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Chapter 25

The Interaction of Behavior Variables in the Development of Dominance Relations

Patricia Draper

Dominance interactions among individuals undoubtedly have both a biological basis and evolutionary significance. Literature on these topics has been copiously cited elsewhere in this book and will not be repeated here. Sex differences in behaviors which separately and together culminate in the ability of an individual to win agonistic encounters are also documented both for human and nonhuman primates. Less attention has been paid, however, to the process by which sex differences in the propensity to behave in a given way interact with socialization experiences of children to produce the familiar usual pattern of male dominance. This chapter proposes to outline a series of probable mechanisms whereby behaviors that are either innate or easily learned become the basis for two reasonably distinct modes of action and interaction by human males and females. Many of the behaviors have analogues, and presumably homologues, in nonhuman primate behavior.

For the purposes of this chapter the two sexual modes of action will be treated as dichotomies to emphasize certain aspects of differentiation which are pivotal for understanding the implication of sex differences for dominance interactions. In fact, with respect to most behavioral variables the sexes evince overlapping distribution, with a sizable proportion of girls and boys showing comparable frequencies of occurrence of the behavior in question. Also true, but often overlooked in such discussions, is the fact that

innumerable behavioral, physiological, and psychological variables have been and could be isolated that show *no* regular pattern of sex differentiation but much individual variation. The notion to be developed here is that there are target areas of behavior which are not only sex differentiated but also differentiated in ways which portend interestingly for inequality in certain types of interaction situations.

When dealing with humans and the issue of the biological basis of any or all behavior, one must consider whether cultural conditioning may not account for some part of the behavior or behavior complex which is under scrutiny. In the analysis which follows the subject will be examined at an elemental level so that the question of cultural influences can be sidestepped. In a later section the topic of sex-differentiated behavior in the context of a particular culture (!King Bushman) will be considered.

There are in the individual a bundle of sex-specific proclivities to behave. These proclivities are furthered by various forces, each of which in isolation carries no directional value but which, in the context of other forces contribute to the characteristic path of the proclivities.

Characteristic Behavior of Infants and Toddlers

In the case of the female there are several behaviors which emerge relatively soon after birth. These, if interpreted in a certain light, are harbingers of things to come. Girl infants (1) smile more frequently than do boys of the same age (Korner, 1974), (2) seem to show preference (as measured by longer attention span) for gazing at human faces rather than other objects and designs (Lewis, Kagan, and Kalafat, 1966), and (3) seem to prefer to listen to unusual and nonrepetitive sounds rather than monotonous, sonorous sounds (Kagan and Lewis, 1965). In all likelihood, these represent responses in the infant which are initially unconditioned but which, given the usual situation of an infant being surrounded by at least one attentive parent, rapidly become conditioned responses. That is, willy-nilly, the infant learns that to give a smile, or a stare, or to show the attitude of listening (separately or all together) brings the caretaker closer and holds her there for longer. Caretaker response as well can become conditioned by different infant signals. Mothers, regardless of their views on the desirability of treating girls and boys equally, may find that what works for a girl with respect to quieting, or predicting, or inter-

vening will be less likely to work with a boy (Moss, 1967; Lewis and Rosenblum, 1974). In addition, as early as 1½ years of age girls show marked linguistic superiority over boys in terms of vocabulary, length of utterances, and understanding of grammatical rules (Maccoby, 1966; but see Maccoby and Jacklin, 1974). By these means an Every Girl has been set in motion. The four elements just mentioned are a bundle of proclivities which when released by birth upon an unsuspecting human audience will start a characteristic set of experiences for the girl.

By the time girls and boys can crawl and walk another aspect of sex-differentiated behavior appears. Girls explore a space that is more restricted than that utilized by boys. In this sense they are less active—that is, they cover less ground in the same amount of time. A number of studies show that girl toddlers in experimental and naturalistic settings remain closer to the major caretaker or the home base than does the average boy of the same age. While staying closer to the caretaker in spatial terms, girls show a heightened interest in the caretaker as evidenced by their greater frequency of looking back at the caretaker and physically returning to touch that adult before moving out again (Goldberg and Lewis, 1969).

Boy toddlers do these things markedly less. It appears that they are not uninterested but less interested in the caretaker as an orientation point. One forms the impression that boys enjoy their own bodily activity and the play with and manipulation of inanimate objects. They do not disregard the caretaker, but in comparison with girls they are freer of influence from that quarter. On the average they are farther away from a caretaker and when the opportunity provides, often out of sight. In this way, and apparently at their own instigation, boys inhabit a socialization environment that is, in comparison with the convivial niche preferred by girls, freer of adult supervision and ultimately adult control. It appears that continued closeness and eye contact with the familiar caretaker is less rewarding to boys, and there is not the same gravitational pull on them back to a place of more intimate socialization. A boy puts himself on a longer leash at an earlier age. Remembering his lesser social orientation and lesser command of language, we can best understand Every Boy as around the corner, out of sight, pulling on his elongated tether and wearing earphones in which the volume has been turned down.¹

Every Mother stands outside the evolving of these patterns, but she learns, consciously or unconsciously, what will work. Daughters (in the 2- to 5-year age range) can be controlled rela-

tively easily because they are more receptive to social cues (verbal and nonverbal) and because they are spatially closer to the mother. The socialization of a girl (or the schedule of her rewards and punishments) will be more consistent, contingent, and hence more efficient. The attribute of compliance in the female behavioral pattern can in this way be seen as the end point in a snowballing trajectory.

These daughters know what is expected of them by the adults in charge, although, of course, they are often disobedient. Nevertheless, they are astute observers and develop a quality of carefulness in their deceptions that follows from their peculiar type of young female intelligence. Boys, on the other hand, ply their outlawry in an innocent vacuum. When apprehended, they have a look of astonishment, not guilt.

Peer Interaction

The literature on children and young primates shows parallel types of sex differentiation in other behaviors. With increasing age juveniles of both sexes move into greater peer interaction, though males exceed females in frequency and duration of peer contact and in the distance they put between themselves and their caretakers. Males outdistance their female age-mates in aggressive encounters and rough-and-tumble play. Males consistently group themselves with larger numbers of their peers than girls do. Girls prefer smaller groups where the interaction is usually quieter and of a less competitive and physically challenging nature (Omark, Omark, and Edelman, 1975).

The male preference for aggressive display and encounter is surely biologically based. Whether the human male's drive to compete—to strive to excel another in various skills and performances—is innate or easily learned is uncertain, but all of the evidence indicates that for boys it is more easily developed or acquired than for girls. An ethological explanation would class male striving as merely one of a number of epigamic behaviors. (I.e., display behaviors which have been selected for in the male because they call the attention of others, especially females, to him and enable females to judge vigor and potential worth as a mate. Such display also signals to other males his competitive ability.)

The social dominance which accrues differentially to human males rather than to females seems an outgrowth of the types of innate predispositions and easily learned behaviors described ear-

lier. At young ages adults are clearly dominant to both girls and boys. According to the analysis developed here, however, boys' attention is directed away from adult signals and thus only a fraction of the signals is received by the boys. As a result, even in their interactions with adults, boys receive less training in submission than do girls.

As they mature, boys are drawn to peer interactions where aggressive display and, in most societies, competitive striving are common. While studies repeatedly show a developmental trend in preference for same-sex playmates by both girls and boys, these same studies, and others too, reveal that boys have greater preference for interaction with same-sex individuals than do girls. This finding is not surprising in view of sex differences in reaction to agonistic encounters. Typically, when assaulted by a peer, a young male returns threat display in kind, and a bout of rough-and-tumble play ensues. However, with increasing age, girls (and juvenile female primates) return a threatening initiation from an age-mate with another type of signal—not necessarily with a signal of submission but with a signal of disengagement—one that says, "I'm not playing your silly games!" Unfortunately for the female, she thereby loses another larger battle.

Much of what a male, age 6 to 20 years, learns in the context of peer interaction is where he stands in comparison with others and with respect to various skills. By his willingness to threaten, to attempt to dominate, to challenge another, he gains practice in dominance—whether or not he is himself dominant in a particular social situation. This know-how, fueled, of course, by ancient urges, is what accounts in large measure for the social dominance of males in most heterosexual settings. It also accounts for the widely reported finding of comparatively well-developed dominance hierarchies in male groups.

Groups of girls have dominance hierarchies which are less well developed and less stable (see Tiger and Shepher, 1975, for interesting findings on hierarchies in women's groups). In part, this would be accounted for by the fact that females prefer to operate in smaller numbers, perhaps in numbers below some threshold for which some hierarchical organization would be favored. Furthermore, if girls are less aggressive and less competitive, the mechanism for establishing a rank ordering among individuals with respect to some skill is clearly not operative or only weakly so.

It is the present author's contention that underlying biologically based predispositions in interaction with constants of

socialization will produce more or less universally observable styles of action and interaction by males and females. Individuals can, and do, diverge from this pattern, either because of constitutional factors or because the socialization environment in which they were reared was constructed in an unusual manner. The discussion thus far has been aimed at a probable path for a particular behavior. Indeed a fascinating subject, but one outside the scope of this chapter, is what modern parents of non-sex stereotyping persuasion could do to minimize the risk of oversocializing their daughters (Bardwick, 1971; Freedman and Omark, 1973; Parker and Omark, this volume, Chapter 24).

Behavior Patterns of !Kung Bushmen Children

Data on the behavior of children among the hunting and gathering !Kung Bushmen² of Botswana and South West Africa bear on the kinds of interactions that can occur between cultural and hereditary factors leading to sex-role differentiation³ (Draper, 1975a). The !Kung (at least those who are still foraging and living nomadically) are an excellent "test case" because they do not put differential socialization pressures on girls and boys.

In most other traditional societies girls and boys from an early age are treated differently, chiefly in anticipation of the work and skills they will need to master as adults. In these technologically simple societies subsistence work is the time-consuming preoccupation of most adults, and, whenever possible, children are enlisted to help in the actual food-producing chores, e.g., managing stock and weeding gardens. In some cases children are excluded from primary food production itself, as when the location of adult work is too far away for children to travel or where the work is dangerous or in some other way unsuitable. In these cases children are asked to remain at home doing other kinds of work which free the parents (chiefly the mother) for other chores. Tending small siblings and cousins and light household work, such as cleaning, washing, drawing water, and the like are typical of this work. Around the world such work falls unequally on girls, who have been shown to experience obedience and responsibility pressure earlier and more severely than boys (Barry, Bacon, and Child, 1957). The usual explanation is that such domestic chores are ultimately the work of women; therefore, when circumstances permit, girls and not boys will be called upon to help. As indicated earlier, and as will be illustrated more empirically below,

this is only one possible interpretation of the regularities observed cross-culturally in the sex-role socialization of children.

The data on the behavior of !Kung children of nomadic groups constitute an apparent paradox in the context of the environmentalist argument that sex-role differences are a result of cultural patterning. In the hunting and gathering setting (which, as noted, does not put obvious differential socialization pressures on the sexes) there are, nevertheless, some consistent differences in the behavior of girls and boys which are not exploited or intensified by sex-specific socialization practices. The particular dimensions of contrast in the behaviors of the foraging children are such that, without too much effort, one can see how girls in particular are "preadapted" to the character requirements of the female role stereotype.

Before proceeding further, some general ethnographic information will be provided about the !Kung as well as an explanation of the circumstances in that society which free children from sex-role typing early in life. The Kalahari !Kung are well described in the anthropological literature (Lee and DeVore, 1976; Marshall, 1976). Like other hunter-gatherer populations which were once more populous and wider in territorial extent, the !Kung are much reduced in numbers and today there are only a few thousand people, most of whom have given up their traditional hunting and gathering and live sedentary lives, often in association with the dominant, Bantu-speaking pastoral peoples of the area. There is only a small minority of !Kung-speakers who still live by nomadic hunting and gathering. Of this group, the author personally knew about 120 individuals, who, in various band groupings, were living on the international border between Botswana and South West Africa in 1969.

There are several aspects of !Kung economy and ecology which must be understood and which relate to the assertion that differential cultural pressure does not account for the observed sex differences in the behavior of the nomadic children. The practice of assigning useful tasks to children is essentially nonexistent among the foraging !Kung. Also, older bush children of either sex are not made responsible for tending younger children. Therefore, neither the practice of divergent and sex-specific task assignment nor the unequal assignment of child tending to girls rather than boys can contribute to different experiences for boys and girls of this society.

The nomadic !Kung are a remarkably "leisured" society. Men and women work on the average only about three days per week

in quest of food (Lee, 1968). This is due in part to the extremely low human population density in the area of the Kalahari where they roam (one person per ten square miles). Thus there is minimal pressure on available resources. In addition, given their mobility and their complex knowledge of edible plant and animal foods, the !Kung find an extremely rich food supply in the Kalahari. Since food is sufficiently abundant and so readily found, there is no economic need for bringing children into the labor force. In a series of systematic and randomly scheduled behavior observations⁴ on !Kung children it was found that girls and boys ranging from 2 to 14 years of age did, on the average, one minute of work per hour of observation. Increasing age had no effect on the amount of work these children were observed to do.

Not only is there no economic necessity for bringing children into the labor force, but there are reasons which the !Kung themselves give for not encouraging children to participate voluntarily in adult work. Both men and women in the course of hunting and gathering, respectively, travel out from camp over a distance of miles. These treks take them over waterless territory and through scorching daytime temperatures. The !Kung realize that if older children went with their parents to hunt or gather during many months of the year, water would have to be brought from camp for them to drink. The children themselves would grow weary and want to be carried. Carrying water and/or carrying the children themselves would substantially reduce the efficiency of the adults. Therefore, and not surprisingly, the !Kung typically discourage children from going on these treks and the children are quite happy to stay in camp.⁵

At the home camp there is no lack of supervision of the children whose parents are working on a given day. Adults alternate their days of food collection with one or more days of rest in camp. There is a tradition among the !Kung to watch over each other's children, and this procedure requires no special arrangements and creates no indebtedness among parents. As a result, neither girls nor boys in this society have a delegated role as child nurse. This is due to the interaction of the economic factors described above with other demographic factors. For example, the average birth spacing between siblings is approximately four years (Howell, 1976). This fact, together with the !Kung practice of nursing into the child's third year, means that the mother-child bond remains intense and strong. So accustomed are these mothers to being able to nurse their young regularly during the

day that the mothers routinely carry 2- and 3-year-olds with them on day-long gathering trips. Given the ubiquitous presence of other adults in camp, the !Kung rely on adults, not older children, to do the regular and reliable supervision of the children who are no longer nursed or back-carried. The older children show a great deal of interest in toddlers and infants, but they are not charged with the responsibility of caring for them for periods of any duration. The author found that girls and boys 2 to 6 years of age showed an average number of child-caring acts per hour of observation of zero and .5, respectively; whereas girls and boys 7 to 14 years of age rated an average of 1 and .42 child-caring acts per hour of observation.⁶

On the basis of the previous discussion, one can assert that children of the nomadic !Kung do not work, and the different types of skills, attitudes, and experiences which girls and boys might acquire in such work is not a factor in their sex-role socialization.

The bulk of the behavioral observations done on 36 nomadic !Kung children reveals, however, areas in which the behavior of the 15 girls and 21 boys is differentiated along familiar lines. The sex differences are small, but in the various measures the differences are in the same direction alluded to in the first half of the chapter. (1) Among the !Kung too girls were spatially closer to adults or home base (in this case closer to the center of the camp), whereas boys on the average were farther away. (2) Girls showed greater preference for the close society of adults and less for peer involvement, while boys generally included fewer adults in their close proximity and sought peers instead. (3) Girls had more frequent physical contact with another person than did boys (which is taken to be an indirect measure of their less physically active recreational style). (4) In addition, girls sustained more verbal and nonverbal directions and interferences from adults than did boys (Draper, 1972, 1975a, 1975b, 1976).

The spot observations showed boys to be beyond eye and ear contact with the adults in camp over twice as frequently as girls. Analysis of the same set of observations revealed that girls on the average were found in social interaction with 2.5 adults whereas boys were with 1.9 adults. Girls were found in groups composed of children only about 25 percent of the time. The corresponding figure for boys was 34 percent. The average frequency of being in physical contact with another person was 70 percent for girls aged up to 5 years. Boys of the same age range showed the much lower

figure of 42 percent. Older children showed a decrease in physical contact with others, but girls remained higher than boys at all ages.

Several behaviors which are characteristic of the !Kung girls have implications for the extent to which they come under the influence of adults. The girls are closer at hand from an adult point of view; they have a greater preference for adult society, and they have less interest in their peers in comparison with boys. Looking at girls' social interactions shows that they interact more with adults, particularly women, but also with men. This is no doubt related both to their spatial proximity to supervising adults and to their apparent preference for adult company. It is also possible that adults call on them more frequently because of the two factors cited above. Such a pattern of being interrupted and redirected frequently by others may well reinforce a pattern of staying close to adults.

In another study Whiting and Edwards (1973) report similar findings and suggest that it may be related to higher female compliance. During the course of the observations this researcher perceived that !Kung adults did not deliberately select female targets from among the children; the adults simply interacted more frequently with those children who were closest.

The findings for !Kung children of a more restricted spatial range of females is, of course, not novel. Findings of this type are one of the most stable in behavior research which attends to sex differences. Primatologists find a comparable sex difference (see Harlow, 1965; Harlow and Harlow, 1962; Harlow, Harlow, and Hansen, 1963; Jay, 1963; Jensen and Bobbitt, 1965; Jensen, Bobbitt, and Gordon, 1967a, 1967b, 1968; Poirier, 1972). The notion that females are more sensitive to social cues and to the needs of others may have its origins in the restricted mobility and greater orientation to adults of females. If girls do follow such a pattern, this would set the stage for a more consistent socialization environment in which positive rewards could be used to a greater extent than with boys who are, on the average, farther away and less aware of what an adult may want and whose behavior, therefore, would be less easy to shape consistently.⁷

Sex differences in rough-and-tumble play with peers are reliably reported with male participation in such activities much greater than female participation (Blurton Jones, 1967; Blurton Jones and Konner, 1973; Freedman and Omark, 1973). In a sampling of ten-minute observations on !Kung children,⁸ girls exceeded boys in rough-housing in the 4- to 7-year age group, but for the 8-

to 14-year age group the more usual picture of males higher in rough-housing than females is seen (Draper and Cashdan, 1974). Another behavioral study of Bushman children from the same population found !Kung girls to be higher than a sample of London girls matched for age. Both these findings regarding high levels of rough-and-tumble play in girls may be attributable to the fact that !Kung children nearly always play in heterosexual play groups rather than in same-sex groups. This is because the usual living group for Bushmen is about 35 to 40 people—a group too small to provide many children of the same sex who are also close in age. It is possible that in this society young girls develop a rougher style of interaction due to their interaction with boys, as is suggested by Blurton Jones and Konner (1973).

A contrasting line of interpretation about the effects of mixed-sex groups is offered by Parker and Omark (this volume, Chapter 24). They suggest that the variable of audience (in particular whether the audience contains opposite-sex others) may affect display behaviors and increase sex differentiation in the variables of overrating and hierarchy formation. It seems that an important task for researchers in this area of ethology is to sort out which behavioral variables are sensitive to this aspect of variation in the social ecology of behavior.

Conclusions

The data on the !Kung children are of interest to the issues raised in this volume for several reasons. Sex differences that occur in the behavior of children have been widely reported elsewhere for human young in a variety of cultural settings and have been reported in very similar form for nonhuman primate young. Among the !Kung children the sex differences remain largely unexploited by differential socialization practices for girls and boys. The economic reasons for this rather unusual circumstance have been discussed. To this author the best explanation for the findings about sex differences in behavior is that biological events in intrauterine life deliver different levels of sex hormones to the brain of male and female fetuses. As a result, certain parts of the brain are preprogrammed in such a way that with respect to certain classes of stimuli, males and females are likely to respond differently (Levine, 1966; McEwen, 1976).

The present discussion makes at least four assumptions. (1) Only a relatively small proportion of the total behaviors of males

and females are noticeably different. (2) Of this minority, a few are crucial for their later role in differentiating the sexes in social dominance. (3) One should not be misled when behavioral variables of the minority type show consistent but not "statistically" significant sex differentiation. It is the combination of sex-differentiated elements which contribute to the familiar sex differences in style. In other words, small differences concatenate so that there are strong reliable sex differences in a multivariate field. These are easily obscured by univariate statistical testing. (4) The concept of evolved ease of learning is essential for understanding the postnatal unfolding of sex-differentiated behaviors. For example, girls undoubtedly can be encouraged to engage in rough-and-tumble play, and it is quite likely that !Kung girls have a rougher style because they are thrown more with male playmates. However, if these girls had mostly girls to play with, they would likely choose different pastimes.

As suggested earlier, males and females given the same social ecological milieu in which to develop will seek out different stylistic niches. Individual behaviors of males and females are often not impressively different. What is impressive is the different organization of these behaviors and for different ends. The final causes of the phenomena discussed are to be sought in the domain of the theory of behavioral evolution, in particular with reference to evolutionary forces affecting sex differences in reproductive strategy.

Notes

1. What is argued here has to do with variables of sensitivity in the child to the caretaker during the caretaker presence and the resulting implications of the variation in this sensitivity for the socialization experience of the child. There is a substantial literature on the behavior of children when they are separated from mothers, and these studies show no clear effect of sex. Interesting differences appear to characterize the types of reactions of girls and boys when the mother is present but out of the child's reach (Goldberg and Lewis, 1969; but see Jacklin, Maccoby, and Dick, 1973). For a good recent review of separation and attachment literature, see Weinraub and Lewis, 1977.
2. The exclamation point represents a click phoneme in the !Kung language. Click sounds are characteristic of this and other Bushman (Khoisan) languages.
3. Fieldwork for this research was supported by NIMH Grant No. MH-136111 to Irven DeVore and Richard B. Lee.

4. See Draper, 1972 and 1975a for a more complete discussion of the observational methods employed in gathering these data. Several observation techniques were used in collecting these data on child behavior. Spot observations were taken on each child on repeated occasions and at different times of the day. Each time the order in which the children of a particular group were to be observed was randomized. Noted was such information as the child's location in space, the names of others in the child's vicinity and in his immediate presence, the whereabouts of the child's parents, and whether or not the child was in physical contact with another person. Along with the spot observations, a series of systematic, randomized "elapsed-time" observations was taken on the same children. (For a discussion of "focal child" observations see Altmann, 1974; Omark, Fiedler, and Marvin, 1976). These time observations extended from ten minutes to one hour in length. In all cases only the subject child was the focus of the observations. This technique recorded commands issued by and received by the child as well as the age and sex characteristics of the individual with whom the child was interacting. Careful notations were also made on the location and location changes during the observation, personnel changes during the observation, along with a running description of the activity, if any, which absorbed the child's interest.
5. Children occasionally do go on gathering trips, but this most often happens when a relatively brief outing is planned and/or when water will be found along the way and temperatures are cool. Children were observed on gathering trips, and they do little if any serious gathering.
6. Child caretaking behaviors include such items as feeds, amuses, wipes face, dresses, comforts, and helps a younger child. Each episode of holding or carrying a child was counted once. It was originally intended to score child caretaking by a subject child in number of minutes per hour of observation. However, this behavior was so fleeting that the other variable of "episodes of child care" was devised as a more meaningful way of representing the frequency of this behavior.
7. See Frieze, Parsons, Johnson, *et al.*, 1978, for a parallel discussion of how sex differences in irritability may interact with socialization.
8. In these ten-minute observations there were 40 observations on 12 males and 29 observations on 7 females.