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Recalled pre-school activities among adults with gender dysphoria who seek gender confirming treatment—An Iranian study

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ABSTRACT

Preschool play behaviors have been frequently shown to be associated with prenatal androgens. It has also been proposed that incongruent sex-typed play behaviors in childhood is associated with gender dysphoria in adulthood in both men and women. Most of these studies, however, have been conducted in western countries. In this study, we investigated the recalled childhood play behavior among a total number of 339 Iranian participants (n = 72 transwomen, n = 92 transmen, n = 75 cisgender men and n = 100 cisgender women) using Preschool Activity Inventory (PSAI). We found that PSAI mean scores of the four groups were significantly different ($F(3,335 = 223.5, p < 0.001)$). Both transmen and cisgender men scored significantly more masculine than transwomen and cisgender women but had no different with each other. Transwomen scored significantly more feminine than cisgender men and cisgender women. Our findings are in line with previous studies that suggest gender nonconforming play behaviors may be associated with gender dysphoria in adulthood. It also emphasizes the importance of this finding for in non-western clinical context and its implications.

1. Introduction

Gender nonconforming or transgender refers to people whose gender expression is incongruent with roles that have been socially assigned to their birth sex (Coleman et al., 2012). Whenever a discrepancy between a person's gender expression and birth sex leads to discomfort or distress, the person is said to experience gender dysphoria (Knudson et al., 2010). According to the Diagnostic and Statistical Manual of Mental Disorders (DSM) 5, gender dysphoria reflects distress related to the incongruence between one's lived gender identity and one's "assigned (or natal) gender" and has lasted for at least 6 months (APA, 2013). Individuals who has been assigned a male sex at birth but feels a female gender identity and seeks gender confirming treatment will be referred to as a transwoman; and individuals who has been assigned a female sex at birth but feels a male gender identity and seek gender confirming treatment will be referred to as transman (Sherer, 2015).

Pre-school activities and preferences in human children have been shown to be sexually dimorphic (Cohen's $d = 3$) (Hines, 2010), that is, they are expressed differently by males and females, as groups (Hines et al., 2015). For example, boys are more likely to prefer vehicles, weapons, and building toys, whereas girls tend to prefer dolls, kitchen accessories, cosmetics and dress-up toys (Cohen-Bendahan et al., 2005). This dimorphism is not limited to toy preferences, but also behavioral expressions (e.g., boys are more active than girls and engage in more rough, active play filled with playful aggression and body contacts), playmates (from age 4.5 to 6.5 the time children spend with same-sex peers is about three to ten times greater than time spent with other-sex peers), and other psychological characteristics (Hines, 2009).

The extensive research on childhood play behaviors did not report sex dimorphism in only humans (Arnold and Chen, 2009; Hines et al., 2016; Lamminmaki et al., 2012; Wong and Hines, 2016), but also in non-human primates (Lonsdorf, 2017). This has caused studies to focus on biological factors such as prenatal androgens as determinants of childhood play behavior (Auyeung et al., 2009; Khorashad et al., 2018a, 2018b; Mitsui et al., 2016, 2018; Pasterski et al., 2011). All these studies support a role for prenatal androgens on development of child's preferences for toys and play behaviors (Berenbaum, 2018; Hines, 2010). Nevertheless, according to the Gender Self-Socialization Model (GSSM), gender identity and social stereotypes can also affect the

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self-perceptions of gender-typed attributes such as actual or recalled childhood play behaviors (Tobin et al., 2010). In this regard, the preferences and behaviors of a child is developed as a result of an interaction between the gender identity, developed at 2–3 years old, and the appreciation of social stereotypes assigned to each category of gender (Martin et al., 2002).

One interesting yet controversial question about childhood play behavior concerns its association with gender dysphoria. It has been proposed that gender dysphoric children, as well as gender dysphoric adults who recall their childhood (Koehler et al., 2017), show play behaviors that are atypical for their natal sex (Zucker, 2005). In other words, gender dysphoric boys tend to play "feminine" games, choose girl playmates, and show feminine characteristics, whereas gender dysphoric girls show the male-typical pattern. Moreover, it has been confirmed that there is an association between recalled childhood gender nonconformity and adulthood androphilia among Western and non-western men (Bailey and Zucker, 1995; Bartlett and Vasey, 2006; Cardoso, 2009; Li et al., 2017; Petterson et al., 2017). The nonconforming behaviors of these children may make them susceptible to the risks of stigma, discrimination, mental and physical abuse and ostracization (Wallien et al., 2010), which in turn can lead to several psychiatric comorbidities (de Vries et al., 2016).

However, very few if any, studies investigated the association between gender dysphoria and recalled childhood play behavior in non-western societies, which makes it difficult to draw cross-cultural generalizations about the relation of gender dysphoria to gender-atypical behavior in childhood. Given this, a gap exists in the literature with respect to whether people with gender dysphoria from non-Western, developed countries recall significantly more gender-nonconforming play behavior in childhood than cisgender people. To fill in this gap in the literature, the current study reports the pre-school activities recalled by a sample of Iranian adults with gender dysphoria who have sought gender affirmative medical and surgical treatments at a gender clinic in Iran and compare it with the recalled activities of their cisgender friends and relatives. Despite noticeable progress in the circumstances of transgender people in Iran with regard to legal issues, health services, and societal attitudes, Iran has a traditional culture and a religious governance which is highly different from western, educated, industrialized, rich, and democratic countries (Henrich et al., 2010). In Iran, gender stereotypes are strictly maintained and propagated by the society and sex segregation is severe. Thus, gender nonconforming individuals supposedly tolerate great amount of distress. Also, without legal permission, cross-dressing, hormone therapy, and sex reassignment surgery is not possible for individuals with gender dysphoria. Therefore, the dynamics of psychosocial development in gender dysphoric persons may differ in Iran compared with western countries. Considering previous research, we hypothesized that transmen would recall engaging in more male-typical play behaviors and preferences, and transwomen in more female-typical play behaviors and preferences, in their childhood, compared to their sex-matched cisgender women and men. We also expect the transgender men and women score similarly to their gender-matched cisgender men and women.

2. Method and materials

2.1. Participants

All participants with confirmed gender dysphoria who attended the gender clinic at Mashhad University of Medical Sciences seeking gender confirming treatment during 2015 and 2016 were invited to participate in this study. Participants were excluded from the study if they had an active major psychiatric comorbidity such as psychosis, intellectual disabilities, were under 18 years of age, were illiterate, or were unwilling to join the study. Based on Standard of Care, version 7 (Coleman et al., 2012), gender dysphoria is confirmed by at least two psychiatrists with experience in gender and sexuality issues. Consequently, clients were permitted to have individual and group psychotherapy, have part- or full-time social transition, and start hormone therapy and surgery. In Iran, these steps require legal permissions that are issued by a judge after consultation with medical personnel. Control participants included 100 androphilic cisgender women and 75 gynophilic cisgender men who reported no history of gender incongruence or gender dysphoria. Controls were recruited among friends and families of transgender participants to minimize the effects of confounding factors such as various socioeconomic status. Participants who were younger than 18, were living outside of Iran or described themselves as not cisgender or non-heterosexual were excluded.

2.2. Materials

2.2.1. Pre-school Activities Inventory (PSAI)

We used the Pre-school Activities Inventory (PSAI) to assess the recalled gender-related behaviors of our participants. The PSAI is a 24-item standardized psychometric instrument that assesses gender-typed toy and activity preferences of children aged 3–7, and generally it is answered by the parents. Therefore, it can be completed by adults to investigate their own activities and preferences during childhood. Items such as “likes to play with dolls” and “likes to play with girls,” assess female-typical play activities, and items such as “likes to play with cars, trains or airplanes” and “likes to play with boys” assess male-typical play behaviors. The instrument was scored by summing responses to masculine items, subtracting the sum of feminine items, and applying a transformation ($48.25 + 1.1 \times$ score) to achieve final score, with higher scores representing more masculine/less feminine behavior and lower scores representing more feminine/less masculine behavior. The rationale behind using a combined score (instead of employing masculine and feminine scores separately) is to make sure that the higher number of toys available to the child does not result in biased scores by artificially increasing their scores(Goldberg et al., 2012). The Persian version of PSAI was originally developed by our research group for another study on individuals with Disorders of Sex Development (Khorashad et al., 2018b). Internal consistency, as evaluated using Cronbach’s alpha, was .756 and 0.865 for masculine and feminine items, respectively.

The PSAI was initially designed as a parent-report questionnaire; parents should answer to it based on their observations of their children. However, it has been shown that it can also be used as a self-reported measure by recalling the childhood play behavior (Hines et al., 2004; Khorashad et al., 2018a, 2018b; Wisniewski and Aston, 2015). Consequently, the PSAI questions were rephrased for use as a retrospective self-report measure: for example, during your childhood, how often did you play with the following toys?”

2.3. Procedure

After hearing a complete explanation of the procedure of the research, participants gave written consent to take part in the study. They all answered the inventory in the same location and under similar circumstances (alone in a silent room in gender study lab in Ibne-sina hospital, with no time limit). Before any assessment all transgender participants were assured that the results of the study will not affect their course of treatment or the privileges they were granted. The study was approved by the Ethics Committee of Mashhad University of Medical Sciences.

2.4. Analysis

ANOVAs and *t*-tests were used to compare age and PSAI scores of transwomen, transmen, cisgender women, and cisgender men. Effect size for PSAI scores was calculated according to Cohen’s *d*. The α level for all statistical tests was .05. All analyses were conducted using SPSS

Table 1
Descriptive statistics of age in transwomen, transmen, cisgender men, and cisgender women.

Gender	N	Mean	Std. Deviation	Minimum	Maximum	Median
Transwomen	72	25.08	6.48	16	43	24.00
Transmen	92	24.24	6.17	16	49	24.00
Cisgender Men	75	24.93	6.6	17	46	23.00
Cisgender Women	100	25.94	5.92	17	37	23.00
Total	339	25.07	6.27	16	49	23.00

version 16.0.1 for Windows.

3. Results

3.1. Sample characteristics

A total number of 339 participants attended in this study, 72 transwomen, 92 transmen, 75 cisgender men and 100 cisgender women. Table 1 describes the ages of participants in each group. The four groups of participants did not differ significantly in age.

There was a negative correlation between the feminine and masculine scores, r = - 0.78, n = 339, $p <$ 0.001. The PSAI scores of cisgender men and women were analyzed. Cisgender men scored significantly higher than cisgender women (t (173) = 19.72, $p <$ 0.001, Cohen's d = 3.1). Next, the PSAI mean scores of the four groups were compared (Table 2). There was significant variability among the means of the four groups (F (3,335 = 223.5, $p <$ 0.001).

Transmen and transwomen had the highest and lowest scores among all participants, respectively; cisgender males and females scored in between (Table 2). Transwomen scored significantly more feminine than cisgender women, but the difference between transmen and cisgender men was not significant.

3.2. Item analysis

Using ANOVA and Tukey's post hoc test, we investigated each item, to see whether there is any item that has been scored differently among the groups. Table 3 demonstrates that in each item, which groups had scored similarly (their difference was not significantly different).

Question 19 was the only item in which there was no significant difference among participants. Questions 8, 11 and 15 were answered significantly different among all groups of participants. In questions 1,2,3,5,6,10, 12, 14 and 17, cisgender males and transmen answered similarly, and other comparisons showed significant different answers. Question 9 was the only item in which the only insignificant difference was between transwomen and cisgender women; all other groups had recalled significantly different preferences.

Cisgender men were the only group who had scored significantly lower from other participants in question 13; others had similar answers. Similarly, transwomen in question 20, and transmen in question 24, scored significantly lower from other three groups. In items 4, 7, 16 and 18, transwomen had reported similarly to what had been reported by cisgender women. Both scored significantly higher than cisgender males and transmen, who were not significantly different with each other.

4. Discussion

This study investigated the recalled childhood play behavior in a group of Iranian transmen and transwomen and compared them to cisgender men and women. Scores of recalled PSAI in transmen were significantly more masculine than their sex-matched cisgender women with a large effect size but did not differ significantly from their gender-matched cisgender men and effect size was small. Transwomen recalled significantly more feminine play behaviors and preferences in their childhood compared to both sex matched cisgender men and gender-matched cisgender women. Effect size of both differences were very large.

Most of the previous studies have focused on demonstrating the role of prenatal testosterone on childhood play behaviors and preferences (Hines et al., 2015). Some have even found associations between prenatal sex hormones and PSAI feminine or masculine scores (Auyeung et al., 2009; Mitsui et al., 2018). Moreover other studies have found more masculine or more feminine PSAI scores in intersex children who have experienced significantly higher or lower levels of androgens during their prenatal period, respectively (Khorashad et al., 2018a, 2018b; Pasterski et al., 2011). Taking all these together, one can propose that the observed association between gender dysphoria and at-birth sex incongruent play behaviors suggests the effects of prenatal androgens on gender dysphoria. However, when comparing the effect sizes of differences between our cisgender and transgender participants with those of between intersex people and control participants (Khorashad et al., 2018b), it seems that the size of transgender children difference with cisgender ones is much larger than the difference between intersex and controls, although the level of prenatal sex hormones in intersex people are higher. An alternative explanation may be based on the Stereotype Emulation hypothesis (Khorashad et al., 2018a, 2018b; Tobin et al., 2010). According to the hypothesis, children's gender identity motivates them to incorporate same-gender stereotypes into their self-concepts ('I am a girl, girls do X, thus I do X').

An unexpected finding in this study is the significant difference between PSAI scores of transwomen and cisgender women. We had hypothesized that trans people report similar level of feminine or masculine play behavior compared to their gender-matched cisgender controls. Transwomen, however, not only recalled more feminine play behaviors compared to their sex-matched cisgender men but also recalled more feminine play behaviors than their gender-matched cisgender women. This was not the case in transmen whose recalled childhood play behavior were not significantly different compared to cisgender men. One explanation is that in a highly gendered socio-political context such as Iran's with legislations which only acknowledge two sexes, people with gender dysphoria try to exaggerate their self-

Table 2
PSAI scores in transwomen, transmen, cisgender men, and cisgender women.

PSAI	Transwomen		Transmen		Cisgender Men		Cisgender Women	
Mean (SD)	17.48 (16.33)		69 (20.12)		64.5 (6.61)		34.72 (11.75)	
Min-Max	0.95-82.35		4.25-92.25		37.25-79.05		13.05-75.75	
Compared to:								
	p[1]	d[2]	P	d	p	d	p	d
Transwomen	—	—	<0.001	2.8	<0.001	3.8	<0.001	1.2
Transmen	—	—	—	—	0.203	0.3	<0.001	2.1
Cisgender Men	—	—	—	—	—	—	<0.001	3.1

[1] P value.
[2] Cohen's d.

Table 3
Comparison of preferences in four groups in each item of PSAI.

		CM vs CW	TW vs CW	TM vs CM	TW vs TM	TW vs CM	TM vs CW
Toys	q1 Guns (or used objects as guns)			Insig.			
	q2 Jewelry			Insig.			
	q3 Tool set			Insig.			
	q4 Dolls, doll's clothes or doll's carriage		Insig.	Insig.			
	q5 Trains, cars, airplanes			Insig.			
	q6 Swords (or used objects as guns)			Insig.			
	q7 Tea set		Insig.	Insig.			
Activities	q8 Playing houses (e.g., cleaning, cooking)						
	q9 Playing with girls		Insig.				
	q10 Pretending to be a female character (e.g. princess)			Insig.			
	q11 Playing at having a male occupation (e.g. soldier)						
	q12 Fighting			Insig.			
	q13 Pretending to be a family character (e.g. parent)		Insig.		Insig.		Insig.
	q14 Sports and ball games			Insig.			
	q15 Climbing (e.g. fences, trees, gym equipment)						
	q16 Playing at taking care of babies		Insig.	Insig.			
	q17 Showing interest in real cars, trains and airplanes			Insig.			
	q18 Dressing up in girlish clothes		Insig.	Insig.			
Characteristics	q19 Likes to explore new surroundings	Insig.	Insig.	Insig.	Insig.	Insig.	Insig.
	q20 Enjoys rough and tumble play	Insig.		Insig.			Insig.
	q21 shows interest in snakes, spiders or insects	Insig.					
	q22 Avoid getting dirty			Insig.			
	q23 Like pretty things	Insig.	Insig.				
	q24 Avoid taking risks	Insig.	Insig.			Insig.	

CW, Cisgender women; CM, cisgender men; TW, transgender women; TM, transgender men.; PSAI, Preschool Activities Inventory.

attributes in a stereotypical way in order to be accepted as men or women. This is in line with findings of Khorashad et al. (2018a) of higher sexist beliefs among participants with gender dysphoria compared to cisgender controls. Item analysis of PSAI, too, provide supports for this explanation. Transwomen in our study scored more feminine than cisgender women in items that are socially stereotyped as very masculine, such as playing with guns, swords, or very feminine, such as playing with jewelry or pretending to be a female fictional character. However, when it comes to the less stereotypical roles, such as pretending to be a family character or exploring new areas the difference is disappeared.

Alternative explanation regards the procedures that transgender people have to go through in Iran. Cross dressing and social transition without official legal permissions in Iran, a traditional and religious country, are not only normatively prohibited but also are illegal and prosecutable. Besides, all the diagnostic and therapeutic measures for gender dysphoria are based on the state dependent institutions. Therefore, the trans people in different stages of their therapy depend completely on social, medical, and governmental support. One may argue that in this context, they need (or they suppose they need) to construct a convincing narrative for the medical and legal staff to get the treatment for their burdensome gender dysphoria. To maintain their narrative, they may need to over-emphasize and over-express their recalling of non-typical childhood play behavior, resulting in significantly more feminine recalled play activities than cisgender controls in the current study.

Recalled gender-related behavior has been also assessed in 634 applicants for gender affirming treatment in Europe (Koehler et al., 2017). Although, like our study, they found out atypical childhood gender expression in female to male and male to female groups, but in contrast to our study where transwomen recalled feminine-typed activities more than cisgender females, their transwomen participants mostly recalled gender-mixed play activities, and their transmen participants reported mostly masculine gender related play behavior in kindergarten and elementary school. They mainly attributed this difference to the heterogeneity of male to female group regarding age, sexual orientation, and age of onset compared with female to male group (Koehler et al., 2017).

Another explanation for the over-expression of the non-typical play behavior in our transwomen may be the recall bias which is the major limitation of our study. Our retrospective data acquisition makes trans people and controls susceptible to this bias, but this bias may be synergistically enhanced in the former group by the fact that trans people are concerned and contemplative about gendered behaviors and stereotypes on an everyday basis, making them more susceptible to errors in recalling childhood play behavior. To overcome this bias, it is vital to investigate play activities in children with gender dysphoria synchronously by direct observation or questionnaires filled by the child's guardian, as Fridell (2001) did and found out that boys with gender identity disorder, similar to cisgender girls, had preference for female peers and feminine-typed toys and activities (Fridell, 2001).

Another limitation of the present study is that we did not control for the effects of various stages of the gender-affirmative therapy in transgender participants. Hormone therapy, social transitioning, and surgery may produce differences in how the trans people recall or report their sex-typed play activities. A larger sample of transwomen and transmen allows categorizing based on the transition state and discerning any existing effect. Controls were recruited among friends and families of transgender participants to minimize the effects of confounding factors such as various socioeconomic status. However, as (Khorashad et al., 2018a) explained, the very familiarity with gender non-binary individuals can affect the controls' understanding of sex differences and thus their own recalled gender-typed behaviors. In other words, they may become more gender-neutral and less inclined to sex stereotypes than the general population (Khorashad et al., 2018a).

A strength of our study is that it reports from Iran where investigations on gender dysphoria are scarce; to our knowledge this is the first study on the childhood sex-typed activities of this population in Iran. Herein, we add to the cross-cultural evidence: nonconforming play behavior is exhibited by the gender dysphoric people of traditional non-western societies. Another strong point for this research is that we used a control group selected from the relatives of transgender clients to minimize the probable sociodemographic effects on PSAI scores.

5. Conclusion

The clinical significance of our findings is crucial for mental health professionals, teachers, and parents who are dealing with children with

gender dysphoria. Exhibiting nonconforming play behavior during their childhood (Koehler et al., 2017), make transgender children highly vulnerable: it can be a source of detriment to peer relations and, consequently, well-being of the child (Wallien et al., 2010). This injury will affect the psychosocial and psychosexual development of the children, making them more susceptible to mental health issues in adulthood (Hay et al., 2004; Sourander et al., 2007). The great amount of gender nonconformity observed in the current study and previous investigations (Koehler et al., 2017; Zucker, 2005) highlights a marker to increase sensitivity for early diagnosis of gender dysphoria in children. In addition, it calls for an inclusive social support for children with atypical play behavior to prevent stigma, victimization, and mental distress.

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Conflict of interest

No conflict of interest to report.

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References

APA, 2013. Diagnostic and Statistical Manual of Mental Disorders. American Psychiatric Association, from American Psychiatric Association Publishing.

Arnold, A.P., Chen, X., 2009. What does the "four core genotypes" mouse model tell us about sex differences in the brain and other tissues? Front. Neuroendocrinol. 30 (1), 1–9. https://doi.org/10.1016/j.yfrne.2008.11.001. doi:S0091-3022(08)00050-2 [pii].

Auyeung, B., Baron-Cohen, S., Ashwin, E., Knickmeyer, R., Taylor, K., Hackett, G., Hines, M., 2009. Fetal testosterone predicts sexually differentiated childhood behavior in girls and in boys. Psychol. Sci. 20 (2), 144–148. https://doi.org/10.1111/j.1467-9280.2009.02279.x.

Bailey, J.M., Zucker, K.J., 1995. Childhood sex-typed behavior and sexual orientation: a conceptual analysis and quantitative review. Dev. Psychol. 31 (1), 43–55. https://doi.org/10.1037/0012-1649.31.1.43.

Bartlett, N.H., Vasey, P.L., 2006. A retrospective study of childhood gender-atypical behavior in Samoan Fa'afafine. Arch. Sex. Behav. 35 (6), 659–666. https://doi.org/10.1007/s10508-006-9055-1.

Berenbaum, S.A., 2018. Beyond pink and blue: the complexity of early androgen effects on gender development. Child Dev. Perspect. 12 (1), 58–64. https://doi.org/10.1111/cdep.12261.

Cardoso, F.L., 2009. Recalled sex-typed behavior in childhood and sports' preferences in adulthood of heterosexual, bisexual, and homosexual men from Brazil, Turkey, and Thailand. Arch. Sex. Behav. 38 (5), 726–736. https://doi.org/10.1007/s10508-008-9312-6.

Cohen-Bendahan, C.C., van de Beek, C., Berenbaum, S.A., 2005. Prenatal sex hormone effects on child and adult sex-typed behavior: methods and findings. Neurosci. Biobehav. Rev. 29 (2), 353–384. https://doi.org/10.1016/j.neubiorev.2004.11.004.

Coleman, E., Bockting, W., Botzer, M., Cohen-Kettenis, P., DeCuypere, G., Feldman, J., et al., 2012. Standards of care for the health of transsexual, transgender, and gender-nonconforming people, version 7. Int. J. Transgenderism 13 (4), 165–232. https://doi.org/10.1080/15532739.2011.700873.

de Vries, A.L.C., Steensma, T.D., Cohen-Kettenis, P.T., VanderLaan, D.P., Zucker, K.J., 2016. Poor peer relations predict parent- and self-reported behavioral and emotional problems of adolescents with gender dysphoria: a cross-national, cross-clinic comparative analysis. Eur. Child Adolesc. Psychiatry 25, 579–588. https://doi.org/10.1007/s00787-015-0764-7.

Fridell, S.R., 2001. Sex-typed Play Behavior and Peer Relationships of Boys with Gender Identity Disorder. (Ph.D.). University of Toronto, National Library of Canada.

Goldberg, A.E., Kashy, D.A., Smith, J.Z., 2012. Gender-typed play behavior in early childhood: adopted children with lesbian, gay, and heterosexual parents. Sex Roles 67 (9–10), 503–515. https://doi.org/10.1007/s11199-012-0198-3.

Hay, D.F., Payne, A., Chadwick, A., 2004. Peer relations in childhood. J. Child Psychol. Psychiatry 45 (1), 84–108.

Henrich, J., Heine, S.J., Norenzayan, A., 2010. The weirdest people in the world? Behav. Brain Sci. 33 (2–3), 61–135. https://doi.org/10.1017/S0140525X0999152X.

Hines, M., 2009. 59 - gonadal hormones and sexual differentiation of human brain and behavior A2 - Pfaff, Donald W. In: Arnold, A.P., Etgen, A.M., Fahrbach, S.E., Rubin, R.T. (Eds.), Hormones, Brain and Behavior (Second Edition). Academic Press, San Diego, pp. 1869–1910.

Hines, M., 2010. Sex-related variation in human behavior and the brain. Trends Cogn. Sci. 14 (10), 448–456. https://doi.org/10.1016/j.tics.2010.07.005.

Hines, M., Brook, C., Conway, G.S., 2004. Androgen and psychosexual development: core gender identity, sexual orientation and recalled childhood gender role behavior in women and men with congenital adrenal hyperplasia (CAH). J. Sex Res. 41 (1), 75–81. https://doi.org/10.1080/00224490409552215.

Hines, M., Constantinescu, M., Spencer, D., 2015. Early androgen exposure and human gender development. Biol. Sex Differ. 6, 3. https://doi.org/10.1186/s13293-015-0022-1.

Hines, M., Spencer, D., Kung, K.T., Browne, W.V., Constantinescu, M., Noorderhaven, R.M., 2016. The early postnatal period, mini-puberty, provides a window on the role of testosterone in human neurobehavioural development. Curr. Opin. Neurobiol. 38, 69–73. https://doi.org/10.1016/j.conb.2016.02.008.

Khorashad, B.S., Roshan, G.M., Talaei, A., Arezoomandan, S., Sadr, M., 2018a. Views of individuals with gender dysphoria and disorders of sex development on sexism: an Iranian study. Int. J. Transgenderism 1–12. https://doi.org/10.1080/15532739.2018.1445573.

Khorashad, B.S., Roshan, G.M., Reid, A.G., Aghili, Z., Moghadam, M.D., Khazai, B., et al., 2018b. Childhood sex-typed behavior and gender change in individuals with 46,XY and 46,XX disorders of sex development: an Iranian multicenter study. Arch. Sex. Behav. 47 (8), 2287–2298. https://doi.org/10.1007/s10508-018-1281-9.

Knudson, G., De Cuypere, G., Bockting, W., 2010. Recommendations for revision of the DSM diagnoses of gender identity disorders: consensus statement of the world professional association for transgender health. Int. J. Transgenderism 12 (2), 115–118. https://doi.org/10.1080/15532739.2010.509215.

Koehler, A., Richter-Appelt, H., Cerwenka, S., Kreukels, B.P.C., Watzlawik, M., Cohen-Kettenis, P.T., et al., 2017. Recalled gender-related play behavior and peer-group preferences in childhood and adolescence among adults applying for gender-affirming treatment. Sex. Relation. Ther. 32 (2), 210–226. https://doi.org/10.1080/14681994.2016.1195908.

Lamminmaki, A., Hines, M., Kuiri-Hanninen, T., Kilpelainen, L., Dunkel, L., Sankilampi, U., 2012. Testosterone measured in infancy predicts subsequent sex-typed behavior in boys and in girls. Horm. Behav. 61 (4), 611–616. https://doi.org/10.1016/j.yhbeh.2012.02.013.

Li, G., Kung, K.T.F., Hines, M., 2017. Childhood gender-typed behavior and adolescent sexual orientation: a longitudinal population-based study. Dev. Psychol. 53 (4), 764–777. https://doi.org/10.1037/dev0000281.

Lonsdorf, E.V., 2017. Sex differences in nonhuman primate behavioral development. J. Neurosci. Res. 95 (1–2), 213–221. https://doi.org/10.1002/jnr.23862.

Martin, C.L., Ruble, D.N., Szkrybalo, J., 2002. Cognitive theories of early gender development. Psychol. Bull. 128 (6), 903–933.

Mitsui, T., Araki, A., Miyashita, C., Ito, S., Ikeno, T., Sasaki, S., et al., 2016. The relationship between the second-to-fourth digit ratio and behavioral sexual dimorphism in school-aged children. PLoS One 11 (1), e0146849. https://doi.org/10.1371/journal.pone.0146849.

Mitsui, T., Araki, A., Miyashita, C., Ito, S., Ikeno, T., Sasaki, S., et al., 2018. Effects of prenatal sex hormones on behavioral sexual dimorphism. Pediatr. Int. https://doi.org/10.1111/ped.13756.

Pasterski, V., Geffner, M.E., Brain, C., Hindmarsh, P., Brook, C., Hines, M., 2011. Prenatal hormones and childhood sex segregation: playmate and play style preferences in girls with congenital adrenal hyperplasia. Horm. Behav. 59 (4), 549–555. https://doi.org/10.1016/j.yhbeh.2011.02.007.

Petterson, L.J., Wrightson, C.R., Vasey, P.L., 2017. Recalled gendered behavior in childhood: a comparison of androphilic men, gynephilic men, and androphilic women in Japan. Arch. Sex. Behav. 46 (1), 119–127. https://doi.org/10.1007/s10508-016-0781-8.

Sherer, I., Ehrensaft, B.J., D, Rosenthal, S.M., 2015. Affirming gender: caring for gender atypical children and adolescents. Contemp. Pediatr. 32, 16–19.

Sourander, A., Jensen, P., Ronning, J.A., Niemela, S., Helenius, H., Sillanmaki, L., et al., 2007. What is the early adulthood outcome of boys who bully or are bullied in childhood? The finnish "from a boy to a man" study. Pediatrics 120 (2), 397–404. https://doi.org/10.1542/peds.2006-2704.

Tobin, D.D., Menon, M., Menon, M., Spatta, B.C., Hodges, E.V.E., Perry, D.G., 2010. The intrapsychics of gender: a model of self-socialization. Psychol. Rev. 117 (2), 601–622. https://doi.org/10.1037/a0018936.

Wallien, M.S.C., Veenstra, R., Kreukels, B.P.C., Cohen-Kettenis, P.T., 2010. Peer group status of gender dysphoric children: a sociometric study. Arch. Sex. Behav. 39 (2), 553–560. https://doi.org/10.1007/s10508-009-9517-3.

Wisniewski, A., Aston, C.E., 2015. A cross-section study of the ontogeny of gender roles in women with DSD. Curr. Pediatr. Rev. 11 (1), 27–35.

Wong, W.I., Hines, M., 2016. Interpreting digit ratio (2D:4D)-behavior correlations: 2D:4D sex difference, stability, and behavioral correlates and their replicability in young children. Horm. Behav. 78, 86–94. https://doi.org/10.1016/j.yhbeh.2015.10.022.

Zucker, K.J., 2005. Gender identity disorder in children and adolescents. Annu. Rev. Clin. Psychol. 1, 467–492. https://doi.org/10.1146/annurev.clinpsy.1.102803.144050.