Investigation of Gender Role Behaviors in Boys With Hypospadias: Comparative Study With Unaffected Boys and Girls

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Received July 8, 2013; revisions received June 7, 2014; accepted June 30, 2014

The purpose of the study was (1) to investigate gender role behaviors of boys with hypospadias compared with groups of unaffected boys and girls using parental reports and direct observations; and (2) to directly observe effects of socialization (mothers’ presence) on children’s gender role behaviors. Ages of 19 children with hypospadias ranged from 3 to 7 years, and each of them were matched to controls of unaffected boys and girls by age. All the children participated with their mothers. Children’s gender role behaviors and their mothers’ behaviors were evaluated using an observation coding system. Mothers also completed questionnaires regarding their children’s gender role behaviors. Results indicated no atypical gender role behavior for the boys with hypospadias and no direct effects of socialization on their gender role behaviors. However, differences were found in negative communicative behaviors between boys with hypospadias and unaffected boys, suggesting a possible role of socialization.

Key words  direct observation; gender role behavior; hypospadias; socialization; toy play.

Hypospadias, an abnormal positioning of the urethral opening (Baskin, 2000), is one of the most common congenital anomalies among males and the second most common birth defect (Parisi et al., 2007). The severity of the anomaly varies with the location of urinary meatus. Although the exact etiology of hypospadias remains unknown, the most prominent theory pertaining to its origin is that abnormalities in prenatal androgen synthesis and/or androgen receptor defects result in faulty embryogenesis of the penile urethra (Baskin, 2004). Reported incidences of hypospadias range from 0.3 to 0.7% of male birth (Porter, Faizen, Grady, & Mueller, 2005). Reconstructive surgery is the most common method of treatment. Surgery for proximal hypospadias is functional by restoring boys’ ability to urinate while standing and to sexually function as normal male adults.

Although medical guidelines concerning the diagnosis and treatment of hypospadias have been established, less is known about possible ongoing prenatal hormonal influences on psychosexual development. Hormones, particularly androgen, have been suggested to influence sexual differentiation of brain during critical periods of early development (Collaer & Hines, 1995). Atypical gender role behavior among boys with hypospadias is suspected because both human (Hines & Green, 1991) and animal research findings (De Vries & Simerly, 2002) have consistently demonstrated that abnormal levels of prenatal sex hormone lead to subsequent atypical gender role behaviors.

Research has shown that children’s gender-related thinking and behavior depends greatly on their sociocultural experience (Brannon, 1996). Parental interaction in particular serves as the foundation of children’s gender role behaviors (McHale, Crouter, & Whitteman, 2003). Parents may orchestrate children’s activities by providing access to toys or limiting children’s toy choices, and by providing
verbal or nonverbal feedback to children regarding their behaviors or interests. Children, in turn, learn to modify (continue or discontinue) their behaviors accordingly. This process of learning has been observed as a part of socialization (Pasterski, Gennner, Brain, Hindmarsh, & Brook, 2005). In the present study, ‘socialization’ is examined by (1) consequences given according to children’s toy choices and (2) differences in toy choices depending on the presence of mother. For parents who are concerned with their boys’ genital anomaly, parents’ role in shaping their children’s behavior to be gender appropriate may be more pronounced. Those parents may differentially reinforce their boys’ toy choices. In return, boys are expected to behave differently depending on parents’ presence.

Most research on gender role behaviors related to abnormal prenatal hormone exposure and elevated androgen has been on affected females of congenital adrenal hyperplasia (CAH). Studies have demonstrated that females with CAH engage more with masculine toys than unaffected girls (Berenbaum & Bines, 1992; Nördenstrom, Servin, Bohlin, Larsson, & Wedell, 2002) and have disturbed body images, female identity, and psychosexual identification (Kuhnle, Bullinger, & Schwarz, 1995). Different types of parental responses to gender-related behaviors between girls with CAH and unaffected girls were also reported (Pasterski et al., 2005). As research on CAH suggests atypical psychosexual development of children with CAH as a result of the hormone imbalance, the same can be expected for those with hypospadias.

Studies of hypospadias reveal inconsistent and mixed findings. Berg, Svensson, and Aström (1981) noted that adults with hypospadias who had undergone surgeries have ambiguous or uncertain gender identities and experience difficulties identifying their gender role behaviors compared with the postappendectomy surgery control group. In one study, the parents of the boys with hypospadias reported that their boys engaged in more feminine behaviors than the parents of the control group did (Sandberg, Meyer-Bahlberg, Aranoff, Sconzo, & Hensle, 1989). However, a follow-up conducted 6 years later showed that these boys endorsed in more masculine behaviors than the control group (Sandberg et al., 1995). In another study of boys with hypospadias, no difference was found in their gender role behaviors, the first sexual experiences and sexual attitudes (Schönbucker, Landolt, Gobet, & Weber, 2008) compared with the control.

Various limitations exist in the previous studies. First, most of the studies are retrospective, leading to a potential risk of recall bias. Second, the studies that are not retrospective used parental reports, which are known as subjective measurements (Sandberg et al., 1989, 1995). Finally, previous studies have only included boys in the control group leading to limited gender comparisons.

The purpose of this study was (1) to investigate gender role behaviors of boys with hypospadias compared with their age-matched unaffected boys and girls using parental proxy reports and direct observations and (2) to examine the effects of socialization on children’s gender role behaviors using direct observation. Based on previous findings from the hormonal perspective, it is hypothesized that boys with hypospadias would play with feminine toys more than unaffected boys. From the socialization perspective, it is hypothesized that the behaviors of boys with hypospadias would differ depending on their mothers’ presence. Also, different parental reinforcement is expected to occur according to a child’s toy selection.

Method
Participants

Three groups of children ranging from 3 to 7 years of age and their mothers participated in this study. Boys with hypospadias who underwent reconstructive surgeries under the age of 30 months were recruited through a university-affiliated hospital in Seoul, one of the most referred hypospadias clinics in Korea. Among the 23 pairs who agreed to participate, 19 boys with hypospadias and their mothers were included in this study. Thirteen boys with hypospadias (68%) went through one genital surgery, and the remaining six boys (32%) had two surgeries. No differences were found between the two groups (p > .05).

Unaffected boys and girls whose parents indicated no genital anomaly and psychological problems were recruited via Internet (7 boys, 10 girls) and from a university-affiliated day-care center (12 boys, 10 girls). The unaffected children were first matched to the boys with hypospadias by age. This was considered the most important matching variable in the analyses of play behavior. Next, their intelligence quotients (IQs) were matched within the 95% confidence interval. No significant group differences in age and IQ were found across the three groups (p > .05). The mean ages of the boys with hypospadias, unaffected boys, and unaffected girls were 53.00 months (SD = 14.03), 53.74 months (SD = 14.58), and 54.68 months (SD = 14.87), respectively. IQ scores measured by the Korean version of Kaufman Assessment Battery for Children (K-ABC-K; Moon & Byun, 1997) for all groups (boys with hypospadias, unaffected boys, unaffected girls) were 109.53 (SD = 11.33), 107.00 (SD = 13.37), and 110.74 (SD = 12.14), respectively. Four boys from the experimental group were excluded in the study because of the following reasons: Participation of a father (instead of
mother), incomplete assessment due to a boy’s noncompliance, a boy’s hyperactivity, and a boy’s physical pain complaints after urological checkup. One girl from the control group was excluded from the study because of her noncompliance and hyperactivity.

**Questionnaires**

*Gender Identity Questionnaire for Children* (Johnson et al., 2004). The *Gender Identity Questionnaire for Children* (GIQC) is a parent-report measure of gender identity and gender role behavior of children aged 2–12 years. The GIQC was translated into Korean using the three-step procedure (e.g., translation, back-translation, and modification) recommended by Brislin (1970). The GIQC consists of 16 items and covers a range of sex-typed behaviors corresponding to various features of the core phenomenology of the gender identity disorder (GID) diagnosis in Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV). Each item is rated using a 5-point Likert scale with higher total scores indicating more masculine behaviors. Effect sizes (Cohen’s $d$) ranged from 1.11 to 3.70 across studies comparing clinically referred children with children who were subthreshold for GID and with the control groups (siblings of the clinically referred children and nonreferred controls), respectively. Test-retest reliability ranged from .72 to .90 (Cohen-Kettenis et al., 2006; Johnson et al., 2004). In this study, total scores were used, and internal consistency was .91.

*Preschool Activities Inventory* (Golombok & Rust, 1993). The *Preschool Activities Inventory* (PSAI) is a parent-report measure of gender role behavior in preschool children. For translation, the same procedure recommended by Brislin (1970) was adopted. The PSAI consists of 24 items (12 masculine and 12 feminine) covering three content categories: (1) toys, (2) activities, and (3) personality characteristics of a child. Each item is rated using a 5-point Likert scale (i.e., $1= Never$, $2=Hardly Ever$, $3=Sometimes$, $4=Often$ or $5=Very Often$). The PSAI is scored by adding the male items and subtracting the female items. Higher scores indicate more masculine behaviors. Test-retest reliability for boys and girls was .64, and split-half reliability was .66 for boys and .80 for girls. The present study used raw scores of male and female items. Internal consistencies of these scales in the present study were .70 (male) and .73 (female).

**Structured Observation**

*Materials*

Toys were selected based on previous research investigating sex differences in children ranging from 3 to 7 years old (Berenbaum & Hines, 1992; Raag & Rackliff, 1998). The masculine toys included a police car, a robot, a catch ball, a construction kit, and a sword. The feminine toys included a Barbie doll, a baby doll with a bottle, kitchen toys, a telephone, and a cosmetic kit. Neutral toys included a stuffed animal, a picture board, a hospital kit, books, and puzzles.

**Experimental Design**

The experiment was designed using 2 (play status: mother absent and present) × 2 (toy condition: all toys vs. feminine toys) conditions among the three groups (boys with hypospadias, unaffected boys, unaffected girls). Each child was observed for 5 min in all four play conditions. The first condition (playing with all toys without mother) was conducted to examine children’s toy selection without their mother’s presence. The second condition (playing with all toys with mother) was then conducted to examine whether the children’s behavior differed by their mothers’ presence. Next, the third condition (playing with only feminine toys without mother) assessed the children’s behaviors regarding feminine toys. The final condition (playing with feminine toys without mother) identified child–mother interaction with feminine toys.

Conditions were not counterbalanced because it was suspected that exposure to feminine toys before all toys might influence toy preference during all toy conditions. Also, mother-absent conditions were conducted before mother-present conditions to observe children’s preferences without mothers’ influence.

**Setting**

The toys were presented in the playroom of ~2.7 m by 3.3 m. For toy conditions, toys were randomly placed in a circle on the floor. All play sessions were videotaped using a standard VHS video recorder. The experimenter was at a distance to not interfere with the interaction between a child and a mother.

**Procedure**

This study has been approved by the Departmental Review Committee and the Institutional Review Board at the university and the hospital. Upon arrival, both mother and child were explained about the procedures. The purpose of observation was not explained to the mothers until the end of the experiment. To address the issue of “deception,” debriefing was provided to mothers upon the completion of participation. A consent form with written explanation about the purpose of this study and the deception procedure was provided. Then mothers were instructed to complete the questionnaires on a table outside.
the playroom, while the K-ABC was administered to the child inside. After completion, the child was told to stand outside the door, while an experimenter set up the playroom with toys. Both child and mother were then videotaped in all four play conditions. For the mother-absent conditions, the child was told to play with the given toys for 5 min, while the mother waited outside. For the mother-present conditions, the child and mother were told to play together with the given toys for 5 min. In between conditions, the child and mother were told to stand outside the door, while the toys were returned to their original positions.

**Coding**

**Coding System and Outcome Measures**

Children’s gender role behaviors and their mothers’ response behaviors were coded separately using a modified version of a play coding system developed by Pasterski et al. (2005). For children, positive and negative verbal and nonverbal communicative behaviors were added to the original three codes for toys selecting behaviors from Pasterski et al. (2005) (Table I). For mothers, only 7 of 15 codes (Pasterski et al., 2005) relevant to this study were used. Each videotaped play session was coded separately using a 10-s partial interval recording method. Outcome measure was frequency of coded behaviors described in Tables I and II.

**Interrater Reliability**

Three undergraduate students, who were blind to the study, were trained to code behaviors. First, three coders were trained until they demonstrated 80% agreement on each coded behavior. Then each student coded the taped sessions independently. To assess interrater agreement, 30% of the sessions were coded by two coders, and interval-by-interval interobserver agreement was calculated. The mean rate of interobserver agreement was 86% with a range of 80–100% across the participants.

**Analyses**

The Statistical Package for the Social Sciences version 18.0 was used for data analyses. First, one-way analyses of variance (ANOVAs) were conducted to compare the children’s gender role behaviors across the three groups. Second, two sets of repeated measures ANOVAs (planned analyses) were conducted to examine the effects of socialization on children’s gender role behaviors. Next, the children’s behaviors across mother-absent and mother-present conditions were directly compared across the three groups. Finally, mothers’ responses to the children in all toys

### Table I. Play Coding System for Children

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toy selecting behavior</td>
<td>Masculine</td>
<td>Child touches, picks up, or engages in a play for &gt;1 s with one of the masculine toys.</td>
</tr>
<tr>
<td></td>
<td>Feminine</td>
<td>Child touches, picks up, or engages in a play for &gt;1 s with one of the feminine toys.</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>Child touches, picks up, or engages in a play for &gt;1 s with one of the neutral toys.</td>
</tr>
<tr>
<td>Verbal and nonverbal</td>
<td>Positive</td>
<td>Child smiles, laughs, or makes positive comments about having to play with a particular toy for &gt;1 s.</td>
</tr>
<tr>
<td>communicative behavior</td>
<td>Negative</td>
<td>Child cries, complains, or makes negative comments about having to play with a particular toy for &gt;1 s.</td>
</tr>
</tbody>
</table>

### Table II. Play Coding System for Mothers

<table>
<thead>
<tr>
<th>Response</th>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>1. Participates cooperatively</td>
<td>Mother initiates or agrees with the child’s play (e.g., “What are we cooking for daddy?”).</td>
</tr>
<tr>
<td></td>
<td>2. Gives praises</td>
<td>Mother praises or encourages the child (e.g., “Well done” or “You are doing great”).</td>
</tr>
<tr>
<td></td>
<td>3. Positive comments</td>
<td>Mother gives approval of the play or shows affection (e.g., “Sweet of you”, “Yes”, or “That sounds great”).</td>
</tr>
<tr>
<td>Negative</td>
<td>4. Refuses</td>
<td>Mother rejects, makes no response, or ignores to play with a toy that the child suggests (e.g., “I don’t want to play with the doll”).</td>
</tr>
<tr>
<td></td>
<td>5. Suggests alternate play</td>
<td>Mother suggests playing with an alternative toy when child is already playing with a toy (e.g., “Why don’t we play with this other toy instead?”).</td>
</tr>
<tr>
<td></td>
<td>6. Negative comments</td>
<td>Mother criticizes or ridicules child for playing with a toy or gives any negative comments about it (e.g., “Stop that”).</td>
</tr>
<tr>
<td>Neutral</td>
<td>7. Neutral comments</td>
<td>Mother gives comments that are not positive or negative related to the child’s play (e.g., “It’s rainy outside”).</td>
</tr>
</tbody>
</table>
and feminine toys conditions were compared across the three groups.

Results

Group Differences in Children’s Gender Role Behaviors

Parent-Reported Questionnaires

One-way ANOVAs were conducted to examine group differences in GIQC and PSAI. Significant group differences were found for GIQC $[F(2, 54) = 80.17, p < .001$, partial $\eta^2 = 0.588]$ and PSAI [masculinity: $F(2, 54) = 22.03, p < .001$, partial $\eta^2 = 0.414$; femininity: $F(2, 54) = 43.75, p < .001$, partial $\eta^2 = 0.327$] (Table III). Post hoc analyses showed that boys with hypospadias scored significantly higher on masculinity and lower on femininity than unaffected girls. However, no group difference was found between boys with hypospadias and unaffected boys for both masculinity and femininity subscales.

Children’s Gender Role Behaviors on Structured Observations

One-way ANOVAs were conducted to examine group differences in the children’s gender role behaviors (toy selecting behaviors) in the all toys condition without mother. Significant group differences were found in the children’s toy selecting behaviors [masculine toys: $F(2, 54) = 8.74, p < .01$, partial $\eta^2 = 0.22$; feminine toys: $F(2, 54) = 11.00, p < .001$, partial $\eta^2 = 0.50$]; boys spent more time with masculine toys than girls [boys with hypospadias: M(SD) = 16.84(10.84); unaffected boys: M(SD) = 16.53 (11.39); unaffected girls: M(SD) = 10.05(7.40), p < .001], and girls played more with feminine toys than boys [boys with hypospadias: M(SD) = 4.42(6.87); unaffected boys: M(SD) = 7.74(10.07); unaffected girls: M(SD) = 17.84 (10.23), p < .001]. No group difference between boys with hypospadias and unaffected boys was found ($p > .05$).

Effects of Socialization (Children’s Behaviors Across the Mother-Absent and the Mother-Present Conditions)

Repeated measures ANOVAs revealed no significant interaction effect (mother’s presence x group) or main effect in the children’s toy selecting behaviors ($p > .05$). For positive and nonverbal communicative behaviors, no interaction effect or main effect was found; all children scored significantly higher in the mother-present condition when compared with the mother-absent condition [$F(1, 54) = 25.93; 43.96, p < .001$]. Regarding negative verbal and nonverbal communicative behaviors, a significant interaction effect (mother’s presence x group) was found only in a feminine toys condition [$F(2, 54) = 3.49, p < .05$, partial $\eta^2 = 0.067$] (Table IV). Post hoc results revealed a significant interaction effect between boys with hypospadias and unaffected boys [$F(1, 36) = 4.59, p = .039$, partial $\eta^2 = 0.091$], and between unaffected boys and unaffected girls [$F(1, 36) = 4.35, p = .044$, partial $\eta^2 = 0.078$] (Figure 1).

Mother’s Behaviors Across All Toys and Feminine Toys Conditions

Repeated measures ANOVAs revealed no significant interaction effect (toy presentation x group) in the mothers’ positive [$F(2, 54) = 1.12, p > .05$], negative [$F(2, 54) = 0.00, p > .05$], or neutral responses [$F(2, 54) = 0.10, p > .05$] to the children. No main effect of toy conditions was found as well [positive: $F(1, 54) = 2.94, p > .05$; negative: $F(1, 54) = 0.79, p > .05$; neutral: $F(1, 54) = 0.10, p > .05$] (Table V).

Discussion

The present study aimed to examine (1) gender role behaviors and (2) the impact of socialization (mothers’ presence) on boys with hypospadias relative to unaffected boys and girls. Results revealed no significant differences between boys with hypospadias and unaffected boys in their gender role behaviors. Secondly, no differences in child’s toy selection among the three groups were found between the mother-absent and the mother-present conditions. However, negative verbal and nonverbal communicative behaviors increased among the boys with hypospadias but decreased among the unaffected boys, when their mothers were present in the feminine toys condition. These results suggest that presence of mothers differentially affects children’s toy play behaviors. The findings above are associated with several important implications.
First, contrary to our hypothesis, boys with hypospadias did not differ from unaffected boys in their gender role behaviors. Such finding is inconsistent with the most prominent theory about hormonal abnormality of hypospadias (Hines & Green, 1991). Several explanations are possible for this insignificant group difference. First, hormone deficiency may not necessarily accompany atypical gender role behavior. Several studies have suggested that severity of hormonal deficiency is not associated with severity of hypospadiac anomaly (Sandberg et al., 1995; Gearhart, Donohoue, Brown, Walsh, & Berkovitz, 1990), which indicates no positive relationship among hormonal deficiency, genital formation, and gender role behaviors.

Another possible explanation for the no group difference is that early childhood may not be the period during which the effect of hormone deficiency emerges. Some studies reported delayed sexual contact, lower frequency of sexual fantasies and masturbation, lower sexual desires, and fewer sexual partners among adolescents and adults with hypospadias (Bubanj et al., 2004). There may be atypical development in gender role behaviors, but it does not become clear until puberty when secondary sexual characteristics begin to develop and gender differentiation becomes clearer. Furthermore, early gender role behavior may not be predictive of later sexual identity or gender identity. For instance, although increased atypical play behavior has been identified in children treated for disorders of sex development, recent studies do not suggest later gender dysphoria or instability (Cohen-Kettenis, 2005).

Recent literature on hypospadias does not suggest that boys/men with hypospadias are at risk for gender dysphoria (Scho¨nbucher et al., 2008). However, no studies have directly tested whether they exhibit clinically significant deviations in their gender role behavior. Thus, the GIQC, designed for psychiatric samples, was used to directly assess gender role behavior for boys with hypospadias. Results indicated no clinically significant difference for boys with hypospadias, which is consistent with previous studies. Present study supports a lack of gender dysphoria for boys with hypospadias using the GIQC with clinical validity. However, the possibility that the GIQC may be

### Table IV. Means and Standard Deviations of Children’s Behaviors

<table>
<thead>
<tr>
<th></th>
<th>BH M(SD)</th>
<th>UB M(SD)</th>
<th>UG M(SD)</th>
<th>F</th>
<th>Mother Group</th>
<th>Mother × group</th>
</tr>
</thead>
<tbody>
<tr>
<td>All toys</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MT</td>
<td>16.84 (10.48)</td>
<td>18.26 (10.23)</td>
<td>16.53 (11.39)</td>
<td>17.95 (10.36)</td>
<td>5.05 (7.40)</td>
<td>6.00 (8.17)</td>
</tr>
<tr>
<td>FT</td>
<td>4.42 (6.87)</td>
<td>9.53 (9.11)</td>
<td>7.74 (10.07)</td>
<td>5.3 (7.75)</td>
<td>17.84 (10.23)</td>
<td>20.16 (10.00)</td>
</tr>
<tr>
<td>PB</td>
<td>5.05 (4.53)</td>
<td>10.79 (6.64)</td>
<td>5.53 (7.70)</td>
<td>8.63 (7.69)</td>
<td>2.21 (3.32)</td>
<td>8.68 (8.19)</td>
</tr>
<tr>
<td>NB</td>
<td>0.32 (1.38)</td>
<td>0.16 (0.69)</td>
<td>0.0 (0.00)</td>
<td>0.0 (0.00)</td>
<td>0.0 (0.00)</td>
<td>0.05 (0.23)</td>
</tr>
<tr>
<td>Feminine toys</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT</td>
<td>27.42 (3.63)</td>
<td>27.42 (5.26)</td>
<td>27.37 (3.61)</td>
<td>28.16 (6.39)</td>
<td>27.82 (3.69)</td>
<td>28.89 (2.40)</td>
</tr>
<tr>
<td>PB</td>
<td>3.21 (5.49)</td>
<td>9.26 (8.16)</td>
<td>3.26 (4.31)</td>
<td>8.89 (7.26)</td>
<td>2.42 (4.43)</td>
<td>9.32 (6.89)</td>
</tr>
<tr>
<td>NB</td>
<td>0.95 (2.27)</td>
<td>2.74 (5.16)</td>
<td>1.74 (3.03)</td>
<td>0.53 (1.17)</td>
<td>0.0 (0.00)</td>
<td>0.0 (0.00)</td>
</tr>
</tbody>
</table>

Note. The table presents frequency of coded behaviors. BH = boys with hypospadias; UB = unaffected boys; UG = unaffected girls; V = variable; Time 1 = mother-absent condition; Time 2 = mother-present condition; MT = masculine toys; FT = feminine toys; PB = positive verbal and nonverbal communicative behaviors; NB = negative verbal and nonverbal communicative behaviors.

*p < .05, **p < .01, ***p < .001.
Insensitive to subtle deviations should be taken into account for future replication. Further, although the PSAI is widely used to obtain atypical gender role behaviors (Swan et al., 2010), it has an acceptable but not particularly strong reliability.

Support for the effects of socialization on gender role behaviors was also not found. Mothers of both boys with and without hypospadias did not respond differently to their children’s toy play. One possibility may be due to advances in surgical and medical techniques. These developments allow reconstruction surgery to restore normal genital appearance and function, resulting in significant reductions in parental anxiety. Once a child’s genital development falls in the normal range, a mother has no reason to behave differently.

Another possibility is that toy play conditions adopted for this study were not sensitive enough for examining the effect of socialization on children’s gender role behavior. Historically, toy preference during toy play is the most common way of investigating gender role behaviors for young children (Raag & Rackliff, 1998). However, gender specific toys have been identified differently over the years, reflecting the changes of gender roles in our society. For example, some researchers have identified a telephone and kitchen toys as neutral toys (Martin et al., 2012), whereas others continue to categorize them as girls’ toys. In this study, a yellow and pink telephone was presented as a feminine toy following previous literature. Some mothers may have considered the telephone as a neutral toy and not have behaved differently. Because of the rapid changes in gender roles in our society and the individual differences in degrees of tolerance of gender role behaviors, it has become increasingly more complex to obtain consensus among people regarding gender-specific toys. Such difficulty suggests the need to find alternative ways to examine the effect of socialization on gender role behaviors. One possibility is to study children’s play patterns rather than their toy preference, considering gender-specific styles of toy interaction: Boys being physically aggressive and girls being verbally interactive (Dipietro, 1981). Another possibility is to compare mother’s behaviors when she interacts with her child with hypospadias to her behaviors with his same-sex unaffected sibling.

Although no differences were found in play with feminine toys between boys with and without hypospadias, boys with hypospadias complained about the toys more when their mothers were present. These results cannot support socialization but suggest a possible role of socialization. That is, it can be inferred that those boys were not comfortable playing with feminine toys when their mothers were present. Another explanation may be that they intentionally complained to prevent possible negative responses from their mothers. These boys may have adapted these negative attitudes from caretakers, including their mothers. Although the mothers showed no reaction to the feminine toys during the observational period, they may have acted differently in their home environment. Further exploration with regards to the role of socialization is needed.

One of the strengths of this study includes the use of multiple sources of information and multidimensional assessment in direct observation. Through the use of such measures, the study tested the role of socialization on behavior of boys with hypospadias. It should be noted that significant differences were found in verbal and nonverbal communicative behaviors but not in actual toy selecting behaviors. Other various methods should be further developed to clarify the speculative explanations.

Second, the present findings provide suggestions for the management of hypospadias. Clinicians may inform parents that their boys do not necessarily differ from unaffected boys in their gender role behaviors during their early development. Previously, studies have suggested

| Table V. Means and Standard Deviations for Mother’s Behaviors |
|-----------------|-----------------|-----------------|-----------------|
| Variable        | BH M(SD) Time 1 | UB M(SD) Time 2 | UG M(SD) Time 1|
| Positive responses | 23.32 (4.93) | 26.84 (5.63) | 26.11 (5.79) |
| Negative responses | 0.05 (0.23) | 0.21 (0.63) | 0.05 (0.23) |
| Neutral responses | 3.32 (4.69) | 2.79 (2.99) | 2.11 (2.05) |

Note: The table presents frequency of coded behaviors. BH = boys with hypospadias; UB = unaffected boys; UG = unaffected girls; Time 1 = all toys condition; Time 2 = feminine toys condition.

*p < .05, **p < .01, ***p < .001.
that parents of children born with chronic conditions, such as a genital malformation, are at a greater risk for emotional distress than parents of healthy newborns (Skari et al., 2002). Thus, informing parents that their children are unlikely to be different from other children can neutralize parental concerns and distress, which would in turn have a positive effect on the upbringing of their children.

Some limitations of the current study warrant to be mentioned. First, the sample size of the present study was relatively small due to practical reasons. The majority of children with hypospadias in Korea are referred to and treated in two university-affiliated hospitals in Seoul. Although the participants of this study were referred from one of those hospitals, the issue of selection bias should still be considered when interpreting the data. Second, only mother–child interactions were observed. Observing toy selection and quality of play behaviors with both genders of caregivers may enable investigators to examine possible role of socialization. Related to the observation procedure, the 5-min analog observation may have not been enough to understand the complex behaviors of the parents. Also, future studies are recommended to incorporate a longitudinal design with various developmental age points and larger samples. Differences across the severity (phenotype) of hypospadias should also be taken into consideration for future research.

**Funding**

This work is supported by the Brain Korea 21.

**Conflicts of interest:** None declared.

**References**


