

Sexual Orientation

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. We express the direction of our sexual interest in our **sexual orientation**—our enduring sexual attraction toward members of our own sex (*homosexual orientation*) or the other sex (*heterosexual orientation*). Cultures vary in their attitudes toward homosexuality. In Chile, 32 percent of people say they think homosexuality “is never justified,” as do 50 percent of people in the United States and 98 percent in Kenya and Nigeria (Pew, 2006). As far as we know, all cultures in all times have been predominantly heterosexual (Bullough, 1990). Whether a culture condemns or accepts homosexuality, heterosexuality prevails and homosexuality survives.

Gay men and lesbians often recall childhood play preferences like those of the other sex (Bailey & Zucker, 1995). But most homosexual people report not becoming aware of same-sex attraction until during or shortly after puberty, and not thinking of themselves as gay or lesbian (their socially influenced identity) until later in their teens or twenties (Garnets & Kimmel, 1990; Hammack, 2005). As adolescents, their friendship quality is similar to that of “straight” teenagers, and as adults, their partnerships are “remarkably similar” to heterosexual couples in love and satisfaction (Busseri et al., 2006; Peplau & Fingerhut, 2007).

sexual orientation an enduring sexual attraction toward members of either one's own sex (homosexual orientation) or the other sex (heterosexual orientation).

- In one British survey, of the 18,876 people contacted, 1 percent were seemingly asexual, having “never felt sexually attracted to anyone at all” (Bogaert, 2004, 2006). •
- In one study of self-described heterosexual, bisexual, and homosexual men, those who described themselves as bisexual responded as did homosexual men—with genital arousal primarily to same-sex erotic stimuli (Rieger et al., 2005). They also exhibit interests and traits more like gay than heterosexual men (Lippa, 2005). •
- 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 cohabited before marriage, and they report having had many fewer sex partners. But (if male) they are just as likely to be homosexual (Smith, 1998). •

Sexual Orientation Statistics

How many people are exclusively homosexual? About 10 percent, as the popular press has often assumed? A little more than 20 percent, as average Americans estimated in a 2002 Gallup survey (Robinson, 2002)? Not according to more than a dozen national surveys in the early 1990s, which explored sexual orientation in Europe and the United States, using methods that protected the respondents’ anonymity. The most accurate figure seems to be about 3 or 4 percent of men and 1 or 2 percent of women (Laumann et al., 1994; Mosher et al., 2005; Smith, 1998). Estimates derived from the sex of unmarried partners reported in the 2000 U.S. Census suggest that 2.5 percent of the population is gay or lesbian (Tarmann, 2002). Fewer than 1 percent of survey respondents—for example, 12 people out of 7076 Dutch adults in one survey (Sandfort et al., 2001)—reported being actively bisexual. A larger number of adults in that study reported having had an isolated homosexual experience. And most people report having had an occasional homosexual fantasy. Health experts find it helpful to know sexual statistics, but numbers do not decide issues of human rights.

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 ostracized or fired for openly admitting or displaying your feelings toward someone of the other sex; if you overheard people making crude jokes about heterosexual people; if most movies, TV shows, and advertisements portrayed (or implied) homosexuality; and if your family members were pleading with you to change your heterosexual lifestyle and to enter into a homosexual marriage.

Sexual orientation is not an indicator of mental health. “Homosexuality, in and of itself, is not associated with mental disorders or emotional or social problems,” declares the American Psychological Association (2007). Moreover, same-sex civil unions provide emotional, social, and health benefits similar to those of heterosexual unions (Herek, 2006; King & Bartlett, 2006; Kurdek, 2005). But some homosexual individuals, especially during adolescence, struggle with their sexual attractions and are at increased risk for thinking about and attempting suicide (Balsam et al., 2005; Kitts, 2005; Plöderl & Fartacek, 2005). 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). Most of today’s psychologists therefore view sexual orientation as neither willfully chosen nor willfully changed. 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. Compared with men’s sexual orientation, women’s tends to be less strongly felt and potentially more fluid and changing (Chivers, 2005; Diamond, 2007; Peplau & Garnets, 2000). Men’s 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, more than men, for example, prefer to alternate periods of high sexual activity with periods of almost none, and are somewhat more likely than men to feel and act on bisexual attractions (Mosher et al., 2005).

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 associated with increased attraction to both men and women (Lippa, 2006, 2007). When shown pictures of heterosexual couples, in either erotic or nonerotic contexts, heterosexual men look mostly at the woman while heterosexual women look more equally at both the man and the woman (Lykins et al., 2008). And 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). Baumeister calls this phenomenon the gender difference in *erotic plasticity*.

Origins of Sexual Orientation

If our sexual orientation is indeed something we do not choose and seemingly cannot change (most clearly so for males), then where do these preferences—heterosexual or homosexual—come from? See if you can anticipate the consensus that has 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 gender, leading individuals to direct their sexual 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 many homosexuals molested, seduced, or otherwise sexually victimized by an adult homosexual?

The answer to all these questions appears to be *no* (Storms, 1983). In interviews with nearly 1000 homosexuals and 500 heterosexuals, Kinsey Institute investigators 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, neglected by their father, or sexually abused. 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.)

Homosexual people do, however, appear more often in certain populations. One study (Ludwig, 1995) of the biographies of 1004 eminent people found homosexual and bisexual people overrepresented, especially among poets (24 percent), fiction writers (21 percent), and artists and musicians (15 percent). Gay more than straight men also express interest in occupations that attract many women, such as decorator, florist, and flight attendant (Lippa, 2002). (Given that some 96 percent of men are not gay, most men in such occupations may nevertheless be straight.)

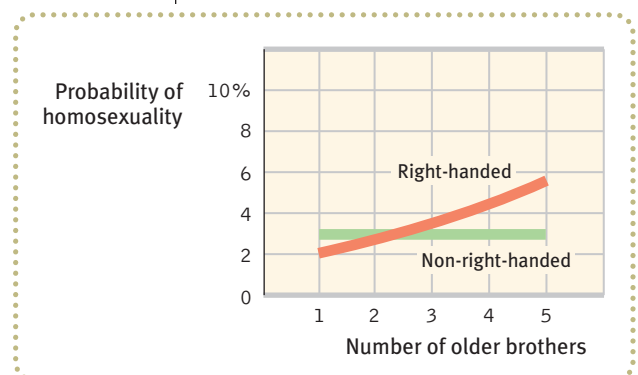
Men who have older brothers are also somewhat more likely to be gay, report Ray Blanchard (1997, 2008) and Anthony Bogaert (2003)—about one-third more likely for each additional older brother. If the odds of homosexuality are roughly 2 percent among first sons, they would rise to nearly 3 percent among second sons, 4 percent for third sons, and so on for each additional older brother (see FIGURE 11.15). The reason for this curious phenomenon—the *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 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 from the same mother (whether reared together or not). Sexual orientation is unaffected by adoptive brothers (Bogaert, 2006). 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).

● 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. ●

► FIGURE 11.15

The fraternal birth order effect

Researcher Ray Blanchard (2008) 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.



So, what else might influence sexual orientation? One theory has proposed that people develop same-sex erotic attachments if segregated by gender 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*.)

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 consider more carefully the possible biological influences on orientation, including evidence of homosexuality in the animal world, and the influences of differing brain centers, genetics, and prenatal hormone exposure.

Same-Sex Attraction in Animals At Coney Island's New York Aquarium, penguins Wendell and Cass spent several years as devoted same-sex partners. Central Park Zoo penguins Silo and Roy show similar devotion. Biologist Bruce Bagemihl (1999) has identified several hundred species in which at least occasional same-sex relations have been observed. Grizzlies, gorillas, monkeys, flamingos, and owls are all on the long list. Among rams, for example, some 6 to 10 percent—to sheep-breeding ranchers, the “duds”—display same-sex attraction by shunning ewes and seeking to mount other males (Perkins & Fitzgerald, 1997). Some degree of homosexuality seems to be a natural part of the animal world.



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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.

The Brain and Sexual Orientation 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 codes: 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 brains differ with sexual orientation, a finding confirmed by a recent discovery that gay men and straight women have brain hemispheres of similar size, whereas in lesbian women and straight men, the right hemisphere is larger (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 hypothalamic center 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 7 to 10 percent of male sheep that display same-sex attraction and the 90+ percent attracted to females (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.”

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

Simon LeVay, *The Sexual Brain*, 1993

Responses to hormone-derived sexual scents also point to a brain difference (Savic et al., 2005). When straight women are given a whiff of a scent derived from men's sweat, their hypothalamus lights up in an area governing sexual arousal. Gay men's brains respond similarly to the men's scent. But straight men's brains show the arousal response only to a female hormone derivative. Gays and lesbians similarly differ from their straight counterparts in other studies of brain responses to sex-related sweat odors and to pictures of male and female faces (Kranz & Ishai, 2006; Martins et al., 2005).

Genes and Sexual Orientation Are these sexuality-related brain differences genetically influenced? Evidence does indicate a genetic influence on sexual orientation. "First, homosexuality does appear to run in families," note 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 (Långström et al., 2008). (Because sexual orientations differ in many identical twin pairs, especially female twins, we know that other factors besides genes are at work.)

Experimenters have also, by genetic manipulations, 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 Barry Dickson (2005). With humans, it's likely that multiple genes, possibly in interaction with other influences, shape sexual orientation. One study financed by the U.S. National Institutes of Health is analyzing the genes of more than 1000 gay brothers in search of such genetic markers.

Researchers have speculated about possible reasons why "gay genes" might exist. Given that same-sex couples cannot naturally reproduce, how could such genes have survived in the human gene pool? 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). Or perhaps, as now seems more likely, maternal genetics is at work (Bocklandt et al., 2006). Recent Italian studies (Camperio-Ciani et al., 2004, 2008) confirm what others have found—that homosexual men have more homosexual relatives on their mother's side than on their father's. And, compared with the maternal relatives of heterosexual men, the maternal relatives of homosexual men produce more offspring. Perhaps, surmise the researchers, the genes that make women more likely to have children (such as by strongly attracting them to men) also produce sons and nephews who are attracted to men.

Prenatal Hormones and Sexual Orientation Elevated rates of homosexual orientation in identical *and* fraternal twins suggest that not just shared genetics but also a shared prenatal environment may be a factor. In animals and some exceptional human cases, abnormal 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.

"Studies indicate that male homosexuality is more likely to be transmitted from the mother's side of the family."

Robert Plomin, John DeFries, Gerald McClearn, and Michael Rutter,
Behavioral Genetics, 1997

"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

TABLE 11.1

BIOLOGICAL CORRELATES OF SEXUAL ORIENTATION

On average (the evidence is strongest for males), various biological and behavioral traits of gays and lesbians fall between those of straight men and straight women. Tentative findings—some in need of replication—include these:

Brain differences

- Brain asymmetry is greater in straight men and lesbian women.
- One hypothalamic cell cluster is larger in straight men than in women and gay men; same difference is found in male sheep displaying other-sex versus same-sex attraction.
- Gay men's hypothalamus reacts as does a straight woman's to the smell of sex-related hormones.

Genetic influences

- Shared sexual orientation is higher among identical twins than among fraternal twins.
- Sexual attraction in fruit flies can be genetically manipulated.

Prenatal hormonal influences

- Altered prenatal hormone exposure may lead to homosexuality in humans and other animals.
- Right-handed men with several older biological brothers are more likely to be gay.

These brain differences and genetic and prenatal influences may contribute to observed gay-straight differences in

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|--------------------------------|-------------------------------------|
| • spatial abilities. | • gender nonconformity. |
| • fingerprint ridge counts. | • age of onset of puberty in males. |
| • auditory system development. | • male body size. |
| • handedness. | • sleep length. |
| • occupational preferences. | • physical aggression. |
| • relative finger lengths. | • male eating disorders. |
| • direction of hair whorls. | |

On several traits, gays and lesbians appear to fall midway between straight females and males (TABLE 11.1). 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). 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).

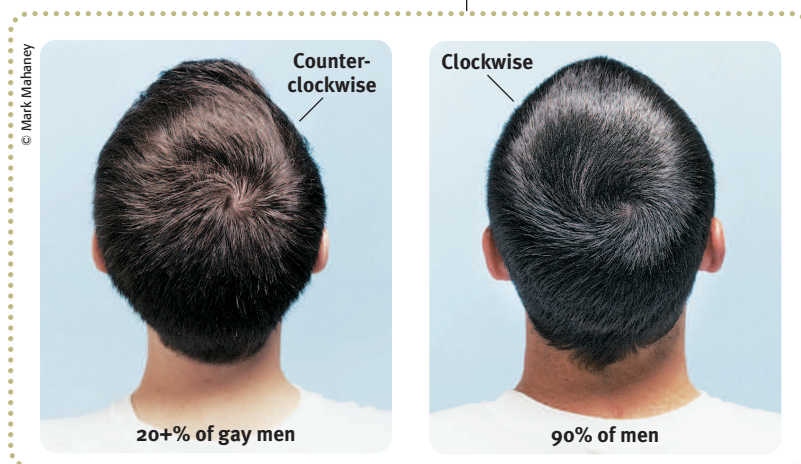
Given that fingerprint ridges are complete by the sixteenth fetal week, this difference may be due to prenatal hormones. Prenatal hormones also are a possible explanation for why data from 20 studies revealed that "homosexual participants had 39 percent greater odds of being non-right-handed" (Lalumière et al., 2000). Gay men are also more likely than straight men to have a genetically influenced counterclockwise hair whorl (FIGURE 11.16), a trait shared by about half of non-right-handed people (Beaton & Mellor, 2007; Klar, 2003, 2004, 2005; Lippa et al., 2008).

Another you-never-would-have-guessed-it gay-straight difference appears in studies showing that gay men's spatial abilities resemble those typical of

► FIGURE 11.16

Hair whorls and sexual orientation

About 1 in 4 gay men and half of non-right-handed people have counterclockwise hair whorls.



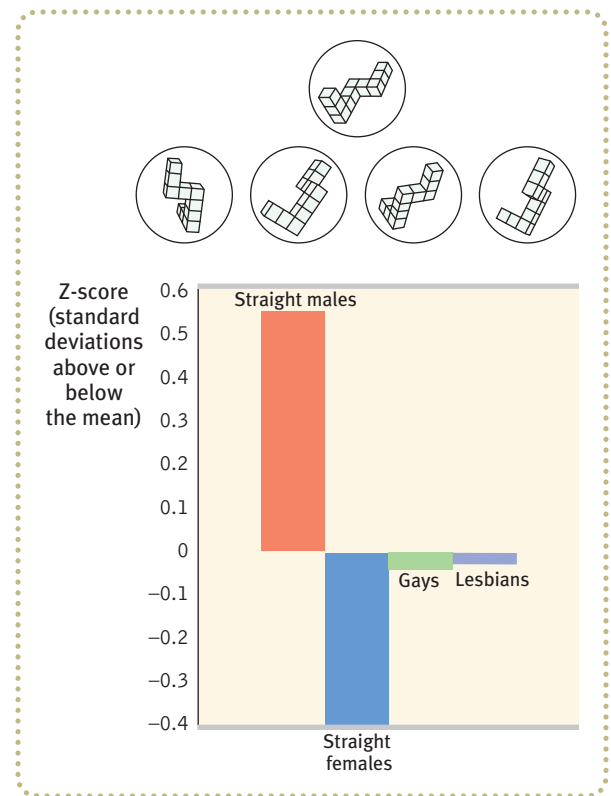
straight women (Cohen, 2002; Gladue, 1994; McCormick & Witelson, 1991; Sanders & Wright, 1997). On mental rotation tasks such as the one illustrated in **FIGURE 11.17**, straight men tend to outscore women. Studies by Qazi Rahman and colleagues (2003, 2008) find that, as on a number of other measures, 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).

Because the physiological evidence is preliminary and controversial, some scientists remain skeptical. Rather than specifying sexual orientation, they suggest, biological factors may predispose a *temperament* that influences sexuality “in the context of individual learning and experience” (Byne & Parsons, 1993). Daryl Bem (1996, 1998, 2000) has theorized that genes code for prenatal hormones and brain anatomy, which predispose temperaments that lead children to prefer gender-typical or gender-atypical activities and friends. These preferences may later lead children to feel attracted to whichever sex feels different from their own. The dissimilar-seeming sex (whether or not it conforms to one’s own anatomy) becomes associated with anxiety and other forms of arousal, which are eventually transformed into romantic arousal. The exotic becomes erotic.

Regardless of the process, the consistency of the brain, genetic, and prenatal findings has swung the pendulum toward a biological explanation of sexual orientation (Rahman & Wilson, 2003). This helps explain why sexual orientation is so difficult to change, and why a BBC Internet study of more than 200,000 people found the same gay-straight differences in personality and interests worldwide (Lippa, 2007a,b, 2008).

Still, some people wonder: Should the cause of sexual orientation matter? Perhaps it shouldn’t, but people’s assumptions matter. Those who believe—as do 41 percent of Americans (up from 13 percent in 1977 [Gallup Polls]) and most gays and lesbians—that sexual orientation is biologically disposed also express more accepting attitudes toward homosexual people (Allen et al., 1996; Haslam & Levy, 2006; Kaiser, 2001; Whitley, 1990).

To gay and lesbian activists, the new biological research is a double-edged sword (Diamond, 1993). If sexual orientation, like skin color and sex, is genetically influenced, that offers a further rationale for civil rights protection. Moreover, it may alleviate parents’ concerns about their children being unduly influenced by gay teachers and role models. At the same time, this research raises the troubling possibility that genetic markers of sexual orientation could someday be identified through fetal testing, and a fetus could be aborted simply for being predisposed to an unwanted orientation.



► **FIGURE 11.17**
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.)