

Exotic Becomes Erotic: A Developmental Theory of Sexual Orientation

Daryl J. Bem
Cornell University

A developmental theory of erotic/romantic attraction is presented that provides the same basic account for opposite-sex and same-sex desire in both men and women. It proposes that biological variables, such as genes, prenatal hormones, and brain neuroanatomy, do not code for sexual orientation *per se* but for childhood temperaments that influence a child's preferences for sex-typical or sex-atypical activities and peers. These preferences lead children to feel different from opposite- or same-sex peers—to perceive them as dissimilar, unfamiliar, and exotic. This, in turn, produces heightened nonspecific autonomic arousal that subsequently gets eroticized to that same class of dissimilar peers: Exotic becomes erotic. Specific mechanisms for effecting this transformation are proposed. The theory claims to accommodate both the empirical evidence of the biological essentialists and the cultural relativism of the social constructionists.

The question “What causes homosexuality?” is both politically suspect and scientifically misconceived. Politically suspect because it is so frequently motivated by an agenda of prevention and cure. Scientifically misconceived because it presumes that heterosexuality is so well understood, so obviously the “natural” evolutionary consequence of reproductive advantage, that only deviations from it are theoretically problematic. Freud himself did not so presume: “[Heterosexuality] is also a problem that needs elucidation and is not a self-evident fact based upon an attraction that is ultimately of a chemical nature” (Freud, 1905/1962, pp. 11–12).

Accordingly, this article proposes a developmental theory of erotic/romantic attraction that provides the same basic account for both opposite-sex and same-sex desire—and for both men and women. In addition to finding such parsimony politically, scientifically, and aesthetically satisfying, I believe that it can also be sustained by the evidence.

The academic discourse on sexual orientation is currently dominated by the biological essentialists—who can point to a corpus of evidence linking sexual orientation to genes, prenatal hormones, and brain neuroanatomy—and the social constructionists—who can point to a corpus of historical and anthropological evidence showing that the very concept of sexual orientation is a culture-bound notion (De Cecco & Elia, 1993). The personality, clinical, and developmental theorists who once dominated the discourse on this topic have fallen conspicuously silent. Some have probably become closet converts to biology because they cannot point to a coherent corpus of evidence that supports an experience-based account of sexual orientation.

I am grateful to several people who provided helpful comments on previous drafts of this article, including especially Elizabeth Adkins-Regan, John Archer, J. Michael Bailey, Jeremy Bem, Gerald Davison, Harlan Lane, Kathleen McCartney, Charlotte Patterson, Dennis Regan, Ritch C. Savin-Williams, Walter Williams, and Kenneth J. Zucker.

Correspondence concerning this article should be addressed to Daryl J. Bem, Department of Psychology, Uris Hall, Cornell University, Ithaca, New York 14853. Electronic mail may be sent via Internet to d.bem@cornell.edu.

This would be understandable; experience-based theories have not fared well empirically in recent years.

The most telling data come from an intensive, large-scale interview study conducted in the San Francisco Bay area by the Kinsey Institute for Sex Research (Bell, Weinberg, & Hammer-smith, 1981a). Using path analysis to test several developmental hypotheses, the investigators compared approximately 1,000 gay men and lesbians with 500 heterosexual men and women. The study (hereinafter, the San Francisco study) yielded virtually no support for current experience-based accounts of sexual orientation. With respect to the classical psychoanalytic account, for example,

our findings indicate that boys who grow up with dominant mothers and weak fathers have nearly the same chances of becoming homosexual as they would if they grew up in “ideal” family settings. Similarly, the idea that homosexuality reflects a failure to resolve boys’ “Oedipal” feelings during childhood receives no support from our study. Our data indicate that the connection between boys’ relationships with their mothers and whether they become homosexual or heterosexual is hardly worth mentioning. . . . [Similarly,] we found no evidence that prehomosexual girls are “Oedipal victors”—having apparently usurped their mothers’ place in the fathers’ affections. . . . [Finally,] respondents’ identification with their opposite-sex parents while they were growing up appears to have had no significant impact on whether they turned out to be homosexual or heterosexual. (pp. 184, 189)

More generally, no family variables were strongly implicated in the development of sexual orientation for either men or women.¹

The data also failed to support any of several possible accounts based on mechanisms of learning or conditioning, including the popular layperson’s “seduction” theory of homosex-

¹ This finding is consistent with accumulating evidence that family variables account for much less of the environmental variance in personality than previously thought. Harris (1995) has proposed that a significant portion of the variance in personality development is accounted for by peer-related variables, which is where the theory proposed in this article locates the source of sexual orientation.

uality. In particular, the kinds of sexual encounters that would presumably serve as the basis for such learning or conditioning typically occurred after, rather than before, the individual experienced the relevant sexual feelings. Gay men and lesbians, for example, had typically not participated in any "advanced" sexual activities with persons of the same sex until about 3 years after they had become aware of same-sex attractions. Moreover, they neither lacked opposite-sex sexual experiences during their childhood and adolescent years nor found them unpleasant.

And finally, there was no support for "labeling" theory, which suggests that individuals might adopt a homosexual orientation as a consequence of being labeled homosexual or sexually different by others as they were growing up. Although gay men and lesbians were, in fact, more likely to report that they had been so labeled, the path analysis revealed the differential labeling to be the result of an emerging homosexual orientation rather than a cause of or even a secondary contributor to it.

But before we all become geneticists, biopsychologists, or neuroanatomists, I believe it's worth another try. In particular, I believe that the theoretical and empirical building blocks for a coherent, experience-based developmental theory of sexual orientation are already scattered about in the literature. What follows, then, is an exercise in synthesis and construction—followed, in turn, by analysis and deconstruction.

Overview of the Theory

The theory proposed here claims to specify the causal antecedents of an individual's erotic or romantic attractions to opposite-sex and same-sex persons. In particular, Figure 1 displays the proposed temporal sequence of events that leads to sexual orientation for most men and women in a gender-polarizing culture like ours—a culture that emphasizes the differences between the sexes by pervasively organizing both the perceptions and realities of communal life around the male-female dichotomy (Bem, 1993). The sequence begins at the top of the figure with biological variables (labeled A) and ends at the bottom with erotic/romantic attraction (F).

A → B. Biological variables such as genes or prenatal hormones do not code for sexual orientation per se but for childhood temperaments, such as aggression or activity level.

B → C. A child's temperaments predispose him or her to enjoy some activities more than others. One child will enjoy rough-and-tumble play and competitive team sports (male-typical activities); another will prefer to socialize quietly or play jacks or hopscotch (female-typical activities). Children will also prefer to play with peers who share their activity preferences; for example, the child who enjoys baseball or football will selectively seek out boys as playmates. Children who prefer sex-typical activities and same-sex playmates are referred to as gender conforming; children who prefer sex-atypical activities and opposite-sex playmates are referred to as gender nonconforming.

C → D. Gender-conforming children will feel different from opposite-sex peers, perceiving them as dissimilar, unfamiliar, and exotic. Similarly, gender-nonconforming children will feel different—even alienated—from same-sex peers, perceiving them as dissimilar, unfamiliar, and exotic.

D → E. These feelings of dissimilarity and unfamiliarity produce heightened autonomic arousal. For the male-typical child,

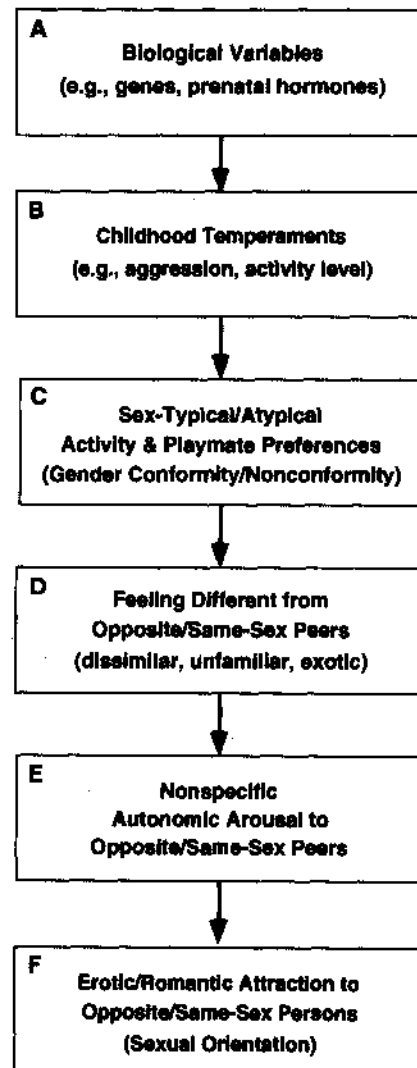


Figure 1. The temporal sequence of events leading to sexual orientation for most men and women in a gender-polarizing culture.

it may be felt as antipathy or contempt in the presence of girls ("girls are yucky"); for the female-typical child, it may be felt as timidity or apprehension in the presence of boys. A particularly clear example is provided by the "sissy" boy who is taunted by male peers for his gender nonconformity and, as a result, is likely to experience the strong autonomic arousal of fear and anger in their presence. Although girls are punished less than boys for gender nonconformity, a "tomboy" girl who is ostracized by her female peers may feel similar, affectively toned arousal in their presence. The theory claims, however, that every child, conforming or nonconforming, experiences heightened, nonspecific autonomic arousal in the presence of peers from whom he or she feels different. In this modal case, the arousal will not necessarily be affectively toned or consciously felt.

E → F. Regardless of the specific source or affective tone of the childhood autonomic arousal, it is transformed in later years into erotic/romantic attraction. Steps D → E and E → F thus encompass specific psychological mechanisms that

Table 1
*Percentage of Respondents Reporting Gender-Nonconforming
 Preferences and Behaviors During Childhood*

Response	Men		Women	
	Gay (<i>n</i> = 686)	Heterosexual (<i>n</i> = 337)	Lesbian (<i>n</i> = 293)	Heterosexual (<i>n</i> = 140)
Had not enjoyed sex-typical activities	63	10	63	15
Had enjoyed sex-atypical activities	48	11	81	61
Atypically sex-typed (masculinity-femininity)	56	8	80	24
Most childhood friends were opposite sex	42	13	60	40

Note. Percentages have been calculated from the data given in Bell, Weinberg, and Hammersmith (1981b, pp. 74-75, 77). All chi-square comparisons between gay and heterosexual subgroups are significant at $p < .0001$.

transform exotic into erotic (**D** → **F**). For brevity, the entire sequence outlined in Figure 1 is referred to as the EBE (Exotic Becomes Erotic) theory of sexual orientation.

As noted above, Figure 1 does not describe an inevitable, universal path to sexual orientation but the modal path followed by most men and women in a gender-polarizing culture like ours. Individual variations, alternative paths, and cultural influences on sexual orientation are discussed in the final sections of the article.

Evidence for the Theory

Evidence for EBE theory is organized into the following narrative sequence: Gender conformity or nonconformity in childhood is a causal antecedent of sexual orientation in adulthood (**C** → **F**). This is so because gender conformity or nonconformity causes a child to perceive opposite- or same-sex peers as exotic (**C** → **D**), and the exotic class of peers subsequently becomes erotically or romantically attractive to him or her (**D** → **F**). This occurs because exotic peers produce heightened autonomic arousal (**D** → **E**), which is subsequently transformed into erotic/romantic attraction (**E** → **F**). This entire sequence of events can be initiated, among other ways, by biological factors that influence a child's temperaments (**A** → **B**), which, in turn, influence his or her preferences for gender-conforming or gender-nonconforming activities and peers (**B** → **C**).

Gender Conformity or Nonconformity in Childhood Is a Causal Antecedent of Sexual Orientation in Adulthood (C → F)

In a review of sex-role socialization in 1980, Serbin asserted that "there is no evidence that highly sex-typed children are less likely to become homosexual than children showing less extreme sex-role conformity" (p. 85).

Well, there is now. In the San Francisco study, childhood gender conformity or nonconformity was not only the strongest but the only significant childhood predictor of later sexual orientation for both men and women (Bell et al., 1981a). As Table 1 shows, the effects were large and significant. For example, gay men were significantly more likely than heterosexual men to report that as children they had not enjoyed boys' activities

(e.g., baseball and football), had enjoyed girls' activities (e.g., hopscotch, playing house, and jacks), and had been nonmasculine. These were the three variables that defined gender nonconformity in the study. Additionally, gay men were more likely than heterosexual men to have had girls as childhood friends. The corresponding comparisons between lesbian and heterosexual women were also large and significant. Moreover, the path analyses implied that gender conformity or nonconformity in childhood was a causal antecedent of later sexual orientation for both men and women—with the usual caveat that even path analysis cannot "prove" causality.

It is also clear from the table that relatively more women than men had enjoyed sex-atypical activities and had opposite-sex friends during childhood. (In fact, more heterosexual women than gay men had enjoyed boys' activities as children—61% vs. 37%, respectively.) As I suggest later, this might account, in part, for differences between men and women in how their sexual orientations are distributed in our society.

The San Francisco study does not stand alone. A meta-analysis of 48 studies with sample sizes ranging from 34 to 8,751 confirmed that gay men and lesbians were more likely to recall gender-nonconforming behaviors and interests in childhood than were heterosexual men and women (Bailey & Zucker, 1995). The differences were large and significant for both men and women, ranging (in units of standard deviation) from 0.5 to 2.1 across studies, with means of 1.31 and 0.96 for men and women, respectively. As the authors noted, "these are among the largest effect sizes ever reported in the realm of sex-dimorphic behaviors" (p. 49).

Prospective studies have come to the same conclusion. The largest of these involved a sample of 66 gender-nonconforming and 56 gender-conforming boys with a mean age of 7.1 years (Green, 1987). The researchers were able to assess about two thirds of each group in late adolescence or early adulthood, finding that about 75% of the previously gender-nonconforming boys were either bisexual or homosexual compared with only one (4%) of the gender-conforming boys. In six other prospective studies, 63% of gender-nonconforming boys whose sexual orientations could be ascertained in late adolescence or adulthood had homosexual orientations (Zucker, 1990). Unfortunately, there are no prospective studies of gender-nonconforming girls.

This body of data has led one researcher in the field to assert that the link between childhood gender nonconformity and an adult homosexual orientation "may be the most consistent, well-documented, and significant finding in the entire field of sexual-orientation research and perhaps in all of human psychology" (Hamer & Copeland, 1994, p. 166). That may be a bit hyperbolic—Hamer is a molecular geneticist, not a psychologist—but it is difficult to think of other individual differences (besides IQ or sex itself) that so reliably and so strongly predict socially significant outcomes across the life span, and for both sexes, too. Surely, it must be true.

Gender Conformity and Nonconformity Produce Feelings of Being Different From Opposite- and Same-Sex Peers, Respectively (C → D)

EBE theory proposes that gender-conforming children will come to feel different from their opposite-sex peers and gender-nonconforming children will come to feel different from their same-sex peers. To my knowledge, no researcher has ever asked children or adults whether they feel different from opposite-sex peers, probably because they expect the universal answer to be yes. The San Francisco researchers, however, did ask respondents whether they felt different from same-sex peers in childhood. They found that 71% of gay men and 70% of lesbian women recalled having felt different from same-sex children during the grade-school years, compared with 38% and 51% of heterosexual men and women, respectively ($p < .0005$ for both gay-heterosexual comparisons).

When asked in what way they felt different, gay men were most likely to say that they did not like sports; lesbians were most likely to say that they were more interested in sports or were more masculine than other girls. In contrast, the heterosexual men and women who had felt different from their same-sex peers in childhood typically cited differences unrelated to gender. Heterosexual men tended to cite such reasons as being poorer, more intelligent, or more introverted. Heterosexual women frequently cited differences in physical appearance.

Finally, the data showed that the gender-nonconforming child's sense of being different from same-sex peers is not a fleeting early experience but a protracted and sustained feeling throughout childhood and adolescence. For example, in the path model for men, gender nonconformity in childhood was also a significant predictor of feeling different for gender reasons during adolescence (which was, in turn, a significant predictor of a homosexual orientation). Similarly, the statistically significant difference between the lesbians and heterosexual women in feeling different from same-sex peers during childhood remained significant during adolescence. This is, I believe, why sexual orientation displays such strong temporal stability across the life course for most individuals.

Exotic Becomes Erotic (D → F)

The heart of EBE theory is the proposition that individuals become erotically or romantically attracted to those who were dissimilar or unfamiliar to them in childhood. We have already seen some evidence for this in Table 1: Those who played more with girls in childhood, gay men and heterosexual women, pre-

ferred men as sexual/romantic partners in later years; those who played more with boys in childhood, lesbian women and heterosexual men, preferred women as sexual or romantic partners in later years. As we shall now see, however, the links between similarity and erotic/romantic attraction are complex.

Similarity and complementarity. One of the most widely accepted conclusions in social psychology, cited in virtually every textbook, is that similarity promotes interpersonal attraction and that complementarity ("opposites attract") does not.

For example, the vast majority of married couples in the United States are of the same race and religion, and most are significantly similar in age, socioeconomic class, educational level, intelligence, height, eye color, and even physical attractiveness (Feingold, 1988; Murstein, 1972; Rubin, 1973; Silverman, 1971). In one study, dating couples who were the most similar were the most likely to be together a year later (Hill, Rubin, & Peplau, 1976). In a longitudinal study of 135 married couples, spouses with similar personalities reported more closeness, friendliness, shared enjoyment in daily activities, marital satisfaction, and less marital conflict than less similar couples (Caspi & Herbener, 1990). In contrast, attempts to identify complementarities that promote or sustain intimate relationships have not been very successful (Levinger, Senn, & Jorgensen, 1970; Strong et al., 1988). Marital adjustment among couples married for up to 5 years was found to depend more on similarity than on complementarity (Meyer & Pepper, 1977).

But there is an obvious exception: sex. Most people choose members of the opposite sex to be their romantic and sexual partners. It is an indication of how unthinkingly heterosexuality is taken for granted that authors of articles and textbooks never seem to notice this quintessential complementarity and its challenge to the conclusion that similarity produces attraction. They certainly don't pause to ponder why we are not all gay or lesbian.

The key to resolving this apparent paradox is also a staple of textbooks: the distinction between liking and loving or between companionate and passionate love (Berscheid & Walster, 1974; Brehm, 1992). The correlation among dating or engaged couples between liking their partners and loving them is only .56 for men and .36 for women (Rubin, 1973). Both fiction and real life provide numerous examples of erotic attraction between two incompatible people who may not even like each other. Collectively, these observations suggest that similarity may promote friendship, compatibility, and companionate love, but it is dissimilarity that sparks erotic/romantic attraction and passionate love.

This is the resolution proposed by both Tripp (1975) and Bell (1982), the senior author of the San Francisco study:

a necessary ingredient for romantic attachment is one's perception of the loved one as essentially different from oneself in terms of gender-related attributes. According to this view it would be argued that, among homosexuals and heterosexuals alike, persons perceived as essentially *different* from ourselves become the chief candidates for our early romantic and, later, erotic investments. Only a superficial view of the matter would maintain that *heterogamy*, as it has been called, operates only among heterosexuals where anatomical differences make the principle, "opposites attract," most obvious. Among both groups we find romantic and sexual feelings aroused by others perceived to be different from ourselves, unfa-

miliar in manner, attitude, and interests, and whose differences offer the possibility of a relationship based upon psychological (not necessarily genital) complementarity. On the other side of the coin is the principle of *homogamy* in which perceived similarity and mutual identification and familiarity makes for friendship as opposed to the romantic . . . state. (Bell, 1982, p. 2)²

But this account fails to resolve the paradox because it errs in the opposite direction, failing to account for the previously cited evidence that, except for sex itself, it is similarity and not complementarity that sustains the majority of successful heterosexual relationships. Similarly, for every gay or lesbian relationship that conforms to the "butch-femme" stereotype of the popular imagination, there appear to be many more in which the partners are strikingly similar to each other in both psychological and physical attributes—including sex. Bell's account resolves the paradox only if one is willing to accept the implausible implication that all those happy, similar partners must be devoid of erotic enthusiasm for each other.

Like the accounts of Tripp and Bell, EBE theory also proposes that dissimilarity promotes erotic/romantic attraction, but it locates the animating dissimilarity in childhood. Consider, for example, a gender-nonconforming boy whose emerging homoeroticism happens to crystallize around the muscular athlete or leather-jacketed motorcyclist. As he moves into adolescence and adulthood, he may deliberately begin to acquire the attributes and trappings of his eroticized hypermasculine ideal—working out at the gym, buying a leather jacket, getting a body tattoo, and so forth. This acquired "macho" image is not only self-satisfying but is also attractive to other gay men who have eroticized this same idealized image. Two such men will thus be erotically attracted to each other, and their striking similarities, including their shared eroticism, will have been produced by their shared childhood dissimilarities from highly masculine boys.

EBE theory thus proposes that once the dissimilarities of childhood have laid the groundwork for a sustained sexual orientation, the noncriterial attributes of one's preferred partners within the eroticized class can range from extremely similar to extremely dissimilar. More generally, the theory proposes that the protracted period of feeling different from same- or opposite-sex peers during childhood and adolescence produces a stable sexual orientation for most individuals but that within that orientation, there can be wide-ranging—and changing—idiosyncratic preferences for particular partners or kinds of partners.

Familiarity and unfamiliarity. Like similarity, familiarity is a major antecedent of liking. In fact, similarity probably promotes liking precisely because it increases familiarity: Social norms, situational circumstances, and mutual interests conspire to bring people together who are similar to one another, thereby increasing their mutual familiarity. When college roommates were systematically paired for similarity or dissimilarity in Newcomb's (1961) ambitious 2-year study of the acquaintance process, familiarity turned out to be a stronger facilitator of liking than similarity.

The "familiarity-breeds-liking" effect has been confirmed in so many contexts that it is now considered to be a general psychological principle. For example, rats repeatedly exposed to compositions by Mozart or Schönberg have shown an enhanced

preference for the composer they heard, and humans repeatedly exposed to nonsense syllables, Chinese characters, or real people have come to prefer those they saw most often (Harrison, 1977).

But like childhood similarity, childhood familiarity does not produce erotic or romantic attraction; on the contrary, it appears to be antithetical to it. This was observed over a century ago by Westermarck (1891), who noted that two individuals who spent their childhood years together did not find each other sexually attractive even when there were strong social pressures favoring a bond between them. For example, he reported problematic sexual relations in arranged marriages in which the couple was betrothed in childhood and the girl was taken in by the future husband's family and treated like one of the siblings; similar findings have emerged from more recent studies of arranged marriages in Taiwan (cited in Bateson, 1978a).

A contemporary example is provided by children on Israeli kibbutzim, who are raised communally with age-mates in mixed-sex groups and exposed to one another constantly during their entire childhood. Sex play is not discouraged and is quite intensive during early childhood. After childhood, there is no formal or informal pressure or sanction against heterosexual activity within the peer group from educators, parents, or members of the peer group itself. Yet despite all this, there is a virtual absence of erotic attraction between peer group members in adolescence or adulthood (Bettelheim, 1969; Rabin, 1965; Shepher, 1971; Spiro, 1958; Talmon, 1964). A review of nearly 3,000 marriages contracted by second-generation adults in all Israeli kibbutzim revealed that there was not a single case of an intrapeer group marriage (Shepher, 1971).

These several observations have figured prominently in debates over the existence and psychodynamics of the incest taboo (e.g., R. Fox, 1962; Spiro, 1958). I will not venture into that thicket but rest content with the relatively atheoretical empirical generalization that close childhood familiarity either extinguishes or prevents the development of manifest erotic/romantic attraction.

The Sambian culture in New Guinea illustrates the phenomenon in a homosexual context. As described by Herdt in several publications (1981, 1984, 1987, 1990), Sambian males believe that boys cannot attain manhood without ingesting semen from older males. At age 7 years, Sambian boys are removed from the family household and initiated into secret male rituals, including ritualized homosexuality. For the next several years, they live in the men's clubhouse and regularly fellate older male adolescents. When they reach sexual maturity, they reverse roles and are fellated by younger initiates. During this entire time, they have no sexual contact with girls or women. And yet, when it comes time to marry and father children in their late teens or early twenties, all but a tiny minority of Sambian males become preferentially and exclusively heterosexual. Although Sambian boys enjoy their homosexual activities, the context of close fa-

² It is puzzling that Bell does not cite Tripp's virtually identical but more elaborate account, especially because both have been associated with the Kinsey Institute. Neither Bell nor Tripp (in his 2nd edition, 1987) cite Stoller's (1979) psychoanalytically based account, which also lists dissimilarity—along with mystery, risk, and (especially) hostility—as a generator and enhancer of sexual arousal.

miliarity in which it occurs either extinguishes or prevents the development of strongly charged homoerotic feelings.

During the years that a Sambian boy is participating in homosexual activities with his male peers, he is taught a misogynist ideology that portrays women as dangerous and exotic creatures—almost a different species. According to EBE theory, this should enhance their erotic attractiveness for him. More generally, EBE theory proposes that heterosexuality is the modal outcome across time and culture because virtually all human societies polarize the sexes to some extent, setting up a sex-based division of labor and power, emphasizing or exaggerating sex differences, and, in general, superimposing the male-female dichotomy on virtually every aspect of communal life. These gender-polarizing practices ensure that most boys and girls will grow up seeing the other sex as dissimilar, unfamiliar, and exotic—and, hence, erotic. Thus, the theory provides a culturally based alternative to the assumption that heterosexuality must necessarily be coded in the genes. I return to this point later.

Finally, the assertion that exotic becomes erotic should be amended to exotic—but not too exotic—becomes erotic (cf. Tripp, 1987). Thus, an erotic or romantic preference for partners of a different sex, race, or ethnicity is relatively common, but a preference for lying with the beasts in the field is not. This phenomenon appears to be a special case of the well-established motivational principle that there is an optimal, nonzero level of stimulus novelty and a correspondingly optimal nonzero level of internal arousal that an organism will seek to attain or maintain (Mook, 1987).

How Does Exotic Become Erotic? (D → E → F)

In Plato's *Symposium*, Aristophanes explained sexual attraction by recounting the early history of human beings. Originally, we were all eight-limbed creatures with two faces and two sets of genitals. Males had two sets of male genitals, females had two sets of female genitals, and androgynes had one set of each kind. As punishment for being overly ambitious, Zeus had all humans cut in half. But because the two halves of each former individual clung to each other in such a desperate attempt to reunite, Zeus took pity on them and invented sexual intercourse so that they might at least reunite temporarily. Sexual attraction thus reflects an attempt to complete one's original self, and heterosexual attraction is what characterizes the descendants of the androgynes.

It is a durable myth. Both Bell (1982) and Tripp (1987) proposed that we are erotically attracted to people who are different from us because we are embarked on a "quest for androgyny" (Bell); we seek to complete ourselves by "importing" gender-related attributes that we perceive ourselves as lacking (Tripp). As noted earlier, I do not believe that this accurately characterizes the data; but even if it did, it would constitute only a description of them, not an explanation. There may not be much evidence for Aristophanes' historical account, but epistemologically at least, it is an explanation.

Because I prefer mechanism to metaphor, EBE theory is unabashedly reductionistic. As already discussed, it proposes that exotic becomes erotic because feelings of dissimilarity and unfamiliarity in childhood produce heightened nonspecific autonomic arousal (D → E), which is subsequently transformed

into erotic/romantic attraction (E → F). To my knowledge, there is no direct evidence for the first step in this sequence beyond the well-documented observation that novelty and unfamiliarity produce heightened arousal (Mook, 1987); filling in this empirical gap in EBE theory must await future research. In contrast, there are at least three mechanisms that can potentially effect the second step, transforming generalized arousal into erotic/romantic attraction: the extrinsic arousal effect, the opponent process, and imprinting.

The extrinsic arousal effect. In his 1st-century Roman handbook, *The Art of Love*, Ovid advised any man who was interested in sexual seduction to take the woman in whom he was interested to a gladiatorial tournament, where she would more easily be aroused to passion. He did not say why this should be so, however, and it was not until 1887 that an elaboration appeared in the literature:

Love can only be excited by strong and vivid emotion, and it is almost immaterial whether these emotions are agreeable or disagreeable. The Cid wooed the proud heart of Donna Ximene, whose father he had slain, by shooting one after another of her pet pigeons. (Horwicz, quoted in Finck, 1887, p. 240).

A contemporary explanation of this effect was introduced by Walster (1971; Berscheid & Walster, 1974), who suggested that it constituted a special case of Schachter and Singer's (1962) two-factor theory of emotion. That theory states that the physiological arousal of our autonomic nervous system provides the cues that we feel emotional but that the more subtle judgment of which emotion we are feeling often depends on our cognitive appraisal of the surrounding circumstances. According to Walster, then, the experience of passionate love or erotic/romantic attraction results from the conjunction of physiological arousal and the cognitive causal attribution (or misattribution) that the arousal has been elicited by the potential lover.

There is now extensive experimental evidence that an individual who has been physiologically aroused will show heightened sexual responsiveness to an appropriate target stimulus. In one set of studies, male participants were physiologically aroused by running in place, by hearing an audiotape of a comedy routine, or by hearing an audiotape of a grisly killing (White, Fishbein, & Rutstein, 1981). They then viewed a taped interview with a woman who was either physically attractive or physically unattractive. Finally, they rated the woman on several dimensions, including her attractiveness, her sexiness, and the degree to which they would be interested in dating her and kissing her. The results showed that no matter how the arousal had been elicited, participants were more erotically responsive to the attractive woman and less erotically responsive to the unattractive women than were control participants who had not been aroused. In other words, the arousal intensified both positive or negative reactions to the woman, depending on which was cognitively appropriate.

This extrinsic arousal effect (my term) is not limited to the individual's cognitive appraisal of his or her emotional state. In two studies, men or women watched a sequence of two videotapes. The first portrayed either an anxiety-inducing or non-anxiety-inducing scene; the second videotape portrayed a nude heterosexual couple engaging in sexual foreplay. Preexposure to the anxiety-inducing scene produced greater penile tumescence

in men and greater vaginal blood volume increases in women in response to the erotic scene than did preexposure to the non-anxiety-inducing scene (Hoon, Wincze, & Hoon, 1977; Wolchik et al., 1980).

In addition to the misattribution explanation, several other explanations for the extrinsic arousal effect have been proposed, but experimental attempts to determine which explanation is the most valid have produced mixed results and the dispute is not yet settled (Allen, Kenrick, Linder, & McCall, 1989; Kenrick & Cialdini, 1977; McClanahan, Gold, Lenney, Ryckman, & Kulberg, 1990; White & Kight, 1984; Zillmann, 1983). For present purposes, however, it doesn't matter. It is sufficient to know that autonomic arousal, regardless of its source or affective tone, can subsequently be experienced cognitively, emotionally, and physiologically as erotic/romantic attraction. At that point, it *is* erotic/romantic attraction.

The pertinent question, then, is whether this effect can account for the link between autonomic arousal in childhood and erotic/romantic attraction later in life. In one respect, the experiments may actually underestimate the strength and reliability of the effect in real life. In the experiments, the arousal is deliberately elicited by a source extrinsic to the intended target, and there is disagreement over whether the effect even occurs when participants are aware of that fact (Allen et al., 1989; Cantor, Zillmann, & Bryant, 1975; McClanahan et al., 1990; White & Kight, 1984). But in the real-life scenario envisioned by EBE theory, the autonomic arousal is genuinely elicited by the class of individuals to which the erotic/romantic attraction develops. The exotic arousal and the erotic arousal are thus likely to be phenomenologically indistinguishable.

But there are at least two apparent difficulties in generalizing the effect to the scenario proposed by EBE theory. First, the effect occurs in the laboratory over time intervals measured in minutes, whereas the proposed developmental process spans several years. The time gap may be more apparent than real, however. As noted earlier, an individual's sense of being different from same- or opposite-sex peers is not a one-time event but a protracted and sustained experience throughout the childhood and adolescent years. This implies that the arousal will also be present throughout that time, ready to be converted into erotic or romantic attraction whenever the maturational, cognitive, and situational factors coalesce to provide the defining attributional moment.

A second apparent difficulty is posed by the experimental finding, described above, that when a participant was exposed to an unattractive woman on the videotape, extrinsic arousal only increased the negativity of the response to her; it did not transform it into a positive erotic response. This might seem to suggest that the extrinsic arousal effect cannot account for those individuals who are erotically or romantically attracted to others whom they dislike. In particular, it suggests that the effect cannot account for the special case of the gender-nonconforming boy who develops an erotic or romantic attraction to precisely that class of persons, males, he fears or dislikes because they have taunted him for his gender nonconformity.

But the videotaped woman in the experiment was not unlikable but physically unattractive, and these are quite different attributes. As noted earlier, both fiction and real life provide numerous examples of erotic attraction between people who

may not even like one other; one can dislike a person or class of persons overall but still be attracted to their physical appearance or idealize and eroticize one or more of their attributes. An all-too-familiar example is the misogynist heterosexual man who is not only erotically aroused by women's bodies but by narrowly specific attributes of their bodies, such as large breasts. Similarly, even those gay men and heterosexual women who find much to dislike about men in general may be turned on by a muscular male body or a pair of tight "buns." In short, the extrinsic arousal effect remains a viable explanation of erotic/romantic attraction, even to disliked individuals.³

Nevertheless, there is an alternative mechanism that accounts even more elegantly for both the proposed developmental time course of erotic/romantic attraction and the conversion of negative to positive affect: the opponent process (Solomon, 1980; Solomon & Corbit, 1974).

The opponent process. The theory of opponent process is a homeostatic theory of affect. When strong affect occurs, the nervous system responds by initiating an opponent process of opposite affective valence that reduces the intensity of the original affect. Strong negative affect is countered by internally generated positive affect and vice versa. (Only the case of initial negative affect is discussed here.) For example, prolonged stress that activates the sympathetic nervous system can produce a parasympathetic rebound when it is suddenly withdrawn. Intense pain is countered by the internal release of endorphins in the brain, which produce positive affect. The affect that the person experiences is the difference between the two opposing affects and shifts over time. For example, if an initial negative affect triggers a positive opponent process but then diminishes, the individual experiences a euphoric aftereffect as the opponent process overcompensates.

The theory further proposes that if the opponent process is evoked repeatedly, it will begin to respond more strongly over time and will become conditioned to the external situation so that it continues to be evoked even if the initiating negative affect no longer occurs. For example, parachutists experience terror on their first jump (Epstein, 1967). Their hearts race, their breathing is irregular, and their bodies are curled and stiff. After landing, they appear stunned, remaining mute and facially unexpressive. After a few minutes, however, they enter a period of mild euphoria, smiling and talking excitedly. After many more jumps, the fear extinguishes and the opponent process dominates. At this point, parachutists regularly experience a strong euphoric "high" after each jump. Similarly, long distance runners push past the pain barrier to feel a runner's high, and beginning sauna bathers suffer through several sessions of pain and burning before beginning to feel "exhilaration" and "a sense of well-being" after each sauna (Solomon, 1980). It seems likely that "masochistic" sexual pleasure that derives

³ For most individuals, cultural norms define which male and female attributes, if any, are to be idealized and eroticized; when a nonnormative attribute is eroticized, it is clinically defined as a paraphilia or a fetish and popularly stigmatized as a perversion. Tripp (1987) makes the intriguing suggestion—without citing evidence—that Hindu cultures have a lower incidence of male homosexuality than Muslim cultures because they do not idealize individualized masculine attributes.

from initially painful stimulation follows a similar developmental course.

We can now return to the case of the gender-nonconforming boy who is taunted by other boys. At first this produces strong negative arousal, but with repeated encounters over time, the fear and anger habituate and the opponent process becomes the conditioned, dominant affect. He thus emerges into late childhood or adolescence experiencing positive affective arousal to males, an arousal ready to be eroticized.

Imprinting. The temporal stability of sexual orientation across the life course for most individuals has suggested to some theorists that it may be the result of an early imprinting-like process (e.g., Archer, 1992; Bateson, 1978a). There are at least two distinct imprinting phenomena that might be pertinent. In filial imprinting, precocial birds, such as ducks and geese, become attached to and follow the first large moving object they encounter after hatching. The imprinting stimulus is usually the bird's mother but, as every introductory textbook in psychology notes, it can also be an inanimate moving object or even the ethologist. The more relevant phenomenon is probably sexual imprinting, a separate process that occurs during a later sensitive period (roughly equivalent to middle childhood) and is the precursor of both species-specific and within-species mate choice after sexual maturity has been attained (Bateson, 1979; Immelmann, 1972).

There are several specific features of sexual imprinting in birds that appear to be analogous to the development of sexual orientation in humans (Archer, 1992). First, sexual imprinting establishes an attraction to an entire class of individuals well before sexual maturity. Second, after imprinting has been established, the sexual preference is quite stable, even irreversible. In one study, male zebra finches were reared in nests of Bengalese finches for periods as brief as 1 week during the sensitive period. When they reached sexual maturity, they preferred to mate with Bengalese finch females even when presented with more receptive females of their own species. Even after considerable sexual experience with females of their own species, these zebra finches still preferred Bengalese finches when again given a choice several years later (Immelmann, 1972). The preference was sustained over both time and alternative experience.

Third, imprinting appears to follow the principle that exotic—but not too exotic—becomes erotic. For example, both male and female Japanese quail reared with their siblings later preferred their slightly different-appearing cousins both to their own siblings and to unrelated, more different-appearing quail (Bateson, 1978b). This has been interpreted as a mechanism that prevents inbreeding, a biologically promoted incest taboo. In fact, the author of the kibbutz study, cited earlier, has interpreted the exogamy of kibbutz members as the product of “negative imprinting” (Shepher, 1971).

Finally, physiological arousal appears to strengthen imprinting. If ducks or chickens are given electric shocks or are otherwise made anxious during the initial filial imprinting, they acquire a stronger attachment to the imprinting stimulus than they do in the absence of such arousal (e.g., Hess, 1959; Moltz, Rosenblum, & Halikas, 1959; Pitz & Ross, 1961). Analogously, the strong autonomic arousal elicited in the gender-nonconforming boy by his taunting male peers may intensify his later erotic/romantic attraction to males. It is also possible that this

phenomenon is just another instance of the opponent process; there is other evidence that the opponent process occurs in imprinting (Solomon, 1980).

Putting it all together. The general model outlined in Figure 1 does not indicate which, if any, of these processes underlie the transformation of nonspecific autonomic arousal to erotic attraction. Here are my best guesses. I believe that the extrinsic arousal effect eroticizes the relatively mild autonomic arousal experienced by virtually all children when they are in the presence of dissimilar peers. In the special case of a gender-nonconforming child who is taunted by same-sex peers, this is augmented by the opponent-process mechanism, which builds up a conditioned positive arousal to that same class of peers over time. Finally, I am willing to entertain the possibility that a process akin to imprinting may also contribute to the eroticization of arousal and the temporal stability of sexual orientation across the life course, again with particular force for the gender-nonconforming child who is taunted by same-sex peers.

One testable hypothesis that emerges from this analysis is that children who appear to their peers to be particularly gender nonconforming are likely to identify homoerotic feelings earlier or feel them more intensely than less strongly nonconforming children. This prediction is supported by data from the San Francisco study. About 44% of the gay men rated themselves as having been feminine in childhood and were also rated at the time of the study as “effeminate” in appearance by the interviewers. A separate path analysis for this subsample of gay men revealed that the variable “homosexual feelings in childhood” was the strongest predictor of their homosexual orientation in later years. In contrast, this variable does not even appear in the path analysis for noneffeminate gay men. Using parallel criteria, 54% of the lesbian women were categorized as “masculine.” Separate path analyses showed that even the causal link between childhood gender nonconformity and a homosexual orientation in adulthood was significant only for the masculine lesbians. (The path to sexual orientation for non-masculine lesbians is discussed later.)

The Biological Connection: (A → F) Versus (A → B)

In recent years, researchers, the mass media, and segments of the lesbian/gay/bisexual community have rushed to embrace the thesis that a homosexual orientation is coded in the genes or determined by prenatal hormones and brain neuroanatomy. Even the authors of the San Francisco study, whose findings disconfirm most experience-based theories of sexual orientation, seem ready to concede the ball game to biology. In contrast, EBE theory proposes that biological factors influence sexual orientation only indirectly, by intervening earlier in the chain of events to determine a child's temperaments and subsequent activity preferences. Accordingly, my persuasive task in this section is to argue that any nonartificial correlation between a biological factor and sexual orientation is more plausibly attributed to its influence in early childhood than to a direct link with sexual orientation.

Genes. Recent studies have provided some evidence for a correlation between an individual's genotype and his or her sexual orientation. For example, in a sample of 115 gay men who had male twins, 52% of monozygotic twin brothers were also

gay compared with only 22% of dizygotic twin brothers and 11% of gay men's adoptive brothers (Bailey & Pillard, 1991). In a comparable sample of 115 lesbians, 48% of monozygotic twin sisters were also lesbian compared with only 16% of dizygotic twin sisters and 6% of lesbian women's adoptive sisters (Bailey, Pillard, Neale, & Agyei, 1993). A subsequent study of nearly 5,000 twins who had been systematically drawn from a twin registry confirmed the significant heritability of sexual orientation for men but not for women (Bailey & Martin, 1995). And finally, a pedigree and linkage analysis of 114 families of gay men and a DNA linkage analysis of 40 families in which there were two gay brothers suggested a correlation between a homosexual orientation and the inheritance of genetic markers on the X chromosome (Hamer & Copeland, 1994; Hamer, Hu, Magnuson, Hu, & Pattatucci, 1993).⁴

But these same studies have also provided evidence for the link proposed by EBE theory between an individual's genotype and his or her childhood gender nonconformity, even when sexual orientation is held constant. For example, in the 1991 twin study of gay men, childhood gender nonconformity was assessed by a composite of three scales that have been shown to discriminate between gay and heterosexual men: childhood aggressiveness, interest in sports, and effeminacy. Across twin pairs in which both brothers were gay ("concordant" pairs), the correlation on gender nonconformity for monozygotic twins was as high as the reliability of the scale would permit, .76 ($p < .0001$), compared with a correlation of only .43 for concordant dizygotic twins, implying significant heritability (Bailey & Pillard, 1991). In the family pedigree study of gay men, pairs of gay brothers who were concordant for the genetic markers on the X chromosome were also more similar on gender nonconformity than were genetically discordant pairs of gay brothers (Hamer & Copeland, 1994). Finally, childhood gender nonconformity was significantly heritable for both men and women in the large twin registry study, even though sexual orientation itself was not heritable for the women (Bailey & Martin, 1995).

These studies are thus consistent with the link specified by EBE theory between the genotype and gender nonconformity ($A \rightarrow C$). The theory further specifies that this link is composed of two parts, a link between the genotype and childhood temperaments ($A \rightarrow B$) and a link between those temperaments and gender nonconformity ($B \rightarrow C$). This implies that the mediating temperaments should possess three characteristics: First, they should be plausibly related to those play activities that define gender conformity and nonconformity. Second, because they manifest themselves in sex-typed preferences, they should show sex differences. And third, because they are hypothesized to derive from the genotype, they should have significant heritabilities.

One likely candidate is aggression and its benign cousin, rough-and-tumble play. As noted above, gay men score lower than heterosexual men on a measure of childhood aggression (Blanchard, McConkey, Roper, & Steiner, 1983), and parents of gender-nonconforming boys specifically rate them as having less interest in rough-and-tumble play than do parents of gender-conforming boys (Green, 1976). Second, the sex difference in aggression during childhood is about half a standard deviation, one of the largest psychological sex differences known (Hyde, 1984). Rough-and-tumble play in particular is more

common in boys than in girls (DiPietro, 1981; Fry, 1990; Moller, Hymel, & Rubin, 1992). And third, individual differences in aggression have a large heritable component (Rushton, Fulker, Neale, Nias, & Eysenck, 1986).

Another likely candidate is activity level, considered to be one of the basic childhood temperaments (Buss & Plomin, 1975, 1984). Like aggression, differences in activity level would also seem to characterize the differences between male-typical and female-typical play activities in childhood, and gender-nonconforming boys and girls are lower and higher on activity level, respectively, than are control children of the same sex (Bates, Bentler, & Thompson, 1973, 1979; Zucker & Green, 1993). Second, the sex difference in activity level is as large as it is for aggression. A meta-analysis of 127 studies found boys to be about half a standard deviation more active than girls. Even before birth, boys in utero are about one third of a standard deviation more active than girls (Eaton & Enns, 1986). And third, individual differences in activity level have a large heritable component (Plomin, 1986).

In sum, existing data are consistent with both a direct path between the genotype and sexual orientation and the EBE path, which channels genetic influence through the child's temperaments and subsequent activity preferences. So why should one prefer the EBE account?

The missing theory for the direct path. The EBE account may be wrong, but I submit that a competing theoretical rationale for a direct path between the genotype and sexual orientation has not even been clearly articulated, let alone established. At first glance, the theoretical rationale would appear to be nothing less than the powerful and elegant theory of evolution. The belief that sexual orientation is coded in the genes would appear to be just the general case of the implicit assumption, mentioned in the introduction, that heterosexuality is the obvious, "natural" evolutionary consequence of reproductive advantage.

But if that is true, then a homosexual orientation is an evolutionary anomaly that requires further theoretical explication. How do lesbians and gay men manage to pass on their gene pool to successive generations? Several hypothetical scenarios have been offered (for a review, see Savin-Williams, 1987). One is that social institutions such as universal marriage can ensure that lesbians and gay men will have enough children to sustain a "homosexual" gene pool (Weinrich, 1987). Another is that the genes for homosexuality are linked to, or piggyback on, other genes that themselves carry reproductive advantage, such as genes for intelligence or dominance (Kirsch & Rodman, 1982; Weinrich, 1978). A third, based on kin selection, speculates that homosexual individuals may help nurture a sufficient number of their kin (e.g., nieces and nephews) to reproductive maturity to ensure that their genes get passed along to successive generations (Weinrich, 1978; Wilson, 1975, 1978).

Although these speculations have been faulted on theoretical, metatheoretical, and empirical grounds (Futuyama & Risch, 1983/84), a more basic problem with such arguments is their circularity. As Bleier has noted about similar accounts,

⁴ This last finding is currently in dispute, and an independent attempt to replicate it has failed (Rice, Anderson, Risch, & Ebers, 1995).

this logic makes a *premise* of the genetic basis of behaviors, then cites a certain animal or human behavior, constructs a speculative story to explain how the behavior (*if it were genetically based*) could have served or could serve to maximize the reproductive success of the individual, and this *conjecture* then becomes evidence for the *premise* that the behavior was genetically determined. (1984, p. 17)

When one does attempt to deconstruct the evolutionary explanation for sexual orientation, homosexual or heterosexual, some problematic assumptions become explicit. For example, the belief that sexual orientation is coded in the genes embodies the unacknowledged assumption that knowledge of the distinction between male and female must also be hardwired into the human species, that sex is a natural category of human perception. After all, we cannot be erotically attracted to a class of persons unless and until we can discriminate exemplars from nonexemplars of that class.

Given what psychology has learned about human language and cognition in recent decades, the notion that humans have innate knowledge of the male–female distinction is not quite so inconceivable as it once was. An explicit version of this notion is embodied in the Jungian belief that an *animus–anima* archetype is part of our collective unconscious. It could also be argued that functional, if not cognitive, knowledge of the male–female distinction is embodied in innate responses to pheromones or other sensory cues, as it is for several other species.

As it happens, I find all these possibilities implausible, but that is not the point. Rather, it is that those who argue for the direct heritability of sexual orientation should be made cognizant of such assumptions and required to shoulder the burden of proof for them. More generally, any genetic argument, including a sociobiological one, must spell out the developmental pathway by which genotypes are transformed into phenotypes (Bronfenbrenner & Ceci, 1994). This is precisely what EBE theory attempts to do and what the competing claim for a direct path between genes and sexual orientation fails to do. It is not that an argument for a direct path has been made and found wanting, but that it has not yet been made.

I am certainly willing to concede that heterosexual behavior is reproductively advantageous, but it does not follow that it must therefore be sustained through genetic transmission. As noted earlier, EBE theory implies that heterosexuality is the modal outcome across time and culture because virtually every human society ensures that most boys and girls will grow up seeing the other sex as exotic and, hence, erotic.

The more general point is that as long as the environment supports or promotes a reproductively successful behavior sufficiently often, it will not necessarily get programmed into the genes. For example, it is presumably reproductively advantageous for ducks to mate with other ducks, but as long as most baby ducklings encounter other ducks before they encounter an ethologist, evolution can simply implant the imprinting process itself into the species rather than the specific content of what, reproductively speaking, needs to be imprinted.⁵ Analogously, because most cultures ensure that the two sexes will see each other as exotic, it would be sufficient for evolution to implant exotic-becomes-erotic processes into our species rather than heterosexuality *per se*. In fact, as noted earlier, an exotic-becomes-erotic mechanism is actually a component of sexual im-

printing. If ducks, who are genetically free to mate with any moving object, have not perished from the earth, then neither shall we.

Prenatal hormones. One of the oldest hypotheses about sexual orientation is that gay men have too little testosterone and lesbians have too much. When the data failed to support this hypothesis (for reviews, see Gartrell, 1982, and Meyer-Bahlburg, 1984), attention turned from adult hormonal status to prenatal hormonal status. Reasoning from research on rats in which the experimental manipulation of prenatal androgen levels can “masculinize” or “feminize” the brain and produce sex-atypical mating postures and mounting responses, some researchers hypothesized that human males who are exposed prenatally to substantially lower than average amounts of testosterone and human females who are exposed to substantially higher than average amounts of testosterone will be predisposed toward a homosexual orientation in adult life (Ellis & Ames, 1987).⁶

One body of data advanced in support of this hypothesis comes from interviews with women who have congenital adrenal hyperplasia (CAH), a chronic endocrine disorder that exposes them to abnormally high levels of androgen during the prenatal period, levels comparable to those received by normal male fetuses during gestation. Most of these women were born with virilized genitalia, which were surgically corrected soon after birth, and placed on cortisol medication to prevent further anatomical virilization. In three studies, CAH women have now reported more bisexual or homosexual responsiveness than control women (Dittmann et al., 1990a; Money, Schwartz, & Lewis, 1984; Zucker et al., 1992).

But a number of factors suggest that this link from prenatal hormones to sexual orientation is better explained by their effects on childhood temperaments and activity preferences. For example, both boys and girls who were exposed to high levels of androgenizing progestins during gestation have shown increased aggression later in childhood (Reinisch, 1981), and girls with CAH have shown stronger preferences for male-typical activities and male playmates in childhood than control girls (Berenbaum & Hines, 1992; Berenbaum & Snyder, 1995; Dittmann et al., 1990b; Money & Ehrhardt, 1972).

It is also possible that the correlation itself is artifactual, having nothing to do with prenatal hormonal exposure—let alone “masculinization” of the brain. The contemporaneous hormonal status of CAH girls could be producing some of these childhood effects. It is even conceivable that the cortisol medication could be increasing their activity level, thereby promoting their preference for male-typical activities (Quadagno, Briscoe, & Quadagno, 1977).

But from the perspective of EBE theory, the major reason for expecting CAH girls to be disproportionately homoerotic in adulthood is that they are overwhelmingly likely to feel different from other girls. Not only are they gender nonconforming in

⁵ Although imprinting birds to other birds is still easier and more stable than imprinting them to ethologists (Immelmann, 1972).

⁶ As Adkins-Regan (1988) pointed out, some authors erroneously refer to the sex-atypical mating postures and mounting responses in rats as “homosexual,” even though the rats’ preferences for same- or opposite-sex mates is not assessed.

their play activities and peer preferences, as most lesbians are during the childhood years, but the salience of their CAH status itself aids and abets their perception of being different from other girls on gender-relevant dimensions. For example, they know about their virilized genitalia and they may be concerned that they will not be able to conceive and bear children when they grow up, one of the frequent complications of the CAH disorder. According to EBE theory, these are not girls who need masculinized brains to make them homoerotic.

A more critical test of the direct link between prenatal hormones and sexual orientation would seem to require a prenatal hormonal condition that is correlated with an adult homosexual orientation but uncorrelated with any of these childhood effects. Meyer-Bahlburg, Ehrhardt, Rosen, and Gruen (1995) hypothesized that abnormally high levels of prenatal estrogens might produce such an outcome in women by masculinizing their brains.

Although the theoretical reasoning behind this hypothesis has been questioned (Byne & Parsons, 1993), Meyer-Bahlburg et al. (1995) cited some supporting evidence from women whose mothers had taken diethylstilbestrol (DES), a synthetic estrogen that was used to maintain high-risk pregnancies until it was banned in 1971. Three samples of such women have now been interviewed and rated on several Kinsey-like scales for heterosexual and homosexual responsiveness. According to the investigators, "more DES-exposed women than controls were rated as bisexual or homosexual. . . ." (p. 12). Because DES does not produce any visible anomalies during childhood and evidence for childhood gender nonconformity among DES-exposed women was weak, this outcome would seem to favor the argument for a direct link between prenatal hormones and sexual orientation over the EBE account.

But the evidence for a bisexual or homosexual orientation among the DES-exposed women was also very weak. As Meyer-Bahlburg et al. (1995) noted, "the majority of DES-exposed women in our study were exclusively or nearly exclusively heterosexual, in spite of their prenatal DES exposure" (p. 20). In fact, of 97 DES-exposed women interviewed, only 4 were rated as having a predominantly homosexual orientation, and not a single woman was rated as having an exclusively homosexual orientation. I think the jury is still out on the link between prenatal estrogens and sexual orientation.

A third line of research on the masculinized or feminized brain hypothesis is based on hormonal feedback mechanisms. In adult female rats, the hypothalamic-pituitary-gonadal axis responds to estrogen input with a release of the pituitary hormone LH (luteinizing hormone). This estrogen-evoked LH response can be altered prenatally in both male and female rats by hormonal treatments that do, in fact, masculinize or feminize their brains. These observations led to the prediction that gay men should show a greater LH response to estrogen input than heterosexual men and that lesbians should show a smaller LH response than heterosexual women.

There are many logical flaws in this jump from rats to humans. For example, several lines of evidence imply that primates, including humans, do not even show a sex difference in the potential hypothalamic regulation of the LH feedback response (Byne & Parsons, 1993). There are also theoretical reasons to expect that it is not possible to obtain a genuine LH

feedback response in any gonadally intact man, an expectation that has now been confirmed in an experiment with both gay and heterosexual men (Gooren, 1986b). Finally, there is evidence that the LH response is dependent largely on the concurrent hormonal status of the individual, not on any putative sex-dimorphic prenatal influence. (For more extended discussions, see Byne & Parsons, 1993; Gooren, 1990; Zucker & Bradley, 1995.)

But these conceptual difficulties are overshadowed by the poor track record of empirical attempts to confirm the hypotheses. Although two early studies claimed to find support for an enhanced LH response in gay men (Dörner, Rhode, Stahl, Krell, & Masius, 1975; Gladue, Green, & Hellman, 1984), the Dörner et al. study found that bisexual men had a lower LH response than heterosexual men, and unpublished data from the Gladue et al. study showed that lesbian women had a higher LH response than did heterosexual women—directly opposite to prediction (Gladue, 1988). More recent studies have failed even to replicate the predicted effect for gay men (Gooren, 1986a; Gooren, 1986b; Hendricks, Graber, & Rodriguez-Sierra, 1989). In general, this line of research is no longer being pursued, and the conceptual criticisms have led some researchers to conclude that even if sexual orientation effects exist, they are probably unrelated to prenatal psychosexual differentiation (for a summary, see Zucker & Bradley, 1995).

Neuroanatomical correlates of sexual orientation. Even the general public now knows that there are neuroanatomical differences between the brains of gay men and those of heterosexual men and that some of these correspond to differences between the brains of women and men (Allen & Gorski, 1992; LeVay, 1991, 1993; Swaab & Hofman, 1990). Gay men also perform less well than heterosexual men on some cognitive, motor, and spatial tasks on which women perform less well than men (e.g., Gladue, Beatty, Larson, & Staton, 1990; McCormick & Witelson, 1991). (There are no comparable studies of lesbian women.)

But such differences are also consistent with the EBE account. Any biological factor that correlates with one or more of the intervening processes proposed by EBE theory could also emerge as a correlate of sexual orientation. For example, any neuroanatomical feature of the brain that correlates with childhood aggression or activity level could also emerge as a difference between gay men and heterosexual men, between women and men, and between heterosexual women and lesbians. Even if EBE theory turns out to be wrong, the more general point, that a mediating personality variable could account for observed correlations between biological variables and sexual orientation, still holds.

Like all well-bred scientists, biologically oriented researchers in the field of sexual orientation dutifully murmur the mandatory mantra that correlation is not cause. But the reductive temptation of biological causation is so seductive that the caveat cannot possibly compete with the excitement of discovering yet another link between the anatomy of our brains and the anatomy of our lovers' genitalia. Unfortunately, the caveat vanishes completely as word of the latest discovery moves from *Science* to *Newsweek*. The public can be forgiven for believing that research is but one government grant away from pinpointing the penis preference gene.

Individual Variations and Alternative Paths

As noted earlier, Figure 1 is not intended to describe an inevitable, universal path to sexual orientation but only the modal path followed by most men and women in a gender-polarizing culture like ours. Individual variations can arise in several ways. First, different individuals might enter the EBE path at different points in the sequence. For example, a child might come to feel different from same-sex peers not because of a temperamentally induced preference for gender-nonconforming activities but because of an atypical lack of contact with same-sex peers, a physical disability, or an illness (e.g., the CAH girls). Similarly, I noted earlier that the nonmasculine lesbians in the San Francisco study were not significantly gender nonconforming in childhood. But they were more likely than heterosexual women to have mostly male friends in grade school, and, consistent with the subsequent steps in the EBE path, this was the strongest predictor for these women of homosexual involvements in adolescence and a homosexual orientation in adulthood.

In general, EBE theory predicts that the effect of any childhood variable on an individual's sexual orientation depends on whether it prompts him or her to feel more similar to or more different from same-sex or opposite-sex peers. For example, it has recently been reported that a gay man is likely to have more older brothers than a heterosexual man (Blanchard & Bogaert, 1996). This could come about, in part, if having gender-conforming older brothers especially enhances a gender-nonconforming boy's sense of being different from other boys.

Individual variations can also arise from differences in how individuals interpret the "exotic" arousal emerging from the childhood years, an interpretation that is inevitably guided by social norms and expectations. For example, girls might be more socially primed to interpret the arousal as romantic attraction whereas boys might be more primed to interpret it as sexual arousal. Certainly most individuals in our culture are primed to anticipate, recognize, and interpret opposite-sex arousal as erotic or romantic attraction and to ignore, repress, or differently interpret comparable same-sex arousal. In fact, the heightened visibility of gay men and lesbians in our society is now prompting individuals who experience same-sex arousal to recognize it, label it, and act on it at earlier ages than in previous years (R. C. Fox, 1995).

In some instances, the EBE process itself may be supplemented or even superceded by processes of conditioning or social learning, both positive and negative. Such processes could also produce shifts in an individual's sexual orientation over the life course. For example, the small number of bisexual respondents in the San Francisco study appeared to have added same-sex erotic attraction to an already established heterosexual orientation after adolescence. Similar findings were reported in a more extensive study of bisexual individuals (Weinberg, Williams, & Pryor, 1994), with some respondents adding heterosexual attraction to a previously established homosexual orientation. This same study also showed that different components of an individual's sexual orientation need not coincide; for example, some of the bisexual respondents were more erotically attracted to one sex but more romantically attracted to the other.

Negative conditioning also appears to be an operative mecha-

nism in some cases of childhood sexual abuse or other upsetting childhood sexual experiences. For example, a reanalysis of the original Kinsey data revealed that a woman was more likely to engage in sexual activity with other women as an adult if she had been pressured or coerced into preadolescent sexual activity with an older male (Van Wyk & Geist, 1984).⁷

Finally, some women who would otherwise be predicted by the EBE model to have a heterosexual orientation might choose for social or political reasons to center their lives around other women. This could lead them to avoid seeking out men for sexual or romantic relationships, to develop affectional and erotic ties to other women, and to self-identify as lesbians or bisexuals. In general, issues of sexual orientation identity are beyond the formal scope of EBE theory.

Deconstructing the Concept of Sexual Orientation

As noted in the introduction, the academic discourse on sexual orientation is currently dominated by the debate between the biological essentialists, who can point to the empirical links between biology and sexual orientation, and the social constructionists, who can point to the historical and anthropological evidence that the concept of sexual orientation is itself a culture-bound notion (De Cecco & Elia, 1993). I suggest that EBE theory can accommodate both kinds of evidence. I have already shown how the theory incorporates the biological evidence. To demonstrate how EBE theory also accommodates the cultural relativism of the social constructionists, it is necessary to deconstruct the theory itself, to explicitly identify its essentialist and culture-specific elements and to see what remains when the latter are stripped away.

There are three essentialist assumptions underlying the scenario outlined in Figure 1. First, it is assumed that childhood temperaments are partially coded in the genes and, second, that those temperaments can influence a child's preferences for male-typical or female-typical activities. Third, and most fundamentally, it is assumed that the psychological processes that transform exotic into erotic are universal properties of the human species. That's it. Everything else is cultural overlay, including the concept of sexual orientation itself.

During the last half of the 19th century, there were two kinds of people: normal people and sexual inverts. The latter included feminine men, masculine women, cross-dressers of both sexes, individuals with same-sex desires—and suffragists. In 1895, the French writer M. A. Raffalovich took one of the first steps toward deconstructing this typology by separating same-sex eroticism from other gender violations: "The inverts are not at all content with the old explanation of the feminine soul in the masculine body. Some of them are more masculine than other men and are attracted to their own sex in proportion to the resemblance" (quoted in Birken, 1988, pp. 105–106). After that, the conceptual space of sexual orientation contained two kinds of people: heterosexuals and homosexuals.

⁷ More generally, these authors advocate a social-learning model of sexual orientation in which early sexual experiences play an important causal role. The San Francisco data, however, imply that most of the other sexual experiences they cite are more likely to be effects rather than causes of an emerging sexual orientation.

In 1948, Alfred Kinsey took the next major step in the deconstruction of the typology by construing sexual orientation as a bipolar continuum, ranging from exclusive heterosexuality, through bisexuality, to exclusive homosexuality. Placement on the original Kinsey scale was determined jointly by the individual's sexual behaviors and fantasies. Since then, many researchers have criticized this merging of two distinct components of sexual orientation and have variously proposed that separate scales be used to index sexual behaviors, sexual feelings, erotic fantasies, interpersonal affection, social preference, sexual lifestyle, and self-identification (e.g., Klein, Sepekoff, & Wolf, 1985; McWhirter, Sanders, & Reinisch, 1990; Shively & De Cecco, 1977). Thus, Kinsey's single dimension fractionated into as many as seven bipolar dimensions of sexual orientation.

Because many of the studies cited in this article have selected their participants on the basis of Kinsey-like scales, EBE theory has necessarily been couched in that language, but the theory itself is not constrained by such bipolar dimensions. In fact, sexual orientation is actually treated in Figure 1 as two conceptually independent dimensions: a heteroerotic dimension and a homoerotic dimension. This approach, first suggested by Shively and De Cecco (1977), parallels contemporary treatments of masculinity and femininity in which independent masculinity and femininity scales are combined into a four-way typology: Those high on one scale and low on the other are defined as either masculine or feminine; those high on both are defined as androgynous; and those low on both are defined as undifferentiated (Bem, 1974; Bem, Martyna, & Watson, 1976; Spence & Helmreich, 1978). Correspondingly, it is possible to identify individuals in shorthand terms as heterosexual, homosexual, bisexual, or asexual, depending on the respective intensities of their heteroerotic and homoerotic responsiveness.

But EBE theory is not about types of persons, but about the processes that determine any individual's location on each of the two dimensions. Thus, Figure 1 actually describes two paths for each individual: a heteroerotic path and a homoerotic path. Conceptually, the two paths are independent, thereby allowing for a panoply of individual differences, including several variants of bisexuality (e.g., being erotically attracted to one sex and romantically attracted to the other). Empirically, however, the two dimensions are likely to be negatively correlated in a gender-polarizing culture like ours in which most individuals come to be familiar with one sex while being estranged from the other. EBE theory predicts that this should be especially true for men in our society because, as shown in Table 1, boys are less likely than girls to have childhood friends of both sexes. This prediction is supported in a survey of a national probability sample of Americans (Laumann, Gagnon, Michael, & Michaels, 1994). When asked to whom they were sexually attracted, men yielded a bimodal distribution, being more likely to report either exclusively heterosexual or exclusively homosexual attraction than bisexual attraction. In contrast, women were more likely to report bisexual attraction than exclusively homosexual attraction.

Culture thus influences not only the structure and distribution of sexual orientation in a society but also how its natives, including its biological and behavioral scientists, think about sexual orientation. Like the natives of any gender-polarizing culture, we have learned to look at the world through the lenses

of gender, to impose the male-female dichotomy on virtually every aspect of life, especially sexuality. Which brings us, finally, to the most deeply embedded cultural assumption of all—that sexual orientation is necessarily based on sex. As Sandra Bem (1993) remarked,

I am not now and never have been a "heterosexual." But neither have I ever been a "lesbian" or a "bisexual" The sex-of-partner dimension implicit in the three categories . . . seems irrelevant to my own particular pattern of erotic attractions and sexual experiences. Although some of the (very few) individuals to whom I have been attracted . . . have been men and some have been women, what those individuals have in common has nothing to do with either their biological sex or mine—from which I conclude, not that I am attracted to both sexes, but that my sexuality is organized around dimensions other than sex. (p. vii)

This statement also suggests the shape that sexual orientation might assume in a non-gender-polarizing culture, a culture that did not systematically estrange its children from either opposite-sex or same-sex peers. Such children would not grow up to be asexual; rather, their erotic and romantic preferences would simply crystallize around a more diverse and idiosyncratic variety of attributes. Gentlemen might still prefer blonds, but some of those gentlemen (and some ladies) would prefer blonds of any sex. In the final deconstruction, then, EBE theory reduces to but one "essential" principle: Exotic becomes erotic.

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Received April 25, 1995

Revision received November 14, 1995

Accepted November 21, 1995 ■