

Through the combined action of the nervous and endocrine systems, the brain monitors and controls most human behavior. In the next section we will see how the endocrine system influences behavior we normally attribute to psychological, not physiological, causes—emotion and motivation.

DRIVES AND FEELINGS:
THE PHYSIOLOGY OF MOTIVATION AND EMOTION

Understanding the physiology of motivation and emotion is difficult, because so much of the brain and body is involved. Structures as far removed from each other as the kidneys and the saliva glands play a role in thirst, for example. The sweat glands, the stomach, and the adrenal glands all contribute to the emotion of fear.

A key concept for understanding the relationship between the body and motivation is the biological drive. A *drive* is a physiological state that arises from some kind of physical need, and energizes and directs behavior. The hunger drive, for example, motivates people to look for food.

Emotion is difficult to define, although we all can identify such emotional experiences as joy, grief, anger, and panic. All of these involve a state of physiological arousal combined with specific experiences that enable us to label the emotion. Feelings of joy are usually very different from feelings of anger. In the pages that follow, we will focus on the physiology of motivation and emotion. In the next chapter we will look at the circumstances that shape these processes.

Motivation

All organisms, including humans, have built-in regulating systems which work like thermostats to maintain body temperature, the level of sugar in the blood, the production of hormones, and so on. As we saw earlier, when the level of thyroxin in the bloodstream is low, the pituitary gland secretes a thyroxin-stimulating hormone. When the thyroxin level is high, the pituitary gland stops producing this hormone. Similarly, when your body temperature drops below a certain point, you start to shiver, your blood vessels constrict, and you put on more clothes. All of these activities reduce heat loss and bring body temperature back to the correct level. If your body heat rises above a certain point, you start to sweat, your blood vessels dilate, and you remove clothes. These processes cool you.

The tendency of all organisms to correct imbalances and deviations from their normal state is known as *homeostasis*. Several of the drives that motivate behavior are homeostatic. Hunger is an example.

Hunger. What motivates people to seek food? Often you eat because the sight and smell of, say, pizza tempts you into a store. Other times you eat out of habit (you always have lunch at 12:30) or to be sociable (a friend invites you out for a snack). But suppose you are working frantically to finish a term paper. You don't have any food in your room, so you ignore

ive, mutual-caring roles have often been downplayed. But throughout life, siblings often protect and help one another. Many families also have a variety of other family members who play a strong role in the infant's development—including grandparents, aunts, uncles, and cousins. Indeed, most children develop in a social context that allows several early attachments. The strength of certain relationships can make up for some of the inadequacies of others. The infant has an opportunity to choose and discriminate between these relationships. His evolving emotional development is not attendant on the strengths and weaknesses of any one attachment bond.

1200

Fathers

Aside from breast-feeding, fathers are usually quite capable of routine, nurturing child care. They can bathe, diaper, feed, and rock as well as the mother. They can be as responsive to infant cues as mothers are (Parke, 1978), and infants become as attached to them as they are to their mothers (Lamb, 1976b). However, despite these similarities, the father's relationship to the infant is different from the mother's.

FATHERING The style of the interaction between the father and infant is different than that between mother and infant. While mothers are likely to hold infants for care-taking purposes, fathers are more likely to hold infants just to play with them (Parke 1978). Fathers are also more often physical and spontaneous. Play between fathers and infants occurs in cycles that have peaks of high excitement and attention followed by periods of minimal activity. Mothers engage their infants in subtle, shifting, gradual play, or they initiate such conventional games as patty-cake. Fathers, however, tend toward unusual, vigorous, and unpredictable games, which infants find most exciting (Lamb & Lamb, 1976). The exception to this pattern occurs when the father is the primary care-giver—he then tends to act more as mothers do (Field, 1978).

As infants get older and require less direct care-taking, father-infant interaction is likely to increase. Fathers may engage in more rough-and-tumble play, and particularly increased interactions with the young child in public places, such as zoos or parks (Lewis, 1987).

Fathers who frequently interact with their infants, who are responsive to their signals, and who become important individuals in their children's world are likely to develop into forceful agents of socialization later on. As the child grows older, the father becomes an important role model. He may also become an admirer and advocate of the child's achievements. An important link seems to exist between paternal interaction in infancy and interaction in later childhood. Fathers who are inaccessible to their infants may have difficulty establishing strong emotional ties later on. It is even possible that they will have a negative influence as the child grows older.

Fathers who are the most influential in their young children's lives not only spend time with them, but are also sensitive to their wants, cries, and developmental needs (Esterbrook & Goldberg, 1984; Parke, 1981). Yet, in many families, mothers seem to be more "naturally" responsive to their children than are the fathers. Several reasons for this are possible. One may be that women have inherited nurturant traits from our mammalian ancestors. Another may be the



Although the popular literature tends to highlight the competitive rivalry between siblings, siblings form strong, long-term bonds and mutual-caring roles that often last a lifetime.

The style of interaction between father and infant differs from the mother-infant relationship in that fathers are generally more physical and spontaneous.

