

SEX DIFFERENCES IN SOCIAL BEHAVIOR

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From an early age, boys and girls can be easily distinguished according to sex. While this is partly due to appearance and the way in which their parents dress them and cut their hair, it is also because of the things that children do. Boys and girls like to play with different toys, prefer different games and engage in different activities. Long before they reach school age it is possible to tell with a reasonable degree of accuracy whether a child is a boy or a girl simply on the basis of his or her behavior. This does not mean that all boys engage in male-typical activities, or that all girls engage in female-typical activities, all of the time. There is a great deal of overlap between the sexes with some girls seeming quite “boyish” and some boys seeming quite “girlish.” Although there is considerable variation in the behavior of children within each sex, it is generally more acceptable for girls to behave like boys than it is for boys to behave like girls. This may explain why the term “tomboy” used to describe masculine girls is often used endearingly whereas “sissy” is a much more derogatory term when applied to feminine boys.

What exactly are the differences in behavior shown by boys and girls? And how do these differences develop? These are the questions that will be addressed in this chapter. Firstly, sex differences in social behavior will be described from the pre-school to the elementary school years. This will be followed by a consideration of the various theories that have been put forward to explain this phenomenon. The sections on biological theories draw from Collaer & Hines (1995) and Hines (2004; 2009) while those on psychological theories draw from Golombok & Fivush (1994). As will be seen, some theories have greater empirical support than others. Following Maccoby (1988), the terms “sex” and “gender” will be used interchangeably throughout the chapter without any assumption that “sex” implies biological causes or that “gender” results from socialization.

BEHAVIORAL SEX DIFFERENCES

Preschool (3-4 years)

Gender Identity. By their third birthday, children have generally developed a rudimentary sense of gender identity (Slaby & Frey, 1975). When asked, “Are you a boy or a girl?” they usually respond correctly. They can also correctly identify other people as male or female. But children of this age

base judgements on physical appearance. A person with long hair and wearing a skirt will be deemed female, and a short-haired person with a necktie will be seen as male. If these same people change their clothes and hairstyle to look like the other sex, children will report that their gender has also changed.

At around 3 to 4 years of age, children develop gender stability, i.e. they begin to recognise that gender does not change over time (Slaby & Frey, 1975). They realise that if they are a girl or a boy now, then they used to be a girl baby or a boy baby, and that they will grow up to be a woman or a man. However, they still believe that children can change gender by changing their behavior; if a boy wears a dress, he can become a girl, and if a girl plays with guns, she can become a boy.

Toy Preference. One of the most striking differences between boys and girls is their preference for different types of toys. This can be detected in the visual preferences of infants (Alexander, Wilcox & Woods, 2009; Cambell, Shirley, Heywood, & Crook, 2000; Jadva, Golombok, & Hines, in press; Serbin, Poulin-Dubois, Colburne, Sen, & Eichstedt, 2001), and by the age of 3 years, girls are much more likely than boys to play with dolls and domestic toys whereas boys are more often found with weapons and vehicles (De Lucia, 1963; Sutton-Smith & Rosenberg, 1971; O'Brien & Huston, 1985; Golombok, et al., 2008).

Playmate Preference. From as early as 2 years old, children prefer same-sex playmates (Maccoby & Jacklin, 1987; Pellegrini, et al., 2007). This phenomenon, known as “gender segregation”, is not specific to particular nationalities or cultures and can be seen in play groups around the world (Whiting & Edwards, 1988). Furthermore, gender segregation is most likely to occur when children are left to their own devices, which suggests that it is children, not adults, who are driving this process. In an observational study of children in a day-care setting, LaFreniere, Strayor & Gauthier (1984) found that the tendency for girls to play together became apparent at age 2, and for boys by age 3. Howes (1988) reported similar findings. She observed children in day-care, and showed that 3-year-olds were more likely to form new friendships with same-sex children.

Play Style. Differences in the play styles of boys and girls can also be seen from age 3 (Maccoby, 1998; Maccoby & Jacklin, 1987; Pitcher & Shultz, 1983). Boys tend to play in a more active, rough-and-tumble and sometimes physically aggressive fashion than girls, who tend to talk more to each other and to be more nurturant. Boys also like to play outdoors in large groups while girls are more often to be found in twos or threes indoors. Differences in the way in which boys and girls resolve conflict are also apparent from age 3. Whereas girls incline towards reaching a compromise, it is more common for boys to use physical force (Sheldon, 1990). Pretend play also differentiates the sexes with boys acting out heroic roles involving fighting and adventure, and girls preferring to be family characters or dressing up in female-typical clothes.

Early school (5-7 years)

Gender Identity. It is not until the early school years that children attain gender constancy, the final stage of gender identity development (Slaby & Frey, 1975). They now realise that gender is constant across time and all situations, and that however much someone wants to be the other sex, behaves like the other sex and wears other sex clothes, this simply cannot happen. The attainment of gender constancy is closely related to the conservation stage of cognitive development (Piaget, 1968). When Marcus & Overton (1978) administered both a conservation task and a gender constancy task to early school-age children they found that children who could successfully complete the conservation task were more likely to pass the gender constancy task as well. There has been some controversy over the age at which children reach gender constancy, with different studies producing different findings depending on the assessment methods used (Zucker, Bradley, Kuksis, Pecore, Birkenfeld-Adams, Doering, Mitchell & Wild, 1999; Martin & Halverson, 1983; Emmerich, Goldman, Kirsh & Sharabany, 1977; Ruble, et al., 2007). Many children, it seems, do not reach the stage of gender constancy until the end of the early school years. It used to be thought that it was necessary for children to develop a full understanding of the gender concept before they would consistently engage in sex-typed behavior (Kohlberg, 1966) but sex differences in toy, playmate and activity preference shown by children as younger than 3 years old clearly demonstrate that this is not the case. Indeed,

Ruble, et al., (2007) have worked to revise Kohlberg's theory based on evidence that an earlier stage of gender constancy, gender stability, mediates relationships between gender knowledge and other sex-typed preferences.

Toy Preference. The sex difference in toy preference that is apparent among pre-school children continues to characterize the early school years. In a study of 3-5 year olds, Martin & Little (1990) demonstrated a greater preference among boys for vehicles and tools over domestic toys and a greater preference among girls for domestic toys over vehicles and tools. Children in this study were also more likely to report that they preferred unfamiliar neutral items such as a pizza cutter and a hole puncher if presented to them as something that children of their sex really like.

Playmate Preference. Gender segregation is an important feature of the early school years. Maccoby & Jacklin (1987) examined the playmate preferences of 100 children at 4 ½ years old and again at 6 ½ years. When first observed, the children were spending nearly three times as much time playing with same sex peers than other sex peers. Two years later, the amount of time spent playing with same-sex peers was more than ten times greater than that spent with other-sex peers. A similar increase in the preference for same-sex peers was demonstrated by Serbin, Powlishta & Gulko (1993) when they compared children in kindergarten with children in the early school years.

Play Style. As children move from pre-school to the early school years, the play styles of boys and girls continue to diverge. Achieving dominance appears to be of particular importance to boys. In order to have status, boys need to be seen as "tough" (Maccoby, 1998). The way in which girls and boys communicate is also different. Girls talk to each other to form and strengthen relationships. Boys use language to give information, assert themselves and command attention (Lever, 1976; Maccoby & Jacklin, 1987). Additionally, boys of this age like to play in large groups whereas girls prefer the company of one or two female friends. The nature of these relationships also differs between the sexes. Whereas girls' friendships are characterised by emotional and physical closeness, the friendships of boys are founded on shared activities and interests (Maccoby, 1998). A longitudinal

study of 2,726 boys and 2,775 girls showed that behavior at age 2.5 predicted behavior at age 5 (Golombok, et al., 2008). The children who showed the strongest preference for sex-typed play style before starting pre-school continued to show strong preferences 2.5 years later.

Late elementary school (8-11 years)

Toy Preference. The preference for sex-typed toys appears to continue right through childhood. In fact, Golombok et al.'s (2008) longitudinal study of over 5,000 children showed that not only did sex-typed toy preferences persist, but that they increased to some extent up until age 8. It seems that right until the end of elementary school boys and girls have a strong preference for sex-typed toys.

Playmate Preference. The preference for same sex peers is strongest among elementary school children. In reviewing the literature on relationships within the school environment, Maccoby (1998) reported that children's best friends are almost always same-sex. Furthermore, when observed during free time, boys and girls are even more likely to be found interacting with same-sex friends. Maccoby (1998) illustrates this with a description of behavior in the lunchroom "In school lunchrooms, the children usually have a shared understanding that certain tables are 'girls' tables' and other tables are for boys. Very few instances are seen in which a child sits down next to an opposite-sex child after emerging from the cafeteria line." A study of 8- to 11-year-olds by Gray and Feldman (1997) was particularly revealing. When they investigated peer group interaction at an ungraded school where boys and girls of all ages had the opportunity to mix, more than half of children spent no time at all with opposite-sex children.

Play Styles. In the elementary school years, much of boys' free time is spent in large groups of other boys playing competitive games. When Crombie & Desjardins (1993) observed boys and girls at play, they found that boys in large groups were involved in competition with other boys 50% of the time whereas this was true for girls in their smaller groups only 1% of the time. Girls spend most of their free time conversing with a female best friend, often sharing secrets or talking about mutual interests (Lever, 1976). Tannen (1990) examined the content of girls' and boys' conversations in a laboratory

setting. The girls had long, intimate conversations. Boys, in contrast, found little to say and resorted to talking about finding something to do.

EXPLANATORY THEORIES

Theories attempting to explain the development of sex differences in childhood behavior have been classified as biological or psychological. This distinction is somewhat misleading, because psychological processes have biological counterparts and because biology and psychology influence one another. In addition, the theories discussed under these headings are not mutually exclusive. Nevertheless, to date, so-called biological and psychological research approaches have proceeded largely separately, and so each will be discussed in turn.

Biological explanations

Biological mechanisms underlying sexual development have been studied extensively in non-human mammals, and have been found to be similar for the genitalia, the brain, and behavior. These processes are summarised below, and discussed more fully in Goy & McEwen, 1980; Wilson, George & Griffin, 1981; and Hines, 2004; 2009.

The primary and immediate biological determinants of sex differences are gonadal hormones. At conception, both genetically male (XY) and female (XX) mammals have the capacity to differentiate phenotypically as either males or females. In XY individuals, a region on the Y chromosome directs the primordial gonads (originally identical in males and females) to become testes. Without this direction, the gonads differentiate as ovaries. The human testes then begin to produce hormones by about week 8 of gestation. These testicular hormones direct male-typical sexual differentiation of the internal and external genitalia, where receptors for these hormones are located. In the absence of testicular hormones, these tissues differentiate in the female-typical pattern.

Similar processes occur within the brain, certainly in non-human mammals, and apparently in humans as well. Like the genitalia, some brain regions have receptors for testicular hormones. The same

brain regions that contain these receptors show structural sex differences and regulate reproductive behaviors or other behaviors that show sex differences. Treating female animals with the testicular hormone, testosterone (T), during early development masculinizes their brain structure and behavior, and removing T from developing males produces the opposite effects. For example, treating pregnant rhesus monkeys with T produces female offspring who show increased rough-and-tumble (male-typical) play as juveniles, and increased male-typical sexual behavior, and decreased female-typical sexual behavior, as adults.

These hormonal influences are graded and linear; smaller doses have smaller effects than larger doses. Therefore, small or moderate changes in hormones during development can move an organism along a male-female continuum. Thus, gradations in hormone levels during development could contribute to individual differences in sex-typical behavior within each sex, as well as between the sexes. Also, the effects occur during critical or sensitive periods of early development that correspond to times when testicular hormones are higher in males than in females. In humans, such periods appear to occur from about weeks 8 to 24 of gestation, as well as from the first to the third, or even sixth, month of postnatal life, although the prenatal surge in testicular hormones has received more research attention than the postnatal surge (see Hines, 2009, for more details).

Knowledge of the basic mechanisms underlying sexual differentiation of the mammalian brain and behavior has come from experimental studies in species such as rats and rhesus monkeys, where hormones can be manipulated. Similar experiments are impossible in humans, because of ethical considerations. Therefore, information on the applicability of these animal models to human development has come from other sources. These include endocrine disorders of prenatal onset, situations where women have been prescribed hormones during pregnancy, and cases where information about prenatal hormone levels is available for individuals with no hormone abnormalities. As might be expected, these sources are limited, and generally it is not possible to discuss the evidence in the age frames specified at the beginning of this chapter. However, where possible, data

will be described in terms of the age groups for which they were gathered. In addition, because many studies have involved small numbers of subjects, sample sizes will be specified.

Toy preferences. Girls exposed prenatally to high levels of androgens (the major type of testicular hormone), because of the genetic disorder, congenital adrenal hyperplasia (CAH), have been a major source of evidence regarding prenatal hormonal influences on human gender development. CAH causes deficiency in an enzyme needed to produce cortisol, and, consequently, substances that would normally be used to produce cortisol are shunted into a pathway that produces androgens. Genetic females with CAH almost always are born with ambiguous (partially masculinized) genitalia caused by the elevated androgen prenatally. The degree of virilization varies, ranging from essentially female-appearing genitalia, to some degree of labial fusion and clitoral hypertrophy, to male-appearing genitalia. In the great majority of cases, diagnosis is made shortly after birth, hormones are prescribed to regulate the postnatal hormonal environment, the genitalia may be surgically feminized and the child is assigned and reared as a girl.

Despite these procedures, girls with CAH show masculinized toy preferences (Ehrhardt, Epstein & Money, 1968; Ehrhardt & Baker, 1974; Berenbaum & Hines, 1992; Dittman et al., 1990; Slijper, 1984; Pasterski, et al., 2005). Studies have obtained information from questionnaires and interviews with the girls and their mothers, and from direct observation of toy choices in a playroom.

Questionnaire and interview studies often combine information on toy choices with other behaviors, such as playmate and activity preferences. However, observational studies indicate that toy choices are altered when considered alone. In two such studies a total of 64 girls with CAH (ages 3 to 10 years) spent more time with toys typically preferred by boys and less time with toys typically preferred by girls than did unaffected female relatives (Berenbaum & Hines, 1992; Pasterski, et al., 2005). Similar findings have been reported by a separate research group, who also found that the severity of the CAH disorder, and associated androgen exposure, correlated with the degree of male-typical toy play (Servin, Nordenstrom, Larsson & Bohlin, 2001).

The interpretation of data from CAH girls has been questioned because of their virilization at birth, and because their parents might treat them differently based on the knowledge that they were exposed to “masculinizing” hormones (Fausto-Sterling, 1992). However, a recent investigation of parental responses to children’s sex-typed toy preferences showed that this is not the case. In an observational study, Pasterski et al. (2005) compared parents’ responses to 34 girls with CAH and 27 unaffected sisters playing with girls’ and boys’ toys. What they found was remarkable. Not only did parents reward their daughters for girl typical play, but they did so more for daughters with CAH than for unaffected daughters. A significant, but negative correlation suggested that the more the CAH daughters played with male-typical toys, the more parents encouraged play with female-typical toys. It appears that parents are encouraging CAH daughters to play with girl-typical toys, but this encouragement is insufficient to override a predisposition to male-typical toy play. Changes in toy play are not typically found between boys with and without CAH.

Evidence for the role of androgens in the development of sex differences in toy preferences of normally developing children comes from studies linking T in maternal blood during pregnancy and in amniotic fluid (aT) to subsequent behavior in the offspring. As part of a large-scale population study, Hines and colleagues (2002) measured T in blood samples from pregnant women and subsequent sex-typed behavior in their children (342 males, 337 females) at 3.5 years using the Pre-school Activities Inventory (PSAI), a measure designed to be sensitive to both between and within sex variation in involvement with sex-typed toys, activities, and interests. They found a linear relationship between maternal T and PSAI scores in girls. That is, higher levels of maternal T were linked to more masculine PSAI scores in daughters at 3.5 years. Conversely, lower levels of maternal T were linked to more feminine scores, and mid-range levels of T were linked to mid-range PSAI scores.

T measured in amniotic fluid during fetal development shows variability in both sexes and is typically higher in male fetuses, making it a plausible measure of prenatal androgen exposure. Although, two studies reported no relationship between aT and sex-typical play (Knickeyer, et al., 2005; van de Beek, et al., 2008), these studies may have lacked sufficient experimental power to detect effects. The

first study assessed childhood behavior by maternal report in 22 girls and 31 boys and the second by observed toy choice in 63 girls and 63 boys. To apply a more rigorous test, Auyeung and colleagues (2009) assessed sex-typed behavior in a larger sample of 212 children using the PSAI. They found a significant correlation between aT and childhood sex-typed behavior in both boys and girls. Like the findings of Hines et al. (2002), these findings support a contribution of prenatal T exposure to the development of sex-typed toy, activity and interest preferences in normally developing children.

Gender identity. Though several studies of girls with CAH have noted reduced female-typical gender identity or reduced satisfaction with the female gender role, the majority identify as female. Dessens, Slijper, and Drop (2005) reviewed the literature dating from 1950 and reported on gender identity in a total of 250 women with CAH. They found that 94.8% of the girls and women did not feel gender dysphoric, while 5.2% exhibited serious problems with their gender identity. However, a closer look at other studies might elucidate nuanced effects of prenatal T. For example, in a sample of 16 women with CAH, Hines, Brook, and Conway (2004) found reduced satisfaction with the female sex of assignment compared with 15 unaffected women, which is consistent with several other studies (Ehrhardt, et al., 1968; Ehrhardt & Baker, 1974; Slijper, 1984; Hurtig & Rosenthal, 1987). While the girls and women in these studies identified as female, the reduced satisfaction suggests that prenatal hormones may contribute to the differentiation of gender identity.

Playmate preferences. Playmate preferences also are altered in girls exposed to androgens prenatally. Three studies have reported that girls with CAH show reduced preferences for female playmates (Ehrhardt et al., 1968; Ehrhardt & Baker, 1974; Hines & Kaufman, 1994). The studies included a total of 58 CAH girls (ages 3 to 20 years) from three different regions of the United States who were compared to matched or sibling controls. The first two studies used interviews to assess playmate preferences along with other sex-typical behaviors. The third asked children to name their three favourite playmates and calculated the percentage of males. The 10 girls exposed to androgens reported increased preferences for male playmates (Money & Ehrhardt, 1972). Boys with CAH do

not show alterations in preferences for male playmates (Ehrhardt & Baker, 1974; Hines & Kaufman, 1994), again consistent with research in other species.

Play styles. Studies of hormone-exposed children have not looked at play styles as extensively as have studies of normal children. However, there is some information concerning aggression and rough-and-tumble play.

Until recently, reports on aggression following prenatal exposure to androgenic hormones have produced confusing results. For example, one study found that 22 women with CAH scored higher than matched controls on a questionnaire measure of “indirect aggression” (Helleday, Edman, Ritzen & Siwers, 1993). A second study, also using questionnaires, presented a more complicated picture (Berenbaum & Resnick, 1997): six groups of CAH individuals (3 female and 3 male) were compared to siblings of the same sex, with only one of them showing an effect. The different outcomes across the groups could relate to the age of participants, the specific questionnaire used to measure aggression or sample size. A more recent study used a larger sample (38 girls with CAH and 25 unaffected sisters) and more direct method of assessment. To avoid biases in girls’ reporting of their own aggressive behavior, Pasterski, et al. (2007) asked mothers to rate how aggressive their 3- to 10-year-old CAH and non-CAH daughters were, as well as how often they got into fights with other children. They found that girls with CAH were rated as more aggressive and as having more fights than their unaffected sisters, suggesting a link between prenatal androgen exposure and aggression. A 2008 study of adolescents and adults also found that females with CAH recalled increased physical aggression in early adolescence (Mathews, et al., 2009). Similarly, a study of girls and boys exposed to progestins, particularly those with androgenic properties, because their mothers were prescribed these hormone during pregnancy, found increased propensities to physical aggression compared to offspring from untreated pregnancies (Reinisch, 1981).

CAH girls also have been reported to show high energy expenditure, and preferences for rough, active play, particularly in the context of “tomboyish” behavior (Ehrhardt et al., 1968; Ehrhardt & Baker,

1974). These studies included a total of 32 CAH girls (4 to 20 years) compared to matched or sibling controls. Similar findings were reported for the 10 girls (3 to 14 years) exposed to androgenic progestins prenatally (Ehrhardt & Money, 1967). A third study of 34 CAH girls (11 to 41 years) found no differences from unaffected sisters in energy expenditure based on interview responses (Dittman, et al. 1990). This study also found no differences in dominance or assertiveness in CAH versus control girls. A fourth study, however, supports previous findings that prenatal androgens influence activity levels. Pasterski et al., (2007) found that, according to mothers' reports, their daughters with CAH (n=38) were more active than their unaffected daughters (n=25). Again, no difference was found between boys with and without CAH.

In terms of rough-and-tumble play, one study observed the behavior of 20 girls with CAH (ages 3 to 8 years) and their unaffected relatives. Children played with a partner in a room containing toys selected to elicit rough-and-tumble play (e.g., a "Bobo" punching doll). Control boys showed more rough-and-tumble play than did control girls (e.g. hitting the "Bobo" doll, playfully hitting one another, wrestling), as found in prior studies using similar procedures (Maccoby, 1988; DiPietro, 1981). However, girls with CAH did not differ from control girls (Hines & Kaufman, 1994). These results contrast with data from female rats and rhesus monkeys, where androgen exposure during early development increases rough-and-tumble behavior (e.g., Goy & McEwen, 1980). Perhaps similar processes do not occur in humans. Alternatively, the testing situation might not have been adequate to detect effects. Most girls do not like rough-and-tumble play and most boys will not play rough with girls. Consequently, girls with CAH may have found that neither male nor female partners were interested in joining them in rough-and-tumble interactions (See Hines & Kaufman, 1994 for additional discussion).

Summary. Studies of girls exposed to high levels of androgen prenatally, because of genetic disorders, such as CAH, suggest that prenatal androgen influences the development of male-typical toy choices, gender identity, and playmate preferences. Some convergent evidence of hormonal influences on these behaviors has come from studies linking normative within-sex variation to T in

maternal blood as well as in aT. Alterations in play-styles, including rough-and-tumble play and aggressive play, are less well established. Variability in the early hormone environment has generally not been found to influence gender development in boys. However, the recent study by Auyeung, et al., (2009) demonstrated a correlation between aT and sex-typed behavior in a large sample of normally developing boys. Clearly, although findings from girls with CAH, together with the normative studies, suggest that hormones can influence the development of children's gender-related behavior, further research is needed to fully understand the role of hormonal factors in the full range of behaviors that show sex differences and to understand their importance in the development of healthy boys as well as girls.

Psychological explanations

The psychological explanations discussed below have been organized according to theoretical approach as each theory has been applied to more than one aspect of gender development of interest in this chapter (gender identity, toy preference, playmate preference and play style). The particular focus of each theoretical perspective will be highlighted where appropriate.

Social learning theory. The idea, founded in psychoanalytic theory, that children's gender development results from identification with the same sex-parent is a cornerstone of social learning theory. According to classic social learning theory, two mechanisms are at play (i) the differential reinforcement of boys and girls; and (ii) children's modelling of individuals of the same sex as themselves (Mischel, 1966 & 1970; Bandura, 1977). Classic social learning theory posits that parents play a key role in the gender development of children, both by differentially reinforcing daughters and sons and by acting as models of sex-typed behavior. However, it is acknowledged that others such as teachers and peers, as well as images presented by the media, are also influential.

The role of differential reinforcement in children's acquisition of sex-typed behavior has been widely investigated in an attempt to establish whether parents really treat sons and daughters differently. In an influential review of the early studies, Maccoby & Jacklin (1974) concluded that there was little

evidence that they do. In terms of the extent to which they allowed sons and daughters to be independent, and the way in which they responded to children's aggressive behavior, there was little evidence for differential reinforcement of boys and girls. Nevertheless, there were some differences. Parents reinforced their children for specifically sex-typed activities and interests such as doll play for girls and more active play for boys, and discouraged play that was associated with the other sex. A more recent review (Lytton & Romney, 1991) found a similar result. The only consistent differences to emerge in parental treatment of boys and girls once again involved sex-typed behaviors relating to toys, games and activities.

Although Maccoby & Jacklin (1974) thought these differences were of little significance, other researchers believe that the differential reinforcement of children's toy, game and activity preferences plays a part in the acquisition of sex-typed behavior (Block, 1983; Lytton & Romney, 1991). From the moment of birth, parents treat sons and daughters differently. They describe newborn girls as soft and newborn sons as strong (Rubin et al 1974), they give more physical stimulation to male infants and talk more to female infants (Moss, 1967; Parke & Sawin, 1980), they dress girls in pink and boys in blue (Shakin, Shakin & Sternglanz, 1985), they give daughters dolls and sons cars and trucks (Rheingold & Cook, 1975), and they decorate children's bedrooms according to sex (Rheingold & Cook, 1975). The way in which parents interact with infants and children is also guided by the child's gender. From at least as early as 1-year-old, parents encourage infants to play with sex-typed toys (Snow, Jacklin & Maccoby, 1983), a phenomenon that becomes even more marked during the toddler years (Fagot, 1978; Langlois & Downs, 1980), but seems to wane by the time they reach 5 years old (Fagot & Hagan, 1991). In addition, mothers are more likely to discuss emotions with daughters than with sons (Dunn, Bretherton & Munn, 1987; Fivush, 1989). Sex difference can also be found *between* mothers and fathers in the speech they use with their children. In a meta-analysis, an approach that looks at results across many studies to determine overall trends, Leaper, and colleagues (1998) found that mothers tended to talk more, use more supportive and negative speech, and use less directive and informing speech with their children than did fathers. Also, mothers tended to talk more and use more

supportive speech with daughters than with sons. This report highlights the complexities of systematic differential gender-typing by mothers and fathers toward their sons and daughters.

It seems, therefore, that parents do treat sons and daughters differently. But this does not mean that differential reinforcement by parents is responsible for the behavioral differences that are apparent between boys and girls. Might parents simply be reacting to the sex-typed behavior of their children rather than causing it? As already discussed, boys and girls may have a biologically based predisposition to behave in sex-typed ways. Most likely, differential reinforcement by parents not only produces sex-typed behavior in children but also increases pre-existing behavioral differences between boys and girls.

Maccoby and Jacklin (1974) also examined the role of modelling in children's development of sex-typed behavior and concluded that the imitation of same-sex parents does not play a major part in this process. They argued that boys did not closely resemble their father, nor girls their mother, which would be expected if children imitated their same-sex parent more than their other-sex parent. Moreover, in observational studies, children did not necessarily imitate adults of the same sex as themselves. It is no longer thought that children learn sex-typed behavior simply by imitating individual same-sex models. Instead, it seems that children learn which behaviors are considered appropriate for their sex by observing large numbers of males and females and by noticing which behaviors are performed frequently by each sex. Children then model the behaviors that they consider appropriate for their sex (Perry & Bussey, 1979).

Children observe a wide variety of role models - not just their parents. Friends, in particular, appear to be important role models. As already discussed, school age boys and girls show a strong preference for same-sex peers (Maccoby, 1988). But it is gender stereotypes (widely held beliefs about the characteristics that are typical of males and females), rather than specific individuals, that seem to be most influential in the acquisition of sex-typed behavior. Gender stereotypes are pervasive in our

society and children are aware of these stereotypes from as early as 2 years of age (Martin, 1991; Signorella, Bigler & Liben, 1993; Stern & Karraker, 1989).

Cognitive theory. For cognitive theorists, the role of parents is minor. A central tenet of this approach is that children play an active part in their own development; they seek out information about gender and socialise themselves as male or female. Parents are viewed as simply one source of gender-related information. Early studies of cognitive processes focused on children's developing understanding of the concept of gender (see above). More recently, gender schema theorists have examined the way in which children organize knowledge about gender (Bem, 1981; Martin, 1989, 1991; Martin & Halverson, 1981). Gender schemas refer to organized bodies of knowledge about gender, and are functionally similar to gender stereotypes. Gender schemas influence the way in which we perceive and remember information about the world around us so that we pay greater attention to, and are more likely to remember, information that is in line with our gender schemas than opposing information.

An important step in gender understanding occurs when children can categorize themselves as belonging to one gender or the other. From as early as 2 to 3 years, soon after they begin to consistently label themselves and others as male or female, children organize information according to gender. If told that a person is male or female, they will make gender-related inferences about that person's behavior (Martin, 1989; Martin, Wood & Little, 1990). For example, pre-school children will say that boys like to play with cars and trains. Older children have a more complex understanding of gender and become more flexible in their understanding of gender stereotypes (Martin et al, 1990; Martin, 1993). Although they may know that boys in general like football, cars and trains, and that girls in general prefer dolls and dressing up, they also come to understand there are many exceptions to the rule (Signorella, Bigler & Liben, 1993). Thus it seems that gender stereotypes are more strongly held by younger than by older children.

Individual children differ in the extent to which they organize, attend to, and remember information according to gender (Carter & Levy, 1988; Levy & Carter, 1989). Interestingly, however, children

who are highly gender schematized are not necessarily more sex-typed in their behavior (Huston, 1985; Martin, 1991).

Social cognitive theory. Social cognitive theory draws upon both social learning theory and cognitive theories (Bandura, 1986; Bussey & Bandura, 1984; Bussey & Bandura, 1999). While same-sex modelling continues to be viewed as an important mechanism in the acquisition of sex-typed behavior, the processes involved are believed to involve complex cognitive skills rather than the direct incorporation of a model's characteristics and behavior. Social cognitive theorists stress the importance of cultural factors in influencing which behaviors are acquired.

Social cognitive theory and the cognitive approach differ in their view of the mechanisms involved in the development of sex-typed behavior (Bussey & Bandura, 1999). Whereas cognitive theorists have focused on children's acquisition of knowledge about gender, social cognitive theorists are interested in the translation of gender knowledge into gender-related behavior, and see a number of cognitive mechanisms are at work. Self-regulatory mechanisms in the form of both social sanctions and sanctions that children impose on themselves are believed to operate; children do things that are valued and give them a sense of self-worth. Motivational mechanisms such as self-efficacy are also considered to be important. It is thought children are most likely to model behavior that they believe they can master. Although social cognitive theory provides a framework for examining the relationship between gender knowledge and gender role behavior, existing research has failed to establish a consistent link between the two.

Gender segregation. Although psychological explanations of gender development have tended to focus on the individual, group processes may also be important. Gender segregation is a striking aspect of gender development that occurs at the group rather than the individual level. Although there is evidence that biological, socialization and cognitive mechanisms each play a part in this phenomenon, the most parsimonious explanation – that children segregate by gender due to behavioral compatibility with same-sex others – incorporates all three approaches (Maccoby &

Jacklin, 1987; Maccoby, 1988; 1990; 1998). Maccoby argues that children prefer to play with other children who have similar interaction styles, and that this both creates and serves to preserve gender segregation. It is believed that girls begin to avoid boys because of boys' higher levels of physical activity and aggression, and boys begin to avoid girls because they find girls too sedentary. Pellegrini, et al., (2007) have extended this argument to suggest that a further factor, status, acts to keep the sexes segregated. In a study of 73 3- to 5-year-olds, they found that children segregated at first according to individual preferences, including activity level, but that this segregation initially found highly active girls choosing male playmates. As time went on, highly active girls segregated into sub-groups themselves. The authors could not say whether they chose to leave the boys' groups or if they were ejected. They suggest that the latter is likely and probably due to reduced social status of being female.

Differences in communication style between the sexes may also play a part. As we have already seen, boys are more dominant than girls. Girls tend to be more co-operative and may find it difficult to have their say. Thus girls may not wish to interact with boys because they see boys as too assertive, and boys may not wish to interact with girls because they find girls too quiet. Once formed, same-sex groups become even more differentiated in their interaction styles. In this way, distinctive male and female cultures are established and maintained.

SUMMARY

Gender development begins in the womb. Early in gestation gonadal hormones mold the internal and external genitalia, as well certain regions of the brain, contributing to such behaviors as sex-typical toy choices, playmate preferences and gender identity. As a consequence, girls and boys are born with behavioral biases that can be enhanced or diminished by postnatal factors. From birth onwards, children are treated differently according to their sex. Although parents and others may simply be responding to differences in behavior that already exist, they may also be creating these differences. It seems likely that both processes are at work.

The extent to which the various aspects of gender development discussed in this chapter (gender identity, toy preference, playmate preference and play style) are interrelated, or develop independently of each other, remains uncertain. Although cognitive theorists have argued that the ability to label gender, and knowledge of gender stereotypes, are essential for children to acquire sex-typed behavior, the sex differences in toy preference that are apparent from as early as 1 year old suggest that this is not the case. It does seem, however, that a child's knowledge of his or her own gender, but not necessarily of gender stereotypes, is associated with a greater preference for sex-typed behaviors. It is also important to remember that gender development does not occur in isolation from the child's social environment. Sex differences in social behavior are most apparent when children interact with each others.

Existing data suggest that components of children's sex-typed behavior are influence by prenatal androgen exposure and postnatal socialization, particularly parental reinforcement. Thus, sex-typical toys choices, for example, appear to be multi-determined, promoted by the prenatal hormone environment, as well as by several postnatal factors, including parental reinforcement, modelling, and gender labelling. A *biopsychosocial* model of gender development accounts for prenatal and postnatal factors. That is to say, it is very likely that sex differences in hormone exposure shape gendered behavior and that socialization, environment, and cognitive development further modify these existing predispositions.

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