Both external and internal factors influence our attraction to others.
Attraction, Arousal, and Response

In sex, one thing leads to another. To be more specific, a predictable sequence of mental and bodily processes characterizes sexual interactions. In this chapter we present these stages as follows: sexual attraction to a potential sex partner; psychological sexual arousal; and the physiological changes in the genitals—the sexual response cycle—that precede and accompany sexual behavior. This sequence is not universal. Sometimes people engage in sex without prior attraction or arousal, for example, and only become aroused as a consequence of their behavior. But the three sequential stages provide a useful story line or framework for discussing the key processes underlying sexuality.

To describe the basic structure of this sexual story line, we must postpone consideration of many issues that relate to it in important ways: how we negotiate sexual interactions, how we enter into sexual relationships, what specific forms of sexual contact we engage in, and how the aging process influences our sexual psychology and performance. What is left, however, is the central core of sex: wanting it, and getting it.
Sexual attraction is an erotically charged orientation toward a specific other person. The attraction may be calm and controlled (“He is a really charming guy”) or it may be madly impetuous (“If I don’t have sex with her in the next 5 minutes, there is no God”). It may be felt at first meeting, or it may build over time. The attraction may be mutual, or it may be one-way. It may be accompanied by feelings of love and commitment, or not.

Sexual attraction is different from simple liking. In fact, we may be sexually attracted to people we dislike or to people we don’t know well enough to like or dislike. Sexual attraction is also different from the judgment that a person is attractive. A heterosexual woman might judge that another woman is attractive, for example, but not be sexually attracted to her. Sexual attraction is also different from mate choice: We may choose to cohabit with someone, marry someone, or even have sex with someone for entirely nonsexual reasons. And sexual attraction is different, at least in part, from romantic love.

Because sexual attraction involves two people, we may approach it in two ways. First, we may ask, what causes a person to be attractive? Second, we may ask, what causes a person to experience attraction? Both questions are important, but we begin with the former. We are asking, essentially, what is beauty?

Beauty is not entirely in the eye of the beholder

If we define beauty as the attributes that combine to make a person sexually attractive, then beauty can include many things, ranging from physical traits such as appearance, voice quality, and odor to less tangible attributes such as personality, behavior, and social circumstances. But our looks are usually the first cues to attractiveness that are available to others. Therefore, in this discussion we consider physical appearance before other aspects of beauty (Figure 5.1).

The saying “Beauty lies in the eye of the beholder” suggests that everything is subjective or idiosyncratic—that no objective characteristics make a person more or less attractive to others. In fact, however, psychologists have found a considerable degree of consensus on the topic of beauty. They have identified certain characteristics that influence the perceived attractiveness of faces and other physical features, no matter who is doing the judging.

MASCULINITY–FEMININITY  The faces of women and men differ in consistent ways that allow one to judge a person’s sex, with fair accuracy, from facial appearance alone—even without obvious clues such as beards or hairstyles. Women typically have fuller lips and larger eyes than men, for example, while men have wider jaws and noses and larger chins. These sex differences are small during childhood but increase greatly at puberty under the influence of sex hormones. The differences are most obvious in computer-generated images derived from large numbers of actual women’s and men’s faces (Figure 5.2).

When viewers are asked to adjust the masculinity–femininity of a computer-generated female face to make it look most attractive, they consistently move the image in the direction of the “hyperfeminine” face. This is true regardless of whether...
the viewer is male or female and regardless of whether the images are derived from the faces of European, African, or Asian women (Perrett, 2010). It’s no wonder, then, that women who want to look attractive use cosmetics in ways that increase their apparent femininity and exaggerate their differences from male faces.

With men’s faces, it’s more complicated. Extremely masculine faces, such as the leftmost image in Figure 5.2, may be very attractive, but they may also be judged as cold or unkind, which reduces their attractiveness (Perrett et al., 1998). Thus, studies in which viewers are asked to adjust the masculinity–femininity of a computer-generated male face have yielded inconsistent results (Johnston et al., 2001; Perrett, 2010), and the overall relevance of this dimension of male attractiveness is probably not great. One consistent finding, however, is that women’s attraction to masculine-looking faces varies around their menstrual cycle; we will discuss this finding later.

**BABYFACEDNESS** We just mentioned that traits indicative of passage through puberty (and therefore of fertility) are considered attractive. Thus, you wouldn’t expect that making an adult woman’s face more like a young child’s would increase her attractiveness, but that is exactly what a research group at the University of Regensburg, Germany, has reported (Braun et al., 2001). The researchers first quantified the facial proportions of children: They computer-averaged images of the faces of a number of actual 4- to 6-year-old children and then measured the layout of facial features on this averaged image. Then they generated an image of an adult woman’s face by averaging images of the faces of 64 actual women. This adult face was judged as quite attractive, but its attractiveness increased as it was progressively morphed toward the standard childlike face. In the example shown in the figure, viewers found that a 30% admixture of “babyfacedness” produced the most attractive face.

What is the explanation of this paradoxical finding? It seems that the main features of children’s faces that enhance the attractiveness of adult women’s faces are the low position of the facial features on the head, a prominent forehead, large eyes, and a small nose. These features help to elicit the positive, protective feelings that adults commonly experience when they view young children. Thus, adult women who happen to have somewhat “babyfaced” features—supermodel Kate Moss is an example, according to the German researchers—may co-opt those positive feelings, in addition to whatever attractiveness they may have by virtue of “adult” characteristics (Zebrowitz, 1997).

Babyfacedness doesn’t increase the attractiveness of male faces in any general way, but it does have a “disarming” effect that can increase likeability in some circumstances. According to Northwestern University researchers, male African-American CEOs tend to have babyfaced features: This, they believe, is because such features help them overcome the stereotype of the “threatening” black male (Livingston & Pearce, 2009).
CHAPTER 5

**Figure 5.3** Babyfacedness increases attractiveness.
A face generated by computer-averaging the faces of 64 adult women (A) and the same face morphed with increasing percentages of babyfacedness, as indicated below each image (B–F). (G) The bar graph shows the percentage of viewers who rated each image as the most attractive of the six. (Images courtesy of Martin Gruendl.)

**Figure 5.4** Symmetry increases attractiveness. (A) Naturally asymmetrical male and female faces. (B) The same faces manipulated to make them symmetrical. Most viewers rate the symmetrical faces as more attractive, even though they are not generally aware that symmetry is being adjusted. (From Perrett et al., 1999.)

**SYMMETRY** Animals look for symmetry in their mates. So do humans, both in industrialized countries and in hunter-gatherer societies (Little et al., 2007). The more symmetrical a person’s face, the more attractive, sexy, and healthy that person seems to others (Perrett et al., 1999; Fink et al., 2006) (Figure 5.4). Symmetry raises the attractiveness of the remainder of the body, too.

Evolutionary psychologists have proposed a reason to explain why asymmetry is unattractive (Thornhill & Gangestad, 1999a). Because a single genetic program guides the development of the left and right sides of the body, asymmetrical features can arise only if the genetic program has been derailed in some way. Either the person’s genes were of poor quality or they ran into some kind of interference (such as an infection) during development. Indeed, people with asymmetrical features are more likely to suffer from a variety of disorders—including extremely premature birth, certain forms of intellectual disability, schizophrenia, and psychological and physiological distress—than are more symmetrical persons (Shackelford & Larsen, 1997). Thus, it is plausible that evolution would favor the spread of genes that give us the ability to assess symmetry as well as the motivation to prefer it.
Culture influences the attractiveness of bodies

Men’s and women’s bodies are more distinct than are men’s and women’s faces. Like facial attractiveness, bodily attractiveness is often a matter of being near one or the other extreme of the masculine–feminine continuum. Thus, body parts that differ relatively little between the sexes, such as the hands and feet, also contribute relatively little to judgments of attractiveness. In general, then, it is likely that the attractiveness of a body signals information about its sexual differentiation under the influence of sex hormones, and hence about its fertility, strength, health, and other traits important for reproduction. Nevertheless, criteria for bodily beauty are not nearly as universal as one might imagine.

Slimness–fatness is an important dimension influencing judgments of attractiveness, especially when women’s attractiveness is being judged (by women or by men). This dimension is usually expressed as the body mass index (BMI).* The “healthy” BMI range has been defined as 18.5 to 25, but the median BMI in the contemporary United States is near the top of this range (about 24.5 for women in their 20s), so by this standard nearly half of U.S. women in this age range are overweight (BMI of 25 to 30) or obese (BMI > 30).

In a number of studies, male and female raters have been asked to judge the attractiveness of women varying in BMI. (They are shown photos of bodies only, without the faces.) Subjects in the United States and other Western countries prefer women with BMIs around 18 to 22, i.e., well below average and near the low end of the normal range. On the basis of these findings, one might be tempted to conclude that slimness is universally preferred, but this is not the case. For one thing, during certain periods in Western history, such as the 17th century, fatness was considered much more attractive than it is now.

Cross-cultural studies have also demonstrated quite diverse preferences. One revealing study was done by a British–South African group of researchers (Tovee et al., 2006). They confirmed that white Britons prefer women with BMIs around 20 and that attractiveness falls off steadily both below and above that value (Figure 5.5). But when judging the same images, rural Zulus in South Africa gave high ratings to women with BMIs of 20 and above, with no suggestion of a fall-off in attractiveness up to a BMI of at least 40. Only on the lower side of 20 was there a rapid reduction in attractiveness.

The researchers added a third group of subjects, namely South African Zulus who had migrated to the United Kingdom within the previous 18 months. As shown in the figure, these subjects quickly changed their preferences, exhibiting much the same dislike of fuller-bodied women as is typical of native Britons. In other words, this study suggested that BMI preferences, at least over the upper part of the range, are influenced by culture. We discuss the cultural forces influencing this variability in Box 5.1.

It may be that the low attractiveness ratings for very underweight women are universal, however. This would make sense in evolutionary terms, because severely underweight women are unlikely to be fertile.

*Your BMI is your weight in kilograms divided by the square of your height in meters. (If you use pounds and inches, multiply the result by 703.) BMI calculators can be found on the Internet.
**Cultural Diversity**

**Beauty and Culture**

Is Gabourey Sidibe unusually good-looking? Apparently so, because *People* magazine included the 27-year-old actress—an Academy Award nominee for her role in the 2009 film *Precious*—in their 2010 list of the “100 Most Beautiful People.” Yet Sidibe’s body mass index (BMI)—estimated to be about 58 (Johnson, 2010)—places her far outside of the 15 to 25 BMI range that most Westerners consider attractive.

Whether *People*’s selection of Sidibe was a straightforward assessment of her looks or more of a tribute to her remarkable acting skills, her selection brings up the issue of cultural standards of beauty, particularly as they relate to body size and skin color. After all, the *People* list is better known for slim white celebrities such as Angelina Jolie (a list regular) and Brad Pitt (twice named *People*’s “Sexiest Man Alive”), But Pitt went missing in 2010—so, is something changing?

The irony is that, while Hollywood is starting to embrace diverse standards of beauty, much of the rest of the world is rejecting fatness and dark skin and is focusing on the ideals embodied by “Brangelina” (the Brad and Angelina archetype). Up until the late 20th century, fatness or outright obesity was considered beautiful and desirable in many cultures around the world (Popenoe, 2003; Swami, 2008; Brewis et al., 2011). In considerable part, this admiration of fatness was related to the scarcity, or uncertain supply, of food. Even in the contemporary United States, the relevance of hunger to judgments of attractiveness can be demonstrated experimentally: In two studies, hungry male students entering a dining hall preferred heavier women than did satiated students leaving the hall (Nelson & Morrison, 2005; Swami & Tovee, 2006). These findings don’t mean that hungry men view women as edible. Rather, they exemplify a general pattern in which men in a state of deprivation (hungry or poor) are attracted to women who can demonstrate (through body size, maturity, or other cues) that they have access to resources (Pettijohn et al., 2009).

Over the last few decades many cultures that formerly embraced fatness have come to stigmatize it: They idealize thinness instead. In part this has to do with increased food security. Thus, in a survey of ten cultures by a team led by Alexandra Brewis of Arizona State University, women and men in all the cultures stigmatized fatness, but those in Tanzania, where hunger is still prevalent, did so the least (Brewis et al., 2011). Education about the health risks associated with obesity has also tended to make fat people seem less attractive.

A more important factor, however, is the spread of Western ideals of beauty through television and other media. For example, medical anthropologist Anne Becker of Harvard University studied Fijian girls before and after the introduction of television. Before television, these girls subscribed to traditional local ideals of beauty—ideals to which they could readily aspire. After just 3 years of *Melrose Place* and similar American fare, these same girls judged themselves to be “slow, poor, dark, and fat,” and an epidemic of eating disorders broke out (Becker, 2004; Estrada, 2011). In India skin-lightening products have become a $200 million annual market (Rashid, 2006), and in South Korea a legion of plastic surgeons is kept busy “Westernizing” men’s and women’s eyes (Yoo, 2008).

Up until recently, the globalization of beauty has been a one-way street, imposing Hollywood’s ideals on the rest of the world. If American culture truly embraces the beauty that can be found in distant lands, this may have positive repercussions far beyond our own borders.

---

**waist-to-hip ratio (WHR)**

The ratio of the circumference of the body at the waist to the circumference at the hip. Another measure related to BMI is the **waist-to-hip ratio (WHR)**, which is the circumference of the body at the waist divided by the circumference at the hip. It could be thought of as a simple estimator of “curvaceousness.” Some researchers believe that a particular WHR—0.9 for women and 0.7 to 0.8 for men—is an important and universally recognized cue to attractiveness (Singh, 2002). Others, however, find that the WHR is an indicator of attractiveness only to the extent that it provides information about BMI (Cornelissen et al., 2009). Thus, the value of the WHR in judgments of attractiveness remains unsettled.
Female breasts are obviously sexually attractive to many men, but the issue of breast size is less clear. Various studies have reported that men prefer women with breasts that are small (Furnham & Swami, 2007), medium (Kleinke & Staneksi, 1980), or large (Gitter et al., 1983), or that men have no size preference (Horvath, 1981). It may be possible to make some sense of these conflicting data. For example, it appears that men do prefer larger-than-average size breasts, but only in combination with a narrow waist (Furnham et al., 1998); in other words, large breasts are not attractive to most men when they simply reflect a general obesity.

In terms of men’s bodies, wide shoulders and well-developed pectoral muscles increase women’s ratings of men’s attractiveness, presumably by increasing their perceived strength (Horvath, 1981; Thompson & Tantleff, 1992) (Figure 5.6A). Men have used clothing and adornment to increase their apparent shoulder width since time immemorial. Interestingly, women with a need to assert strength in a male-dominated environment have often followed the same strategy (Figure 5.6B).

There is a disconnect between perception and reality when it comes to some of these judgments of bodily attractiveness. Men tend to think that extreme muscularity is the most attractive to women, but in fact most women prefer only moderate muscularity (Frederick & Haselton, 2007). For that reason men’s magazines tend to show images of body-builder types, whereas women’s magazines are more likely to show men with “swimmers’ bodies.” Similarly, the breast size preferred by men is not nearly as large as the breast size that women think that men prefer (Thompson & Tantleff, 1992). Such disconnects can cause a lot of needless anxiety, of course.

As with body mass index, culture has a considerable influence on the assessment of attractiveness of female breasts and other body features. In the case of breasts, some human cultures place little emphasis on them as sexually attractive features and do not require women to cover them. This is the case in the traditional culture of Mali (West Africa), for example (Dettwyler, 1994). In non-Western cultures that do consider the breasts sexually attractive, the preferred appearance may range from small and upright to long and pendulous (Ford & Beach, 1951).

People generally find faces of individuals from their own ethnic group more attractive than faces from other groups—a finding that almost certainly reflects an influence of familiarity and culture. However, individuals in different cultures rely on similar cues to attractiveness. Furthermore, people make consistent judgments of faces from other cultures. The way that Caucasians rank the attractiveness of Japanese faces, for example, is similar to the way that Japanese rank those same faces (Perrett et al., 1994). In other words, the judgment of beauty depends on a blend of cultural and universal factors.

If there is any universality to attractiveness, we may wonder whether very young children are sensitive to it. It seems that they are. When newborn infants are presented with pairs of images of faces, one of which has been rated by adults as more attractive than the other, the infants spend more time looking at the more attractive face (Slater et al., 1998).

From the general appearance of a person’s face and body, we can assess their age, which is an important criterion for attractiveness in women, at least according to men. When judging women solely by physical appearance, men find women decreasingly attractive as women progress from the late teen years onward (Mathes
et al., 1985). This makes sense in evolutionary terms, because young women are at their most fertile and have the most years ahead to nurture children. A preference for women of youthful appearance is found in men of all ages but is most marked for younger men. Women’s judgments of men’s physical attractiveness do not vary nearly so much with the men’s age, but women generally prefer men who are somewhat older than they themselves are.

The cosmetic enhancements that people use to increase their own attractiveness often involve the exaggeration of sexually differentiated traits. Breast augmentation is a well-known example in Western society—though breast reduction is also a commonly requested surgery. Women’s lips are typically fuller than men’s; women may augment their lips, and in a few non-Western societies this practice is taken to a remarkable extreme (Figure 5.7).

It’s worth stressing that the process of judging visual attractiveness is a largely unconscious process. When men are asked to choose the more attractive of two women’s faces, for example, and then asked why they found that face more attractive, they will give detailed, persuasive reasons for their choice, as if they had carefully thought the matter through before choosing. But if they are deceived into thinking that the face they rejected was the one they chose, they usually fail to notice the deception and give equally detailed and persuasive reasons why that face was the more attractive one (Johansson et al., 2005). This phenomenon has been called “choice-blindness.” It’s as if consciousness simply provides a plausible explanation for choices that are really made at a much deeper level of the mind.

Attractiveness involves senses besides vision

Although we tend to rely on our eyes in assessing the physical attractiveness of potential partners, other senses also play a role. If that were not true, blind people could not experience sexual attraction, but they do. Here’s how one blind person expressed it on an online bulletin board: “If anything I think being blind has made me kinkier and more intense as you touch a lot more. Being blind, I would have to say sex is better and deeper, feeling your way around a body you get to know everywhere.”

Besides touch, hearing and smell may also be important. Men’s voices are generally deeper-pitched than those of women, reflecting the sexual differentiation of the larynx at puberty. Women find men with deep voices more attractive than those with higher-pitched voices, and in hunter-gatherer societies fertile women bestow their favors more readily on deep-voiced men (Apicella et al., 2007). Men, on the other hand, prefer women’s voices that are higher-pitched than average (Feinberg et al., 2008). These are further examples of sexually differentiated traits being particularly important criteria for physical attractiveness.

Everyone knows that body odor can have a strong influence on a person’s attractiveness. Some researchers, however, have gone further, claiming that specific sex pheromones in men and women influence sexual arousal through unconscious olfactory mechanisms. This topic is highly controversial and is not well understood at this time, but we’ll mention just one intriguing experiment. Randy Thornhill and Steven Gangestad had women sniff T-shirts previously worn by men they hadn’t seen. Those women who were in the fertile phase of their menstrual cycles rated as most attractive the shirts worn by men with physically symmetrical bodies—even though the women were unable to assess the men’s bodily symmetry directly (Thornhill & Gangestad, 1999b). As mentioned earlier, symmetry is considered attractive and is thought to be a cue to good genes. Thus, it appears that some aspect of men’s body odor is correlated with physical symmetry and likewise offers a cue to their reproductive fitness.
To summarize the research on physical attractiveness, we can say that there are some respects in which beauty is not in the eye of the beholder but, rather, reflects objective, universal attributes of men and women. The attributes that make for attractiveness give some indication of a person’s health, strength, fertility, or genetic fitness. How significant these traits are in the modern world may vary a great deal: Physical strength is obviously not as important as it was hundreds or thousands of years ago, for example, so finding bulging pecs attractive could be thought of as a pointless holdover from earlier times.

Yet attractiveness is also associated with traits that are still of great importance in our contemporary world, which may mean that attending to physical attractiveness is about more than simply appreciating “eye candy.” According to two very large longitudinal studies, for example, physical attractiveness is associated with an approximately 10-point advantage in IQ (Kanazawa, 2011). Still, let’s keep this in proportion: One can probably assess a person’s IQ far more reliably in other ways, such as by having a conversation with them.

Behavior and personality influence sexual attractiveness

All this talk of physical beauty can have a downside because it can provoke anxiety among people who think that their faces or bodies fall short of the standards necessary to attract a desirable partner. Yet this kind of anxiety is seldom justified. For one thing, people tend to underestimate their own physical attractiveness. For another, they can improve their attractiveness by means of all the technologies—from cosmetics to plastic surgery—that human ingenuity has devised. And most important, they can influence their attractiveness through their behavior.

In fact, we may speak of a behavioral or psychological beauty that can be independent of physical beauty. Behavior and personality tend to influence attractiveness more slowly than appearance does, because they are not so immediately apparent. But even in a still photograph, behavior matters: Smiling faces are judged to be more attractive than those with neutral expressions, at least when the faces are looking directly at the observer (Jones et al., 2006).

Presumably, sexual attractiveness influences the desirability of partners for casual encounters or dating relationships more than it does for longer-term, live-in relationships such as marriage, because long-term relationships involve so much more than sex. To get some insight into the spectrum of traits that influence sexual attractiveness, therefore, we do best to look at studies that have questioned men and women about the traits they would value in a casual or short-term sex partner. Most such studies report that physical appearance is the most important criterion used by both men and women in choosing casual sex partners (Regan & Berscheid, 1997), but many personality traits are also highly rated, including trustworthiness, warmth, and a sense of humor (Regan et al., 2000). These are traits that are likely to be important in any relationship. It may be that, even when people are “hooking up,” they are still unconsciously evaluating the person they are hooking up with as a potential long-term partner (Sprecher & Regan, 2002). In any event, general “likability” traits seem to intensify sexual attraction.

To fully understand behavioral beauty it is necessary to go beyond surveys and use tests that are closer to real-life situations. Both men and women say that they value a sense of humor in their sex partners, for example, but what do they actually mean by that? To find out, one group of psychologists presented subjects with photos of people along with humorous or nonhumorous statements that those people had supposedly written. For women subjects, the humorous statements increased the attractiveness of the people in the photos, as expected. For men, however, the humor had no such effect (Bressler & Balshine, 2006).
Why then do men say that they value a sense of humor in their partners? A follow-up study revealed the reason (Bressler et al., 2006). Male subjects find their partners sexually attractive when they respond with laughter to the subjects’ jokes, not when they make their own jokes. Subjects label their partners’ appreciation of their wit a “sense of humor.” In a potentially sexual situation, laughter often signals sexual receptivity; thus, when men say they find a “sense of humor” attractive they might simply mean that they are glad when a sexual situation shows signs of moving toward actual sex.

In one study, men and women were asked to list desirable characteristics in romantic partners and then were invited to a “speed-dating” event (an event in which people meet a large number of potential partners in a sequence of brief one-on-one conversations). The people who the subjects chose for future dating were not those whose characteristics matched the subjects’ previously stated preferences (Eastwick & Finkel, 2008). For example, a woman who rated high earnings as the most important criterion for selecting a romantic partner actually chose the lowest-earning of the men she talked with at the event. Thus, people might not have a clear idea of what they are looking for in a sex partner until they actually meet someone who appeals to them—another example of the limited role of conscious processes in sexual attraction. What people think they want does not necessarily predict what they actually choose.

It has been reported over and over again that men are more interested than women in the physical attractiveness of their prospective sex partners, whereas women are more interested than men in their partners’ wealth or social status (Buss, 1989; Regan et al., 2000). But what happens when women themselves acquire wealth or power? According to several studies, such women have a preference for even wealthier or higher-status partners, as if the important criterion is that their partners be wealthier or of higher status than themselves (Buss, 1995). To the extent that this is the case, affluent women risk pricing themselves out of the market. Some studies report different results, however: namely, that women who have many resources tend to focus more on their partners’ physical attractiveness and less on their pocketbooks (Moore et al., 2006). If this latter idea is correct, it could explain why, in this age of financial independence for women, young men make more effort to look good than their fathers did.

**Familiarity may increase or decrease attraction**

How attractive we find people (and things in general) is strongly influenced by our prior experience, but this influence can work in either direction, making people and things more attractive or less attractive. In general, mere exposure to any stimulus—whether it be the music of a particular composer or a particular kind of food—makes us like that stimulus better when we encounter it again, even if we don’t remember having experienced it before. The same is true of faces: The mere fact of having seen a face before makes us judge it as more attractive than if we are seeing it for the first time (Peskin & Newell, 2004).

One face we see a lot of is our own, so are we especially attracted to our own face or to faces like our own? That’s a tricky question to answer. For one thing, most of us are heterosexual, so our faces are the wrong sex—for sexual attraction, at least. Also, recognizing one’s own face carries a lot of cognitive baggage—thoughts that could interfere with judgments of attractiveness. A Scottish research group got
around these problems in an ingenious way: They took photographs of their subjects, then changed the subjects’ apparent sex by computer-morphing techniques (Penton-Voak et al., 1999). The subjects did not recognize themselves in their morphed “twins”; nevertheless, they found their “twins” more attractive than the “twins” of other subjects. This could be taken as support for the idea that familiarity contributes to attractiveness.

A related study was conducted many years ago by psychologists at the University of Wisconsin (Mita et al., 1977). The researchers showed subjects photographs of themselves as well as the same photographs after left–right reversal. The subjects liked the mirror-reversed photos better than the unaltered ones. Friends of the subjects, however, liked the unaltered photos of the subjects better. The researchers reasoned that subjects were used to seeing themselves in mirrors, whereas their friends were used to seeing them directly; in both cases, long exposure to the image had increased its attractiveness.

The influence of familiarity also helps explain an intriguing observation, which is that composite faces generated by averaging a considerable number of individual faces are rated as more attractive than any of the individuals that contributed to the composite (Langlois & Roggman, 1990; Perrett, 2010) (Figure 5.8). This seems an improbable finding, because the phrase “average-looking” is hardly a compliment. However, the attractiveness of such composites derives in large part from the fact that they emphasize features common to many faces, and are therefore very familiar. Indeed, if you look at the composite face in Figure 5.8 for long enough, the individual faces that contributed to the composite may begin to look more and more unusual.

In some circumstances, however, familiarity can reduce attractiveness. For example, being close to another child (such as a sibling) during early childhood makes it unlikely that one will find that person sexually attractive in adult life. This seems to be an evolved mechanism whose adaptive value is that it reduces the likelihood of incestuous matings (Bevc & Silverman, 2000). Olfaction may be involved in this process, because opposite-sex siblings develop an aversion to the scent of each other’s bodies (Weisfeld et al., 2003).

Sexual familiarity may also reduce attractiveness. In animals, it’s well known that males who have just mated will mate again more promptly if presented with a novel female. This is called the Coolidge effect.*

There has never been a full-scale test of the Coolidge effect in humans, but here’s something close: Researchers at the University of North Dakota (Plaud et al., 1997) recruited male psychology students for a study that involved listening to erotic tapes narrated by a female student. (As if further incentive were needed, the students received $20 and research credit.) The students’ sexual arousal—monitored by strain gauges placed around their penises (Figure 5.9)—declined, due to habituation, if the

---

*This calls for a brief digression to explain how the phenomenon of arousal by a novel sex partner came to be associated with the name of Calvin Coolidge—yes, the 29th president of the United States. According to legend, the President and Mrs. Coolidge were once touring a farm. Soon after their arrival they were taken off on separate tours. When Mrs. Coolidge passed the chicken pens she paused to ask the man in charge if the rooster copulated more than once each day. “Dozens of times,” was the response. “Please tell that to the President,” Mrs. Coolidge requested. When the President passed the pens and was told about the roosters, he asked, “Same hen each time?” “Oh no, a different hen each time.” “Please tell that to Mrs. Coolidge,” said the President.

---

© 2011 Sinauer Associates, Inc. This material cannot be copied, reproduced, manufactured or disseminated in any form without express written permission from the publisher.
**Habituation** A psychological or physiological process that reduces a person’s response to a stimulus or drug after repeated or prolonged exposure.

The same tapes were repeated, but their arousal remained high if new tapes were played. The habituation effect lasted for several weeks at least.

Habituation also affects real sexual relationships: Both men and women derive less and less sexual satisfaction from their steady relationships as the duration of the relationship increases, and this effect is relationship specific; that is, it is not accounted for simply by the aging process (Klusmann, 2002). It’s likely, however, that couples can counteract this habituation to some extent by introducing forms of novelty other than novel partners. These could include novel sex positions, novel practices such as bondage and dominance, sex in novel locations, and so on. In addition, other forms of satisfaction, such as emotional satisfaction, may counterbalance sexual habituation.

Although we don’t discuss falling in love until Chapter 10, we should mention the obvious, which is that falling in love vastly increases the physical and behavioral attractiveness of the beloved. Physical flaws and distracting tics may suddenly seem like special features that make the person unique—for as long as love lasts, at least. In this situation, beauty may truly lie in the eye of the beholder.

---

**Perceived attractiveness varies around the menstrual cycle**

Another way in which attractiveness is affected by factors intrinsic to the viewer has to do with the menstrual cycle. Two research groups have found that women prefer men with somewhat more masculine faces near the time of ovulation, when they are most likely to conceive, and prefer less masculine faces at other times (Penton-Voak & Perrett, 2000; Johnston et al., 2001). Similarly, women prefer deep-voiced men near the time of ovulation but not at other times (Hodges-Simeon et al., 2010).

These changes in women’s perception of male attractiveness around the menstrual cycle have a tempting explanation in terms of evolutionary psychology: Women may be attracted to masculine-looking men during their fertile period because such men are most likely to possess genes conferring health and strength. During the rest of their cycle they may be drawn to other males, such as their regular partner (who, by the law of supply and demand, is not likely to be the most genetically favored male out there).

Does this mean that partnered women are more likely to engage in sex outside the partnership during the fertile days of their cycle? It seems that they are (Gangestad & Thornhill, 1998). We are not suggesting that partnered women consciously set out to have babies by that “tall, dark stranger.” Indeed, a tall, dark baby might be hard to explain to the rest of the family. To the extent that women engage in extra-pair sex, they often take care not to get pregnant. But their evolutionary history, mediated by the ebb and flow of sex hormones around the menstrual cycle, does seem to influence their sexual desires.

Women’s sexual attractiveness to men also varies around the menstrual cycle. University of New Mexico psychologists demonstrated this by recording the tips received by female lap dancers in “gentlemen’s clubs” (Miller et al., 2007) (Figure 5.10). Tips were much higher near the time of ovulation than at any other time in the women’s cycles. The researchers did not identify what exactly was more attractive about the women near the time of ovulation, but other studies have reported a variety of subtle changes in women’s appearance, including an increased facial attractiveness at that time (Roberts et al., 2004). Near ovulation, women’s behavior also subtly changes to make them more attractive: They pay more attention to grooming, make-up, ornamentation, and clothes (Haselton et al., 2007).

---

**Some people do not experience sexual attraction**

All this talk of sexual attraction probably resonates with experiences you have had in your own life. But what do you make of these comments?
I’ve never in my life had a dream or a sexual fantasy about being with another woman. So I can pretty much say that I have no lesbian sort of tendencies whatsoever. But I’ve never had a dream or a sexual fantasy about being with a man either—that I can ever, ever remember.

I didn’t find the act something I enjoyed. I guess I thought, “What’s the big whoop? Why are they so interested in this thing?” I don’t get anything out of it. (Prause & Graham, 2007.)

For reasons unknown, a small number of people experience no (or very little) sexual attraction over their entire lifetime. These asexual men and women may still experience romantic attraction in the sense of desiring psychological intimacy with a specific partner, but they do not desire to express that intimacy in physical sex.

Asexuality is different from a conscious decision not to engage in sexual relationships (sexual abstinence). Nor does it stem from conditions that impair general social interactions such as autism, from a morbid fear of sex, from repressed homosexuality, or from problems in sexual performance such as erectile dysfunction. In fact, self-identified asexual men masturbate at about the same frequency as sexual men (Brotto et al., 2010). This suggests that the difference between asexual and sexual men lies not in the pleasure that genital stimulation and orgasm can provide, but in the interpersonal aspect of sexual desire.

Self-identified asexual men and women say that their lack of sexual motivation has both positive and negative effects on their lives (Prause & Graham, 2007). On the plus side, they have more free time and are spared the complications of negotiating sexual relationships, sexually transmitted diseases, and unwanted pregnancies. On the negative side, they may worry about what is wrong with them, and they may have difficulty maintaining close relationships while rebuffing sexual advances. In fact, asexual people often do enter into sexual relationships, simply for the purpose of maintaining the relationship.

Because cultural forces (including this book) emphasize the central place of sexuality in human life, asexual individuals may be made to feel impaired. In reality,
most function well in society, although some are socially withdrawn (Brotto et al., 2010). The Asexual Visibility and Education Network (AVEN—see Web Resources at the end of this chapter) works to promote understanding and dispel myths about asexuality. “Asexuality is not an illness,” says AVEN’s founder, David Jay. “People are using it as their sexual orientation.” AVEN markets T-shirts proclaiming “Asexuality—It’s not just for amoebas any more.”

This mention of “sexual orientation” reminds us that a person’s sexual orientation—defined as their predisposition to experience sexual attraction to one sex or the other, or to both—is the most dramatic example of an internal trait influencing sexual attraction. Because of its personal and social significance, however, we dedicate an entire chapter to it (see Chapter 12).

**Sexual Arousal Has Multiple Roots**

Sexual arousal is an acute psychological state of excitement marked by sexual feelings, attractions, or desires. In addition, it is a physiological state marked by changes in the genitalia. Psychological and physiological arousal usually go together, but not always. Sexual arousal may be triggered by external events, such as the appearance of a sexually attractive person, or by some particular aspect of that person, such as their sexually suggestive behavior or their nudity. However, arousal may come entirely from within, apparently triggered by nothing (this phenomenon is called spontaneous sexual arousal).

**Fantasy is a common mode of sexual arousal**

Sexual fantasy—imagined sexual experiences during waking hours—is a route by which internal mental processes promote sexual arousal. The great majority of men and women engage in sexual fantasy. It might occur when no actual sexual behavior is possible—mentally undressing classmates during a boring lecture would fall into this category. Or it might accompany masturbation or sex with a partner. In either of these cases, it might add a great deal of arousal and might even be necessary to reach orgasm.

Men engage in sexual fantasy quite a bit more than women, both in the regular course of the day and during masturbation or sex with a partner (Leitenberg & Henning, 1995). In one study, heterosexual male and female college students were asked to keep written records of all their sexual fantasies as they had them. The men averaged 7.2 fantasies per day, as compared with 4.5 for the women (Jones & Barlow, 1990). In another study, over 4000 men and women were asked whether they had thought about sex within the previous 5 minutes. Among 14- to 25-year-olds, the sex difference was not great: 52% of the men and 39% of the women said “yes.” Among 26- to 55-year-olds, the total amount of sexual thought decreased, but men continued to fantasize more than women: 26% of the men and only 14% of the women said “yes” (Cameron & Biber, 1973).

The content of sexual fantasies varies a great deal, but the common items are fairly similar to the kinds of behaviors people actually engage in. According to one study of heterosexual college students (Hsu et al., 1994), over half of both males and females reported that they had recently fantasized the following activities: touching and being touched sensually, oral–genital sex, naked caressing, watching a partner undress, seducing a partner, having intercourse in unusual positions, walking hand in hand, being seduced, and having sex in an unusual location.
How come I’m sexually aroused when I don’t want to be?

Sexual arousal is not under conscious control, and it’s common and harmless for arousal to occur in circumstances that seem inappropriate. Rarely, arousal may be so persistent as to constitute a disorder (see Chapter 14).
truthful indication of what they find arousing than asking them directly about their attraction to men and to women. This assumption, however, is debatable. In the Hsu et al. (1994) study, for example, 19% of the men and 33% of the women (all of whom identified as heterosexual) reported having had at least one recent fantasy of engaging in sex with a same-sex partner. Does that mean all these people were actually sexually attracted to same-sex partners in real life? Not if we are to go by their self-identification as heterosexual, which by definition means they are attracted only to the other sex. The Hsu finding illustrates the limitations of a simple unidimensional scale of sexual orientation.

To some extent, the sexual fantasies of men and women differ in a way that is consistent with stereotypes about male and female sexuality: Men are more likely to focus almost exclusively on the visualization of explicit sexual behavior, and their fantasies often involve taking a dominant role in sex acts. Women’s fantasies, however, tend to include more romance, affection, and indications of committed relationships (such as the marriage fantasy mentioned above) and may involve taking a more passive role in sex acts (Ellis & Symons, 1990; Leitenberg & Henning, 1995).

People sometimes feel guilty about their sexual fantasies, especially if the fantasies involve behaviors in which they wouldn’t want to engage in real life. Yet people who can enjoy a range of sexual fantasies without experiencing guilt seem to have a generally more satisfying sex life.

Rape fantasies may be aversive or erotic

Many women have fantasies in which they are sexually coerced, raped, or otherwise subjected to force by a partner. In a survey of female undergraduates, psychologists at the University of North Texas found that 62% of women had experienced rape fantasies, some as often as once per week (Bivona & Critelli, 2009). About 9% of all the reported rape fantasies were entirely aversive (unpleasant) in quality. Here is an example, abridged and slightly modified from the original:

A strange man runs up behind me and covers my mouth and tells me not to say anything. I want to leave but the mysterious man will not let me because he wants to rape me. I begin to get raped and abused by this mysterious person and all I remember is a lot of crying and sadness. There is not much said except me telling the man to stop. I feel used, disgusting, and sad. I’m left alone in the rain and have to walk home.

A much larger number of the rape fantasies (about 45% of the total) were erotically exciting in nature. In most of these fantasies the nonconsent had a feigned quality and often changed to consent in the course of the fantasy. Here is an abridged example:

This friend of mine comes over and immediately shoves me against the wall, pinning my hands over my head and kisses me passionately. I tell him to stop, that it’s wrong and we can’t do this. He says he doesn’t care; he cannot wait another minute. His motivation is satisfying his own sexual hunger. While my hands are still pinned over my head he uses his other hand to tear off my clothes, not caring if they rip. We’re both naked and he kisses me all over my body. I am begging him to stop, telling him it’s wrong and that we can get caught any minute. He picks me up and screws me against the wall. At first it hurts but it feels so good that I can’t help but enjoy it. When we’re done he leaves because he knows my boyfriend is going to be over soon. I am torn between the pleasure and knowing that it’s morally wrong.

The remaining 46% of the reported fantasies contained a mixture of erotic and aversive elements: In many, the fantasized sexual contact began consensually but transitioned to some activity, such as anal sex, that the woman resisted.
The researchers interpreted the aversive fantasies (and the aversive elements in the mixed fantasies) as reflecting fears about the possibility of rape and an attempt to deal with these fears by gaining some control over the rape situation. On the other hand, the women who had erotic rape fantasies rated them as positive experiences. The perpetrators in these erotic fantasies were often good-looking men who were actually known to the woman, and the men were often represented as being motivated by an irresistible attraction to the woman. Women’s fantasies of this kind may reflect a desire to direct the sexuality of dominant, forceful men (“warrior lovers”) toward themselves (Hawley & Hensley, 2009). They certainly don’t reflect a desire to be raped in real life. Actual rape denies the victim any control of the situation—the exact opposite of a fantasy.

Is it healthy or unhealthy for women to have such fantasies? In one study (Strassberg & Lockerd, 1998), women who reported engaging in force fantasies (more than half the total number of women in the sample) were, if anything, better adjusted sexually than those who did not—they suffered from less guilt about sex, for example. They also engaged in more sexual fantasies generally than other women. They did not differ from other women in terms of their actual experience of sexual coercion or molestation. There therefore seems to be little reason for concern about rape fantasies, except insofar as aversive fantasies may reflect anxieties that need to be addressed.

Arousal occurs in response to a partner

Being with an actual or potential sex partner in real life is a potent trigger to arousal, especially if that person is judged sexually attractive. In such a situation, both men and women are aroused by looking at the partner’s face, but men also find looking at their partner’s genital area arousing, as we mentioned in our discussion of nudity in Chapter 4. Men are more likely than women to report that they are highly aroused by watching their partner undress (Laumann et al., 1994). Even in totally nonsexual situations, in fact, men tend to look at people’s crotches, but women don’t (Figure 5.12).

Arousal increases as flirting or other forms of sexual negotiation proceed (see Chapter 7). It increases even further as actual sexual contact is initiated, because sensory signals from the genitals and other body regions feed into the brain circuits that mediate arousal.

In order to identify the brain regions that are involved in sexual arousal, researchers have shown erotic film clips to subjects who are undergoing functional brain imaging (Figure 5.13). Among the brain regions that light up under these conditions is a

© 2011 Sinauer Associates, Inc. This material cannot be copied, reproduced, manufactured or disseminated in any form without express written permission from the publisher.
region of the cerebral cortex named the anterior cingulate cortex. This region also lights up when people who are in love simply view a photo of their beloved (Bartels & Zeki, 2004) and when people are given euphoria-inducing drugs such as cocaine. Thus, it seems to be involved in the processing of “happy” states.

For reasons that are not well understood, sexual arousal appears to operate in a more specific manner in men than in women. Most men are aroused (psychologically and genitally) by erotic images that are appropriate to their sexual orientation; that is, straight men are aroused by images of women, and gay men are aroused by images of men. Most women, on the other hand, are aroused about equally by erotic images of women and men, although bisexual and lesbian women usually experience more arousal to images of women than of men (Chivers et al., 2004; Suschinsky et al., 2009; Chivers et al., 2011). Another study tracked the gaze of men and women while they were watching erotic heterosexual videos: The men looked mostly at the women, whereas the women looked about equally at the men and the women (Lykins et al., 2008). It may be that these differences reflect a greater fluidity of sexual orientation in women than in men—a topic we will discuss in Chapter 12. Alternatively, it may be that women are more interested in the totality of the sexual interaction and perhaps wish to know whether both partners are sexually aroused.

**Hormones influence sexual arousability**

Do biological factors influence sexual arousal? The first thing one thinks of in this context is testosterone. A popular misconception is that this hormone influences sexual arousal—particularly in men—on a minute-by-minute or hour-by-hour basis. A man who is feeling “horny” (that is, who is experiencing an unfocused sense of sexual arousal and is motivated to find some way of satisfying it) might comment that he “can feel the testosterone flowing,” or the like.

In reality, testosterone does not seem to have any short-term influence on the sexual feelings of either men or women. For example, a research group at Georgia State University (Dabbs & Mohammed, 1992) hypothesized that heterosexual couples would be more likely to have sex on evenings when the testosterone level of one or both partners was high. They recruited a number of couples and had them take saliva samples early and late in the evening over many nights. Salivary testosterone levels (which correlate well with the level of free testosterone in the blood) were no higher early on the “sex” evenings than on the “no sex” evenings, in either the men or the
women. Testosterone levels were higher late on the “sex” evenings—after sex had occurred—than late on the “no sex” evenings, and this was true for both the men and the women. This finding suggests that sexual activity triggers a rise in testosterone but that high testosterone does not trigger a desire for sexual activity.

There is evidence, however, that testosterone has a longer-term influence on our capacity to experience sexual arousal. The clearest connection between testosterone levels and sexual arousability is found in boys at around the time of puberty. In one study of boys in grades 8, 9, and 10 of a public school system, those boys who were experiencing the rise in testosterone levels associated with puberty were much more likely to experience sexual feelings and engage in sexual behavior than boys of the same age whose testosterone levels had not yet risen (Udry et al., 1985). This finding is consistent with research in nonhuman animals, which suggests that testosterone activates brain circuits involved in male-typical sexual behavior. The researchers noted that the boys’ sexual motivation was less closely related to their degree of physical maturation than it was to their testosterone levels. More recent longitudinal studies by the same research group have supported a role for testosterone in the onset of sexual feelings and behavior—in both boys and girls (Halpern et al., 1997, 1998).

An ideal experiment would be to vary testosterone levels in children artificially and then study the effects on their sexuality. Under most circumstances, conducting such an experiment would be unethical, but some boys with delayed puberty receive testosterone as part of their treatment (Finkelstein et al., 1998). A group of such boys agreed to participate in a study in which their testosterone treatments were alternated with placebo treatments in a double-blind experimental design (that is, neither the patients nor their doctors knew who was receiving the real hormone). The researchers then studied the boys’ sexual ideation and behavior over a period of 21 months. The treated boys did think more about sex, and they engaged in more sexual touching and “necking.” Still, the effects were not particularly strong, and the researchers concluded that social effects must also play an important role in determining when adolescent boys begin to engage in sexual behavior.

Testosterone levels do influence sexual arousability in adult men; in fact, men who have a profound reduction in testosterone levels for any reason (hypogonadal men) suffer a gradual decline in sexual desire and activity, and this decline can be reversed by testosterone replacement therapy (Wang et al., 2000). Most men seem to have levels of testosterone that are well above the “ceiling” for its effect on arousability, however. In other words, variation in the testosterone levels of healthy men does not account for variation in their sexual feelings and behavior—or it does so to only a small degree. Testosterone is one of many substances used as aphrodisiacs (Box 5.2), but it’s doubtful that testosterone enhances sexual desire or performance in healthy men.

The situation in women is more complex because at least two groups of hormones are involved—androgens (including testosterone) and estrogens—and their levels vary around the menstrual cycle. Testosterone levels in women are quite low compared with those in men—roughly 10 to 20 times lower—so it is less likely that these levels are at a “ceiling.” In other words, there may be more potential for changes in testosterone levels to modulate sexual arousability in women than in men.

The Pennsylvania State University study of children with delayed puberty, described above, included girls as well as boys. The girls were treated with oral estrogen, which had almost no effect on the girls’ sexual thoughts or behaviors. In general, it appears that testosterone is more important than estrogens in influencing female sexual arousability, both in adolescent girls and in adult women, and may contribute to changes in women’s sex drive at different times in the menstrual cycle (Morris et al., 1987; Udry et al., 1988; Van Goozen et al., 1997; Davis, 2000). Estrogens may have important indirect effects on sex, however: A reduction in estrogen levels, such as the decline that occurs at menopause, may lead to vaginal dryness and hence to painful intercourse, which in turn may cause a decline of interest in sex.

© 2011 Sinauer Associates, Inc. This material cannot be copied, reproduced, manufactured or disseminated in any form without express written permission from the publisher.
Biology of Sex

Aphrodisiacs and Drugs

Aphrodisiacs—named for the Greek goddess of love, Aphrodite—are substances intended to improve one’s own sexual desire, sexual performance, or sexual pleasure or to cause someone else to respond to one’s advances or to fall in love. In the latter case, they may be called “love potions.”

Traditionally, the belief that certain substances are aphrodisiacs has been based on magical thinking, especially the “law of similarity,” which holds that “like produces like” (Frazer, 1922). Thus, aphrodisiacs have been derived from things that resemble penises (e.g., rhinoceros horns) or vulvas (e.g., oysters) or from sex organs or secondary sexual structures of animals, such as bull’s testicles, the bacula (penis bones) of harp seals, and deer velvet (the skin covering the growing antlers of male deer—see figure). It’s not likely that any of these substances work, unless simply by the power of suggestion. A New Zealand research group went to the trouble of conducting a double-blind, placebo-controlled trial of deer velvet and found absolutely no effect on men’s sexual function or that of their partners (Conaglen et al., 2003). The slaughter of wild animals for their “aphrodisiac” body parts is a threat to the survival of several species.

Eastern medical practitioners have long claimed that ginseng root is useful in the treatment of sexual dysfunctions. Controlled scientific studies have lent some support to this belief: Ginseng facilitates sexual behavior in male rats (Murphy et al., 1998), and studies report that it alleviates erectile dysfunction in some men (de Andrade et al., 2007) and improves sexual function in some menopausal women (Oh et al., 2010). ArginMax—a proprietary mixture of ginseng, the amino acid arginine, and other substances—has been reported in small pilot studies to improve sexual function in men and women, but the components of this mixture can have serious side effects (Memorial Sloan-Kettering Cancer Center, 2009). Its use is not recommended until researchers have conducted large-scale studies of the product. Botanicals such as ginseng are poorly regulated and are not necessarily safe simply because they are natural products.

Another class of substances that is sometimes used as aphrodisiacs is that of recreational drugs. Here the issue is not so much whether they work—they often do—but their safety. The following are some examples:

- **Amyl nitrite (“poppers”) and related drugs such as butyl nitrite**, which are administered by inhalation, produce a brief “rush,” during which time sexual feelings are enhanced and the pleasurable sensations of orgasm are intensified. It is dangerous to use these drugs in combination with Viagra or related drugs, since a life-threatening drop in blood pressure can result. Even used alone, they can have serious harmful effects in people with cardiovascular or breathing problems.

- **Marijuana**, the most widely used illicit drug in the United States, tends to exaggerate preexisting personality traits and thus has very different effects in different people. In some it induces relaxation or heightened sensitivity that makes sex more enjoyable. In others it increases anxiety or impairs the physical skills required for a satisfying

Conditioning may influence arousal

**Classical or Pavlovian conditioning** is the name given to a form of associative learning first studied by the Russian physiologist Ivan Pavlov in the early 20th century. Pavlov observed that dogs salivate automatically when they smell food (which is an “unconditioned stimulus”). Pavlov began to ring a bell just before a dog was given food. Over time, the dog began to salivate at the sound of the bell alone—which had become a “conditioned stimulus” due to its repeated association with food.

Classical conditioning influences sexual arousal. In one Canadian study (Lalumière & Quinsey, 1998), researchers repeatedly showed male subjects a photograph of a moderately attractive, partially nude woman. Some of the subjects viewed the photo by itself; the others viewed it in conjunction with a highly arousing video of heterosexual sex. Over time, the men who viewed the photo in conjunction with the arousing video were more strongly aroused by the photo alone than they were at the start of the study. This, the researchers concluded, demonstrated the effect of classical conditioning.

A research group based in the Netherlands conducted an experiment on women that was more analogous to Pavlov’s experiments on dogs (Both et al., 2008b). In this case the unconditioned stimulus (analogous to food for a dog) was the application
sexual experience. In chronic users it may cause difficulty in experiencing orgasm (Johnson et al., 2004).

- Methamphetamine (“meth”) is said to intensify the pleasure of sexual experiences. It is a highly addictive drug, however. With repeated use, it damages the brain’s dopamine system, producing psychosis as well as symptoms similar to Parkinson’s disease. It eventually reduces the pleasure of sex and makes orgasm unattainable even with the help of the drug.

- Cocaine in moderate doses can enhance sexual sensations but in high doses or with chronic use can cause erectile difficulties as well as the inability to achieve orgasm (in both men and women). Overdoses are potentially fatal.

- MDMA (“Ecstasy”) is a serotonin-related drug that can increase sexual arousal as well as general energy and euphoria. It can have serious adverse effects in people with cardiovascular problems, and with repeated use it can damage the brain’s serotonin system. It can cause psychological problems such as depression and anxiety that persist after drug use ceases. Ecstasy tablets are often contaminated with other drugs.

- Heroin and other opiates, when injected intravenously, produce a “rush” that users often describe as resembling orgasm, but these dangerous drugs lower the sex drive and impair sexual performance. Another sexual “side effect” is that at least half of female users support their habit through prostitution (Independent Drug Monitoring Unit, 2011).

of a vibrator to the clitoris, which typically elicits sexual arousal. In conjunction with the vibratory stimulus, the women were shown a test photo of a heterosexual couple engaging in sex. (The photo was presented subliminally—that is, it was shown too briefly for the women to be conscious of it.) As a control, a different photo of heterosexual sex was shown while the vibrator was turned off. Later the test photo, unaccompanied by the vibrator, elicited more genital blood flow than did the control photo, suggesting that the association of the test photo with the vibrator turned the test photo into a conditioned stimulus.

In both of these studies, the conditioned stimuli (the photo of a partially nude woman in the first study, and the photo of heterosexual sex in the second) were in themselves potentially arousing sexually; the effect of the conditioning was simply to make them more so. By extension, it’s conceivable that the same process could explain how a person becomes sexually aroused by an object—such as a shoe—that originally was not sexually arousing at all. What it would take might be for the person to repeatedly use or fantasize about the object while masturbating or having sex. We will discuss this issue when we cover atypical forms of sexual expression, such as fetishes, in Chapter 13.
**Figure 5.14** Genital changes in women during the sexual response cycle.

**Sexual Arousal Follows a Response Cycle**

In Chapters 2 and 3 we described some of the genital phenomena that accompany sexual arousal in women and men. We now attempt to tie these phenomena together into a coherent sequence or process—the sexual response cycle. This cycle goes forward in a fairly similar way regardless of how arousal occurs (e.g., through partnered sex or by solitary masturbation).

The best-known description of the overall response cycle is the one developed by Masters and Johnson, in which they divided the process into four phases: excitement, plateau, orgasm, and resolution.

In the *excitement phase, genital responses begin*

The *excitement phase* is just what it sounds like: the period during which sexual arousal begins. In women it is marked by swelling and opening up of the labia minora, vaginal lubrication, a deepening in the color of the labia minora and the vaginal walls (caused by *vasocongestion*), erection of the clitoris and nipples, swelling of the breasts, and an increase in heart rate and blood pressure (*Figure 5.14*). The uterus elevates within the pelvis (Schultz et al., 1999); this is known as the “tenting effect.”

---

**sexual response cycle** The sequence of physiological processes that accompany sexual behavior.

**excitement phase** The beginning phase of the sexual response cycle.

**vasocongestion** Tissue swelling caused by increased filling of local blood vessels.
In men the excitement phase is marked mainly by erection of the penis (Figure 5.15). In healthy and highly aroused young men the process of erection takes less than a minute—perhaps as little as 10 seconds. Usually the corpora cavernosa become erect first, followed more slowly by the corpus spongiosum. In older men, men who have health problems affecting erection, or men who are not highly aroused, the process of penile erection may take many minutes.

Also during the excitement phase, contraction of the cremaster muscle begins to elevate the testicles. The skin of the scrotum becomes thicker and more wrinkled, due to contraction of the underlying muscle layer. The nipples may also become erect.

Of course, the various components of the excitement phase don’t always occur together or to the same degree. The duration of the excitement phase also varies, from less than a minute to an hour or more.

In the plateau phase, arousal is maintained

The plateau phase is a state of high arousal that may be maintained for some time, from several minutes to several hours (in the case of extended lovemaking). Among
**orgasmic platform** The outer portion of the vagina and surrounding tissues, which thickens and tenses during sexual arousal.

**myotonia** A general increase in muscle tension.

**orgasm** The intense, pleasurable sensations at sexual climax, and the physiological processes that accompany them.

Men, there is considerable variability in how long a man is able (or wishes) to remain in the plateau phase before reaching orgasm. In women, physiological events that occur during the plateau phase include the thickening and tightening of the outer third of the vagina and the surrounding muscles of the pelvic floor. This causes the outer part of the vaginal canal to narrow, so that (if coitus is occurring) it grips the penis more tightly. This tense outer region of the vagina and surrounding tissues is called the **orgasmic platform**. The inner part of the vagina, in contrast, tends to balloon out and lengthen, so that it does not grip the penis at all tightly during coitus.

During the plateau phase, the glans of the clitoris usually disappears under its hood. The breasts may swell further, and the areolae may become engorged and swollen, making the nipples appear less prominent than before. In some women, the breasts or other parts of the body may take on a flushed appearance. Heart rate and blood pressure increase further, accompanied by a general increase in muscle tension (**myotonia**) throughout the body.

In men, secretions from the bulbourethral glands (“pre-cum”) may appear at the urethral opening during the plateau phase. The erection of the penis becomes stronger and is less readily lost. The testicles elevate farther. According to Masters and Johnson, the testicles also swell by a variable amount (Masters & Johnson, 1966). Heart rate and respiration rate increase, accompanied by a general increase in muscle tension.

The term “plateau,” which means a flat region in a graph, suggests a steady state in which not much is changing, physiologically speaking. This may be misleading, however. Sometimes a person will pass rapidly from excitement through plateau to orgasm. (This might be because the person deliberately tries to reach orgasm quickly, or because he or she has difficulty in delaying orgasm.) In such cases the plateau phase may be a brief period of rapidly increasing arousal that is difficult to distinguish from the excitement phase. If the plateau phase is maintained for an extended time, however, there are likely to be periodic increases and decreases in arousal depending on the stimulation the person is experiencing, distraction, fatigue, and other factors. Thus, the plateau phase is more of a general concept than a definable episode within each and every sexual experience.

**Orgasm is the climax of sexual arousal**

**Orgasm** is the subjective experience of intense pleasure and release at sexual climax, as well as the accompanying physiological processes. As previously discussed in Chapter 3, it is very similar in men and women. Orgasm is usually felt as a brief series of muscle contractions in the genital area, but the sensation often radiates out to involve other parts of the body. Respiration rate, heart rate, and blood pressure all reach peak levels during orgasm. Muscle contractions may occur anywhere in the body. In men orgasm is accompanied by two genital events described in Chapter 3: emission, in which the various components that make up semen are released into the urethra, and ejaculation, in which the semen is forcefully expelled from the urethral opening. Some women also ejaculate during orgasm (**Box 5.3**).

Orgasm may be experienced as a brief period of altered consciousness or as a loss of control. The person experiencing orgasm may groan or shout involuntarily. Orgasm is usually felt as a release of sexual tension, followed by calm. What about the actual sensation of orgasm in women and men—is it the same? Given the difficulty of assessing subjective sensations, we may never know for sure, but based on written descriptions provided by women and men there seems to be little if any difference (**Box 5.4**).

Masters and Johnson, as well as more recent sex researchers, have investigated the physiological basis of the muscle contractions experienced during orgasm. (We described some of the research, on men, in Chapter 3). In women, the spasms derive
BOX 5.3 Biology of Sex

Female Ejaculation

You might think that ejaculation would be a purely male experience, but some women say that they experience a discharge of some type of fluid from the urethra at sexual climax (Darling et al., 1990). The discharge seems to be of two kinds. In one kind, a small amount (a few drops to a teaspoonful or so) of an opalescent (pearly) fluid is discharged, usually without great force. In another kind, a larger quantity of clear fluid is discharged, sometimes with sufficient force to project the fluid away from the woman’s body (“squirt”). For the most part, different women report experiencing the two different kinds of discharge.

The low-volume, opalescent discharge appears to be a secretion from the paraurethral glands. As described in Chapter 2, these small glands, which are probably equivalent to the much larger prostate gland in men, lie just in front of the front wall of the vagina, in close proximity to the urethra, but are highly variable in size and position (Wimpissinger et al., 2009). The ducts of these glands open into the urethra about 1 inch (2 cm) back from the urethral opening. Consistent with this interpretation, the low-volume discharge contains an enzyme characteristic of secretions from the male prostate gland: prostatic acid phosphatase (Belzer et al., 1984). The functional role of this kind of discharge in women, if any, is unknown. Because the male ejaculate consists in part of prostatic secretions, the paraurethral ejaculation in women is a partial parallel to male ejaculation—minus the sperm, of course.

The high-volume, clear discharge has been much more controversial, with some sexologists doubting the reality of the phenomenon or interpreting it as urine. To solve the riddle, sexologist Gary Schubach recruited volunteers who stated that they experienced large-volume discharges (Schubach, 2001). Schubach observed that these women did indeed expel large volumes—3 ounces (100 mL) or more—of watery fluid from the urethra at orgasm.

To investigate the origin of this fluid, Schubach passed a fine rubber tube (catheter) through the urethras of some of the women, past the ducts of the paraurethral glands and into the bladder (see the figure). The women then masturbated (or were stimulated by their partners) to orgasm. The idea was that if the fluid was urine, it should exit the urethra via the inside of the catheter, but if it was a secretion from the paraurethral glands or other nearby glands, it should exit the urethra outside the catheter. In all cases, all the high-volume fluid expelled at orgasm exited via the inside of the catheter. Schubach’s conclusion: High-volume female “ejaculation” involves the expulsion of urine from the bladder. However, this discharge may be experienced as sexual in nature. Some of the women also released the low-volume, opalescent discharge, and this fluid emerged outside the catheter, consistent with an origin in the paraurethral glands.

Both types of discharge may legitimately be referred to as “female ejaculation,” but only the low-volume, opalescent discharge has anything in common with male ejaculation.

from intense contractions of the pubococcygeus muscle and nearby pelvic-floor muscles, which cause tightening of the outer portion of the vagina. The anal sphincters, the uterus, and even the oviducts may also undergo contractions. The contractions occur about once per 0.8 second, and a total of about eight or ten occur in a typical orgasm. This would give a total duration of about 10 seconds, but researchers using a different method (blood flow in the vaginal wall) came up with a longer estimate (20 seconds), which corresponds more closely to the average duration of orgasm as indicated by women in a laboratory setting (26 seconds) (Levin & Wagner, 1985).

There has long been debate about whether women experience different kinds of orgasms depending on what parts of their genitals are stimulated. According to Masters and Johnson, the key physiological sign of orgasm in women—rhythmic contractions of the muscles around the outer part of the vagina—are the same no matter how orgasm is triggered and are probably the result of direct or indirect stimulation.
Women and Men Describe Their Orgasms

The following are descriptions of orgasms written by students in an introductory psychology course in the 1970s. Some sex-specific words, such as “penis” or “clitoris,” have been changed to “genitals.” Experts who read these descriptions were unable to tell which descriptions were written by women and which by men.

- “Feels like tension building up until you think it can’t build up any more, then release. The orgasm is both the highest point of tension and the release almost at the same time. Also feeling contractions in the genitals. Tingling all over.”
- “An orgasm ... located (originating) in the genital area, capable of spreading out further ... legs, abdomen. A sort of pulsating feeling—very nice if it can extend itself beyond the immediate genital area.”
- “Begins with tensing and tingling in anticipation, rectal contractions starting series of chills up spine. Tingling and buzzing sensations grow suddenly to explosion in genital area, some sensation of dizzying and weakening—almost loss of conscious sensation, but not really. Explosion sort of flowers out to varying distance from genital area, depending on intensity.”
- “A heightened feeling of excitement with severe, muscular tension especially through the back and legs, rigid straightening of the entire body for about 5 seconds, and a strong and general relaxation and very tired relieved feeling.”
- “Tension builds up to an extremely high level—muscles are tense, etc. There is a sudden expanding feeling in the pelvis and muscle spasms throughout the body followed by release of tension. Muscles relax and consciousness returns.”
- “Intense excitement of entire body. Vibrations in stomach—mind can consider only your own desires at the moment of climax. After, you feel like you’re floating—a sense of joyful tiredness.”
- “A building of tension, sometimes, and frustration until the climax. A tightening inside, palpating rhythm, explosion, and warmth and peace.”
- “Often loss of contact with reality. All senses acute. Sight becomes patterns of color, but often very difficult to explain because words were made to fit in the real world.”
- “Has a buildup of pressure in genitals with involuntary thrusting of hips and twitching of thigh muscles. Also contracting and releasing of the genital muscles. The pressure becomes quite intense—like there is something underneath the skin of the genitals pushing out. Then there is a sudden release of the tension with contraction of genitals with a feeling of release and relaxation.”
- “Spasm of the abdominal and groin area, tingling sensation in limbs, and throbbing at the temples on each side of my head.”


- Orgasm—does it feel different for men and women?

of the clitoris (Masters & Johnson, 1966). Masters and Johnson placed relatively little emphasis on erotic sensitivity within the vagina itself. A different view has been put forward by Barry Komisaruk and Beverly Whipple (of Rutgers University) and several colleagues (Ladas et al., 2004; Komisaruk et al., 2006). According to studies by this group, stimulation of the clitoris and stimulation of the anterior wall of the vagina (a region including the “G-spot”—see Figure 2.8) give rise to two different orgasmic sensations. Clitoral orgasms, they say, involve sensations more or less restricted to the area of the clitoris itself, whereas vaginal orgasms are described as involving the entire body. Yet a third kind of sensation is said to be elicited by direct stimulation of the cervix. The differences arise, according to these authors, because these three regions are connected to the brain via different
neural pathways. Simultaneous stimulation of all three regions is said to give rise to a “blended orgasm” that combines the sensations elicited by each of the regions. There is definitely room for more research in this area. While it is possible that women experience more than one kind of orgasm, it is also possible that stimulation of different sites leads to the same kind of orgasm, varying perhaps in intensity but not in its physiological basis.

**Brain imaging suggests where orgasm may be experienced**

The subjective experience of orgasm must result from some kind of activity in the brain, but where in the brain does that activity occur? To study this question in men, a Dutch group (Holstege et al., 2003) used a functional brain imaging technique (PET scanning). The researchers took scans in two conditions: when the subject was being manually stimulated by his female partner but was not experiencing orgasm, and in the same situation when he was experiencing orgasm (Figure 5.16). One scan was then digitally subtracted from the other to show the pattern of activity that was specifically associated with orgasm. The researchers found that the most active region was a zone in the midline of the brain including part of the thalamus and nearby structures. Interestingly, this same region has been shown to be active during a heroin rush. It contains many neurons that use dopamine as a neurotransmitter; dopamine is believed to be involved in brain processes that have to do with pleasure and reward. Activity in the cerebral cortex—seat of our intellectual lives—decreases greatly during orgasm. This may reflect a switching-off of cognitive or behavioral processes that would otherwise inhibit orgasm.

More recently, the Dutch group extended their observations to women: Again, there was activation of dopamine-related systems and a general drop in activity in the cerebral cortex (Georgiadis et al., 2006). The Rutgers University group has also observed activation of dopamine-related systems during orgasm in women. In particular, they saw heightened activity in the nucleus accumbens. Portions of the nucleus accumbens appear to serve as a final common pathway for reward and pleasure: The evidence for this is that, given the opportunity, animals will electrically stimulate their own nucleus accumbens in preference to any real-world reward such as food or sex. Thus, the activation of this region during orgasm may help explain why the experience of orgasm is intensely pleasurable.

**nucleus accumbens** A nucleus within the basal ganglia that is part of the brain’s reward system.
oxytocin  A hormone secreted by the pituitary gland that stimulates uterine contractions and the secretion of milk.

resolution phase  The phase of the sexual response cycle during which physiological arousal subsides.

In both men and women, orgasm is accompanied by the surgelike release of the hormone oxytocin from the pituitary gland (Carmichael et al., 1994). Oxytocin contributes to the contraction of smooth (involuntary) muscles such as those in the wall of the uterus and in breast tissue. (It plays an important role in childbirth and breastfeeding, and possibly also in the formation of durable sexual relationships, as we’ll see in Chapter 7.) Its release during orgasm may contribute to the contractions that accompany orgasm. In addition, however, oxytocin released during orgasm probably acts directly on the brain, helping generate the pleasurable sensations of orgasm. If the release of oxytocin is blocked, the physiological events of orgasm occur more or less normally, but the pleasurable quality of the orgasm is greatly reduced (Murphy et al., 1990). Administration of oxytocin may help some individuals, who otherwise have difficulty doing so, experience orgasm (Ishak et al., 2008).

In the resolution phase, arousal subsides

The resolution phase is the period during which the physiological signs of arousal reverse themselves. In women, clitoral erection, vasocongestion, and lubrication subside, the vaginal and pelvic-floor muscles relax, and the breasts lose their swollen appearance. In men, the penis loses its erection and the testicles descend within the scrotum. In both sexes, heart rate and blood pressure return to normal levels. Psychological arousal usually subsides too, and there is often a sense of relaxed contentment. Full resolution typically takes about 15 minutes, but resolution is slower if an orgasm has not occurred.

The phases may be linked in different ways

Although the excitement, plateau, orgasm, and resolution phases are the building blocks of the sexual response cycle, individual cycles may be assembled in a variety of ways (Figure 5.17). In one type of cycle (shown in orange in the figure), the person passes sequentially through the four phases in the sequence just described—excitement, plateau, orgasm, and resolution. This might be called the “standard version” of the response cycle.

A second type of cycle (shown in red in the figure) skips the orgasm phase: The person passes from excitement to the plateau phase, and then directly to the resolution phase. We have become acculturated to think of this as a sign of something wrong or missing: We might say that the person “failed to achieve” orgasm. Still, the fact is that it is a common type of cycle. Women may describe it as a fully satisfying sexual experience—in fact some women never experience orgasm but nevertheless express satisfaction with their sex lives. Alternatively, they may feel frustrated, and they may even be left with an aching sensation in their pelvic area, perhaps due to prolonged vasocongestion and the resulting loss of tissue oxygenation.

Men are less likely than women to be satisfied with a sexual experience that doesn’t include orgasm—only 34% of men, compared with 50% of women, believe that sex without orgasm can be satisfying, according to a large British survey (Wellings et al., 1994). Besides the loss of the pleasure and release associated with orgasm, men sometimes experience
testicular pain (“blue balls”), which is likely due to vasocongestion and anoxia (Chalett & Nerenberg, 2000). Men sometimes plead “blue balls” by way of pressuring their partner into continuing a sexual encounter. That’s hardly a compelling argument, because in that situation the condition—if real—could easily be relieved by masturbation.

**Some people experience multiple orgasms**

A third type of cycle involves multiple orgasms (the blue line in Figure 5.17). A multiple orgasm means a sequence of at least two orgasms, between which the person descends only to the plateau phase of genital arousal (Amberson & Hoon, 1985). It does not refer to having an orgasm, losing one’s arousal completely, and then quickly entering another arousal cycle that culminates in a second orgasm.

Multiple orgasms are far more common in women than in men. One survey of college-educated U.S. nurses found that about 43% of them usually experienced multiple orgasms (Darling et al., 1991). No doubt many more women could experience multiple orgasms if they wanted to or if they had the cooperation of their partners. However, women are not necessarily more satisfied with multiple orgasms than with a single orgasm, as many men would imagine. Reports of large numbers of multiple orgasms—up to 50 or so—are based on women who are masturbating with vibrators, rather than engaging in coitus.

Masters and Johnson reported that women can sometimes experience a sequence of orgasms that follow almost directly one after the other, so that the woman doesn’t even descend into the plateau phase between them. The orgasms may be considered to form one single, unusually prolonged orgasm. These serial orgasms, can last from 20 seconds up to a minute or so.

A few men also experience multiple orgasms (Dunn & Trost, 1989). Usually, only one orgasm in the series—usually the last—is accompanied by ejaculation, while the previous ones are “dry.” Some sexologists believe that all men can learn to have multiple orgasms. For those who wish to try, instructions are available online (Silverberg, 2008). The key, it is said, is learning to separate orgasm from ejaculation by stopping stimulation just short of ejaculation.

A small number of men, however, are naturally capable of experiencing multiple ejaculatory orgasms. One such man was observed in the lab while he experienced six orgasms over the course of 36 minutes, without any loss of erection between orgasms. Each of the six events was accompanied by ejaculation, intense psychological arousal, and all the other manifestations of orgasm (Whipple et al., 1998).

**Men experience a refractory period**

In spite of the unusual case just described, most men experience a period of time after orgasm during which further sexual stimulation does not lead to renewed erection or a second orgasm. According to Masters and Johnson, this refractory period lasts between 30 and 90 minutes. The length of the period varies greatly with age, however, being negligible in some boys around the age of puberty but extending over a day or more in some older men. While the early part of the refractory period may be absolute—that is, the man cannot be physiologically aroused by any means—it may be followed by a relative refractory period during which the man can be aroused by stronger than usual stimuli, such as a novel sex partner. This is probably related to the Coolidge effect, described earlier.

**The Masters and Johnson cycle may be incomplete**

Masters and Johnson’s four-stage model of sexual response is primarily a description of physiological processes—effects that one can observe or measure during sexual

---

**Multiple orgasms** Two or more orgasms, between which the person descends only to the plateau level of arousal.

**Serial orgasms** Two or more orgasms with no more than a few seconds between them.

**Refractory period** In males, a period of reduced or absent sexual arousability after orgasm.
behavior, such as erection or changes in blood pressure. Since Masters and Johnson’s time, researchers have made efforts to place the physiological response cycle in a larger psychological context.

One important issue is this: Do the physiological markers of sexual arousal—erection, vasocongestion, lubrication, and so forth—correspond to psychological or subjective arousal, meaning the person’s sense of being sexually excited? There appears to be a difference between men and women in this respect. A man’s psychological arousal is usually closely tied to his genital arousal—his mind and his penis are one, so to speak. Women, however, do not always feel sexually excited when their genitals are showing every sign of arousal (Suschinsky et al., 2009). It may be that a woman’s genital arousal is less obvious to her than is penile erection to a man, or women may be acculturated to ignore the messages from their genitals. But the reason for this potential disconnect between physiological and psychological arousal in women remains mysterious and deserves further study. For one thing, it may affect whether drugs that increase genital arousal offer any psychological benefit for women with sexual dysfunctions.

Another issue is this: Where does sexual desire fit into the overall response cycle? According to Helen Singer Kaplan, sexual desire is the psychological state that precedes and leads to physiological arousal (Kaplan, 1979). This makes intuitive sense: We want to engage in sex, so our genitals become aroused. But here again, there may be a difference between men and women. For men, Kaplan’s model is widely accepted. In the case of women, however, several researchers have moved away from Kaplan’s model (Basson, 2000, 2001). Psychiatrist Rosemary Basson proposes that many women, especially those in established relationships, are not motivated to engage in sexual behavior by what we would usually think of as sexual desire—“horniness,” “sex hunger,” “the urge to merge,” or whatever you want to call it. Rather, they have an interest in sex that flows from a wish for intimacy with the partner or from an expectation of benefits that may flow from a sexual interaction. This interest is responsive, cognitive, or even intellectual in quality, rather than being the expression of a biological drive. Once physical interactions begin, however, and the physiological processes of sexual arousal are triggered, genital sensations provide a “feedback” stimulus that reinforces sexual interest and gives it more the quality of true sexual desire, so a self-reinforcing cycle is set up. Again, this model has implications for the treatment of sexual dysfunctions in women (see Chapter 14).

In fact, a survey by Cindy Meston and David Buss identified no fewer than 237 distinct reasons why people have sex, many of them having nothing to do with sexual attraction, desire, or arousal (Meston & Buss, 2007). These included such reasons as “I wanted to get back at my partner for cheating on me,” “I wanted to get closer to God,” and “I wanted the person to feel good about himself/herself.” Evidently the motivations for engaging in sex can be complex and diverse and can’t be encompassed by any single model.
Summary

- Sexual attraction is a response to another person that is influenced by objective attributes of that person, as well as by both durable and varying characteristics of the person experiencing the attraction.
- The “masculinity” and “femininity” of faces is an important part of their attractiveness. In women, most people find very feminine faces the most attractive. Women’s judgments of the attractiveness of male faces vary around their menstrual cycle.
- Another attribute that increases a person’s attractiveness is facial and bodily symmetry. One reason we may find symmetry attractive is because it indicates that a person had a healthy physical development.
- One important factor influencing the attractiveness of bodies is the body mass index (BMI). For cultural reasons, lower BMIs are preferred in Western cultures than in some non-Western cultures.
- Youthful appearance—another cue to fertility—is an important criterion of physical attractiveness in women, but less so in men.
- Attractiveness is strongly enhanced by general “likability” traits such as trustworthiness, warmth, and a sense of humor. When people are given the opportunity to select partners from a large group, however, they don’t generally choose the partners who correspond most closely to their stated preferences. This suggests that some aspects of attraction operate below the level of conscious thought.
- Other factors modulating sexual attraction include familiarity and, in women, the phase of the menstrual cycle.
- Some individuals are asexual: They never experience sexual attraction. They might not engage in sexual relationships, or they might do so simply to satisfy their partners.
- Sexual arousal may be triggered internally or by external factors. Internal processes include erotic dreams and sexual fantasies. Fantasies are a healthy part of most people’s sex lives.
- Testosterone plays an important role in conferring the capacity for sexual arousal in males, especially at puberty. Testosterone does not play a minute-by-minute role in sexual arousal, however. Both testosterone and estrogens may contribute to sexual arousability in women; testosterone is probably the more important of the two.
- Classical conditioning may increase the sexual arousal that individuals learn to associate with people, body parts, and other things that have been linked with sex in the past.
- The sexual response cycle has four phases: excitement, plateau, orgasm, and resolution.
- The subjective experience of orgasm is similar in women and men. Many women but few men experience multiple orgasms in a single cycle. Sometimes a response cycle does not include orgasm. A cycle without orgasm may be perceived as sexually satisfying, or it may leave the person dissatisfied and in discomfort from vasocongestion that is slow to resolve.
- After orgasm, men but not women experience a refractory period during which they cannot enter a new cycle. The length of the refractory period increases with age but can be shortened by situational factors such as exposure to a novel partner.

Discussion Questions

1. Cultural influences shape sexual arousal and attractiveness. Identify the culture of your ancestors, and identify the attributes that your culture finds sexually attractive (e.g., are thin women, or those with “curves” and “meat on their bones,” more attractive?).
2. Consider your reaction as you walk around campus or other areas and see people holding hands, kissing, lying on the grass in a passionate embrace, or almost having intercourse. What are your reactions to seeing such behavior? How does your reaction differ depending on whether the couple is homosexual or heterosexual? Do you think we should have rules or limits on the extent of public displays of affection or arousal?
3. Should sexual partners discuss what is arousing for each person? What are the costs and benefits of this type of communication? What are your attitudes toward talking with an intimate partner about what is arousing and what is not? Imagine for a moment that your partner had a fascination with your feet and wanted to kiss and touch them. How would your attitudes encourage or discourage this discussion?
4. As a class, make a list of words or phrases (e.g., common expressions, slang, words in other languages) that are used for (a) a woman who has sex with numerous partners; (b) a woman who doesn’t engage in partnered sex at all; (c) a man who has sex with numerous partners; and (d) a man who doesn’t engage in partnered sex. After the list is complete, discuss the attitudes and values it illustrates about men’s and women’s sexuality. Do you think that a double standard exists?
Web Resources

Asexuality Visibility and Education Network (AVEN)
www.asexuality.org

Beautycheck (study of attractiveness, using digitally manipulated faces) www.uni-regensburg.de/Fakultaeten/phil_Fak_II/Psychologie/Psy_II/beautycheck/english/index.htm

Recommended Reading


