

RETRIEVAL PRACTICE

- Which THREE of the following five factors contribute to unplanned teen pregnancies?
 - a. Alcohol use
 - b. Higher intelligence level
 - c. Unprotected sex
 - d. Mass media models
 - e. Increased communication about options

ANSWERS: a., c., d.

In one British survey, of the 18,876 people contacted, 1 percent were asexual, having “never felt sexually attracted to anyone at all” (Bogaert, 2004, 2006b; 2012). People identifying as asexual are, however, nearly as likely as others to report masturbating, noting that it feels good, reduces anxiety, or “cleans out the plumbing.”

Sexual Orientation

11-10 What has research taught us about sexual orientation?

To motivate is to energize and direct behavior. So far, we have considered the energizing of sexual motivation but not its direction, which is our **sexual orientation**—our enduring sexual attraction toward members of our own sex (*homosexual orientation*), the other sex (*heterosexual orientation*), or both sexes (*bisexual orientation*). We experience this attraction in our interests, thoughts, and fantasies (who’s that person in your imagination?). Cultures vary in their attitudes toward same-sex attractions. “Should society accept homosexuality?” *Yes*, say 88 percent of Spaniards, 80 percent of Canadians, 60 percent of Americans, 39 percent of South Koreans, 21 percent of Chinese, and 1 percent of Nigerians, with women everywhere being more accepting than men (Pew, 2013). Yet whether a culture condemns or accepts same-sex unions, heterosexuality prevails.

Sexual Orientation: The Numbers

How many people are exclusively homosexual? About 10 percent, as the popular press has often assumed? Or 20 percent, as the average American estimated in a 2013 survey (Jones et al., 2014)? According to more than a dozen national surveys that have explored sexual orientation in Europe and the United States, a better estimate is about 3 or 4 percent of men and 2 percent of women (Chandra et al., 2011; Herbenick et al., 2010a; Savin-Williams et al., 2012). When Gallup asked 121,290 Americans about their sexual identity—“Do you, personally, identify as lesbian, gay, bisexual, or transgender?”—3.4 percent answered *Yes* (Gates & Newport, 2012). When the National Center for Health Statistics asked 34,557 Americans about their sexual identity, they found essentially the same result: All but 3.4 percent answered “straight,” with 1.6 percent answering “gay” or “lesbian” and 0.7 percent saying “bisexual” (Ward et al., 2014).

Survey methods that absolutely guarantee people’s anonymity reveal another percent or two of gay people (Coffman et al., 2013). Moreover, people in less tolerant places are more likely to hide their sexual orientation. About 3 percent of California men express a same-sex preference on Facebook, for example, as do only about 1 percent in Mississippi. Yet about 5 percent of Google pornography searches in both states are for gay porn. And Craigslist ads for males seeking “casual encounters” with other men tend to be at least as large in less tolerant states, where there are also more Google searches for “Is my husband gay?” (Stephens-Davidowitz, 2013).

Fewer than 1 percent of people—for example, only 12 people out of 7076 Dutch adults in one survey (Sandfort et al., 2001)—reported being actively bisexual. A larger number of adults—13 percent of women and 5 percent of men in a U.S. National Center for Health Statistics survey—report some same-sex sexual contact during their lives (Chandra et al., 2011). And still more have had an occasional homosexual fantasy. In laboratory assessments, some self-identified bisexual men show a homosexual arousal pattern by responding with genital arousal mostly to male erotic images. Others exhibit increased viewing time and genital arousal to both male and female images (Cerny & Janssen, 2011; Lippa, 2013; Rieger et al., 2013; Rosenthal et al., 2012).

sexual orientation an enduring sexual attraction toward members of one’s own sex (homosexual orientation), the other sex (heterosexual orientation), or both sexes (bisexual orientation).

What does it feel like to be homosexual in a heterosexual culture? If you are heterosexual, one way to understand is to imagine how you would feel if you were socially isolated for openly admitting or displaying your feelings toward someone of the other sex. How would you react if you overheard people making crude jokes about heterosexual people, or if most movies, TV shows, and advertisements portrayed (or implied) homosexuality? And how would you answer if your family members were pleading with you to change your heterosexual lifestyle and to enter into a homosexual marriage?

Facing such reactions, some individuals struggle with their sexual attractions, especially during adolescence and if feeling rejected by parents or harassed by peers. If lacking social support, the result may be lower self-esteem and higher anxiety and depression (Jager & Davis-Kean, 2011; Kwon, 2013; Oswalt & Wyatt, 2011), as well as an increased risk of contemplating suicide (Plöderl et al., 2013; Ryan et al., 2009; Wang et al., 2012). They may at first try to ignore or deny their desires, hoping they will go away. But they don't. Then they may try to change, through psychotherapy, willpower, or prayer. But the feelings typically persist, as do those of heterosexual people—who are similarly incapable of becoming homosexual (Haldeman, 1994, 2002; Myers & Scanzoni, 2005). Moreover, as we noted in Chapter 6, people's sexual orientation is so basic to who they are that it operates unconsciously, as seen in experiments that draw their attention toward particular flashed nude images not consciously perceived.

Today's psychologists therefore view sexual orientation as neither willfully chosen nor willfully changed. "Efforts to change sexual orientation are unlikely to be successful and involve some risk of harm," declared a 2009 American Psychological Association report. Sexual orientation in some ways is like handedness: Most people are one way, some the other. A very few are truly ambidextrous. Regardless, the way one is endures.

This conclusion is most strongly established for men. Women's sexual orientation tends to be less strongly felt and potentially more fluid and changing (Chivers, 2005; Diamond, 2008; Dickson et al., 2013). In general, men are sexually simpler. Their lesser sexual variability is apparent in many ways, notes Roy Baumeister (2000). Across time, across cultures, across situations, and across differing levels of education, religious observance, and peer influence, adult women's sexual drive and interests are more flexible and varying than are adult men's. Women, for example, more often prefer to alternate periods of high sexual activity with periods of almost none (Mosher et al., 2005). In their pupil dilation and genital responses to erotic videos, and in their implicit attitudes, heterosexual women exhibit more bisexual attraction than do men (Rieger & Savin-Williams, 2012; Snowden & Gray, 2013). Baumeister calls women's more varying sexuality a difference in *erotic plasticity*.

In men, a high sex drive is associated with increased attraction to women (if heterosexual), or men (if homosexual). In women, a high sex drive is generally associated with increased attraction to both men and women (Lippa, 2006, 2007a; Lippa et al., 2010). When shown sexually explicit film clips, men's genital and subjective sexual arousal is mostly to preferred sexual stimuli (for heterosexual viewers, depictions of women). Women respond more nonspecifically to depictions of sexual activity involving males or females (Chivers et al., 2007).

Is there truth to the homosexual-as-child-molester stereotype? No. Measuring men's genital response to various sexual images indicates that sexual orientation is unrelated to pedophilia (Blanchard et al., 2009; Herek, 2014). A Canadian research team led by Ray Blanchard (2012; Dreger, 2011) outfitted 2278 men (mostly sex offenders) with a device that measured their "phallometric response" to viewing nude photos of adults and children of both sexes, accompanied by sexual audio stories. Most of the men responded not to children, but to adult men (if gay) or to adult women (if straight). Some of the men exhibited pedophilia, by instead responding mostly to young boys or girls, and much less to adults.



Stan Honda/AFP/Getty Images

Driven to suicide In 2010, Rutgers University student Tyler Clementi jumped off this bridge after his intimate encounter with another man reportedly became known. Reports then surfaced of other gay teens who had reacted in a similarly tragic fashion after being taunted. Since 2010, Americans—especially those under 30—have been increasingly supportive of those with same-sex orientations.

Personal values affect sexual orientation less than they affect other forms of sexual behavior

Compared with people who rarely attend religious services, for example, those who attend regularly are one-third as likely to have lived together before marriage, and they report having had many fewer sex partners. But (if male) they are just as likely to be homosexual (Smith, 1998).



Stephen J. Carrerra/AP Photo

Note that the scientific question is not “What causes homosexuality?” (or “What causes heterosexuality?”) but “What causes differing sexual orientations?” In pursuit of answers, psychological science compares the backgrounds and physiology of people whose sexual orientations *differ*.

Origins of Sexual Orientation

So, our sexual orientation is something we do not choose and (especially for males) cannot change. Where, then, do these preferences come from? See if you can anticipate the conclusions that have emerged from hundreds of research studies by responding *Yes* or *No* to the following questions:

1. Is homosexuality linked with problems in a child’s relationships with parents, such as with a domineering mother and an ineffectual father, or a possessive mother and a hostile father?
2. Does homosexuality involve a fear or hatred of people of the other sex, leading individuals to direct their desires toward members of their own sex?
3. Is sexual orientation linked with levels of sex hormones currently in the blood?
4. As children, were most homosexuals molested, seduced, or otherwise sexually victimized by an adult homosexual?

The answer to all these questions has been *No* (Storms, 1983). In a search for possible environmental influences on sexual orientation, Kinsey Institute investigators interviewed nearly 1000 homosexuals and 500 heterosexuals. They assessed nearly every imaginable psychological cause of homosexuality—parental relationships, childhood sexual experiences, peer relationships, dating experiences (Bell et al., 1981; Hammersmith, 1982). Their findings: Homosexuals are no more likely than heterosexuals to have been smothered by maternal love or neglected by their father. In one national survey of nearly 35,000 adults, those with a same-sex attraction were somewhat more likely to report having experienced child sexual abuse. But 86 percent of the men and 75 percent of the women with same-sex attraction reported no such abuse (Roberts et al., 2013).

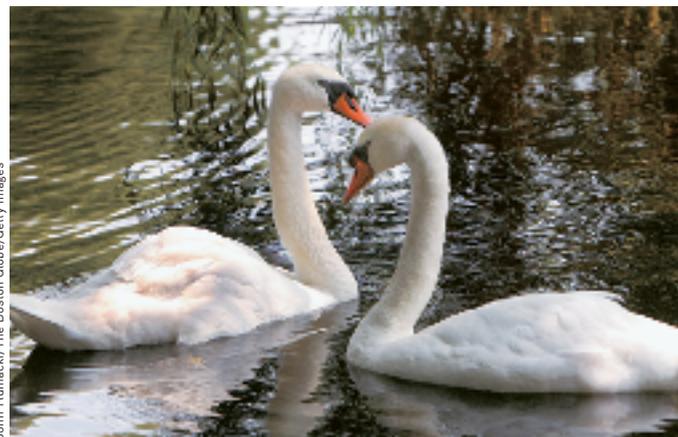
And consider this: If “distant fathers” were more likely to produce homosexual sons, then shouldn’t boys growing up in father-absent homes more often be gay? (They are not.) And shouldn’t the rising number of such homes have led to a noticeable increase in the gay population? (It has not.) Most children raised by gay or lesbian parents grow up straight and well-adjusted (Gartrell & Bos, 2010).

So, what else might influence sexual orientation? One theory has proposed that people develop same-sex erotic attachments if segregated by sex at the time their sex drive matures (Storms, 1981). Indeed, gay men tend to recall going through puberty somewhat earlier, when peers are more likely to be all males (Bogaert et al., 2002). But even in tribal cultures in which homosexual behavior is expected of all boys before marriage, heterosexuality prevails (Hammack, 2005; Money, 1987). (As this illustrates, homosexual *behavior* does not always indicate a homosexual *orientation*.) Moreover, though peer network attitudes predict teens’ sexual attitudes and behavior, they do not predict same-sex attraction. “Peer influence has little or no effect” on sexual orientation (Brakefield et al., 2014).

The bottom line from a half-century’s theory and research: If there are environmental factors that influence sexual orientation, we do not yet know what they are. This reality has motivated researchers to explore same-sex behaviors in animals and to consider gay-straight brain differences, genetics, and prenatal influences.

Same-Sex Attraction in Other Species In Boston’s Public Gardens, caretakers solved the mystery of why a much-loved swan couple’s eggs never hatched. Both swans were female. In New York City’s Central Park Zoo, penguins Silo and Roy spent several years as devoted same-sex partners. Same-sex sexual behaviors

Juliet and Juliet Boston’s beloved swan couple, “Romeo and Juliet,” were discovered actually to be, as are many other animal partners, a same-sex pair.



John Tlumacki/The Boston Globe/Getty Images

have also been observed in several hundred other species, including grizzlies, gorillas, monkeys, flamingos, and owls (Bagemihl, 1999). Among rams, for example, some 7 to 10 percent display same-sex attraction by shunning ewes and seeking to mount other males (Perkins & Fitzgerald, 1997). Homosexual behavior seems a natural part of the animal world.

Gay-Straight Brain Differences Researcher Simon LeVay (1991) studied sections of the hypothalamus taken from deceased heterosexual and homosexual people. As a gay scientist, LeVay wanted to do “something connected with my gay identity.” To avoid biasing the results, he did a *blind study*, not knowing which donors were gay. For nine months he peered through his microscope at a cell cluster he thought might be important. Then, one morning, he broke the code: One cell cluster was reliably larger in heterosexual men than in women and homosexual men. “I was almost in a state of shock,” LeVay said (1994). “I took a walk by myself on the cliffs over the ocean. I sat for half an hour just thinking what this might mean.”

It should not surprise us that in other ways, too, brains differ with sexual orientation (Bao & Swaab, 2011; Savic & Lindström, 2008). Remember our maxim: *Everything psychological is simultaneously biological*. But when do such brain differences begin? At conception? In the womb? During childhood or adolescence? Does experience produce these differences? Or is it genes or prenatal hormones (or genes via prenatal hormones)?

LeVay does not view the hypothalamus as a sexual orientation center; rather, he sees it as an important part of the neural pathway engaged in sexual behavior. He acknowledges that sexual behavior patterns may influence the brain’s anatomy. In fish, birds, rats, and humans, brain structures vary with experience—including sexual experience, reports sex researcher Marc Breedlove (1997). But LeVay believes it more likely that brain anatomy influences sexual orientation. His hunch seems confirmed by the discovery of a similar hypothalamic difference between the male sheep that do and don’t display same-sex attraction (Larkin et al., 2002; Roselli et al., 2002, 2004). Moreover, report University of London psychologists Qazi Rahman and Glenn Wilson (2003), “the neuroanatomical correlates of male homosexuality differentiate very early postnatally, if not prenatally.”

Responses to hormone-derived sexual scents also point to a brain difference (Savic et al., 2005). When straight women were given a whiff of a scent derived from men’s sweat, their hypothalamus activated in an area governing sexual arousal. Gay men’s brains responded similarly to the men’s scent. But straight men’s brains showed the arousal response only to a female hormone derivative. Other studies of brain responses to sex-related sweat odors and to pictures of male and female faces have found similar gay-straight differences, including differing responses between lesbians and straight women (Kranz & Ishai, 2006; Martins et al., 2005).

Genetic Influences Evidence indicates a genetic influence on sexual orientation. “First, homosexuality does appear to run in families,” noted Brian Mustanski and Michael Bailey (2003). “Second, twin studies have established that genes play a substantial role in explaining individual differences in sexual orientation.” Identical twins are somewhat more likely than fraternal twins to share a homosexual orientation (Alanko et al., 2010; Långström et al., 2008, 2010). (Because sexual orientations differ in many identical twin pairs, especially female twins, we know that other factors besides genes are also at work.)

By genetic manipulations, experimenters have created female fruit flies that during courtship act like males (pursuing other females) and males that act like females (Demir & Dickson, 2005). “We have shown that a single gene in the fruit fly is sufficient to determine all aspects of the flies’ sexual orientation and behavior,” explained

“Gay men simply don’t have the brain cells to be attracted to women.”

Simon LeVay, *The Sexual Brain*, 1993

Barry Dickson (2005). With humans, it's likely that multiple genes, possibly in interaction with other influences, shape sexual orientation. A genome-wide study of 409 pairs of gay brothers identified sexual orientation links with areas of two chromosomes, one maternally transmitted (Sanders et al., 2014). And molecules attached to genes may affect their expression. Some scientists speculate that, by affecting sensitivity to testosterone, such epigenetic influences might also cause the masculinization of females in the womb, or the feminization of males (Rice et al., 2012).

Researchers have speculated about possible reasons why “gay genes” might exist in the human gene pool, given that same-sex couples cannot naturally reproduce. One possible answer is kin selection. Recall from Chapter 4 the evolutionary psychology reminder that many of our genes also reside in our biological relatives. Perhaps, then, gay people's genes live on through their supporting the survival and reproductive success of their nieces, nephews, and other relatives (who also carry many of the same genes). Gay men make generous uncles, suggests one study of Samoans (Vasey & VanderLaan, 2010).

A *fertile females theory* offers further support for the idea that maternal genetics may be at work (Bocklandt et al., 2006). Recent Italian studies confirm what others have found—that homosexual men tend to have more homosexual relatives on their mother's side than on their father's (Camperio-Ciani et al., 2004, 2009, 2012; VanderLaan et al., 2011, 2012). And the relatives on the mother's side also produce more offspring than do the maternal relatives of heterosexual men. Perhaps the genes that dispose women to be strongly attracted (or attractive) to men, and therefore to have more children, also dispose some men to be attracted to men (LeVay, 2011). Thus, the decreased reproduction by gay men appears offset by the increased reproduction by their maternal extended family.

Prenatal Influences Elevated rates of homosexual orientation in identical *and* fraternal twins suggest the influence not only of shared genes but also a shared prenatal environment. In animals and some human cases, prenatal hormone conditions have altered a fetus' sexual orientation. German researcher Gunter Dorner (1976, 1988) pioneered research on the influence of prenatal hormones by manipulating a fetal rat's exposure to male hormones, thereby “inverting” its sexual orientation. In other studies, when pregnant sheep were injected with testosterone during a critical period of fetal development, their female offspring later showed homosexual behavior (Money, 1987).

A critical period for the human brain's neural-hormonal control system may exist between the middle of the second and fifth months after conception (Ellis & Ames, 1987; Gladue, 1990; Meyer-Bahlburg, 1995). Exposure to the hormone levels typically experienced by female fetuses during this time appears to predispose the person (whether female or male) to be attracted to males in later life. “Prenatal sex hormones control the sexual differentiation of brain centers involved in sexual behaviors,” notes Simon LeVay (2011, p. 216). Thus, female fetuses most exposed to testosterone, and male fetuses least exposed to testosterone, appear most likely later to exhibit gender-atypical traits and to experience same-sex desires.

The mother's immune system may also play a role in the development of sexual orientation. Men who have older brothers are somewhat more likely to be gay, report Ray Blanchard (2004, 2008a,b, 2014) and Anthony Bogaert (2003)—about one-third more likely for each additional older brother. If the odds of homosexuality are roughly 2 percent among first sons, they would rise to nearly 3 percent among second sons, 4 percent for third sons, and so on for each additional older brother (see FIGURE 11.10). The reason for this curious phenomenon—the *older brother* or *fraternal birth-order effect*—is unclear. Blanchard suspects a defensive maternal immune response to foreign substances produced by male fetuses. With each pregnancy with a male fetus, the maternal antibodies may become stronger and may

“Modern scientific research indicates that sexual orientation is . . . partly determined by genetics, but more specifically by hormonal activity in the womb.”

Glenn Wilson and Qazi Rahman, *Born Gay: The Psychobiology of Sex Orientation*, 2005

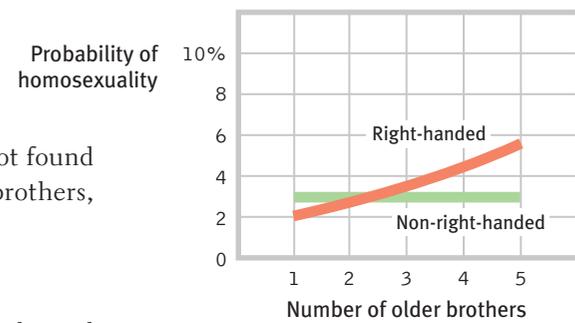
prevent the fetus' brain from developing in a male-typical pattern. Consistent with this biological explanation, the fraternal birth-order effect occurs only in men with older brothers born to the same mother (whether raised together or not). Sexual orientation is unaffected by adoptive brothers (Bogaert, 2006b). The birth-order effect on sexual orientation is not found among women with older sisters, women who were womb-mates of twin brothers, and men who are not right-handed (Rose et al., 2002).

Gay-Straight Trait Differences

On several traits, gays and lesbians appear to fall midway between straight females and males (TABLE 11.2; see also LeVay, 2011; Rahman & Koerting, 2008). For example, lesbians' cochlea and hearing systems develop in a way that is intermediate between those of heterosexual females and heterosexual males, which seems attributable to prenatal hormonal influence (McFadden, 2002). Gay men tend to be shorter and lighter, even at birth, than straight men, while women in same-sex marriages were mostly heavier than average at birth (Bogaert, 2010; Frisch & Zdravkovic, 2010). Fingerprint ridge counts may also differ: Although most people have more fingerprint ridges on their right hand than on their left, some studies find a greater right-left difference in heterosexual males than in females and gay males (Hall & Kimura, 1994; Mustanski et al., 2002; Sanders et al., 2002). Given that fingerprint ridges are complete by the sixteenth fetal week, this difference may be due to prenatal hormones.

▼ TABLE 11.2
Biological Correlates of Sexual Orientation

Gay-straight trait differences	
Sexual orientation is part of a package of traits. Studies—some in need of replication—indicate that homosexuals and heterosexuals differ in the following biological and behavioral traits.	
<ul style="list-style-type: none"> • spatial abilities • fingerprint ridge counts • auditory system development • handedness • occupational preferences • relative finger lengths 	<ul style="list-style-type: none"> • gender nonconformity • age of onset of puberty in males • birth size and weight • sleep length • physical aggression • walking style
On average (the evidence is strongest for males), results for gays and lesbians fall between those of straight men and straight women. Three biological influences—brain, genetic, and prenatal—may contribute to these differences.	
Brain differences	
<ul style="list-style-type: none"> • One hypothalamic cell cluster is smaller in women and gay men than in straight men. • Gay men's hypothalamus reacts as do straight women's to the smell of sex-related hormones. 	
Genetic influences	
<ul style="list-style-type: none"> • Shared sexual orientation is higher among identical twins than among fraternal twins. • Sexual attraction in fruit flies can be genetically manipulated. • Male homosexuality often appears to be transmitted from the mother's side of the family. 	
Prenatal influences	
<ul style="list-style-type: none"> • Altered prenatal hormone exposure may lead to homosexuality in humans and other animals. • Men with several older biological brothers are more likely to be gay, possibly due to a maternal immune-system reaction. 	

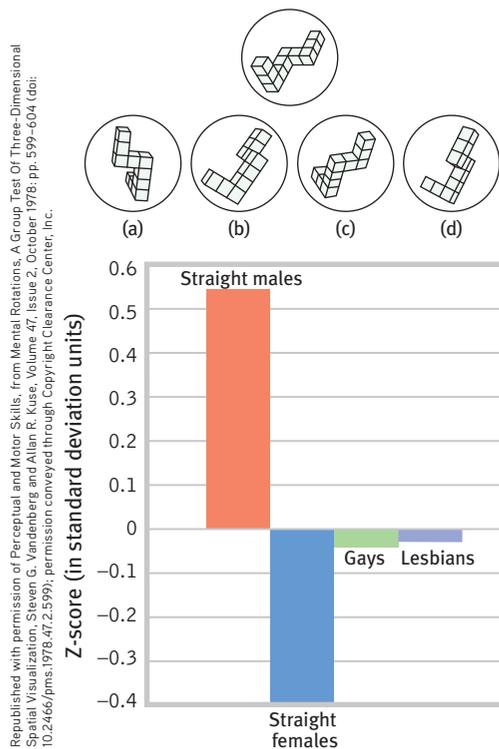


▼ FIGURE 11.10
The fraternal birth-order effect
Researcher Ray Blanchard (2008a) offers these approximate curves depicting a man's likelihood of homosexuality as a function of his number of older brothers. This correlation has been found in several studies, but only among right-handed men (as about 9 in 10 men are).



Video material is provided by BBC Worldwide Learning and CBS New Archives, and produced by Princeton Academic Resources.

LaunchPad For an 8-minute overview of the biology of sexual orientation, see LaunchPad's *Video: Homosexuality and the Nature-Nurture Debate*.



▼ FIGURE 11.11

Spatial abilities and sexual orientation Which of the four figures can be rotated to match the target figure at the top? Straight males tend to find this an easier task than do straight females, with gays and lesbians intermediate. (From Rahman et al., 2003, with 60 people tested in each group.)

Answer: Figures a and d.

“There is no sound scientific evidence that sexual orientation can be changed.”

UK Royal College of Psychiatrists, 2009

Another you-never-would-have-guessed-it gay-straight difference appears in studies showing that gay men’s spatial abilities resemble those typical of straight women (Cohen, 2002; Gladue, 1994; McCormick & Witelson, 1991; Sanders & Wright, 1997). On mental rotation tasks such as the one illustrated in **FIGURE 11.11**, straight men tend to outscore straight women. (So do women who were womb-mates of a male co-twin [Vuoksima et al., 2010].) Studies by Qazi Rahman and colleagues (2004, 2008) find that, as on a number of other measures, the scores of gays and lesbians fall between those of heterosexual males and females. But straight women and gays both outperform straight men at remembering objects’ spatial locations in tasks like those found in memory games (Hassan & Rahman, 2007).

The consistency of the brain, genetic, and prenatal findings has swung the pendulum toward a biological explanation of sexual orientation (Rahman & Wilson, 2003; Rahman & Koerting, 2008). Still, some people wonder: Should the cause of sexual orientation matter? Perhaps it shouldn’t, but people’s assumptions matter. To justify his signing a 2014 bill that made some homosexual acts punishable by life in prison, the president of Uganda, Yoweri Museveni, declared that homosexuality is not inborn but rather is a matter of “choice” (Balter, 2014; Landau et al., 2014).

However, the new biological research is a double-edged sword (Diamond, 1993; Roan, 2010). If sexual orientation, like skin color and sex, is genetically influenced, that offers a further rationale for civil rights protection. At the same time, this research raises the troubling possibility that genetic markers of sexual orientation could someday be identified through fetal testing, that a fetus could be aborted simply for being predisposed to an unwanted orientation, or that hormonal treatment in the womb might engineer a desired orientation.

RETRIEVAL PRACTICE

- Which THREE of the following five factors have researchers found to have an effect on sexual orientation?
 - a. A domineering mother
 - b. Size of certain cell clusters in the hypothalamus
 - c. Prenatal hormone exposure
 - d. A distant or ineffectual father
 - e. For men, having multiple older biological brothers

ANSWERS: b., c., e.

Sex and Human Values

11-11 Is scientific research on sexual motivation value free?

Recognizing that values are both personal and cultural, most sex researchers and educators strive to keep their writings value free. But the very words we use to describe behavior can reflect our personal values. Whether we label certain sexual behaviors as “perversions” or as an “alternative sexual lifestyle” depends on our attitude toward the behaviors. Labels describe, but they also evaluate.

Scientific research on sexual motivation does not aim to define the personal meaning of sex in our own lives. You could know every available fact about sex—that the initial spasms of male and female orgasm come at 0.8-second intervals, that the female nipples expand 10 millimeters at the peak of sexual arousal, that systolic blood pressure rises some 60 points and the respiration rate to 40 breaths per minute—but fail to understand the human significance of sexual intimacy.