The Origins of Sex Differences in Human Behavior

Evolved Dispositions Versus Social Roles

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The origins of sex differences in human behavior can lie mainly in evolved dispositions that differ by sex or mainly in the differing placement of women and men in the social structure. The present article contrasts these 2 origin theories of sex differences and illustrates the explanatory power of each to account for the overall differences between the mate selection preferences of men and women. Although this research area often has been interpreted as providing evidence for evolved dispositions, a reanalysis of D. M. Buss's (1989a) study of sex differences in the attributes valued in potential mates in 37 cultures yielded cross-cultural variation that supports the social structural account of sex differences in mate preferences.

As more research psychologists have become willing to acknowledge that some aspects of social behavior, personality, and abilities differ between women and men (e.g., Eagly, 1995; Halpern, 1997), their attention has begun to focus on the causes of these differences. Debates about causes center, at least in part, on determining what can be considered the basic or ultimate causes of sex differences. Theories of sex differences that address causes at this level are termed in this article *origin theories* (Archer, 1996). In such theories, causation flows from a basic cause to sex-differentiated behavior, and biological, psychological, and social processes mediate the relation between the basic cause and behavior. In this article, we consider two types of origin theories: One of these implicates evolved psychological dispositions, and the other implicates social structure. Evolutionary psychology, as illustrated in the work of Buss (1995a), Kenrick and Keefe (1992), and Tooby and Cosmides (1992), thus represents the first type of origin theory, and social psychological theories that emphasize social structure represent the second type of origin theory (e.g., Eagly, 1987; Eagly, Wood, & Diekman, in press; Lorenzi-Cioldi, 1998; Ridgeway, 1991; West & Zimmerman, 1987; Wiley, 1995).

In the origin theory proposed by evolutionary psychologists, the critical causal arrow points from evolutionary adaptations to psychological sex differences. Because women and men possess sex-specific evolved mechanisms, they differ psychologically and tend to occupy different social roles. In contrast, in the social structural origin theory, the critical causal arrow points from social structure to psychological sex differences. Because men and women tend to occupy different social roles, they become psychologically different in ways that adjust them to these roles.

One important feature is shared by these two origin theories: Both offer a functional analysis of behavior that emphasizes adjustment to environmental conditions. However, the two schools of thought differ radically in their analysis of the nature and timing of the adjustments that are most important to sex-differentiated behavior. Evolutionary psychologists believe that females and males faced different pressures in primeval environments and that the sexes' differing reproductive status was the key feature of ancestral life that framed sex-typed adaptive problems. The resolutions of these problems produced sex-specific evolved mechanisms that humans carry with them as a species and that are held to be the root cause of sex-differentiated behavior. Although evolutionary psychologists readily acknowledge the abstract principle that environmental conditions can influence the development and expression of evolved dispositions, they have given limited attention to variation of sex differences in response to individual, situational, and cultural conditions (e.g., Archer, 1996; Buss, 1995b; Buss & Kenrick, 1998). For example, Buss (1998) emphasized "universal or near-uni-

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versal sex differences" (p. 421) in preferences for long-term mates.

Social structuralists maintain that the situations faced by women and men are quite variable across societies and historical periods as social organization changes in response to technological, ecological, and other transformations. From a social structural perspective, a society's division of labor between the sexes is the engine of sex-differentiated behavior, because it summarizes the social constraints under which men and women carry out their lives. Sex differences are viewed as accommodations to the differing restrictions and opportunities that a society maintains for its men and women, and sex-differentiated behavior is held to be contingent on a range of individual, situational, and cultural conditions (see Deaux & LaFrance, 1998). Despite this emphasis on the social environment, social structuralists typically acknowledge the importance of some genetically mediated sex differences. Physical differences between the sexes, particularly men's greater size and strength and women's childbearing and lactation, are very important because they interact with shared cultural beliefs, social organization, and the demands of the economy to influence the role assignments that constitute the sexual division of labor within a society and produce psychological sex differences (Eagly, 1987; Wood & Eagly, 1999).

These thumbnail sketches of these two origin theories should make it clear that this debate about the origins of sex differences cannot be reduced to a simple nature-versus-nurture dichotomy. Both evolutionary psychology and social structural theory are interactionist in the sense that they take both biological and environmental factors into account, but they treat these factors quite differently. Evolutionary psychology views sex-specific evolved dispositions as psychological tendencies that were built in through genetically mediated adaptation to primeval conditions; the theory treats contemporary environmental factors as cues that interact with adaptations to yield sex-typed responses. Social structural theory views sex-differentiated tendencies as built in through accommodation to the contemporaneous sexual division of labor; in this approach, physical differences between the sexes serve as one influence on role assignment.

Another caution is that these theories do not merely reflect different levels of analysis. In some attempts to reconcile the two perspectives, writers have proposed that social structural theories identify proximal, contemporaneous causes for the behavior of women and men, whereas evolutionary analyses invoke more distal causes that arose early in human history (e.g., Borkenau, 1992; Jackson, 1992; Schaller, 1997). Although the timing of the human adjustment to environmental conditions that is deemed critical is indeed different in the two theories, they propose causes that are similar in their position on the proximal versus distal continuum of causality. Both theories thus identify psychological causes (i.e., evolved dispositions, role expectations) that operate in the present and that exert their impact through more proximal processes (e.g., emotions, perceptions). The social structural perspective is thus in stark contrast to evolutionary psychology models that attribute sex differences in contemporary society to sex-typed evolved mechanisms. The causes of sex differences in evolutionary psychology involve these mechanisms, which are intended to replace the social psychological mechanisms featured in theories that give a key role to social structure.

It also would be inappropriate to conclude that the social structural approach is incompatible with the general perspective of evolutionary theorizing. Social structural analyses suggest an evolved organism, but one in which evolutionary pressures yielded a variety of dispositions, such as the capacity for group living and for culture. These analyses do not imply that people's minds are blank slates, because humans possess facilities, such as for language, that develop in certain ways, given appropriate environments. Moreover, our critique of theorizing in evolutionary psychology is not meant to apply to evolutionary principles in general. Evolutionary reasoning pertaining to humans is diverse (Smith, in press) and provides the basis, not only of evolutionary psychology, but also of models of the relation between biology and culture (Janicki & Krebs, 1998) and human behavioral ecology approaches that emphasize behavioral variability in response to socioecological conditions (Cronk, 1991). The implications of these other evolutionary theories for psychological processes have yet to be fully developed and are not discussed in this article.

To illustrate the contrasting approaches of evolutionary psychology and social structural theory, we first present and discuss each theory. Then we examine their predictions concerning the criteria men and women use in selecting mates. This domain of behavior has been central to evolutionary theorizing about human sex differences (e.g., Buss & Schmitt, 1993; Kenrick & Keefe, 1992), and the cross-cultural findings available in this area provide an opportu-

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nity to examine empirically some of the predictions of evolutionary and social structural analyses.

Evolutionary Psychology as an Origin Theory of Sex Differences

From the perspective of evolutionary psychology, human sex differences reflect adaptations to the pressures of the differing physical and social environments that impinged on females and males during primeval times (Buss, 1995a; Tooby & Cosmides, 1992). Evolutionary psychologists thus label the environment that produced a species' evolved tendencies as its environment of evolutionary adaptedness (EEA; Cosmides, Tooby, & Barkow, 1992; Symons, 1979, 1992; Tooby & Cosmides, 1990b). They loosely identify the Pleistocene era as the human EEA and generally assume that it was populated by hunter–gatherer groups. To the extent that males and females faced different adaptive problems as they evolved, the two sexes developed different strategies to ensure their survival and to maximize their reproductive success. The resolutions to these problems produced evolved psychological mechanisms that are specific to each problem domain and that differ between women and men.

Although humans' evolved mechanisms developed in response to the types of problems consistently encountered by their ancestors and thus are presumed to be universal attributes of humans, environmental input affects how these mechanisms develop in individuals and how they are expressed in behavior (e.g., Buss & Kenrick, 1998). Because culture influences developmental experiences and patterns current situational input, culture is in principle important to the expression of adaptive mechanisms (Tooby & Cosmides, 1992). However, evolutionary psychologists have devoted relatively little attention to the interaction between such broader attributes of the social and cultural environment and the evolved mechanisms that may underlie sex differences. The contextual factors that have interested them generally relate directly to these hypothesized mechanisms. For example, Buss and Schmitt (1993) maintained that the characteristics that people seek in mates depend, not only on their sex, but also on whether they are engaging in short-term or long-term mating. Because of a relative neglect of broader social context, evolutionary psychologists have generated little understanding of how variation in sex-differentiated behavior arises from developmental factors and features of social structure and culture (for an exception, see Draper & Harpending, 1982).

The aspect of evolutionary theory that has been applied most extensively to sex differences is the theory of sexual selection initially proposed by Darwin (1871) and further developed by Trivers (1972). In the evolutionary psychologists' rendition of these views, sex-typed features of human behavior evolved through male competition and female choice of mates. Because women constituted the sex that devoted greater effort to parental investment, they were a limited reproductive resource for men, who were the less investing sex. Women were restricted in the number of children they could propagate during their life span because of their investment through gestating, bearing, and nursing their children; men did not have these restrictions. Men therefore competed for access to women, and women chose their mates from among the available men. As the more investing sex, women were selected for their wisdom in choosing mates who could provide resources to support their parenting efforts. Women's preferences for such men, in turn, produced sexual selection pressures on men to satisfy these criteria.

Proponents of sexual selection theory argue that sex differences in parental investment favored different strategies for reproductive success for men and women and consequently established different adaptive mechanisms governing mating behavior (Buss, 1996; Kenrick, Trost, & Sheets, 1996). It was to men's advantage in terms of fitness outcomes to "devote a larger proportion of their total mating effort to short-term mating than do women" (Buss & Schmitt, 1993, p. 205)—that is, to be relatively promiscuous. Women, in contrast, benefited from devoting a smaller proportion of their effort to short-term mating and a larger proportion to long-term mating. Also, because of women's concealed fertilization, men were unable to determine easily which children could proffer the fitness gains that follow from genetic relatedness. Men ostensibly adapted to this problem of paternity uncertainty by exerting sexual control over women and developing sexual jealousy and a motive to control women's sexuality (Daly & Wilson, 1998).

According to evolutionary psychologists (e.g., Buss, 1995b; Buss & Kenrick, 1998), sex differences in numerous psychological dispositions arose from differing fitness-related goals of women and men that followed from their contrasting sexual strategies. Because men competed with other men for sexual access to women, men's evolved dispositions favor violence, competition, and risk taking.

Women in turn developed a proclivity to nurture and a preference for long-term mates who could support a family. As a result, men strived to acquire more resources than other men in order to attract women, and women developed preferences for successful, ambitious men who could provide resources.

Critical to some of evolutionary psychologists' claims about sex differences is the assumption that ancestral humans living in the EEA had a hunter–gatherer socioeconomic system (e.g., Buss, 1995b; Cosmides et al., 1992; DeKay & Buss, 1992). The idea of a division of labor in which men hunted while women gathered suggests sex-differentiated pressures linked to survival and reproduction. Such an ancestral division of labor might have favored men who were psychologically specialized for hunting and women who were specialized for gathering. For example, cognitive abilities could have been affected, with men acquiring the superior spatial skills that followed from ancestral hunting, and women acquiring the superior spatial location memory that followed from ancestral gathering (e.g., Geary, 1995; Silverman & Phillips, 1998).

Various mediating processes are implied in evolutionary psychology models of behavioral sex differences. The first and most important involves some means of retaining effective adaptations in human design and perpetuating them over time. Thus, sex-differentiated psychological mechanisms and developmental programs, like other adaptations, are "genetic, hereditary, or inherited in the sense that . . . their structured design has its characteristic form because of the information in our DNA" (Tooby & Cosmides, 1990a, p. 37; see also Buss, Haselton, Shackelford, Bleske, & Wakefield, 1998; Crawford, 1998). Some evolutionary accounts also emphasize that genetic factors trigger biochemical processes that mediate psychological sex differences, especially by means of sex differences in hormone production (e.g., Daly & Wilson, 1983; Geary, 1995, 1996). In addition, sex-typed evolved mechanisms are translated into behavioral sex differences by various cognitive and affective processes. Establishing these links requires theoretical understanding and empirical documentation of the range of processes by which the genetic factors implicated in innate dispositions might affect human behavior (e.g., Collear & Hines, 1995).

Buss and Kenrick (1998) described evolutionary psychology's approach to understanding sex differences as a "metatheory" and summarized it as follows: "Men and women differ in domains where they faced different adaptive problems over human evolutionary history" (p. 994). These theorists thus derive sex differences from heritable adaptations built into the human species. Because these differences are assumed to follow from evolutionary adaptations, they are predicted to occur as central tendencies of male versus female behavior. Human behavior would thus be characterized by a deep structure of sex-differentiated dispositions, producing similar, albeit not identical, behavioral sex differences in all human societies.

Critique of the Evolutionary Origin Theory

A number of questions can be raised about evolutionary psychology's account of the origins of sex differences. One consideration is that evolutionary analyses have generally identified adaptations by relying on "informal arguments as to whether a presumed function is served with sufficient precision, economy, efficiency, etc. to rule out pure chance as an adequate explanation" (Williams, 1966, p. 10). Explanations that reflect this approach consist of an analysis of the functional relations served by a particular psychological mechanism, along with the construction of a convincing story about how the adaptation might have made an efficient contribution to genetic survival or to some other goal contributing to reproduction in the EEA. These explanations serve as hypotheses that require additional validation and thus can be useful for initiating scientific research.

In developing these analyses of the possible functions of behaviors, evolutionary scientists face special challenges in distinguishing adaptations from other possible products of evolution—for example, features that were random or that had utility for one function but were subsequently coopted to fulfill a new function (see Buss et al., 1998; Gould, 1991; Williams, 1966). Moreover, the products of evolution must be distinguished from the products of cultural change. Behaviors that provide effective solutions to problems of reproduction and survival can arise from inventive trial-and-error among individuals who are genetically indistinguishable from other members of their living groups; such beneficial behaviors are then imitated and transmitted culturally.

An understanding of humans' primeval environment might help validate evolutionary hypotheses because adaptations evolved as solutions to past environmental challenges. Various bodies of science have some relevance, including observational studies of other primates, the fossil record, and ethnographic studies. However, models of human nature constructed from the behavior of nonhuman primates do not yield a uniform picture that reflects key features of sex differences in modern human societies (see Fedigan, 1986; Strier, 1994; Travis & Yeager, 1991). Similarly ambiguous concerning sex differences are the models of early human social conditions that paleontologists and paleoanthropologists have developed from fossil evidence. Anthropologists continue to debate fundamental points—for example, whether hunting of dangerous prey might have emerged during the period that is usually identified as the human EEA (e.g., Potts, 1984; Rose & Marshall, 1996). As a consequence, assumptions that certain traits were adaptive and consequently are under genetic control cannot be firmly supported from analyzing attributes of the EEA. Moreover, early human societies likely took a wide variety of forms during the period when the species was evolving toward its modern anatomical form (Foley, 1996). Variability in social organization is consistent with observations of more contemporary hunter–gatherer societies, which show great diversity in their social organization (Kelly, 1995). For example, studies of power relations between the sexes across diverse cultures show variability in the extent

to which men control women's sexuality (Whyte, 1978), although evolutionary psychologists have assumed that this control is a defining feature of male–female relations. Therefore, because the EEA likely encompassed a variety of conditions, tracing humans' evolution requires understanding of the timing, social organization, and ecological circumstances of multiple periods of adaptation (Foley, 1996). The ambiguity and complexity of the relevant scientific findings leave room for evolutionary psychologists to inadvertently transport relatively modern social conditions to humans' remote past by inappropriately assuming that the distinctive characteristics of contemporary relations between the sexes were also typical of the EEA.

Given the difficulty of knowing the functions of behaviors and the attributes of the EEA, other types of scientific evidence become especially important to validating the claims of evolutionary psychologists. The most convincing evidence that a behavioral pattern reflects an adaptation would be that individuals who possessed the adaptation enjoyed a higher rate of survival and reproduction than individuals who did not possess it. However, such evidence is difficult, if not impossible, to produce. Because humans' evolved mechanisms emerged in relation to past selection pressures, present reproductive advantage does not necessarily reflect past advantage, and evolutionary psychologists have warned against relying on measures of current reproductive success to validate hypothesized adaptations (Buss, 1995a; Tooby & Cosmides, 1992). In the absence of evidence pertaining to reproductive success, scientists might document the genetic inheritance of postulated mechanisms and the processes by which genetic factors result in sex differences in behavior. However, for the psychological dispositions considered in this article, such evidence has not been produced. Instead, the scientific case for these sex-differentiated evolved dispositions rests on tests of evolutionary psychologists' predictions concerning the behavior of men and women in contemporary societies (e.g., Buss & Schmitt, 1993; Kenrick & Keefe, 1992). We evaluate some of these predictions in this article.

Social Structural Theory as an Origin Theory of Sex Differences

A respected tradition in the social sciences locates the origins of sex differences, not in evolved psychological dispositions that are built into the human psyche, but in the contrasting social positions of women and men. In contemporary American society, as in many world societies, women have less power and status than men and control fewer resources. This feature of social structure is often labeled gender hierarchy, or in feminist writing it may be called patriarchy. In addition, as the division of labor is realized in the United States and many other nations, women perform more domestic work than men and spend fewer hours in paid employment (Shelton, 1992). Although most women in the United States are employed in the paid workforce, they have lower wages than men, are concentrated in different occupations, and are thinly represented at the highest levels of organizational hierarchies (Jacobs, 1989; Reskin & Padavic, 1994; Tomaskovic-Devey, 1995). From a social structural perspective, the underlying cause of sex-differentiated behavior is this concentration of men and women in differing roles.

The determinants of the distribution of men and women into social roles are many and include the biological endowment of women and men. The sex-differentiated physical attributes that influence role occupancy include men's greater size and strength, which gives them priority in jobs demanding certain types of strenuous activity, especially activities involving upper body strength. These physical attributes of men are less important in societies in which few occupational roles require these attributes, such as postindustrial societies. Also important in relation to role distributions are women's childbearing and in many societies their activity of suckling infants for long periods of time; these obligations give them priority in roles involving the care of very young children and cause conflict with roles requiring extended absence from home and uninterrupted activity. These reproductive activities of women are less important in societies with low birthrates, less reliance on lactation for feeding infants, and greater reliance on nonmaternal care of young children.

In general, physical sex differences, in interaction with social and ecological conditions, influence the roles held by men and women because certain activities are more efficiently accomplished by one sex. The benefits of this greater efficiency can be realized when women and men are allied in cooperative relationships and establish a division of labor. The particular character of the activities that each sex performs then determines its placement in the social structure (see Wood & Eagly, 1999). As historians and anthropologists have argued (e.g., Ehrenberg, 1989; Harris, 1993; Lerner, 1986; Sanday, 1981), men typically specialized in activities (e.g., warfare, herding) that yielded greater status, wealth, and power, especially as societies became more complex. Thus, when sex differences in status emerged, they tended to favor men.

The differing distributions of men and women into social roles form the basis for a social structural metatheory of sex differences, just as evolutionary theory provides a metatheory. The major portion of this social structural theory follows from the typical features of the roles of men and women. Thus, the first metatheoretical principle derives from the greater power and status that tends to be associated with male-dominated roles and can be succinctly stated as follows: Men's accommodation to roles with greater power and status produces more dominant behavior, and women's accommodation to roles with lesser power and status produces more subordinate behavior (Ridgeway & Diekema, 1992). Dominant behavior is controlling, assertive, relatively directive and autocratic, and may involve sexual control. Subordinate behavior is more compliant to social influence, less overtly aggressive, more cooperative and conciliatory, and may involve a lack of sexual autonomy.

The second metatheoretical principle follows from the differing balance of activities associated with the typical roles of each sex. Women and men seek to accommodate sex-typical roles by acquiring the specific skills and re-

sources linked to successful role performance and by adapting their social behavior to role requirements. A variety of sex-specific skills and beliefs arise from the typical family and economic roles of men and women, which in many societies can be described as resource provider and homemaker. Women and men seek to accommodate to these roles by acquiring role-related skills, for example, women learning domestic skills such as cooking and men learning skills that are marketable in the paid economy. The psychological attributes and social behaviors associated with these roles have been characterized in terms of the distinction between communal and agentic characteristics (Bakan, 1966; Eagly, 1987). Thus, women's accommodation to the domestic role and to female-dominated occupations favors a pattern of interpersonally facilitative and friendly behaviors that can be termed communal. In particular, the assignment of the majority of child rearing to women encourages nurturant behaviors that facilitate care for children and other individuals. The importance of close relationships to women's nurturing role favors the acquisition of superior interpersonal skills and the ability to communicate nonverbally. In contrast, men's accommodation to the employment role, especially to male-dominated occupations, favors a pattern of assertive and independent behaviors that can be termed agentic (Eagly & Steffen, 1984). This argument is not to deny that paid occupations show wide variation in the extent to which they favor more masculine or feminine qualities. In support of the idea that sex-differentiated behaviors are shaped by paid occupations are demonstrations that to the extent that occupations are male dominated, they are thought to require agentic personal qualities. In contrast, to the extent that occupations are female dominated, they are thought to require communal personal qualities (Cejka & Eagly, 1999; Glick, 1991).

In social structural theories, differential role occupancy affects behavior through a variety of mediating processes. In social role theory (Eagly, 1987; Eagly et al., in press), an important mediating process is the formation of gender roles by which people of each sex are expected to have characteristics that equip them for the tasks that they typically carry out. These expectations encompass the preferred or desirable attributes of men and women as well as their typical attributes. Gender roles are emergents from the productive work of the sexes; the characteristics that are required to perform sex-typical tasks become stereotypic of women or men. To the extent that women more than men occupy roles that demand communal behaviors, domestic behaviors, or subordinate behaviors for successful role performance, such tendencies become stereotypic of women and are incorporated into a female gender role. To the extent that men more than women occupy roles that demand agentic behaviors, resource acquisition behaviors, or dominant behaviors for successful role performance, such tendencies become stereotypic of men and are incorporated into a male gender role. Gender roles facilitate the activities typically carried out by people of each sex. For example, the expectation that women be other-oriented and compassionate facilitates their nurturing activities within the family as well as their work in many female-dominated occupations (e.g., teacher, nurse, social worker).

People communicate gender-stereotypic expectations in social interaction and can directly induce the targets of these expectations to engage in behavior that confirms them (e.g., Skrypnek & Snyder, 1982; Wood & Karten, 1986). Such effects of gender roles are congruent with theory and research on the behavioral confirmation of stereotypes and other expectancies (see Olson, Roese, & Zanna, 1996). Gender-stereotypic expectations can also affect behavior by becoming internalized as part of individuals' self-concepts and personalities (Feingold, 1994). Under such circumstances, gender roles affect behavior through self-regulatory processes (Wood, Christensen, Hebl, & Rothgerber, 1997). The individual psychology that underlies these processes is assumed to be the maximization of utilities. People perceive these utilities from the rewards and costs that emerge in social interaction, which takes place within the constraints of organizational and societal arrangements.

Gender roles coexist with specific roles based on factors such as family relationships and occupation. These specific social roles contribute directly to sex-differentiated behavior when women and men are differently distributed into them—for example, women into the homemaker role and men into the provider role. In contrast, when men and women occupy the same specific social role, sex differences would tend to erode because specific roles are constraining (e.g., Eagly & Johnson, 1990). However, gender roles ordinarily continue to have some impact on behavior, even in the presence of specific roles (see Gutek & Morasch, 1983; Moscowitz, Suh, & Desaulniers, 1994; Ridgeway, 1997). Moreover, experimental evidence (e.g., Hembroff, 1982) suggests that people combine or average the expectations associated with specific roles and more diffuse roles such as gender roles in a manner that weights each set of expectations according to its relevance to the task at hand.

The social structural perspective provides a broad theoretical outline within which many social scientific theories of sex-differentiated behavior can be placed. These theories focus on different aspects of the processes by which societies produce sex-differentiated behavior, and many theories have spawned detailed predictions and a substantial body of empirical research (see Beall & Sternberg, 1993; Canary & Dindia, 1998; England & Browne, 1992). For example, developmental psychologists have studied socialization in the family, school, and peer group. Social psychologists have examined the impact of gendered self-schemas, men's greater status, sex-differentiated expectations about behavior, and gendered patterns of social interaction. Sociologists have implicated organizational factors such as discriminatory employment practices, societal factors such as men's greater ownership of capital, and cultural factors such as the ideologies that legitimize gender inequality. Social scientists have thus provided an array of interrelated theories, each of which illuminates certain aspects of the processes by which sex-differentiated behavior is produced.

In summary, in social structural accounts, women and men are differently distributed into social roles, and these differing role assignments can be broadly described in terms of a sexual division of labor and a gender hierarchy. This division of labor and the patriarchal hierarchy that sometimes accompanies it provide the engine of sex-differentiated behavior because they trigger social and psychological processes by which men and women seek somewhat different experiences to maximize their outcomes within the constraints that societies establish for people of their sex. Sex differences in behavior thus reflect contemporaneous social conditions.

Response to Critiques of the Social Structural Origin Theory

A number of criticisms have been leveled against the social structural theory of sex differences and more specifically against social role theory (see Archer, 1996; Buss, 1996). At least some evolutionary psychologists have expressed skepticism that culture and social structure could have any independent causal role in relation to behavior. Instead, culture and social structure are seen as reflecting the underlying logic of evolved dispositions, and consequently they do not constitute the causal force underlying behavioral sex differences (Buss, 1995a; Tooby & Cosmides, 1992). However, from our perspective, culture and social structure can influence behavior. Culture consists of knowledge, beliefs, and evaluations shared among members of a society and reflects, not only the biological endowment of humans, but also the constraints of their social and physical environments. Social structure reflects culture and consists of "persisting and bounded patterns of behavior and interaction among people or positions" (House, 1995, p. 390). Gender roles and other social roles are simultaneously aspects of culture, because they represent shared knowledge, and of social structure, because they represent bounded patterns of interaction.

Another criticism is that in social structural theories, individuals are treated as mere passive receptacles of the roles they are assigned (Buss, 1996). Although social scientists often do refer to *role assignment,* this term does not imply that people are typically assigned to roles arbitrarily, as if they were passive actors in the social system. On the contrary, social and organizational psychologists have demonstrated that the assumption of roles is a complex and dynamic process (e.g., Kerckhoff, 1995; Pfeffer, 1998). In deciding whether to attempt to assume particular roles at all, individuals take their own attributes, skills, and personal preferences into account, although in some cultural contexts some roles are imposed on people regardless of their own preferences (e.g., the practice of early betrothal of girls). In general, social systems are arranged to shape people's self-concepts, skills, beliefs, and values so that the majority of people actively seek out experiences that help them to become appropriate occupants of existing social roles by meeting the expectations of these roles.

Evolutionary psychologists also claim that sociocultural theorists view gender roles as "essentially arbitrary" (Buss, 1996, p. 19) or as arising by "historical accident" (Archer, 1996, p. 915). On the contrary, as we have explained, the content of gender roles is not arbitrary but is embedded in social structure and culture. Roles must thus facilitate the endeavors of a society, if its members are to prosper and survive. Therefore, different types of role systems become effective under differing circumstances. For example, in industrial economies, many roles are organized by a market pricing system that takes into account factors such as ownership of property and contribution to production (see Fiske, 1992). The analytical frameworks for understanding how systems of social roles change over time have been developed by scholars in other disciplines (e.g., Diamond, 1997; Toynbee, 1934–1961). Yet, understanding the principles by which women and men distribute themselves into a society's roles is part of the agenda of social psychologists as well as other social scientists.

A related criticism is that from a social structural perspective, "differences between cultures are random with respect to evolutionary hypotheses and therefore that, for example, sex differences should occur as frequently in one direction as the other" (Tooby & Cosmides, 1989, p. 37). However, our theoretical perspective is not consistent with random variation in sex differences across societies. Instead, societal variation in the roles of men and women depends on multiple factors, including men's greater size and physical strength, women's reproductive activities, and the activities required by a society's economy and social organization, which in turn reflect technological developments and the current ecology. Because these factors are not randomly distributed, certain types of social arrangements are more common than others, and sex differences appropriate to the common arrangements should be more frequent than reversals of these differences.

The social structural approach has also been criticized for treating the minds of women and men as identical except by virtue of the constraints that follow from externally assigned roles (Buss, 1996). We acknowledge that the social structural perspective does imply that differences in the minds of women and men arise primarily from experience and socialization, which reflect the physical attributes of women and men and the characteristics of the social and physical environment. This assumption that humans' psychological attributes are minimally constrained by genetically encoded sex differences is consistent with the diversity of behaviors and skills exhibited by men and women across societies and within societies. Yet, our perspective is fully compatible with the idea that people possess evolved facilities, such as for language, that develop in predictable ways in appropriate environments.

Sex Differences in Mate Selection Criteria Predicted From Evolutionary Psychology and Social Structural Theory

One reasonable area for comparing the predictive power of the evolutionary and the social structural origin theories of sex differences is human mating behavior, especially the criteria that people use for selecting mates. Evolutionary

predictions have been articulated especially clearly for mating activities, and these behaviors can also be used to test a social structural perspective. Furthermore, empirical findings concerning mate selection preferences have been well-established for many years in the literature on the sociology of the family (e.g., Coombs & Kenkel, 1966). Powers's (1971) summary of 30 years of research concluded that at least in the United States, women generally prefer mates with good earning potential, whereas men prefer mates who are physically attractive and possess good domestic skills. Furthermore, women typically prefer a mate who is older than them, whereas men prefer a mate who is younger. Feingold's (1990, 1991, 1992a) meta-analyses of studies drawn from various research paradigms established that the sex differences in valuing potential mates' earning potential and physical attractiveness are robust, despite sex similarity on most criteria for selecting mates. Subsequent research based on a national probability sample of single adults provided further confirmation of the sex differences in age preferences as well as in valuing earning potential and physical attractiveness (Sprecher, Sullivan, & Hatfield, 1994).

Evolutionary psychologists have adopted mate preferences as signature findings of their analysis. Women's valuing of mates' resources and men's valuing of mates' youth and physical attractiveness are thought to arise from the different parental investment of the sexes that was outlined in Trivers's (1972) sexual selection theory. It is commonly argued that women, as the more investing sex, seek mates with attributes that can support their parenting efforts. However, human mate selection does not follow a strict version of Trivers's males-compete-and-females-choose model, because among humans, selection is a product of the behavior of both sexes, a process Darwin (1871) called "dual selection." In Buss's (1989a) account, male choice derives from women's time-limited reproductive capacity and the tendency for men to seek mates with attributes that suggest such capacity. In Kenrick and Keefe's (1992) account, men and women are both selective about potential mates and both invest heavily in offspring but with different kinds of resources. In particular, "males invest relatively more indirect resources (food, money, protection, and security), and females invest relatively more direct physiological resources (contributing their own bodily nutrients to the fetus and nursing child)" (Kenrick & Keefe, 1992, p. 78). As a result, women prefer mates who can provide indirect resources, and men prefer healthy mates with reproductive potential.[1]

In contrast, from a social structural perspective, the psychology of mate selection reflects people's effort to maximize their utilities with respect to mating choices in an environment in which these utilities are constrained by societal gender roles as well by as the more specific expectations associated with marital roles. Consistent with these ideas, Becker's (1976) economic analysis of mating decisions characterized marriage as occurring between utility-maximizing men and women who can reach an equilibrium with a variety of types of exchanges, including, for example, an exchange between men's wages and women's household production and other attributes such as education and beauty. This cost–benefit analysis of mating appears even on occasion in the writings of evolutionary scientists. For example, Tattersall (1998) maintained that behavioral regularities, such as sex differences in mate selection criteria, are as likely to be due to rational economic decisions as to inherited predispositions, and Hrdy (1997) wrote that "a woman's preference for a wealthy man can be explained by the simple reality that . . . males monopolize ownership of productive resources" (p. 29).

The outcomes that are perceived to follow from mating decisions depend on marital and family arrangements. To the extent that women and men occupy marital and family roles that entail different responsibilities and obligations, they should select mates according to criteria that reflect these divergent responsibilities and obligations. Consider, for example, the family system based on a male provider and a female domestic worker. This system became especially pronounced in industrial economies and is still prevalent in many world societies. To the extent that societies have this division of labor, women maximize their outcomes by seeking a mate who is likely to be successful in the economic, wage-earning role. In turn, men maximize their outcomes by seeking a mate who is likely to be successful in the domestic role.

The sex differences in the preferred age of mates also can be understood as part of the general tendency of men and women to seek partners likely to provide a good fit to their society's sexual division of labor and marital roles. Specifically, the marital system based on a male breadwinner and a female homemaker favors the age gap in marriage. Marriageable women who are younger than their potential mates tend to have lesser wages, social status, and education and knowledge than women who are the same age as potential mates. With the combination of a younger, less experienced woman and an older, more experienced man, it would be easier to establish the power differential favoring men that is normative for marital roles defined by a male breadwinner and a female domestic worker (Lips, 1991; Steil, 1997). Moreover, compared with somewhat older women, young women lack independent resources and therefore are more likely to perceive that their utilities are maximized in the domestic worker role. In complementary fashion, older men are more likely to have acquired the economic resources that make them good candidates for the provider role. The older man and younger woman thus fit more easily than same-age partners into the culturally expected pattern of breadwinner and homemaker.

[1] Darwin (1871) expressed skepticism about the applicability of the processes of sexual selection to modern human societies. He argued that sexual selection was more powerful among early humans, who were guided by instinctive passions, than among contemporary members of society, who show greater foresight and reason in mating behavior. In fact, Darwin maintained that "civilized men are largely attracted by the mental charms of women, by their wealth, and especially by their social position" (Darwin, 1871, p. 178).

Cross-Cultural Evidence for Sex Differences in Mate Preferences

Evolutionary psychologists' predictions that women select for resources and older age and men for attractiveness and younger age have been examined cross-culturally. Buss's (1989a; Buss et al., 1990) impressive study in 37 cultures of the characteristics that people desire in mates suggested that consistent with evolutionary psychology, these sex differences in mate preferences emerged cross-culturally. Similarly, Kenrick and Keefe (1992) examined the preferred ages of mates in five countries and across various time periods in the 20th century and concluded that all provided evidence of sex differences in these preferences. Specifically, for dating and marriage, women preferred older men and men preferred younger women, although men's preferences were moderated by their age, with teenage boys preferring girls of similar age.[2]

On the basis of these investigations, evolutionary accounts have emphasized the cross-cultural commonality in women's preference for resources and older age and men's preference for attractiveness and younger age. According to Buss (1989a) and Tooby and Cosmides (1989), uniformity across diverse cultures and social circumstances suggests powerful sex-differentiated evolved mechanisms that reflect an innate, universal human nature. Kenrick and Keefe (1992) also argued that "invariance across cultures is evidence that supports a species-specific, rather than a culture-specific, explanation" (p. 76).

Despite evidence for cross-cultural commonality in sex differences in mate selection criteria, these investigations also yielded evidence for cultural variation. For example, Kenrick and Keefe (1992) found that the preference for younger wives was evident among Philippine men of all ages, but only among older men (i.e., age 30 or over) in the United States. However, the simple existence of uniformity or variability does not provide a definitive test of either the evolutionary or the social structural origin theory. Although evolutionary psychologists emphasize uniformity and social structural theorists emphasize variability, both perspectives have some power to explain both of these cross-cultural patterns. To account for uniformity, social structuralists can point to similarities in the sexual division of labor in the studied societies and can argue that these similarities produce these relatively invariant sex differences. As Buss (1989a) noted, his 37 cultures, which were drawn from 33 nations, were biased toward urbanized cash-economy cultures, with 54% from Europe and North America. Furthermore, respondents selected from each society tended to be young, comparatively well-educated, and of relatively high socioeconomic status. To the extent that these societies similarly defined the roles of women and men and that the respondents were similarly placed in these societies' social structures, commonality in the sex differences that follow from social structure should characterize these societies.

To account for cross-cultural variability, both evolutionary and social structural origin theories recognize that developmental processes and social factors that are unique to each society direct behavior in ways that can yield variability in sex differences across cultures. Beyond this insight that some evidence of cross-cultural variability would not surprise theorists in either camp, the particular pattern of cross-cultural variation provides an informative test of the mechanisms underlying sex differences. Specifically, the social structural argument that a society's sexual division of labor and associated gender hierarchy are responsible for sex differences in social behavior yields predictions concerning cross-cultural variability in mate preferences.

In the nations included in Buss et al.'s (1990) cross-cultural sample, whose economies ranged from agrarian to postindustrial, some cultures were still strongly marked by this division of labor between the provider and domestic worker, whereas other cultures had departed from it. In advanced economies like the United States, women have entered the paid labor force and spend a smaller proportion of their time in domestic labor (Haas, 1995; Shelton, 1992). Although the tendency for men to increase their hours of domestic work is much more modest, the lives of men and women become more similar with greater gender equality. Therefore, people of both sexes should lessen their emphasis on choosing mates whose value is defined by their fit to the division between domestic work and wage labor. Even in postindustrial economies such as the United States, however, the sex-typed division of labor remains in modified form, with men devoting longer hours than women to wage labor and women devoting longer hours to domestic work (e.g., Ferree, 1991; Presser, 1994; Shelton, 1992). Therefore, the social structural prediction is that the sex differences in mate selection criteria that follow from the male–female division of labor should be substantially weakened in societies characterized by greater gender equality, albeit they should still be present to the extent that complete equality has not been achieved.[3]

Reanalysis of Buss et al.'s (1990) 37 Cultures Data

To evaluate whether the division of labor within a society could explain the mate preferences of men and women, we reanalyzed Buss et al.'s (1990) 37 cultures data. Our efforts focused on men's tendencies to select wives for domestic skill and younger age and women's tendencies to select husbands for earning capacity and older age. To test the hypothesis that a higher level of gender equality lessens these sex differences, we represented societies' gender equality in terms of archival data available from the United Nations (United Nations Development Programme, 1995).

Buss et al. (1990) derived the data on criteria for

[2] Although Kenrick and Keefe (1992) showed that teenage boys prefer girls of similar age, this tendency is most likely a product of the lower age limits that exist for culturally and maturationally appropriate marital partners (Broude, 1992).

[3] Prior efforts to test social structural hypotheses within Buss et al.'s (1990) 37 cultures data produced mixed or nonsignificant findings (Buss, 1989a; Glenn, 1989).

selecting mates from questionnaire measures of preferences for a wide range of characteristics that might be desired in a mate: (a) One instrument obtained rankings of a set of 13 characteristics according to "their desirability in someone you might marry" (p. 11); (b) the other instrument obtained ratings on a 4-point scale of each of 18 characteristics on "how important or desirable it would be in choosing a mate" (p. 11). Buss et al. represented each culture by the male and female respondents' mean ranking of each of the 13 mate selection criteria and by their mean rating of each of the 18 criteria. A separate question inquired about preferences for a spouse's age. The data that we reanalyzed consisted of mean preferences for each culture.

Our reanalysis confirmed Buss et al.'s (1990) conclusion that women placed more value than men on a mate's wage-earning ability. Furthermore, consistent with the greater domestic responsibility of women than men in most cultures, men valued *good cook and housekeeper* more than women did, a sex difference that has received little attention from evolutionary psychologists. When the sex differences in the mean preference ratings were averaged across the cultures, this difference was of comparable magnitude to those obtained on the attributes most strongly emphasized by evolutionary psychologists. Specifically, in both the rating and ranking data, the criteria of *good earning capacity, good housekeeper and cook,* and *physically attractive* produced the largest sex differences. The appropriateness of focusing on the criteria pertaining to earning ability and domestic skill within Buss et al.'s data was also supported by the good agreement across the ranking and rating data sets for sex differences in the valuation of the qualities of financial prospect, $r(33) = .76$, $p < .001$, and domestic skill, $r(33) = .68$, $p < .001$, whereas the agreement in the valuation of physical attractiveness was poorer, $r(33) = .34$, $p < .05$. In addition, as Buss et al. reported, the sex difference in the preferred age of mates was fully intact in the 37 cultures data.[4]

Additional evidence for the social structural predictions emerged when we evaluated the pattern of sex differences in preferences across societies. Consistent with the division of labor principle, a substantial relation emerged between the sex difference in valuing a spouse's domestic skills and the sex difference in valuing a spouse's capacity to provide a good income. Specifically, on the basis of the ranking measure, the sex differences in the good earning capacity criterion and the good housekeeper criterion were correlated across the cultures, $r(33) = .67$, $p < .001$. On the basis of the rating measure, the sex differences in the financial prospect criterion and the housekeeper–cook criterion were also correlated, $r(35) = .38$, $p < .05$. These positive correlations indicate that to the extent that women more than men reported seeking a mate who is a good breadwinner, men more than women reported seeking a mate who is a good homemaker. In addition, the sex difference in the preferred age of one's spouse bore a positive relation to the sex difference in preference for a good earner, $r(33) = .34$, $p < .05$ for the ranking data, and $r(35) = .32$, $p < .06$ for the rating data. Similarly, the sex difference in preferred age bore a positive relation to the sex difference in preference for a good housekeeper and cook, $r(33) = .58$, $p < .001$ for the ranking data, and $r(35) = .60$, $p < .001$ for the rating data. These relationships show that to the extent that the sex difference in the preferred age of spouses was large, women more than men preferred mates who were good providers and men more than women preferred mates who were good domestic workers. The division of labor provides the logic of all of these relationships: Women who serve in the domestic role are the complement of men who serve as breadwinners, and the combination of older husbands and younger wives facilitates this form of marriage.

Analysis of gender equality. To test our hypothesis that sex differences in mate preferences erode to the extent that women and men are similarly placed in the social structure, we sought cross-national indicators of gender equality. Among the many such indicators compiled by United Nations researchers, the most direct indicator of gender equality is the aggregate Gender Empowerment Measure, which represents the extent to which women participate equally with men in economic, political, and decision-making roles (United Nations Development Programme, 1995). This index increases as (a) women's percentage share of administrative and managerial jobs and professional and technical jobs increases, (b) women's percentage share of parliamentary seats rises, and (c) women's proportional share of earned income approaches parity with men's.

The Gender-Related Development Index is another useful indicator of societal-level gender equality provided by United Nations researchers. It increases with a society's basic capabilities to provide health (i.e., greater life expectancy), educational attainment and literacy, and wealth, but imposes a penalty for gender inequality in these capabilities (United Nations Development Programme, 1995). Whereas this measure reflects equality in basic access to health care, education and knowledge, and income, the Gender Empowerment Measure is a purer indicator of equal participation in economic and political life.

In the set of 37 cultures, the Gender Empowerment Measure and the Gender-Related Development Index were correlated, $r(33) = .74$, $p < .001$, and both of these indexes were moderately correlated with general indexes of human development and economic development. One limitation of the indexes of gender equality is that they are based on data from the early 1990s. Because Buss et al.'s (1990) data were collected in the mid-1980s, these indexes are from a slightly later time period, but the relative posi-

[4] We did not also focus on the criterion of *ambition and industriousness* because it produced a substantially smaller sex difference in the 37 cultures data than the criteria of *good earning capacity, good housekeeper and cook,* and *physically attractive.* From the social structural perspective, industriousness is important for performance of domestic work as well as wage labor, and therefore both men and women should seek this quality in mates under the traditional division of labor between homemakers and providers.

Table 1
Correlations of Mean Rankings and Ratings of Mate Selection Criteria With United Nations Indexes of Gender Equality for Buss et al.'s (1990) 37 Cultures Sample

Mate selection criterion and rater	Ranked criteria		Rated criteria	
	Gender Empowerment Measure (n = 33)	Gender-Related Development Index (n = 34)	Gender Empowerment Measure (n = 35)	Gender-Related Development Index (n = 36)
Good earning capacity (financial prospect)				
Sex difference	−.43*	−.33†	−.29†	−.23
Women	−.29	−.18	−.49**	−.42**
Men	.24	.27	−.40*	−.36*
Good housekeeper (and cook)				
Sex difference	−.62***	−.54**	−.61***	−.54**
Women	.04	−.01	.11	−.07
Men	−.46**	−.42*	−.60***	−.61***
Physically attractive (good looks)				
Sex difference	.13	−.12	.20	.18
Women	.14	.34†	−.45**	−.25
Men	.20	.28	−.33†	−.14

Note. The criteria were described slightly differently in the ranking and the rating tasks: The ranking term is given first, with the rating term following in parentheses. Higher values on the gender equality indexes indicate greater equality. For the preferences of women or men, higher values of the mean rankings and ratings of mate selection criteria indicate greater desirability in a mate; therefore, a positive correlation indicates an increase in the desirability of a criterion as gender equality increased, and a negative correlation indicates a decrease. Sex differences in these preferences were calculated as female minus male means for good earning capacity and male minus female means for good housekeeper and physically attractive. A positive correlation thus indicates an increase in the sex difference as gender equality increased, and a negative correlation indicates a decrease in the sex difference.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

tions of the cultures should remain approximately the same.[5]

To examine the relation between societal gender equality and mate preferences, we calculated the correlations of these indexes with the sex differences in valuing a mate as a breadwinner and as a domestic worker—the two criteria most relevant to the traditional division of labor. These correlations for the ranking and the rating data, which appear in Table 1, are generally supportive of the social structural predictions. As the Gender Empowerment Measure increased in value, the tendency decreased for women to place greater emphasis than men on a potential spouse's earning capacity, although the correlation with the rated criterion was relatively weak. Also, as the Gender Empowerment Measure increased, the tendency decreased for men to place greater emphasis than women on a potential spouse's domestic skills. As expected in terms of the Gender-Related Development Index's less direct representation of the similarity of the roles of women and men, its correlations with these sex differences were somewhat weaker.

The preference data for each sex reported in Table 1 provide insight into these sex-difference findings. For good housekeeper and cook, the correlations for both the rating data and the ranking data indicated that as gender equality increased, men decreased their interest in choosing mates for their skill as domestic workers, and women showed no change in this preference. In contrast, for good earning capacity, as gender equality increased, women decreased their emphasis on mates' earning potential in the rating data (although nonsignificantly in the ranking data). However, men's preferences for good earning capacity are more difficult to interpret because their relations to gender equality were inconsistent across the ranking and rating measures. Inconsistencies between the two measures may reflect that rankings are judgments of the relative importance of the criteria in relation to the others in the list, whereas ratings are judgments of the absolute importance of the different criteria.

As shown in Table 2, examination of preferences for a spouse's age showed that as gender equality increased, women expressed less preference for older men, men expressed less preference for younger women, and consequently the sex difference in the preferred age of mates became smaller. These relations suggest that sex differ-

[5] Another compromise consisted of representing differing subsamples from the same broader culture (e.g., mainland United States and Hawaiian United States) with the same values of the United Nations indexes. For the Gender Empowerment Measure and the Gender-Related Development Index, data for all represented nations were published in 1995, with the exception of data for two nations published in 1996 and one in 1997 (United Nations Development Programme, 1995, 1996, 1997). For two cultures, ranking data for mate selection preferences were not available.

Table 2
Correlations of Mean Preferred Age Difference Between Self and Spouse With United Nations Indexes of Gender Equality for Buss et al.'s (1990) 37 Cultures Sample

Rater	Gender Empowerment Measure (n = 35)	Gender-Related Development Index (n = 36)
Sex difference	−.73***	−.70***
Women	−.64***	−.57***
Men	.70***	.70***

Note. Higher values on the gender equality indexes indicate greater equality. Positive ages indicate preference for an older spouse, and negative ages indicate preference for a younger spouse. Therefore, for the preferences of women, a negative correlation indicates a decrease in the tendency to prefer an older spouse as gender equality increased, whereas for the preferences of men, a positive correlation indicates a decrease in the tendency to prefer a younger spouse. Because the sex difference in preferred age was calculated as female minus male mean preferred spouse age in relation to self, a negative correlation indicates a decrease in the sex difference in preferred age as gender equality increased.
*** $p < .001$.

ences in age preferences reflect a sex-differentiated division of labor.[6]

Interpretation of the magnitudes of the correlations reported in Tables 1 and 2 should take several considerations into account. One feature limiting the strength of these relationships is the assessment of the mate selection preferences with one-item questionnaire measures. Also, the indexes of gender equality imperfectly represented the critical conceptual variable, the extremity of the division of labor between male providers and female homemakers. In addition, the sampling of respondents was not uniformly implemented across the 37 cultures, nor would these samples have corresponded to those that contributed to the indexes of gender equality. Finally, there may be a time lag between the social and economic changes reflected in these indexes and shifts in the individual preferences that constitute the 37 cultures data. For these several reasons, it is plausible to conclude that the correlations we report underestimate the true magnitude of the predicted relationships.

Preference for physical attractiveness. As also shown in Table 1, correlations between the sex difference in valuing potential mates' physical attractiveness and the United Nations indexes of gender equality were low and nonsignificant. These findings are not surprising, because this mate selection criterion does not mirror the division between wage labor and domestic labor in the manner that earning potential, domestic skill, and age do. Nevertheless, under some circumstances, physical attractiveness may be part of what people exchange for partners' earning capacity and other attributes.

Assuming that attractiveness is sometimes exchanged for other gains, the social structural perspective offers possibilities for understanding its value. Research on the physical attractiveness stereotype has shown that attractiveness in both sexes conveys several kinds of meaning—especially social competence, including social skills, sociability, and popularity (Eagly, Ashmore, Makhijani, & Longo, 1991; Feingold, 1992b). Therefore, men's greater valuing of attractiveness might follow from the greater importance of this competence in women's family and occupational roles, including women's paid occupations in postindustrial societies (Cejka & Eagly, 1999; Lippa, 1998), and the consequent inclusion of this competence in the female gender role. If women's roles demand greater interpersonal competence in societies with greater and lesser gender equality, the tendency for men to place greater value on mates' attractiveness would not covary with indexes that assess equality.

Another possibility is that the value of attractiveness stems from its perceived association with the ability to provide sexual pleasure. This idea receives support from research showing that attractiveness conveys information about sexual warmth (Feingold, 1992b). If so, men might seek sexiness in a mate in all societies, in addition to attributes such as domestic skill, whose importance varies with the society's level of gender equality. Given that the female gender role often includes sexual restraint and lack of sexual autonomy, women may place less emphasis on sexiness in mates than men do.

It is less certain that physical attractiveness conveys information about women's fertility, as should be the case if men's preference for attractiveness in mates developed because attractiveness was a cue to fertility (Buss, 1989a; Jones, 1995; Singh, 1993). It seems reasonable that perceptions of attractiveness and potential fertility would covary even in contemporary data, but these relations have proven to be inconsistent (e.g., Cunningham, 1986; Tassinary & Hansen, 1998). Moreover, Singh's (1993) research on judgments of female figures that varied in weight and waist-to-hip ratio suggested three somewhat independent groupings of attributes: health, attractiveness, and sexiness; capacity and desire for children; and youth.

Although little is known about the relation between women's attractiveness and their actual fecundity, Kalick, Zebrowitz, Langlois, and Johnson (1998) found that facial attractiveness in early adulthood was unrelated to number of children produced or to health across the life span. Although the few participants in their sample who did not marry were less attractive than those who did marry, once the nonmarried were excluded, physical attractiveness was unrelated to the number of children produced by male or female participants. Kalick et al. (1998) concluded that "any relation between attractiveness and fecundity was due to mate-selection chances rather than biological fertility"

[6] The United Nations indexes of economic development and fertility showed relationships to mate preferences that were similar to those displayed in Tables 1 and 2. The magnitude of these relationships was in general nonsignificantly smaller than those involving the Gender Empowerment Measure. These relationships were expected, given that this measure increased with economic development (real gross domestic product per capita), $r(33) = .71$, $p < .001$, and decreased with fertility, $r(33) = -.61$, $p < .001$.

(p. 10). Of course, as we noted in our critique of evolutionary psychology in this article, proponents of the theory do not predict that hypothesized evolved dispositions, such as men's preference for physically attractive partners, would necessarily be related to current reproductive success. Evolutionary psychologists argue instead that actual fertility in modern societies may bear little relation to the factors indicative of reproductive success in the EEA.

In summary, several aspects of the findings from Buss et al.'s (1990) 37 cultures study are compatible with the social structural origin theory of sex differences. The idea that the extremity of the division between male providers and female homemakers is a major determinant of the criteria that people seek in mates fits with the observed covariation between men placing more emphasis than women on younger age and domestic skill and women placing more emphasis than men on older age and earning potential. The lessening of these sex differences with increasing gender equality, as represented by the United Nations indexes, is consistent with our claim that these sex differences are by-products of a social and family structure in which the man acts as a provider and the woman acts as a homemaker. More ambiguous are the sex differences in valuing mates' physical attractiveness. Without evidence that men's greater valuing of attractiveness follows from one or more specific mechanisms, the simple absence of a relation between gender equality and sex differences in valuing attractiveness in our reanalysis does not advance the claims of evolutionary psychology or the social structural theory. Convincing evidence for either interpretation has yet to be generated. However, with respect to the other sex differences emphasized by evolutionary psychologists, their cross-cultural patterning suggests that they arise from a particular economic and social system.

Within-Society Effects of Social Position

As evidence that presumably counters the social structural interpretation of sex differences in mate selection criteria, evolutionary psychologists (e.g., Buss & Schmitt, 1993) have sometimes cited studies that examined the relation within a given culture between individuals' mate preferences and their economic resources (e.g., Buss, 1989b; Kenrick & Keefe, 1992; Townsend, 1989). In one of the most extensive of these studies, Wiederman and Allgeier (1992) assessed mate preferences and anticipated income of undergraduate students from a midwestern university and of a convenience sample of Ohio residents. Mate preference ratings from both samples yielded the typical sex differences in ratings of good looks and good financial prospect. The central finding was that women's anticipated income and their valuing of mates as a good financial prospect were positively related in the college sample, $r(635) = .17$, $p < .001$, and unrelated in the community sample, $r(165) = .04$, *ns*. That women who expected to earn higher incomes still valued financial resources in their mates was taken as evidence in favor of the evolutionary theory of mate preferences.

On the basis of such data, any conclusions about the validity of the evolutionary or the social structural origin theory are unwarranted because such studies confound women's income with their socioeconomic status. Women who themselves have higher incomes would tend to come from higher socioeconomic groups and would anticipate selecting mates from their own stratum of society. In the United States, both sexes' homogamous mating on the basis of education, occupation, and economic resources is a well-established phenomenon (e.g., Kalmijn, 1991, 1994; Mare, 1991). Therefore, women's socioeconomic status typically should be positively related to expectations concerning mates' financial prospects.

An additional consideration is that, because societal gender roles coexist with specific roles, achieving a high-paying job does not completely neutralize the impact of broader gender role expectations. Therefore, consistent with these broader norms, even women with higher-than-average income commonly regard themselves as secondary wage earners in their marriages (Ferree, 1991) and often prefer to leave the labor force entirely or to become employed part-time while raising a family (Herzog, Bachman, & Johnston, 1983; Tittle, 1981). Despite earning a substantial income, most women likely anticipate being fully or partially dependent on their husband's income during a portion of their life span. Consequently, within-society analyses of mate preferences that seek to draw conclusions about the effects of women's own economic resources must control for the influences of expectations based on social class and education as well as actual and anticipated marital roles.

Conclusion

Considered at the level of a general metatheory of sex differences, social structural theories provide alternative explanations of the great majority of the general predictions about sex-differentiated social behavior that have been featured in evolutionary psychology. Because the central tendencies of sex differences (see Eagly, 1995; Halpern, 1997; Hyde, 1996) are readily encompassed by both of these perspectives, neither the evolutionary metatheory nor the social structural metatheory is convincingly substantiated by a mere noting of the differences established in the research literature. It is far too easy to make up sensible stories about how these differences might be products of sex-differentiated evolved tendencies or the differing placement of women and men in the social structure. This overlap in general main-effect predictions calls for more refined testing of the two theoretical perspectives, and each perspective is associated with numerous more detailed predictions and empirical tests.

Certainly there are many possibilities for distinguishing between the two approaches with appropriate research designs (see Jackson, 1992). Evolutionary psychologists have been especially resourceful in obtaining cross-cultural data intended to support their claims of invariance across cultures in sex-differentiated behavior. To be maximally informative about social structural factors, cross-cultural research should be systematically designed to represent cultures with differing forms of social organization and levels of gender equality. In addition, a variety of other

research methods, including experiments and field studies, can yield tests of predictions that emerge from evolutionary and social structural perspectives.

Although this article contrasts social structural explanations of sex differences with those based on evolutionary psychology, social structural analyses may be generally compatible with some evolutionary perspectives, as we noted in the introductory section of this article. Our argument that sex differences in behavior emerge primarily from physical sex differences in conjunction with influences of the economy, social structure, ecology, and cultural beliefs is potentially reconcilable with theories of coevolution by genetic and cultural processes (Janicki & Krebs, 1998). Our position is also sympathetic to the interest that some evolutionary biologists and behavioral ecologists have shown in the maintenance of behavioral patterns from generation to generation through nongenetic, cultural processes (e.g., Sork, 1997). However, despite our acknowledgement of the importance of some evolved genetic influences on the behavior of women and men, an implicit assumption of our approach is that social change emerges, not from individuals' tendencies to maximize their inclusive fitness, but instead from their efforts to maximize their personal benefits and minimize their personal costs in their social and ecological settings.

One test of the evolutionary psychology and social structural origin theories of sex differences lies in the future—that is, in the emerging postindustrial societies in which the division between men's wage labor and women's domestic labor is breaking down. Notable is the increase in women's paid employment, education, and access to many formerly male-dominated occupations. Accompanying these changes is a marked attitudinal shift toward greater endorsement of equal opportunity for women in the workplace and role-sharing in the home (e.g., Simon & Landis, 1989; Spence & Hahn, 1997; Twenge, 1997). Nonetheless, occupational sex segregation is still prevalent with women concentrated in occupations that are thought to require feminine qualities and with men in occupations thought to require masculine qualities (Cejka & Eagly, 1999; Glick, 1991). Given that occupational distributions currently take this form and that the homemaker–provider division of labor remains weakly in place, social structuralists would *not* predict that sex differences in behavior should have already disappeared. Instead, to the extent that the traditional sexual division between wage labor and domestic labor disappears and women and men become similarly distributed into paid occupations, men and women should converge in their psychological attributes.

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