



## Sexual Development and Human Behavior <sup>[1]</sup>

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Studying the biological aspects of sexual development and human behavior gives light to understanding sex-related psychological disorders.

### Sexual Development

The activity of the sex-determining gene situated at the Y chromosome's short arm influences the sexual development of a zygote (fertilized egg), into becoming a male or a female. Embryonic sexual development begins at 6 weeks, when primordial reproductive structures are formed. Two different systems are involved in the early development of sexual reproductive structures. Male reproductive structures are formed through the Wolffian system, whereas female reproductive structures originate from the Mullerian system. The sex-determining gene in males produces the testis-determining factor (TDF). As TDF is absent in female embryos, their gonads become ovaries, followed by the maturation of the Mullerian system. In males, the undifferentiated gonads develop into testes, which release testosterone that leads to the development of male external organs and also produce a substance that inhibits the Mullerian system.

### Human Sexual Behavior

Males and females have several differences when it comes to sexual response. In males, arousal comes during the excitement phase. In the plateau phase, sexual arousal becomes intensified. Afterwards, male orgasm follows, which includes two phases – (1) contraction of the vas deferens, seminal vesicles and prostate gland, and (2) rhythmical contraction of the urethra and penis). Then, the resolution phase occurs, when the male goes back to his non-aroused state with period/s of non-response. Females also experience excitement and plateau phase. During orgasm, there is rhythmic contraction of female genital organs. While most males experience a maximum of four orgasms per sexual activity, females may have multiple orgasms. When a female experiences the resolution phase, she does not experience any refractory period. Succeeding orgasms in females tend to be stronger than the initial orgasm, and thus the sexual activity becomes more pleasurable for them even after the male becomes non-responsive due to his refractory period.

Human sexual behaviors across the lifespan are comprehensively explained by the famous theorist Sigmund Freud in his Psychosexual Development Theory <sup>[3]</sup>.

# Control of Sexual Behavior

In males, sexual behavior starts with the state of arousal, which is produced by increased levels of the hormone testosterone. When a male is castrated, testosterone is lost, leaving him with an inability to have sexual arousal. In females, sexual arousal and behavior are significantly influenced by estrogen levels. Studies show that the increase in female sexual activity occurs between the end of a menstrual cycle and period of ovulation, as well as before menstruation begins.

## The Brain and Sexual Behavior

The hypothalamus indirectly stimulates the production and secretion of the male hormone testosterone. In addition, medial preoptic area elicits male sexual behavior. Directly connected to this area is the medial amygdaloid nucleus, which receives information from the olfactory bulbs tasked to detect the pheromones secreted by a receptive female. In response, the cerebral cortex sends signals to initiate motor responses during sexual activity.

In females, the ventromedial part of the hypothalamus stimulates the release of estrogen. Female-typical sexual behavior is associated to the medial preoptic area similar to but smaller than that of the males.

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