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## *Sex Differences in Social Behavior*

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From an early age, boys and girls can be easily distinguished according to their sex. While this is partly due to their 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 activities, or that all girls engage in female activities, all of the time. There is a great deal of overlap between the sexes with some girls being more “boyish” than the average boy and some boys behaving in a way that is more typical of a “girlish” girl. 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 preschool 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 and Hines (1995) and Hines (2000) while those on psychological theories draw from Golombok and Fivush (1994). As we shall see, 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.

## Preschool (3–4 Years)

### *Gender identity*

By the time of 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 will give the right answer. They can also correctly identify other people as male or female. But children of this age use physical appearance to make their judgments. A person with long hair who is wearing a skirt will be deemed female, and a short-haired person with a necktie will be seen as male, purely because of their external appearance. If these same people change their clothes and hairstyle to look like the other sex, children will report that their gender has changed as well.

At around 3 to 4 years of age, children develop gender stability, that is, they begin to recognize that gender does not change over time (Slaby & Frey, 1975). They realize 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 1 year olds (Snow, Jacklin, & Maccoby, 1983), and by 3 years of age, girls are much more likely than boys to play with dolls, dolls’ houses, tea sets and other domestic toys whereas boys are most often to be found with toy guns, swords, cars, trains, and trucks (De Lucia, 1963; O’Brien & Huston, 1985; Sutton-Smith & Rosenberg, 1971).

### *Playmate preference*

From as early as 3 years old, girls prefer other girls as playmates and boys prefer to play with boys (Maccoby & Jacklin, 1987). This phenomenon, known as “gender segregation,” is not specific to particular nationalities or cultures. It can be seen in children’s playgrounds around the world. Children’s preference for same-sex playmates is a universal aspect of growing up (Whiting & Edwards, 1988). Gender segregation is most likely to occur when children are left to their own devices, especially when they are with others of a similar age, which suggests that it is children, not adults, who are driving this process. In an observational study of children in a daycare setting, LaFreniere, Strayor, and Gauthier (1984) found that the tendency for girls to play together became apparent at age 2. For boys, the preference for male playmates occurred slightly later but was clearly established at 3 years of age. Howes (1988) reported similar findings. Like LaFreniere et al. (1984), she observed children in daycare, and showed that 3 year olds were more likely to form new friendships with children of the same sex.

### *Play style*

Differences in the play styles of boys and girls can also be seen from 3 years of age (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 be more nurturant than boys. When girls are aggressive this is more likely to take the form of behaviors intended to damage relationships such as exclusion from a circle of friends (Crick, Casas, & Mosher, 1997; McNeilly-Choque, Hart, Robinson, Nelson, & Olsen, 1996). 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 toward reaching a compromise, it is more common for boys to use physical force (Sheldon, 1990). In addition, pretend play differentiates the sexes with boys acting out heroic roles involving fighting and adventure, and girls preferring to be family characters or dressing up in feminine 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), and understand that gender is a fundamental aspect of a person's identity. They now realize that gender is constant across time and across 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 and 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 (Emmerich, Goldman, Kirsh & Sharabany, 1977; Martin & Halverson, 1981; Zucker et al., 1999). 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 the differences in toy, playmate, and activity preference shown by children as young as 3 years old clearly demonstrate that this is not the case.

### *Toy preference*

The sex difference in toy preference that is apparent among preschool children continues to characterize the early school years. In a study of 3–5 year olds, Martin, Wood, and Little (1990) demonstrated a greater preference among boys for a car, an airplane, and a tool set and a greater preference among girls for a tea set, a doll, and a haircare set. 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. Similarly, when parents were asked to rate how often their children played with a selection of toys, differences between boys and girls were reported for guns, jewelry, tool sets, dolls, dolls' carriages, trains, cars, swords, and tea sets (Golombok & Rust, 1993).

### *Playmate preference*

Gender segregation is an important feature of the early school years. Eleanor Maccoby and Carol Jacklin examined the playmate preferences of 100 children at 4.5 years old and again at 6.5 years (Maccoby & Jacklin, 1987). When first observed, the children were spending nearly three times as much time playing with same-sex peers than other-sex peers. By the second observation, only 2 years later, the amount of time spent playing with same-sex peers was more than 10 times greater than that spent with peers of the other sex. A similar increase in the preference for same-sex peers was demonstrated by Serbin, Powlishta, and Gulko (1993) when they compared children in kindergarten with children in the early school years. The process of gender segregation involves not only the preference for same-sex playmates but also the avoidance of playmates of the other sex as well.

### *Play style*

As children move from preschool 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). Boys of this age like to play in large groups of other boys 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 characterized by emotional and physical closeness, the friendships of boys are founded on shared activities and interests (Maccoby, 1998).

## Elementary School (8–11 Years)

### *Toy preference*

A study of letters to Santa Claus by elementary school children revealed a marked difference in the toys requested by boys and girls (Robinson & Morris, 1986). More than one quarter of the girls wanted a doll compared with less than 1% of the boys whereas almost half of the boys but less than 10% of the girls asked for some kind of vehicle. 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 the same sex as themselves. Furthermore, when observed during free time – in the playground, at lunch, or in the corridors – boys and girls are most likely to be found interacting with others of their own sex. 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 a child of the other sex after emerging from the cafeteria line.” A recent study of 8–11 year olds was particularly revealing. When Gray and Feldman (1997) investigated peer-group interaction at an ungraded school where boys and girls of all ages had the opportunity to mix, more than half of the children spent no time at all with children of the other sex. And from their examination of the peer preferences of children of different ages, Serbin et al. (1993) reported that 95% of elementary school children preferred same-sex peers. This is not just a Western phenomenon. The research of Whiting and Edwards (1988) shows that in India, Africa, South East Asia, and Central America, children of this age spend three quarters of their play time with peers of their own sex.

### *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 and 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.

Theories attempting to explain the development of sex differences in toy preferences, playmate preferences, gender identity, and play styles have been classified as biological or psychological. This distinction is somewhat misleading, because psychological processes have a biological basis 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 has proceeded largely separately, and so each will be discussed in turn.

## Biological Explanations

Biological mechanisms underlying sexual development have been studied extensively in nonhuman mammals, and have been found to be similar for the genitalia, the brain, and behavior. These processes are summarized below, and discussed more fully in Collaer and Hines (1995), Goy and McEwen (1980), and Wilson, George, and Griffin (1981).

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 typically directs the primordial gonads (originally identical in males and females) to become testes. If this direction is not given, the gonads differentiate as ovaries.

The human testes differentiate at about week 6 of gestation and begin to produce hormones by about week 8. Testicular hormones then direct sexual differentiation of the internal and external genitalia, where receptors for these hormones are located. Testosterone causes the Wolffian ducts to develop into vas deferens, prostate, and seminal vesicles, while another testicular hormone causes Mullerian tissues, destined to become the uterus, fallopian tubes, and upper vagina, to regress. Testicular hormones also stimulate the external genitalia to become penis and scrotum. In the absence of these hormones, these tissues become the clitoris, labia, and lower vagina, the Wolffian ducts regress and the Mullerian organs develop.

Within the brain, similar processes occur, certainly in nonhuman mammals, and perhaps in humans as well. Like the genitalia, portions of the brain have receptors for testicular hormones. The same brain regions that contain hormone receptors typically show structural sex differences and regulate reproductive behaviors or other behaviors that show sex differences (i.e., differ for males and females of the species). Perhaps the best-known example is the sexually dimorphic nucleus of the pre-optic area (SDN-POA), a region that is larger in male than female rats (and some other species as well). Administering testosterone to genetic females during critical developmental periods increases the size of the nucleus. Similar hormonal effects on brain structure have been noted in other brain regions. In general, administering testosterone or its metabolites sculpts a more masculine-typical brain, while reducing these hormones sculpts a more feminine-typical brain.

Gonadal hormones also influence behavior. Genetic female rats treated with testosterone on the day of birth show increased male-typical sexual behavior, and decreased female-typical sexual behavior, as adults. Similarly, removing testosterone from develop-

ing males (by neonatal castration or treatment with anti-androgens) reduces male-typical behavior and increases female-typical behavior in adulthood. Hormones influence not only reproductive behaviors, but also other characteristics that show sex differences. In the rat, these include rough-and-tumble play, activity levels, and aggression. Hormonal influences are not limited to rats, but are seen in many species, including nonhuman primates. In the rhesus macaque, for instance, treating pregnant animals with testosterone produces female offspring who show increased rough-and-tumble (masculine-typical) play, increased masculine-typical sexual behavior, and decreased feminine-typical sexual behavior.

Two additional points regarding hormonal influences on brain development and behavior are relevant. First, hormones do not affect all aspects of sex-typical development in a uniform manner. For instance, hormones influence masculine-typical sexual behavior earlier than feminine-typical sexual behavior. The times of maximal effect are called critical periods, and they differ from one behavior to another. Thus, a brief hormonal perturbation can influence one sex-typical behavior without influencing others. In general, there is an overall critical period when hormones are influential and this corresponds to the time when testicular hormones are higher in developing males than females. In humans this is probably from about week 8 to 24 of gestation and from about the first to the sixth month postnatally. Second, the impact of hormones is graded. A developing organism does not become masculine when testicular hormones exceed a certain threshold and remain feminine otherwise. Instead, the amount of hormone corresponds to the amount of masculine-typical development. Therefore, small or moderate changes in hormones during development can move the organism along a male–female continuum, without causing it to become completely male or completely female. 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.

### *Human development*

Knowledge of mechanisms underlying sexual differentiation of the mammalian brain and behavior has come from experimental studies in species 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, and situations where women have been prescribed hormones during pregnancy. As might be expected, these sources are limited, and 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 hormonal products of the testes) show increased preferences for masculine-typical toys. This conclusion is based largely on studies of girls with congenital adrenal hyperplasia (CAH), a genetic disorder involving deficiency in an enzyme (usually 21 hydroxylase) needed to produce cortisol. Because of the deficiency, feedback systems in the brain direct the adrenal glands to produce precursors to cortisol, including androgens. Genetic females with CAH almost always are born with ambiguous genitalia caused by elevated androgen prenatally. The clitoris is enlarged and the labia are partially fused to resemble a scrotum. The degree of virilization varies, ranging from essentially female-appearing genitalia, to genitalia that resemble those of a normal male. In the great majority of cases, diagnosis is made within the first few days or weeks of life, hormones are prescribed to regulate the postnatal hormonal environment, the genitalia are surgically feminized and the child is reared as a girl.

Despite these procedures, girls with CAH show alterations in their toy preferences (Berenbaum & Hines, 1992; Dittman et al., 1990; Ehrhardt & Baker, 1974; Ehrhardt, Epstein, & Money, 1968; Slijper, 1984). 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. When toy choices are considered separately, conclusions are based on a few, or even a single, questionnaire or interview item. However, the observational study indicates that toy choices are altered when considered alone. In this study, 26 girls with CAH (ages 3 to 8 years) spent more time with toys typically preferred by boys (e.g., cars and trucks) and less time with toys typically preferred by girls (e.g., dolls) than did unaffected female relatives (Berenbaum & Hines, 1992).

The interpretability 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, the degree of genital virilization in individual girls does not correlate with the degree of alteration in their toy choices (Berenbaum & Hines, 1992), and interview and questionnaire data suggest that parents treat their CAH daughters as they would other girls (Berenbaum & Hines, 1992; Ehrhardt & Baker, 1974). Indeed, parents are advised by healthcare professionals to encourage feminine development in girls with CAH, and it would seem likely that they would do so.

The observational study of toy choices found no differences between 11 boys with CAH and unaffected boys. This finding, like that of increased masculine-typical toy preferences in CAH girls, is generally consistent with other studies of CAH children (Ehrhardt & Baker, 1974), and with data from studies of other species where adding testosterone to developing males does not typically enhance masculine-typical behavior.

Evidence regarding hormonal influences on toy choices has also come from situations where pregnant women were given hormones for medical reasons. One study involved 10 girls (ages 3 to 14 years) whose mothers were prescribed androgenic progestins during pregnancy (Money & Ehrhardt, 1972). Like girls with CAH, these girls were typically

born with virilized genitalia, and surgically feminized during infancy. Sex assignment and rearing were female. Nevertheless, the hormone-exposed girls showed increased masculine-typical toy preferences.

Another study reported on 15 girls (ages 8 to 12 years) whose mothers were prescribed medroxyprogesterone acetate (MPA) during pregnancy. Because MPA counteracts the action of androgen, exposed girls might be expected to show enhanced feminine-typical behavior. The MPA-exposed girls did not differ from matched controls in interest in masculine-typical toys, but there was some evidence of reduced masculine-typical behavior on a composite variable called "tomboyism" ( $p = .06$ ) and of increased interest in feminine-typical clothing (Ehrhardt, Grisanti, & Meyer-Bahlburg, 1977). MPA-exposed boys might be expected to be less masculine than other boys. Compared to matched controls, 13 MPA-exposed boys (ages 9 to 13 years) showed some reduction in masculine-typical play, but not specifically in toy choices (Meyer-Bahlberg, Feldman, Cohen, & Ehrhardt, 1988).

These studies of administered hormones assessed toy preferences using interviews and questionnaires. Typically, assessments were based on a small number of items in a questionnaire or interview assessing a range of sex-typical behaviors. In addition, exogenous hormone treatments differ from individual to individual and can be as brief as a few days or as long as several months. Thus, some children may not have been exposed to enough hormones to produce behavioral changes. Finally, regarding the studies of MPA, the authors note that effects might be hard to see in girls, because there is little scope for them to become more feminine, while for boys the testes might compensate for the small reduction in hormone levels likely to be produced by MPA. Thus, the studies of MPA-exposed children may have lacked the experimental power to detect hormonal influences on behavior.

### *Gender identity*

Girls with CAH appear to show reduced feminine-typical gender identity or reduced satisfaction with the female gender role. This has been noted in four studies of girls with CAH ranging in age from 4 to 20 years. A total of 63 girls with CAH from three different regions of the United States and from the Netherlands participated in the studies and were compared to their unaffected sisters, as well as to matched controls and girls with other medical disorders. Data were collected using various methods, including interviews, paper and pencil questionnaires, and projective tests (Ehrhardt et al., 1968; Ehrhardt & Baker, 1974; Hurtig & Rosenthal, 1987; Slijper, 1984). A fifth study found that 2 of 18 girls with CAH met the criteria for a clinical diagnosis of gender identity disorder of childhood, as did 5 of 29 additional girls who had been exposed to high levels of androgen prenatally because of other endocrine disorders (Slijper, Drop, Molenaar, & de Muinck Keizer-Schrama, 1998). Two other studies (McGuire, Ryan & Omenn, 1975; Perlman, 1973), including 9 and 15 CAH girls respectively, found no significant alterations in gender identity. Given the small samples of CAH girls typically available for study, what might be more remarkable than one or two failures to find differences in gender identity is the relatively consistent evidence of an alteration in this fundamental aspect of a person's sense of self.

Studies of children exposed prenatally to progestins have generally not reported alterations in gender identity (Ehrhardt et al., 1977; Ehrhardt & Money, 1967; Meyer-Bahlburg

et al., 1988). As was the case for toy choices, it is not possible to say whether this reflects a lack of an effect or a lack of power to detect effects. Boys with CAH also have not been found to show alterations in gender identity or satisfaction in the male gender role (Ehrhardt & Baker, 1974), a finding that is again consistent with predictions from animal models.

### *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 favorite playmates and calculated the percentage of males. The 10 girls exposed to androgenic progestins who showed increased preferences for male-typical toys also reported increased preferences for male playmates (Money & Ehrhardt, 1972). Studies of MPA-exposed children have not found alterations in playmate preferences (Meyer-Bahlburg et al., 1988). It is again unclear whether this reflects a lack of an effect or a lack of experimental power. 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 in a manner comparable to that used in studies of other children. However, there is some information concerning aggression and rough-and-tumble play.

Reports on aggression following prenatal exposure to androgenic hormones do not present a clear picture. 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. One group of 18 female adolescents and adults with CAH reported more aggression than controls, but two other female samples (one including 11 adolescents and adults and the other 20 girls with CAH) did not. The different outcomes across the groups could relate to the age of participants, the specific questionnaire used to measure aggression, or sample size. There were no significant differences between males with and without CAH. Studies using interviews to assess fighting in girls with CAH have found no differences for a total of 32 girls (ages 4 to 20 years) from either siblings or matched controls (Ehrhardt et al., 1968; Ehrhardt & Baker, 1974). Finally, a questionnaire study found that 17 girls and 8 boys (ages 6 to 18 years) exposed to androgenic progestins prenatally showed increased tendencies to physical aggression in comparison to their unexposed siblings (Reinisch, 1981). Thus, some studies suggest an

increase in aggression, as measured by questionnaires, following prenatal exposure to androgenic hormones, but this is not always the case. In addition, it is not clear whether hormone-related changes in questionnaire responses would translate into increased aggressive behavior, or if they would apply to children as well as adults. Therefore, it is not possible to say if the early hormone environment contributes to individual differences in aggressive play styles in children.

CAH girls 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 (ages 4 to 20 years) compared to matched or sibling controls. Similar findings were reported for the 10 girls exposed to androgenic progestins prenatally (Ehrhardt & Money, 1967). A third study of 34 CAH girls (ages 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. Differences in assessment strategies could explain the different conclusions that might be drawn from these studies.

One study observed rough-and-tumble behavior in 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). Boys showed more rough-and-tumble play (e.g. hitting the “Bobo” doll, playfully hitting one another, wrestling), as found in prior studies using similar procedures (DiPietro, 1981; Maccoby, 1988). However, girls with CAH did not differ from control girls (Hines & Kaufman, 1994). These results contrast with data from female rats and rhesus macaques, where androgen exposure during 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 the genetic disorder, CAH, suggest that they show more masculine-typical toy choices, gender identity, and playmate preferences. Some convergent evidence of hormonal influences on these behaviors has come from girls exposed to androgenic progestins. Alterations in play styles, including rough-and-tumble play and aggressive play, are less well established. The early hormone environment has generally not been found to influence gender development in boys. However, the most telling information, which would come from boys who were exposed to lower than normal levels of testicular hormones during development, is largely unavailable. Clearly, although findings from girls with CAH suggests that hormones can influence the development of children’s gender-related behavior, further research is needed to fully understand the role of hormonal factors, particularly as they apply to normal development in both boys and 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 modeling of individuals of the same sex as themselves (Bandura, 1977; Mischel, 1966, 1970). Classic social learning theory posits that parents play a key role in the gender development of their children, both by differentially reinforcing their 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, may also be 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 their sons and daughters differently. In an influential review of the early studies, Maccoby and Jacklin (1974) concluded that there was little evidence that they do. In terms of the extent to which they allowed their sons and daughters to be independent, and the way in which they responded to their children's aggressive behavior, there was little evidence for the differential reinforcement of boys and girls. Nevertheless, there were some differences. Parents were found to reinforce their children for specifically sex-typed activities and interests such as doll play for girls and more active play for boys, and to discourage 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 between the treatment of boys and girls by parents were once again for sex-typed behaviors relating to toys, games, and activities.

Although Maccoby and Jacklin (1974) thought these differences to be of little significance, other researchers believe that the differential reinforcement of children's toy, game, and activity preferences does play a part in the acquisition of sex-typed behavior (Block, 1983; Lytton & Romney, 1991). From the moment of birth, parents treat their sons and daughters differently. They describe their newborn girls as soft and their newborn sons as strong (Rubin, Provenzano, & Luria, 1974), they give more physical stimulation to their male infants and talk more to their female infants (Moss, 1967; Parke & Sawin, 1980), they dress their girls in pink and their boys in blue (Shakin, Shakin, & Sternglanz, 1985), they give their daughters dolls and their sons cars and trucks (Rheingold & Cook, 1975), and they decorate their children's bedrooms according to their sex (Rheingold & Cook, 1975). The way in which parents interact with their infants is also guided by the child's gender. From as early as 1 year old, parents encourage their infants to play with sex-typed

toys (Snow et al., 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 their daughters than with their sons (Dunn, Bretherton, & Munn, 1987; Fivush, 1989).

It seems, therefore, that parents do treat their 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. Parents might 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 a sex-typed way. Most likely, differential reinforcement by parents not only produces sex-typed behavior in children but also operates by maximizing pre-existing behavioral differences between boys and girls.

Maccoby and Jacklin (1974) also examined the role of modeling 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 boys, and which for girls, 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 in their daily life, 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 a minor one. A central tenet of this approach is that children play an active part in their own development; they seek out for themselves information about gender and socialize 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 et al., 1990). For example, preschool 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, 1993; Martin et al., 1990). 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 et al., 1993). Thus it seems that gender stereotypes are more strongly held by younger than by older children.

There are differences between children in the extent to which they are gender schematized, that is, 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, 1999). While same-sex modeling 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 social factors in influencing which behaviors are acquired. Thus behavior that is generally viewed as an other-sex activity, such as men's involvement in cooking, will be adopted in cultures where it is common for men to cook.

A major difference between social cognitive theory and the cognitive approach is the emphasis placed by social cognitive theorists on 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. According to social cognitive theorists, 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 be operating; children do things that are valued and give them a sense of self-worth. Motivational mechanisms such as self-efficacy beliefs 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, it is important to remember that 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, greater attention has been paid in recent years to group processes. Gender segregation – children’s tendency to play with others of their own sex – 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 children of the same sex as themselves – incorporates all three approaches (Maccoby, 1988, 1990, 1998; Maccoby & Jacklin, 1987). Maccoby argues that children prefer to play with other children who have similar styles of interaction, 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. The 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 cooperative 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 styles of interaction. In this way, distinctive male and female cultures are established and maintained.

### **Summary**

Gender development begins in the womb. Early in gestation hormones from the gonads mold the internal and external genitalia. These same hormones also may influence certain regions of the brain to develop in a more masculine-typical or feminine-typical manner. As a consequence, it is likely that we are each born with behavioral biases that can be enhanced or diminished by postnatal factors. Hormonal influences appear to play a role in children’s gender development particularly in regard to sex-typical toy choices, playmate preferences, and gender identity. Hormonal influences on children’s play styles are less well established.

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 between their daughters and sons, they may also be creating these differences. It seems likely that both processes are at work. In addition, children model behavior they consider to be appropriate for their sex. Although it used to be thought that gender constancy was necessary for modeling to occur, it is now believed that only a basic ability to label gender is required. The extent to which the various aspects of gender development discussed in this chapter (gender identity, toy preference, playmate preference, and play style) are inter-related, or develop independently of each other, remains uncertain. Although cognitive theorists have tended to argue 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. As Eleanor Maccoby has so cogently pointed out, sex differences in social behavior are most apparent when children interact with each other.

Theorists operating from different perspectives have approached the analysis of gender development somewhat differently. To some, it is a unitary construct influenced uniformly by factors such as hormones or socialization. One contribution of recent research on hormonal influences is the realization that each aspect of gender-typical behavior may be influenced at different times and by different mechanisms. If so, it might be useful to conceptualize different sex-typical behaviors separately and evaluate the effects of different types of influences on each behavior considered alone. At present, data on toy choices are the most likely to provide an opportunity to do this. There is evidence that levels of androgenic hormones prenatally influence sex-typical toy choices. In addition, there is evidence that parents socialize children to show gender-typical toy choices, reinforcing them for playing with sex-appropriate toys. In fact, this is the one area of gender development where such differential reinforcement by parents has been established. Children also have been found to model the behavior of others of the same sex choosing neutral toys, and to express interest in toys that they have been told are for children of their own sex. Thus, sex-typical toy choices appear to be multidetermined, promoted by the prenatal hormone environment, as well as by several postnatal factors, including parental reinforcement, modeling, and gender labeling. In order to achieve a better understanding of sex differences in social behavior, it seems that an integration of biological and psychological explanations is required.

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