selected from the Child Affective Facial Expression set (LoBue & Thrasher, 2014) and Google images. Photos of five boys (one Caucasian/European American boy, one East Asian boy, one South Asian boy, one Southeast Asian boy, and one African American boy) and five girls (one Caucasian/European American girl, one East Asian girl, one South Asian girl, one Southeast Asian girl, and one African American girl) were chosen and standardized at 240 pixels (2.5 cm) wide and 300 pixels (3.2 cm) high. The main indicator of gender was the child having short hair (boy) or long hair (girl), given the broad gender-appearance stereotypes across cultures (Miller et al., 2009) and the extensive evidence that hairstyle is regarded as a prominent cue for gender categorization (Goshen-Gottstein & Ganel, 2000; Macrae & Martin, 2007). Photos of East Asian and Southeast Asian faces were selected for China and Thailand, respectively. For Canada, four child face images were selected: Caucasian/European American, East Asian, South Asian, and African American children. For each individual Canadian child participant, the experimenter chose a set of faces from the four categories that were perceived to have the most similar skin tone to the child participant. This was done to avoid giving children obvious cues about race and instead encourage them to focus on gender as a salient category. Additionally, it is common for developmental studies to match the skin tone of stimuli to that of child participants (Dys & Malti, 2016; Nabbijohn et al., 2020). The face images were presented at the bottom left or right of the screen (counterbalanced) in a frontal view with happy expressions and without noticeable marks (e.g., glasses).

Analytic Approach

Conventional D scores were used in previous research (Greenwald et al., 2003) to measure implicit gender stereotypes. D scores are the average response latencies for contrasting pairings (e.g.,

stereotype-consistent and stereotype-inconsistent pairings) divided by the standard deviation of response latencies across pairings (Greenwald et al., 2003). Within the context of this field, D scores were calculated by the difference between children's response times in stereotype-consistent pairings (e.g., respond to a boy's face upon seeing a boy-typed toy and respond to a girl's face upon seeing a girl-typed toy) and their response times in stereotype-inconsistent pairings (e.g., respond to a boy's face upon seeing a girl-typed toy and respond to a girl's face upon seeing a boy-typed toy). Positive D scores indicate implicit gender-toy stereotype knowledge of associating boys with boy-typed toys and girls with girl-typed toys. Recent research using similar methods in the domain of race has shown that children's D scores are not influenced by their ability to manage the task or shift between the congruent and incongruent pairings (C. Yu et al., 2022).

The following exclusion criteria, which were consistent with the standard exclusion criteria (Greenwald et al., 2003), were used: (a) trials with latencies > 10,000 ms, (b) participants for whom more than 10% of trials were faster than 300 ms, and (c) participants for whom the average response latency was 3 *SD* above the mean response latency for the whole sample (Greenwald et al., 2003). Also, when calculating the conventional D scores, a 600 ms penalty was added to error trials (i.e., trials for which the participant gave an incorrect response when pairing a toy stimulus with a boy's or girl's face). No participants were excluded based on the exclusion criteria. The descriptive data for accuracy rates and response latencies are presented in Table S2 in the online supplemental materials.

To explore whether children of different groups in each culture display implicit gender-toy associations, we first conducted one-sample *t* tests to compare implicit D scores with zero (no gender-toy associations). Participants were binned into three age groups, given previous evidence indicating that children reach their peak in stereotype rigidity by age five and increase flexibility by age seven (Trautner et al., 2005). Also, there is evidence of changes between 4- to 5- and 8- to 9-year-olds in their ratings of peers' gender-nonconforming behaviors (Kwan et al., 2020; Nabbijohn et al., 2020; Wang et al., 2022). To further explore the developmental changes and cultural differences in implicit gender-toy associations, we conducted a 3 (age group: 4- to 5-, 6- to 7-, and 8- to 9-year-olds) × 3 (culture: Canada, China, and Thailand) × 2 (participant gender: boy and girl) analysis of variance (ANOVA) on implicit D scores.

For the ANOVA, seven main and interaction effects were produced. The statistical significance of these omnibus effects was determined using a Bonferroni-adjusted critical alpha = .0071 (i.e., .05/7 = .0071). Given the current sample size of 1,013 and a critical alpha of .0071, a power analysis using G*Power (Faul et al., 2007) showed that we had a conventional 80% power to detect small omnibus effects of $f = .13$ (Cohen et al., 2003). Follow-up post hoc analyses employed a conventional critical alpha of .05 when exploring the nature of the omnibus interactions. This study was not preregistered. Data associated with this article are available at Open Science Framework: https://osf.io/h5amx/?view_only=60a2712d24394379ae7ee1686a72f56a.

Results

To examine whether children of different age groups in each culture displayed implicit gender-toy associations, we conducted one-sample *t* tests. Implicit D scores of the three age groups in each

culture were significantly above zero (no gender-toy associations), suggesting that children tended to associate the boy-typed toys with boys' faces and girl-typed toys with girls' faces, all $t > 8.04$, $p < .001$, Cohen's $d > 0.42$ (see Figure 1). These results indicate significant implicit gender-toy associations across 4- to 9-year-olds from Canada, China, and Thailand, which is consistent with Hypothesis 1.

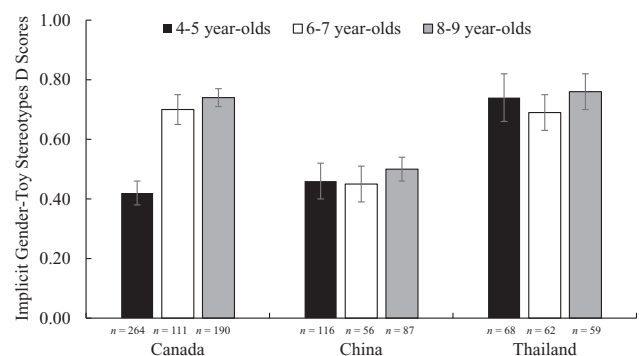
For implicit D scores, the ANOVA table is presented in Table S1 in the online supplemental materials. We found a significant Culture × Age Group interaction, $F(4, 995) = 4.40$, $p = .0017$, $\eta_p^2 = .02$ (see Figure 1). Of note, no significant main or interaction effects related to participant gender were found, $F_s < 4.04$, $p_s > .018$.

Post hoc ANOVAs found that Chinese children displayed similar levels of D scores across the three age groups, $F(2, 258) = .22$, $p = .801$, $\eta_p^2 = .002$. Similarly, Thai children showed similar levels of D scores across the three age groups, $F(2, 183) = .36$, $p = .699$, $\eta_p^2 = .004$. Thus, inconsistent with Hypothesis 2, the implicit gender-toy associations were stable among Chinese and Thai 4- to 9-year-olds.

For Canadian children, however, we found a significant age group effect, $F(2, 559) = 19.39$, $p < .001$, $\eta_p^2 = .07$. Post hoc independent samples *t* tests indicated that Canadian 4- to 5-year-olds displayed lower D scores than 6- to 7-year-olds, $t(285.98) = -4.27$, $p < .001$, Cohen's $d = 0.46$, and 8- to 9-year-olds, $t(423.91) = -6.20$, $p < .001$, Cohen's $d = 0.57$. These latter age groups showed similar D scores, $t(183.26) = -.80$, $p = .424$, Cohen's $d = 0.09$. Thus, the age-related increase expected by Hypothesis 2 only applied to Canadian children.

Post hoc ANOVAs on the Culture × Age Group interaction also revealed the main effects of culture within each age group, all $F > 5.74$, $p < .004$, $\eta_p^2 > .03$. Post hoc independent samples *t* tests indicated that, among 4- to 5-year-olds, Thai children had higher D scores than Chinese, $t(182) = 3.10$, $p = .002$, Cohen's $d = 0.44$,

Figure 1
Implicit Gender-Toy Associations (Overall D Scores) in 4- to 5-, 6- to 7-, and 8- to 9-Year-Olds From Canada, China, and Thailand



Note. Zero indicates no gender-toy association. Error bars represent standard errors. A positive D score indicates an implicit gender-toy association consistent with traditional gender-toy stereotypes. The *ns* represent sample sizes. For Canadian children, 4- to 5-year-olds had lower D scores than 6- to 7- and 8- to 9-year-olds. For 4- to 5-year-olds, Thai children had higher D scores than Chinese and Canadian children. For 6- to 9-year-olds, Thai and Canadian children had higher D scores than Chinese children.

and Canadian children, $t(330) = 3.34, p = .001$, Cohen's $d = 0.46$. These latter groups had similar D scores, $t(274.97) = 0.49, p = .623$, Cohen's $d = 0.06$. For 6- to 7- and 8- to 9-year-olds, Thai and Canadian children displayed higher D scores than same-aged Chinese children, all $t > 2.94, p < .004$, Cohen's $d > 0.53$. Within these two age groups, Thai and Canadian children showed similar D scores, both $t < 0.13, p > .70$, Cohen's $d < 0.05$. Therefore, consistent with Hypothesis 3 and refuting Hypothesis 4, Chinese 6- to 9-year-olds showed weaker implicit gender-toy associations than their Canadian counterparts. Also, consistent with Hypothesis 6, Chinese 4- to 9-year-olds and Canadian 4- to 5-year-olds showed weaker implicit gender-toy associations than their Thai counterparts.

Discussion

We examined cross-cultural similarities and differences in the development of implicit gender-toy associations. Gender stereotyping has been characterized as developing early and increasing, particularly during ages 5–7 years (Martin & Cook, 2018; Martin & Ruble, 2010). Yet, this characterization was based on studies of Western children, and little is known about the developmental pattern in non-Western cultures. Our results indicate that although gender-toy associations were apparent in all three cultures examined here, culture moderated the magnitude and developmental pattern of these associations. Among our non-Western samples of Thai and Chinese 4- to 9-year-olds, implicit gender-toy associations showed no age-related differences. These associations were relatively strong among Thai children and relatively weak among Chinese children. In contrast, developmental change over this period was only evident among our Western sample of Canadian children; 4- to 5-year-olds displayed weaker implicit gender-toy associations, whereas 6- to 9-year-olds displayed stronger ones.

Consistent with Hypothesis 1, implicit gender-toy associations were evident among 4- to 9-year-olds across Canada, China, and Thailand. Children tended to associate boy-typed toys with boys and girl-typed toys with girls. These findings are consistent with previous work suggesting spontaneous gender stereotyping among school-aged children in the toy domain (Banse et al., 2010; Rabelo et al., 2014) and extend implicit methods beyond gender stereotyping of academic performance (Cvencek et al., 2011). It also aligns with previous work from industrialized countries, indicating that gender-toy associations emerge early in development (Davis & Hines, 2020; Todd et al., 2017). These results suggest the toy stimuli employed were gender-stereotyped and thus appropriate for use with children in the cultures examined here, allowing for the examination of possible cultural differences in stereotyping magnitudes and developmental trajectories.

In the cultures examined here, differences were found in the developmental course of implicit gender-toy associations. Consistent with Hypothesis 2, Canadian children showed an age-related increase in the strength of these associations between 4- to 5- and 6- to 7-year-olds, replicating previous Western studies using verbal reports and rating scales (for a review, see Martin & Ruble, 2010). In contrast, despite past findings suggesting that other domains such as gender constancy follow similar stage-like development across many cultures (Gibbons, 2000), Thai and Chinese children's implicit gender-toy stereotypes were stable across ages 4–9 years. The difference in age-related patterns between Canadian children,

on the one hand, and Thai and Chinese children, on the other hand, indicates a moderating influence of culture on the developmental course of implicit gender-toy associations. By age 4–5 years, Chinese and Thai children may have consolidated gender-toy associations that remain stable through to age 8–9 years due to more consistent emphasis placed on gender norms in China and Thailand (e.g., Lobel et al., 2001; Sinnott, 2004). This speculation aside, cultural differences in the developmental pattern suggest that age-related increases in the strength of gender-toy stereotypes between ages 4 and 7 years may be specific to or more pronounced in Western countries. If so, this finding challenges conventional wisdom based solely on Western studies that gender stereotyping uniformly increases between ages 4 and 7 years in a manner that simply reflects changes in cognitive ability.

Regarding cultural differences observed in the strengths of gender-toy associations, consistent with Hypothesis 3 (and contrary to Hypothesis 4), Canadian children displayed stronger associations than Chinese children ages 6–9 years. This result aligns with recent research on masculine appearance that suggested gender norms of appearance are weaker in Hong Kong than in American boys (Gutierrez et al., 2020). One possible reason relates to Chinese culture's conceptualization of masculinity as including qualities such as having a scholarly, civil, and gentle demeanor (Louie, 2014). Popular culture in China also promotes softer masculinities that incorporate femininity. Examples include the growth in popularity of “little fresh meat” (an Internet term referring to young male celebrities with well-groomed looks) and the rising market for male cosmetic surgery in China (Wen, 2021).

Furthermore, popular culture in China also encourages “power femininity,” such as emancipation and self-determination (E. Chen, 2016). It should also be noted that the one-child policy, a national program that began in 1980 and ended in 2015 to control the size of the rapidly growing population of China, has produced a generation of empowered daughters (Fong, 2002). Importantly, our findings indicate that the strength of implicit gender-related associations might not align with the greater explicit bias toward peer gender nonconformity seen among Chinese children (Kwan et al., 2020; Nabbijohn et al., 2020; Wang et al., 2022). Our findings reinforce that implicit and explicit biases may follow different patterns, which should be considered in future research.

Thai children displayed stronger implicit gender-toy associations than Chinese children across ages 4–9 years and Canadian 4- to 5-year-olds, which supports Hypothesis 6 (and runs contrary to Hypothesis 5). These results align with Sinnott's (2004) assertion that Thais hold strict gender norms, as well as research showing that gender-role stereotypes in advertising were more salient in Thai than in Chinese and U.S. culture (Zhang et al., 2009). On the surface, some might find it counterintuitive that Thai society would simultaneously hold strict gender norms while also showing relatively high social visibility and reputed acceptance of *phet thii saam* individuals. To reconcile this apparent contradiction, a possible explanation is that gender stereotypes in Thai culture are more descriptive than prescriptive. Whereas prescriptive stereotypes inform the gender roles people should follow based on their sex/gender, descriptive stereotypes merely reflect beliefs about the gender roles people tend to follow based on their sex/gender (Fiske & Stevens, 1993). Thus, if Thais held strong descriptive gender stereotypes but relatively weak prescriptive ones, it could explain how Thai culture simultaneously manifests the concept of *phet thii*

saam (i.e., individuals who tend not to adhere to Thais' strict descriptive gender stereotypes are considered and/or self-identify as a third sex/gender) while accepting *phet thii saam* individuals (i.e., adherence to gender norms based on one's birth-assigned sex is not strictly prescribed and, therefore, is accepted). Future research in Thailand and other cultures should examine children's endorsements of descriptive and prescriptive gender stereotypes to evaluate this explanation more fully.

One potential explanation for why implicit gender-toy associations were strongest in Thailand, followed by Canada, and then China, is the varying salience of gender reflected in the languages used in these cultures. In contrast to English, where pronouns are typically gendered (e.g., she/her and he/him), spoken Chinese does not identify the gender of the person because both pronouns sound the same (i.e., *tā* in Mandarin). In Thai, gendered pronouns are commonly used in both written and spoken language, with *phom* for masculine individuals and *dichan* (or *chan* or *noo*) for feminine individuals. Furthermore, Thai language incorporates polite particles at the end of a phrase or sentence that are gendered (e.g., *kha* for feminine individuals, *khrap* for masculine individuals). Future research could investigate the hypothesis that children's gender-related development is affected by the degree to which the language(s) they are exposed to make gender salient.

Limitations and Future Directions

Although the toy domain was an ideal starting point for cross-cultural comparison of children's gender stereotypes, future research should explore whether the patterns observed here apply to other gender-typed domains. For example, North American children displayed stronger gender stereotypes in appearance (Gutierrez et al., 2020) but weaker biases toward peer gender nonconforming behaviors when compared with Hong Kong children (Kwan et al., 2020; Nabbijohn et al., 2020; Wang et al., 2022). Also, although implicit stereotypes remain stable over ages 4–9 years in Chinese and Thai children, the developmental pattern and any cross-cultural similarities or differences before or after this period are unknown. Behavioral measures like the one used here help assess children's implicit associations but are challenging to deliver to children before age four given the cognitive demands of the task. Future cross-cultural research should utilize alternative child-friendly methods, such as affiliative preference tasks or explicit measures of gender stereotyping. The use of both implicit and explicit methods can inform a more nuanced and multifaceted view of the complex process of gender stereotype development.

Additionally, implicit attitudes may differ depending on whether participants intentionally categorize targets (Olson & Fazio, 2003; Williams & Steele, 2019). In the present study, the implicit method asks children to categorize targets' genders and gender-typed toys. Future research should recognize and acknowledge gender categories beyond the binary and design new methods to understand gender and gender stereotyping. It is also crucial to acknowledge and accommodate nonbinary genders in light of the growing visibility of individuals who identify outside of the binary gender construct (e.g., genderqueer).

It should also be noted that race and country of origin were confounded in the samples recruited from China and Thailand. Future research could aim to disentangle the two factors. For example, this could be done by directly comparing Chinese children in

Canada and Chinese children in mainland China or Thai children in Canada and Thai children in Thailand.

Last, we provided important evidence of cross-cultural similarities and differences in children's implicit gender-toy associations, but further research could help better understand the role of ecological systems in shaping gender stereotype development. For example, future cross-cultural research should track how cultural beliefs are translated via socialization agents such as parents (Del Río et al., 2019; Weisgram & Bruun, 2018) and peers (Brown & Stone, 2018; Cook et al., 2019; Martin et al., 2012). Future research could also examine individual differences in processing gendered information, such as the perception of gender salience (Bigler & Liben, 2006).

Conclusion

In Canada, China, and Thailand, 4- to 9-year-olds evidenced implicit gender-toy associations consistent with stereotypes for this domain. However, cultural differences in the developmental pattern and magnitude of these associations were apparent. Specifically, the increase in implicit gender-toy associations over this period was specific to Canadian children, suggesting that age-related patterns of increased gender stereotyping during ages 5–7 years might apply more to Western children. Also, implicit gender-toy associations tended to be weakest among Chinese children and strongest among Thai children, possibly reflecting gender socialization differences in these cultures. Overall, this study adds to our relatively nascent understanding of the generalizability of gender stereotyping and associated developmental trajectories in diverse cultural contexts and points to the need to further examine the role of socio-cultural factors.

References

- Banse, R., Gawronski, B., Rebetz, C., Gutt, H., & Morton, J. B. (2010). The development of spontaneous gender stereotyping in childhood: Relations to stereotype knowledge and stereotype flexibility. *Developmental Science*, 13(2), 298–306. <https://doi.org/10.1111/j.1467-7687.2009.00880.x>
- Bian, L., Leslie, S. J., & Cimpian, A. (2017). Gender stereotypes about intellectual ability emerge early and influence children's interests. *Science*, 355(6323), 389–391. <https://doi.org/10.1126/science.aah6524>
- Bigler, R. S., & Liben, L. S. (2006). A developmental intergroup theory of social stereotypes and prejudice. In R. V. Kail (Ed.), *Advances in child development and behavior* (Vol. 34, pp. 39–89). Elsevier. [https://doi.org/10.1016/S0065-2407\(06\)80004-2](https://doi.org/10.1016/S0065-2407(06)80004-2)
- Blaise, M., & Andrew, Y. (2005). How 'bad' can it be? Troubling gender, sexuality, and teaching in early childhood education. In N. Yelland (Ed.), *Critical issues in early childhood* (pp. 49–57). Open University Press.
- Blakemore, J. E. O., & Centers, R. E. (2005). Characteristics of boys' and girls' toys. *Sex Roles*, 53(9–10), 619–633. <https://doi.org/10.1007/s11199-005-7729-0>
- Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In W. Damon (Series Ed.) & R. M. Lerner (Vol. Ed.), *Handbook of child psychology: Theoretical models of human development* (pp. 793–828). John Wiley & Sons.
- Brown, C. S., & Stone, E. A. (2018). Environmental and social contributions to children's gender-typed toy play: The role of family, peers, and media. In E. S. Weisgram & L. M. Dinella (Eds.), *Gender typing of children's toys: How early play experiences impact development* (pp. 121–140). American Psychological Association.
- Chen, E. (2016). "Power femininity" and popular women's magazines in China. *International Journal of Communication Systems*, 10, 2831–2852. <https://ijoc.org/index.php/ijoc/article/view/4150>

- Chen, E. S. L., & Rao, N. (2011). Gender socialization in Chinese kindergartens: Teachers' contributions. *Sex Roles, 64*(1–2), 103–116. <https://doi.org/10.1007/s11199-010-9873-4>
- Cheung, G. W., & Rensvold, R. B. (2000). Assessing extreme and acquiescence response sets in cross-cultural research using structural equations modeling. *Journal of Cross-Cultural Psychology, 31*(2), 187–212. <https://doi.org/10.1177/0022022100031002003>
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple correlation/regression analysis for the social sciences*. Lawrence Erlbaum Associates.
- Collins, R. L. (2011). Content analysis of gender roles in media: Where are we now and where should we go? *Sex Roles, 64*(3–4), 290–298. <https://doi.org/10.1007/s11199-010-9929-5>
- Cook, R. E., Nielson, M. G., Martin, C. L., & DeLay, D. (2019). Early adolescent gender development: The differential effects of felt pressure from parents, peers, and the self. *Journal of Youth and Adolescence, 48*(10), 1912–1923. <https://doi.org/10.1007/s10964-019-01122-y>
- Cvencek, D., Meltzoff, A. N., & Greenwald, A. G. (2011). Math–gender stereotypes in elementary school children. *Child Development, 82*(3), 766–779. <https://doi.org/10.1111/j.1467-8624.2010.01529.x>
- Davis, J. T. M., & Hines, M. (2020). How large are gender differences in toy preferences? A systematic review and meta-analysis of toy preference research. *Archives of Sexual Behavior, 49*(2), 373–394. <https://doi.org/10.1007/s10508-019-01624-7>
- Del Río, M. F., Strasser, K., Cvencek, D., Susperreguy, M. I., & Meltzoff, A. N. (2019). Chilean Kindergarten children's beliefs about mathematics: Family matters. *Developmental Psychology, 55*(4), 687–702. <https://doi.org/10.1037/dev0000658>
- Du, D., & Su, Y. (2005). The development of children's gender stereotype and the influence of stereotyped information. *Psychological Exploration, 25*, 56–61. <https://doi.org/CNKI:SUN:XLXT.0.2005-04-012>
- Dys, S. P., & Malti, T. (2016). It's a two-way street: Automatic and controlled processes in children's emotional responses to moral transgressions. *Journal of Experimental Child Psychology, 152*, 31–40. <https://doi.org/10.1016/j.jecp.2016.06.011>
- Ellemers, N. (2018). Gender stereotypes. *Annual Review of Psychology, 69*(1), 275–298. <https://doi.org/10.1146/annurev-psych-122216-011719>
- Epstein, M., & Ward, L. M. (2011). Exploring parent-adolescent communication about gender: Results from adolescent and emerging adult samples. *Sex Roles, 65*(1–2), 108–118. <https://doi.org/10.1007/s11199-011-9975-7>
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175–191. <https://doi.org/10.3758/BF03193146>
- Fisher, R. J. (1993). Social desirability bias and the validity of indirect questioning. *Journal of Consumer Research, 20*(2), 303–315. <https://doi.org/10.1086/209351>
- Fiske, S. T., & Stevens, L. E. (1993). What's so special about sex? Gender stereotyping and discrimination. In S. Oskamp & M. Costanzo (Eds.), *Gender issues in contemporary society* (pp. 173–196). Sage Publications.
- Fong, V. L. (2002). China's one-child policy and the empowerment of urban daughters. *American Anthropologist, 104*(4), 1098–1109. <https://doi.org/10.1525/aa.2002.104.4.1098>
- Furnham, A., Mak, T., & Tanidjojo, L. (2000). An Asian perspective on the portrayal of men and women in television advertisements: Studies from Hong Kong and Indonesian television. *Journal of Applied Social Psychology, 30*(11), 2341–2364. <https://doi.org/10.1111/j.1559-1816.2000.tb02440.x>
- Galdi, S., Cadinu, M., & Tomasello, C. (2014). The roots of stereotype threat: When automatic associations disrupt girls' math performance. *Child Development, 85*(1), 250–263. <https://doi.org/10.1111/cdev.12128>
- Gawronski, B., & Bodenhausen, G. V. (2006). Associative and propositional processes in evaluation: An integrative review of implicit and explicit attitude change. *Psychological Bulletin, 132*(5), 692–731. <https://doi.org/10.1037/0033-2909.132.5.692>
- Gelman, S. A., Taylor, M. G., & Nguyen, S. P. (2004). Mother–child conversations about gender: Understanding the acquisition of essentialist beliefs: Abstract. *Monographs of the Society for Research in Child Development, 69*(1), vii, 116–127. <https://doi.org/10.1111/j.1540-5834.2004.06901001.x>
- Gibbons, J. L. (2000). Gender development in cross-cultural perspective. In T. Eckes & H. M. Trautner (Eds.), *The developmental social psychology of gender* (pp. 389–415). Lawrence Erlbaum Associates.
- Giles, J. W., & Heyman, G. D. (2005). Young children's beliefs about the relationship between gender and aggressive behavior. *Child Development, 76*(1), 107–121. <https://doi.org/10.1111/j.1467-8624.2005.00833.x>
- Goshen-Gottstein, Y., & Ganel, T. (2000). Repetition priming for familiar and unfamiliar faces in a sex-judgment task: Evidence for a common route for the processing of sex and identity. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 26*(5), 1198–1214. <https://doi.org/10.1037/0278-7393.26.5.1198>
- Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review, 102*(1), 4–27. <https://doi.org/10.1037/0033-295x.102.1.4>
- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74*(6), 1464–1480. <https://doi.org/10.1037/0022-3514.74.6.1464>
- Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the implicit association test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology, 85*(2), 197–216. <https://doi.org/10.1037/0022-3514.85.2.197>
- Gutierrez, B. C., Halim, M. L. D., Ng, F. F.-Y., Kwak, K., Ortiz-Cubias, S., Cheng, G. Y.-L., & Sze, I. N. L. (2020). Gendered appearances among young children and in the media: An East–West cultural comparison. *Sex Roles, 82*(5–6), 306–320. <https://doi.org/10.1007/s11199-019-01059-3>
- Halim, M. L., & Ruble, D. (2010). Gender identity and stereotyping in early and middle childhood. In J. Chrisler & D. McCreary (Eds.), *Handbook of gender research in psychology* (pp. 495–525). Springer.
- Halim, M. L. D., Walsh, A. S., Tamis-LeMonda, C. S., Zosuls, K. M., & Ruble, D. N. (2018). The roles of self-socialization and parent socialization in toddlers' gender-typed appearance. *Archives of Sexual Behavior, 47*(8), 2277–2285. <https://doi.org/10.1007/s10508-018-1263-y>
- Kwan, K. M. W., Shi, S. Y., Nabbijohn, A. N., MacMullin, L. N., VanderLaan, D. P., & Wong, W. I. (2020). Children's appraisals of gender nonconformity: Developmental pattern and intervention. *Child Development, 91*(4), e780–e798. <https://doi.org/10.1111/cdev.13316>
- Leaper, C. (2015). Gender and social-cognitive development. In R. M. Lerner (Ed.), *Handbook of child psychology and developmental science* (7th ed., pp. 1–47). John Wiley & Sons. <https://doi.org/10.1002/9781118963418.childpsy219>
- Lee, J. F. K., & Collins, P. (2008). Gender voices in Hong Kong English textbooks—Some past and current practices. *Sex Roles, 59*(1–2), 127–137. <https://doi.org/10.1007/s11199-008-9414-6>
- Levant, R. F., Rankin, T. J., Williams, C. M., Hasan, N. T., & Smalley, K. B. (2010). Evaluation of the factor structure and construct validity of scores on the Male Role Norms Inventory–Revised (MRNI-R). *Psychology of Men & Masculinity, 11*(1), 25–37. <https://doi.org/10.1037/a0017637>
- Lobel, T. E., Gruber, R., Govrin, N., & Mashraki-Pedhazur, S. (2001). Children's gender-related inferences and judgments: A cross-cultural study. *Developmental Psychology, 37*(6), 839–846. <https://doi.org/10.1037/0012-1649.37.6.839>
- LoBue, V., & Thrasher, C. (2014). The Child Affective Facial Expression (CAFE) set: Validity and reliability from untrained adults. *Frontiers in Psychology, 5*, Article 1532. <https://doi.org/10.3389/fpsyg.2014.01532>
- Louie, K. (2014). Chinese Masculinity studies in the twenty-first century: Westernizing, Easternizing and globalizing *wen* and *wu*. *Norma, 9*(1), 18–29. <https://doi.org/10.1080/18902138.2014.892283>

- Macrae, C. N., & Martin, D. (2007). A boy primed *Sue*: Feature-based processing and person construal. *European Journal of Social Psychology, 37*(5), 793–805. <https://doi.org/10.1002/ejsp.406>
- Martin, C. L., & Cook, R. E. (2018). Cognitive perspectives on children's toy choices. In E. S. Weisgram & L. M. Dinella (Eds.), *Gender-typing of children's toys: How early play experiences affect development* (pp. 141–164). American Psychological Association.
- Martin, C. L., Kornienko, O., Schaefer, D. R., Hanish, L. D., Fabes, R. A., & Goble, P. (2012). The role of sex of peers and gender-typed activities in young children's peer affiliative networks: A longitudinal analysis of selection and influence. *Child Development, 84*(3), 921–937. <https://doi.org/10.1111/cdev.12032>
- Martin, C. L., & Ruble, D. N. (2010). Patterns of gender development. *Annual Review of Psychology, 61*(1), 353–381. <https://doi.org/10.1146/annurev.psych.093008.100511>
- Mellor, D., & Moore, K. A. (2014). The use of Likert scales with children. *Journal of Pediatric Psychology, 39*(3), 369–379. <https://doi.org/10.1093/jpepsy/jst079>
- Meyer, M., & Gelman, S. A. (2016). Gender essentialism in children and parents: Implications for the development of gender stereotyping and gender-typed preferences. *Sex Roles, 75*(9–10), 409–421. <https://doi.org/10.1007/s11199-016-0646-6>
- Miller, C. F., Lurye, L. E., Zosuls, K. M., & Ruble, D. N. (2009). Accessibility of gender stereotype domains: Developmental and gender differences in children. *Sex Roles, 60*(11–12), 870–881. <https://doi.org/10.1007/s11199-009-9584-x>
- Nabbijohn, A. N., MacMullin, L. N., Kwan, K. M. W., Santarossa, A., Peragine, D. E., Wong, W. I., & VanderLaan, D. P. (2020). Children's bias in appraisals of gender-variant peers. *Journal of Experimental Child Psychology, 196*, Article 104865. <https://doi.org/10.1016/j.jecp.2020.104865>
- Nosek, B. A., Smyth, F. L., Sriram, N., Lindner, N. M., Devos, T., Ayala, A., Bar-Anan, Y., Bergh, R., Cai, H., Gonsalkorale, K., Kesebir, S., Maliszewski, N., Neto, F., Olli, E., Park, J., Schnabel, K., Shiomura, K., Tulbure, B. T., Wiers, R. W., ... Greenwald, A. G. (2009). National differences in gender–science stereotypes predict national sex differences in science and math achievement. *Proceedings of the National Academy of Sciences of the United States of America, 106*(26), 10593–10597. <https://doi.org/10.1073/pnas.0809921106>
- Ocha, W. (2012). Transsexual emergence: Gender variant identities in Thailand. *Culture, Health & Sexuality, 14*(5), 563–575. <https://doi.org/10.1080/13691058.2012.672653>
- Olson, M. A., & Fazio, R. H. (2003). Relations between implicit measures of prejudice: What are we measuring? *Psychological Science, 14*(6), 636–639. https://doi.org/10.1046/j.0956-7976.2003.psci_1477.x
- Paterson, S. (2010). What's the problem with gender-based analysis? Gender mainstreaming policy and practice in Canada. *Canadian Public Administration, 53*(3), 395–416. <https://doi.org/10.1111/j.1754-7121.2010.00134.x>
- Qian, M., Heyman, G. D., Quinn, P. C., Messi, F. A., Fu, G., & Lee, K. (2016). Implicit racial biases in preschool children and adults from Asia and Africa. *Child Development, 87*(1), 285–296. <https://doi.org/10.1111/cdev.12442>
- Qian, M., Wang, Y., Wong, W. I., Fu, G., Zuo, B., & VanderLaan, D. P. (2021). The effects of race, gender, and gender-typed behavior on children's friendship appraisals. *Archives of Sexual Behavior, 50*(3), 807–820. <https://doi.org/10.1007/s10508-020-01825-5>
- Rabelo, L. Z., Bortoloti, R., & Souza, D. H. (2014). Dolls are for girls and not for boys: Evaluating the appropriateness of the implicit relational assessment procedure for school-age children. *The Psychological Record, 64*(1), 71–77. <https://doi.org/10.1007/s40732-014-0006-2>
- Ruble, D. N., Taylor, L. J., Cyphers, L., Greulich, F. K., Lurye, L. E., & Shrout, P. E. (2007). The role of gender constancy in early gender development. *Child Development, 78*(4), 1121–1136. <https://doi.org/10.1111/j.1467-8624.2007.01056.x>
- Setoh, P., Lee, K. J. J., Zhang, L., Qian, M. K., Quinn, P. C., Heyman, G. D., & Lee, K. (2019). Racial categorization predicts implicit racial bias in preschool children. *Child Development, 90*(1), 162–179. <https://doi.org/10.1111/cdev.12851>
- Sims, R. N., Rizzo, M. T., Mulvey, K. L., & Killen, M. (2022). Desire to play with counterstereotypical peers is related to gender stereotypes and playmate experiences. *Developmental Psychology, 58*(3), 510–521. <https://doi.org/10.1037/dev0001269>
- Sinnott, M. (2004). *Toms and Dees: Transgender identity and female same-sex relationships in Thailand*. University of Hawaii Press.
- Todd, B. K., Fischer, R. A., & Di Costa, S. (2017). Sex differences in children's toy preferences: A systematic review, meta-regression, and meta-analysis. *Infant and Child Development, 27*(2), Article e2064. <https://doi.org/10.1002/icd.2064>
- Trautner, H. M., Ruble, D. N., Cyphers, L., Kirsten, B., Behrendt, R., & Hartmann, P. (2005). Rigidity and flexibility of gender stereotypes in childhood: Developmental or differential? *Infant and Child Development, 14*(4), 365–381. <https://doi.org/10.1002/icd.399>
- Wang, Y., Qian, M., Nabbijohn, A. N., Wen, F., Fu, G., Zuo, B., & VanderLaan, D. P. (2022). Culture influences the development of children's gender-related peer preferences: Evidence from China and Thailand. *Developmental Science, 25*(4), Article e13221. <https://doi.org/10.1111/desc.13221>
- Weisgram, E. S., & Bruun, S. T. (2018). Predictors of gender-typed toy purchases by prospective parents and mothers: The roles of childhood experiences and gender attitudes. *Sex Roles, 79*(5–6), 342–357. <https://doi.org/10.1007/s11199-018-0928-2>
- Weisgram, E. S., & Dinella, L. M. (Eds.). (2018). *Gender-typing of children's toys: How early play experiences impact development*. American Psychological Association.
- Wen, H. (2021). Gentle yet Manly: *Xiao xian rou*, male cosmetic surgery and neoliberal consumer culture in China. *Asian Studies Review, 45*(2), 253–271. <https://doi.org/10.1080/10357823.2021.1896676>
- Williams, A., & Steele, J. R. (2019). Examining children's implicit racial attitudes using exemplar and category-based measures. *Child Development, 90*(3), e322–e338. <https://doi.org/10.1111/cdev.12991>
- Wong, W. I., & VanderLaan, D. P. (2020). Sex differences in early life: A cross-cultural perspective. In F. M. Cheung & D. F. Halpern (Eds.), *Cambridge international handbook on psychology of women* (pp. 83–95). Cambridge University Press.
- Yu, C., Qian, M., Amemiya, J., Fu, G., Lee, K., & Heyman, G. D. (2022). Young children form generalized attitudes based on a single encounter with an outgroup member. *Developmental Science, 25*(3), Article e13191. <https://doi.org/10.1111/desc.13191>
- Yu, L., Winter, S., & Xie, D. (2010). The child play behavior and activity questionnaire: A parent-report measure of childhood gender-related behavior in China. *Archives of Sexual Behavior, 39*(3), 807–815. <https://doi.org/10.1007/s10508-008-9403-4>
- Yun, S. H. (2013). An analysis of Confucianism's yin-yang harmony with nature and the traditional oppression of women: Implications for social work practice. *Journal of Social Work, 13*(6), 582–598. <https://doi.org/10.1177/1468017312436445>
- Zhang, L., Srisupandit, P., & Cartwright, D. (2009). A comparison of gender role portrayals in magazine advertising: The United States, China and Thailand. *Management Research News, 32*(7), 683–700. <https://doi.org/10.1108/01409170910965279>

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