

Psychophysiology of human sexuality

Human sexual behavior is the result of a long evolutionary process. It is a very old motivational structure, closely connected with the very existence of the homo sapiens species. **In the popular understanding of sexuality, the concept of "sexual drive"** is still applied. So the idea that sex is a similar need as food or drink. That it is activated by an inner lack and is characterized by a drive for satisfaction. Once satisfaction is achieved, the internal overpressure is "discharged" and a temporary homeostasis is established.

However, the reality of human sexuality is much more **complicated**. Human sexual behavior can be very imperative, largely independent of rational control mechanisms. It is this subjectively felt "instinctive urgency" so intimately known to every person that undoubtedly gave rise to various interpretations of sexual motivation as a powerful internal energy source. However, it is not possible to reduce sexual behavior only to sexual excitement and emotional climax. Sexual behavior includes a whole range of activities that are intended to both signal the subject's sexual interest and induce the sexual interest of possible objects.

Definition of sexuality

Sexuality is fundamentally **a couple activity with a basic reproductive mission**. Its opening stages are designed to create a pair. The basic category of this preparatory phase is **sexual attractiveness**. This is due to the presence of secondary sexual characteristics, which are the most effective sexual signals. However, it also has a behavioral component. Certain sexual activities can be a source of significant reactions in a potential partner. In human behavior, we have the names of flirting, wooing, and pairing for these preparatory stages and pairing. Simplified and mainly for didactic reasons, we recommend distinguishing the following four basic components in **human sexual motivation**:

1. **sexual identification** (sex role);
2. **sexual orientation** (erotic preference);
3. **sexual emotions** (sexual excitement, orgasm, falling in love);
4. **sexual behavior**.

Sexual identification

The feeling of belonging to the male or female gender is undoubtedly the basic building block of human sexual motivation. In the vast majority of cases, this feeling follows genetic and fetal-gonadal determinants without conflict. They are mediated by the organizational influence of sex steroids on the central nervous system during critical stages of intrauterine development. This critical period occurs in the second trimester of prenatal development. **A manifestation of sexual identification is the individual's ability to assume a social role** corresponding to this identification.

An isolated disorder of sexual identification in its pure form is transsexuality – an individual affected by this deviation is identified with the opposite sex and is strongly driven to the opposite sexual role.

Sexual orientation

The basic dimorphism of sexual orientation follows from the principle of two-sex differentiation. **Erotic signals** from members of the opposite sex usually have the highest erotic value. This special effectiveness of the secondary sexual characteristics of the opposite sex can also be easily detected by psychophysiological examination of sexual reactions in both men and women.

Several percentages of homosexually oriented individuals are regularly found among men and women. Specific educational and developmental postnatal influences are not sufficient to form marked homosexuality. The basis here is the specific peculiarity of the programming of the respective sexual centers in the critical stages of prenatal development. The center for sexual identification and orientation will probably not be identical, since deviations of both mentioned qualities can occur to a large extent independently of each other.

Sexual emotions

From our rejection of the concept of a single sex drive comes the recognition of several sexual emotions:

- **sexual arousal**,
- **emotional climax** (orgasm) a
- **emotions of falling in love** (erotic fascination with an object).

Sexual excitement

Sexual arousal is an elementary sexual emotion that has a typical experiential quality and peripheral manifestations. A specific accompaniment of sexual excitement is primarily genital vasodilatation (*tumescence*). It is manifested **by an erection** in men and **moistening of the vaginal mucosa** (*lubrication*) in women.

The central **mediators of sexual arousal** include dopamine and noradrenaline . GABA and serotonin have depressant effects . The effect of sex steroids on sexual arousal is not fundamental, but only modeling. They lower the threshold for the effect of erotic stimuli, expand the reflex zones for peripheral stimuli and increase sexual activity. Sexual arousal expresses the degree of ease with which sexual excitement is achieved in the subject under the influence of erotic stimuli. Visual stimuli have a privileged position in humans, but the other senses do not come up short either. Repeated presentation of the same stimulus reduces sexual arousal. On the contrary, exposure to a new, unusual stimulus has a facilitative effect.

An emotional climax

Sensational climax (*orgasm*) is the **consummatory phase of sexual motivation in the coital act** . It can be achieved just as easily by **masturbation** or non-coital stimulation of the erogenous zones. Orgasm is also experienced in sleep as part of erotic dreams. The experiential and peripheral component of orgasm can be of varying intensity. In the experiential component, it is a range of feelings from absolute simple satisfaction to ecstatic states with narrowed consciousness . In the peripheral area, there are clonic contractions of varying intensity, especially in the muscles of the pelvic floor. In men, as a rule, during orgasm, semen is ejected in the ejaculatory process. *A woman's orgasm* is more vulnerable than *a man's*. There are at least 8% of women in the population who never achieve orgasm and at least a third of women have greater or lesser problems with achieving orgasm. It is not a pathology, but an evolutionarily comprehensible reality. **Sexual satisfaction** (*satisfaction*) is a state of relaxation and refractoriness to sexual stimulation that occurs after a "big" orgasm. Endogenous opioids (endorphins), as well as oxytocin and prolactin , are probably significantly involved in the development of this condition .

Falling in love

Infatuation is an emotion that is a **specifically human expression of the capacity for erotic fascination with a sexual object** . The emotion of falling in love is not learned. It usually occurs when the central nervous system reaches a certain maturity .

Sexual behavior

Human sexual behavior has **a paired nature** . As with other mating animals, the first phase is primarily about choosing a suitable partner and establishing partner erotic interaction on a pre-tactile level. In this phase, emotional states are reconciled. A pair relationship is established in communication of various lengths, which passes into tactile phases. Once established, a sexual couple has a certain cohesion. It shows an obvious tendency to restrict sexual behavior towards other members of the group.

Monogamy

Fidelity and monogamy are not a phenomenon determined only culturally and socially. They logically follow from the basic biological motivational properties of human sexuality. In a well-functioning couple, sexuality is experienced most naturally and most intensely. Unfortunately, there is no biological mechanism that would guarantee people the lifelong monogamy required by some cultural norms. A specific cultural phenomenon is **the consumer approach to sexuality** . Impersonal sex and sex with superficially known people thus become a sought-after commodity. It can be obtained by purchase, as in prostitution, but also by fraud or violence, as in sexual delinquency.

Autoerotics

A special manifestation of human sexuality is **autoerotics** . A person is usually able to get sexually aroused by the relevant fantasies. These ideas actually replace practical sexual behavior. In the autoerotic area, people reach sexual excitement and satisfaction (orgasm) often by stimulating themselves on the genitals. In general, men show higher masturbatory activity. Masturbation sometimes already occurs in young children before puberty.

Sexual behavior of men and women

There are clear differences in the sexual behavior of men and women . Some experts explain them only by socio-cultural or economic influences. However, the dimorphism of sexual behavior has its basis in biological factors. The difference undoubtedly starts with the different parental input of both sexes. In nature, the sex with a higher parental investment is more selective in sexual selection and devotes more time to the care of the offspring. A female produces only a few hundred mature eggs in her lifetime and can normally give birth to a little more than ten babies. In contrast, a man produces tens of millions of sperm every day and if he achieves copulation with a larger number of partners, his offspring can be very numerous. While a woman will not greatly increase her practical reproductive performance with a greater number of sexual partners, a man with a higher number of partners can significantly increase the number of his offspring. This logically results from the biological disposition

of men towards higher sexual promiscuity and a greater interest in impersonal copulation. A woman, on the other hand, is more selective and her sexual behavior depends more on the quality of the partner and the entire relationship.

Sexual motivation

If we summarize the basic characteristics **of normal human sexual motivation** , we arrive at the following five characteristics:

1. Fixed **sexual identification** (associated with a well-established sexual role).
2. Erotic preference for an object **of the opposite sex** (part of the broader norm is the homosexual minority).
3. Sexual **maturity** of the appetized object.
4. Cooperation, **consent** of the partner, absence **of aggression** not accepted by the partner .
5. Pairing , reciprocity .

Sexual behavior in childhood and adolescence

Human sexuality reaches its adult form through a complex development, shown in fig.

The influence of genetics (genetic sex), fetal gonads and the related influence of fetal sex steroids, sex-specific organization of the central nervous system and sexual dimorphism of body features and external genitalia are involved in the adult sexual behavior of people .

Childhood

We often understand childhood before puberty as a completely **asexual period of life** . Nevertheless, young children have already formed the basic properties of the brain in the sense that corresponds to their gender. Fixed sexual identification is already formed at the time when the child starts to speak. Children show an inner affection for the relevant sexual role, which is very difficult to significantly influence through educational action. So boys gravitate towards fighting games and competitive sports activities. Girls, on the other hand, tend to look for caring games and less competitive sports. In childhood, both boys and girls bond primarily with members of their own sex. (*children's "homophilia"*). Conspicuous preference for the company of peers of the opposite sex can be one of the signals of minority sexual orientation or identification. A few percent of both boys and girls behave noticeably heterotopically. We refer to such girls as *tomboys* , and boys as *effeminate* (sissy boys). By no means all such conspicuous children have any real problems with their sexual identification and orientation as adults, but more than half of them do. Children are capable of basic sexual emotions. That is, both sexual excitement and orgasm. This is also why some children masturbate quite often. There is no need to fight against **child masturbation** . As a rule, it will disappear spontaneously if it is not negatively reinforced by disproportionate punishments. **Sexual games** are a frequent activity of children. They consist in the curious exploration of other children's intimate body parts, in imitation of the sexual behavior of adults, sometimes surprisingly advanced. Only very rarely does sexual intercourse occur during the sexual games of children before puberty. Non-coital genital manipulations are much more common, as are imitations of coitus without sexual connection. Even a child before puberty can be **eroticized by external influences** . Such manifestations can be most clearly observed in victims of sexual abuse. Here, the perpetrator achieves the eroticization of the child in a non-physiologically early life stage by physical manipulations with the relevant verbal legend.

Puberty

Puberty is a period of **dramatic developmental changes** , during which a child develops into an individual with expressed secondary sexual characteristics, somatosexually mature. The basic criterion of sexual maturity is the ability to produce a mature gamete . In girls, the first menstrual bleeding usually occurs between the ages of 10 and 15. For boys, the age at first ejaculation is usually around 13 to 15 years. However, some works find mature sperm in the urine of ten-year-old boys.

We evaluate the degree of somatosexual maturity primarily according to the development of **secondary sexual characteristics** . In girls, according to breast development, body proportions, genital and axillary hair. In boys, it is easy to assess the size of the testicles , which before puberty are the size of a pea and during puberty rapidly increase in volume up to an adult minimum diameter in the long axis of 35 mm. Boys will develop the typical pubic hair and voice mutation, when under the influence of androgens the voice will permanently move from a high, childish to a deeper, masculine position.

Puberty brings a high level of eroticism and high **sexual activity** in boys . Even the first ejaculations of semen are accompanied by high sexual excitement and strong experiences of emotional climax. The eroticization of girls is not nearly so fast and intense. A relatively significant part of girls in puberty and adolescence do not know emotional climax at all. Although these young women are physically highly attractive, their sexual activity is still developing. It is more dependent on partner sexual experiences than boys, and increases with age.

Puberty and adolescence are a period of life in which young people's capacities for adult sexual behavior are substantially shaped. It is the period when a young person most easily adopts an ethically defective consumer relationship to sexuality. **Ethical defects** acquired during this period are then difficult to fundamentally change in adulthood. From the point of view of sociosexual adaptation, the period of puberty is a fundamental critical stage.

Neuroendocrine regulation of sexual behavior

The neuroendocrine regulation of sexual behavior in humans is sexually dimorphic . In adult men, the hypothalamus - pituitary -gonadal axis works without major periodic fluctuations. The same regulatory axis in women is characterized by the menstrual cycle , the pacemaker of which resides in the hypothalamus. The higher floors of the central nervous system are also used significantly.

Man is an animal species that knows no such thing as an estrous cycle. Therefore, the sexual activity of people is not subject to seasonal fluctuations. Even the menstrual cycle of women does not significantly interfere with sexual behavior. Hormonal mechanisms are very important in sexual life.

However, elementary sexual responses are not strictly hormonally dependent in a simple all-or-nothing sense. Even people with severe hypogonadism are capable of sexual excitement and emotional climax. They are also capable of erotic fascination with the object. The difference with people with normal levels of sex hormones is in the strength and frequency of sexual emotions.

Brain effects

Of the brain neurotransmitters, dopamine (dihydroxyphenylethylalanine) is of particular importance for human sexual behavior . Dopaminergic substances increase sexual activity (ergoline derivatives, apomorphine, yohimbine), dopamine antagonists decrease it (neuroleptics). Serotonergic influences usually reduce sexual activity in people, similar to GABA-ergic mechanisms. In addition to neurotransmitters, some polypeptides are also used in the brain. Of greatest importance in relation to sexual behavior are prolactin (PRL) and endorphins . Their influence on sexuality is rather dampening. Melanocortins are also related to sexual activity, namely stimulating.

Hypothalamus

Hormones are formed in the hypothalamus and transported to the anterior lobe of the pituitary gland via the portal vascular system. LH-RH is a decapeptide that stimulates the pulsatile release of luteinizing hormone (LH) in the anterior pituitary gland. It is probably also responsible for stimulating the secretion of follicle-stimulating hormone (FSH).

Hypophysis

Prolactin (PRL) is a peptide hormone of the pituitary gland. It affects the secretory function of the mammary gland . Its secretion is influenced by the suppressive influence of dopamine. Hyperprolactinemia reduces sexual activity in both men and women. In women, it blocks ovulation and can therefore significantly impair fertility .

Sex steroids

Estrogens

Estrogens are responsible for the development and trophism of the female genital organs. The most important estrogen is estradiol (E2). The level of estradiol secretion in women fluctuates significantly throughout the menstrual cycle, with a peak around ovulation. Estradiol increases the tone and improves the trophism of the vaginal mucosa . The central effect of estrogens is also indisputable. They improve the overall emotional tuning of a woman.

Progestogens

Progesterone is a steroid produced mainly by the thecal cells of the ovarian follicles, the corpus luteum, the placenta and also the cortex of the adrenal glands . Progestogens have a dampening effect on sexual excitement.

Androgens

The most important male sex hormone is **testosterone** (T). It is produced mainly in the Leydig interstitial cells of the testes. Small amounts of androgens are also produced by the adrenal glands in both men and women. It is a hormone that has significant organizational effects on the prenatal differentiation of the male embryo. In puberty and adulthood, it is the main stimulator of mental and physical sexual activity. It is co-responsible for spermiogenesis and for the development and maintenance of male sexual activity.

related articles

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Reference

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