

# SEX DIFFERENCES: EVOLVED, CONSTRUCTED, AND DESIGNED

HEATHER LOOY

*The King's University College  
Edmonton, Alberta, Canada*

Evolutionary psychology (EP) is reviewed as one currently popular theoretical framework to explain and predict psychological and behavioral differences between women and men. This approach has considerable promise, but there are numerous logical, theoretical, and methodological problems yet to be resolved. Social constructionism (SC) is briefly reviewed as an alternative approach that more adequately accounts for gender and sexual diversity; however it minimizes human embodiment. Both approaches deny a supernatural or spiritual dimension in creation; EP often explicitly assumes philosophical naturalism—a belief in a material universe in which evolutionary processes are random and purposeless. This assumption limits its ability to account for several aspects of the experience and the expression of human sexuality. The intelligent design (ID) approach is considered here as a possible complement to EP and SC. The key difference is foundational: ID assumes and infers the necessity of a supernatural, purposeful element. This assumption provides a broader interpretive framework and some potentially novel predictions about human sexuality. All three approaches have something to contribute to our understanding of human sexuality, and I conclude that a cautious, critical mutual engagement may enable us to transcend the dichotomies and limitations of each theoretical framework.

Few topics generate more fascination and controversy than the question of what it means to be sexual: female and male. North

American popular media uses images and information to suggest that women and men are virtually different species, while promising to explain the mysteries of one sex to the other. Since the late 1980's, the technology-based surge in the neurosciences and genetics has revealed sex differences in physiological systems, brain structure and function, and cognitive abilities by linking them to genetically driven hormonal effects, which has fueled the popular belief in a deep and immutable gender dichotomy. More recently, a new player has entered the "gender wars," weighing in heavily in support of innate, genetic origins of an astonishingly wide range of sex differences. Evolutionary psychology (EP) claims that universal differences between females and males reflect the fact that each sex plays different reproductive roles, and therefore has faced different adaptive "problems" during evolutionary history. This has resulted in naturally selected, genetically based differences in everything from physical and physiological characteristics, mate selection strategies, parenting styles, communication and interpersonal skills, to cognitive abilities.

Does this EP theory have merit? Its proponents certainly declare its scientific and philosophical merits; indeed, many evolutionary psychologists claim that EP provides a powerful and virtually complete account of human nature, including ontological and teleological questions—a meta-narrative of breathtaking proportions (Buss, 1995a; Dawkins, 1986; Tooby & Cosmides, 1992). Its detractors criticize EP for its scientific, political, and philosophical inadequacies (see Rose & Rose, 2000). One objective of this paper is to review and evaluate the merit of EP as an account of human sexuality. Because sexuality includes a broad range of topics, I will restrict my focus primarily to an area that has garnered considerable EP attention: mate selection and marriage.

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However, it is one thing to critically evaluate a theory and another thing to propose constructive adjustments or viable alternatives. Thus, another objective of this paper is to explore such alternatives, such as social constructionism (SC). SC scholars argue that sex differences are almost entirely a result of differential socialization of females and males in particular historical and cultural contexts (Hawkesworth, 1997; Kessler & McKenna, 1978; Lorber, 1993). However, while EP has been criticized for not taking the processes of socialization and enculturation sufficiently seriously (Caporael & Brewer, 1991), SC has been criticized for inappropriately minimizing our embodied and evolved natures (Archer, 1996). As a biopsychologist, a feminist, and a Christian, I find myself in a dilemma. I believe that we are embodied. I am also convinced that our social context powerfully shapes our perceptions, beliefs, and experiences in ways that are sometimes Godly or life giving and in ways that are sometimes not. We need a theory of human sexuality that transcends the oversimplifications of either/or and welcomes "the rich complexities of both/and" (Shakespeare & Erickson, 2000, p. 193), and that makes possible the considerations of normative questions, such as how we ought to live.

One potential candidate is an approach known as intelligent design (ID). ID has recently been proffered as an alternative to the naturalism that underlies much evolutionary theorizing (Dembski, 1998; Moreland, 1994). At this time, ID has primarily focused on the biological sciences, but the theory logically extends into those social scientific domains where biological and evolutionary processes are believed to be relevant. Later in this paper I will examine whether ID potentially provides a theoretical framework within which to explore human sexuality without becoming trapped in the either/or polarities of EP and SC.

Before I begin, one important qualifier is necessary. The question of human sex differences has been addressed in numerous contexts for centuries. It is not possible in a paper of this size to deal adequately with the entire breadth, depth, and nuances of the various approaches. Instead, I have attempted to provide a general overview, necessarily oversimplified, some broad critiques, and some tentative and admittedly speculative suggestions. I hope that scholars working within different theoretical frameworks and from a variety of foundational assumptions feel enabled to engage in constructive mutual dialogue

and critique, and to at least consider whether some aspects of ID might further our understanding of human sexuality.

## EVOLUTIONARY PSYCHOLOGY AND SEX DIFFERENCES

### *Overview*

EP theory begins with a simple set of observations:

Gene frequencies in breeding populations change from generation to generation because environments affect differentially individuals' reproductive success. The next generation more closely resembles the successful breeders and nurturers of the preceding generation, because their genes are more frequent in the offspring generation. Generational changes in gene distributions lead to changes in behavioral phenotype distributions across species' histories, because different phenotypes arise from different genotypes. (Scarr, 1997, p. 2)

In other words, the characteristics of a species at any point in time reflect genetically based traits that led to survival, successful reproduction, and nurture of offspring. EP applies this observation directly to humankind. This is theoretically and logically appropriate because humans are also a biological species. In addition, we carry and pass on our genes from generation to generation, and these genes bear some relation to our physical, psychological, and behavioral characteristics.

EP then attaches a set of assumptions to this indisputable observation. The first is that humankind first emerged and spent most of our evolutionary history in small, nomadic hunter-gatherer groups on the African savanna. The adaptive challenges we faced must therefore reflect the nature of that environment: What traits and behaviors would have facilitated survival and reproduction in this context? The second assumption is that these adaptive challenges remained relatively constant over the roughly three millennia during which hominid forms have been evolving. At some unknown point in evolutionary history hominids began migrating from Africa to populate vastly diverse environments throughout the globe. EP argues that there has been insufficient time for natural selection in these varied environments to have altered the basic characteristics of human nature that evolved during those millennia on the savanna. Thus, the third assumption is that "our modern skulls house a stone age mind" (Cosmides & Tooby, 1997). We cannot understand our most basic motives and responses unless we recognize that we did not evolve to function in our modern environment. Fourth, based on the belief

that the brain is the ultimate source of human behavior, natural selection acted on this organ to produce specific responses to specific adaptive challenges. This resulted in a "modularization" of the human brain, so that specific environmental triggers activate specific modules. Somehow these modules have become sufficiently integrated so that our complex behavioral repertoire usually unfolds smoothly. The basic organization of these modules is genetically hard-wired into the brain, because by definition, natural selection cannot act upon non-genetically-based characteristics (Cosmides & Tooby, 1997).

Underlying these assumptions is a set of deeper assumptions that constitute the worldview of most evolutionary psychologists. First, the most basic, motivation driving behavior is the need to ensure genetic survival through propagation of one's genes. Second, most evolutionary psychologists are philosophical naturalists: They believe that random, undirected, blind natural processes are fully sufficient to account for the structures, systems, and species of our universe. There is no need to postulate a supernatural or spiritual dimension (Dawkins, 1986).

The relatively small but vocal and productive group of evolutionary psychologists have used the EP model to account for a wide range of psychological traits and behaviors, including sex differences, altruism, cognitive abilities, warfare, language, religion, morality, landscape preferences, and humor. However, their primary theoretical and empirical focus has been on sex differences. Evolutionary psychologists often point out that their approach focuses on fundamental similarities, which make differences among humans, such as those of race or culture, superficial and trivial (Tooby & Cosmides, 1992). Underneath, we share a universal human nature. Sex differences are the one exception to this universal human nature because they are traced back to our evolutionary origins. As a result of human females and males playing different roles in reproduction, they faced different adaptive challenges throughout evolutionary history (Mealey, 2000). To the extent that females and males faced these different challenges, EP argues, different physical and psychological traits were naturally selected (Archer, 1996; Buss, 1995b; Buss & Schmitt, 1993).

In order to predict specific sex differences or to account for empirical observations of differences, evolutionary psychologists begin with these assumptions and then use a combination of fossil evidence, inference from modern-day "primitive" hunter-gath-

erer societies, and speculation to postulate specific adaptive challenges that differentially affected females and males in the environment of evolution. These postulated adaptive challenges lead to empirically testable predictions about the ways in which females and males differ today.

Human females produce relatively few energy-rich gametes (i.e., eggs), but they conceive, gestate, birth, and nourish, through lactation, their offspring. Therefore, they "invest" many physical resources and a great deal of time into each child. Because females can produce only a limited number of offspring, EP argues that they are strongly motivated to ensure that the children they conceive will have the physical and psychological traits necessary to survive and successfully reproduce, as well as have access to necessary resources. Since pregnant and lactating women are relatively more vulnerable physically and are limited in their ability to move about to find shelter, protection, and food, only those who persuade others to provide protection and resources for them will ultimately be successful in producing and rearing offspring. There are of course many solutions to these adaptive problems. EP proposes one particular set.

Over evolutionary history, "successful" women were those who were able to select a mate whose genes would combine with hers to produce viable offspring. In addition, these women selected mates who were both able and willing to provide the protection and the resources she and her offspring required. This translates into predictions about an array of specific psychological and behavioral mechanisms in women that evolutionary psychologists have begun to confirm empirically. For example, women prefer men with more symmetrical features, clear, unblemished skin, and white sclera of the eye—features that supposedly indicate good health and possibly "good" genes. They also prefer men with sufficiently "masculine" features (e.g., strong jaw, facial hair, heavier brow bone, broader shoulders, narrower hips, and muscular build), which indicate sufficient testosterone for maximum fertility, and sufficient strength for protection and resource gathering. At the same time, they prefer men who are not "hypermasculine," but men who show some "feminization" of their features, presumably because these are correlated with a more cooperative, less aggressive nature and a willingness to help raise the children (Perrett, Lee, Penton-Voak, Rowland, Yoshikawa, Burt, Henzi, Castles, & Akamatsu,

1998). They prefer men who are older, intelligent, have high social status, and/or who are rich—all apparently indicators of either the ability to obtain, or the current presence of resources. In other words, according to EP, a woman's ideal mate is a good-looking, strong, intelligent, wealthy, older, professional male who will make a long-term commitment to her and her children (see Buss, 1999, pp. 104-129, for a review and summary).

Human males, on the other hand, produce relatively many, small, energy-poor gametes (i.e., sperm) and impregnate females. Their "investment" in each child is relatively low. EP claims that men are therefore motivated to focus mainly on quantity, rather than quality, based on the presumption that if they father numerous offspring, at least some of them will be reproductively fit. Their main interest is in successful impregnation, which translates into a preference for healthy, fertile mates. Cross-cultural empirical studies of men's modern mate preferences support the prediction that men are attracted to relatively young women with full lips, breasts, and hips, and a smaller waist, all indicators of sufficient estrogen levels, fertility, and ability to successfully birth a child (Perrett et al., 1998). They also look for facial symmetry, shiny hair, clear, unblemished skin, and white sclera. They are less concerned about social status or intelligence. In addition, men had to compete for the most desirable women, which led to the evolution of a competitive nature and traits that facilitated successful competition (see Buss, 1999, pp. 134-159 for a review and summary).

Successful reproduction requires the coordination of female and male interests and motives; therefore, co-evolutionary processes are predicted to have produced adaptations that increased mutual desirability of mates (Mealey, 2000). Some of these adaptations are physical. For example, hidden ovulation in women, according to EP, was developed to create uncertainty in males about fertile periods and thus uncertainty about their paternity. The result is that a male will monopolize a particular woman to increase his certainty of fatherhood, and therefore he will be more willing to provide resources for the mother and her children. Men also developed the ability to produce different kinds of sperm, including one type that specifically attacks other sperm. The relative quantity of these "kamikaze" sperm increases the longer a man has not had sexual intercourse with his mate. This sperm can attack sperm introduced by a competing male, which reduces the risk of raising

children genetically unrelated to him (Baker & Bellis, 1995).

It is suggested that many of these co-evolved adaptations are psychological and behavioral. Because of women's hidden ovulation and the resulting paternity uncertainty, men have developed a preference for sexually faithful women. This has led to the widespread "double standard" of sexually active males insisting on virgin females. In men, jealousy is triggered by cues that could indicate sexual infidelity, such as their mate smiling at another man, especially a relatively higher-status, better-looking man. This jealousy is an emotional cue for men to engage in behaviors that ensure that they monopolize sexual access to their partners (Dijkstra & Buunk, 1998; Daly, Wilson & Weghorst, 1982). The priority for women is to safeguard their access to resources provided by their mates. Thus, they are more concerned about emotional infidelity. A mate that is emotionally connected to another woman may show a reduced commitment in providing resources for his first partner. Thus, jealousy in women should be triggered by cues related to emotional connection or by the presence of younger, more attractive women (Buunk, Angleitner, Oudbaud & Buss, 1996; Dijkstra & Buunk, 1998). Women are predicted to have skills for detecting cooperative and committed mates, whereas men are predicted to have developed deceptive techniques that promise commitment in return for sexual access. In a particularly pernicious twist of EP theory, Thornhill and Thornhill (1992) argue that less desirable males, such as those that are unattractive or poor, have developed more aggressive and coercive sexual styles, such as raping women, in order to ensure their gene propagation.

This overview has focused on sex differences quite directly related to reproduction. EP theory, however, extends its speculation regarding sex differences into other domains. Differences in cognitive, emotional, and behavioral aspects of parenting, navigating, food-seeking, and social relationships have all been predicted by reasoning from the basic distinction in reproductive roles (Mealey, 2000). Even though EP claims that both women and men have a universal human nature and are basically similar, it qualifies this claim by describing a very different, divergent evolutionary history for each sex, resulting in different physical, psychological, and behavioral traits.

### *Evaluation*

EP tells a compelling story about human sex differences, one that fits our modern sexual stereotypes remarkably well. Cross-cultural empirical studies have found support for several of these predictions, particularly general mate preferences and the sexual double standard (Buss, 1989; Buss, Abbott, Angleitner, Asherian, Biaggio, et al., 1990; Buss & Barnes, 1986; Buss & Schmitt, 1993; Buunk et al., 1996). Some of the premises on which this theory is based are also well supported and logical. Shifts in genotypic and phenotypic trait frequencies are associated with differential reproductive success. We are a sexual species, and we must find ways to successfully reproduce and rear offspring in order to survive. Also, females and males do play different reproductive roles. Therefore, it is eminently reasonable that the sexes developed differential traits to facilitate the reproductive process. The question is whether EP, in its current form, is able to accurately identify those traits. When a theory produces predictions that uncannily fit the predominant sexual stereotypes of a culture, warning flags arise. We have a history of generating scientific "facts" that support cultural and political values and agendas (Gould, 1981). Further, EP reasoning about sex differences contains logical gaps, the methodology is questionable, and there is much that is left unexplained. Below, I highlight just a few of the many criticisms of EP.

For example, if we agree that in the environment of evolution women needed to obtain protection and resources from others, particularly during pregnancy and nursing, then it does not follow that they would necessarily expect this only from the fathers of their children. Women who built tight-knit communities in which everyone participated to enhance the survival of all members may have been just as successful as women who found a man to provide their necessary resources. Fathers have a greater genetic interest in caring for their children than more distant relatives or other community members. However, if evolutionary psychologists are correct in stating that we spent most of evolutionary history in small, nomadic hunter-gatherer communities, then it seems probable that the more internally cooperative communities might have had a survival edge over more individualistic, isolated pairs and their offspring. There is some evidence that, for example, postmenopausal women and possibly elderly men played a significant role in providing food for the young

children of a community (Hawkes, O'Connell, & Blurton Jones, 1997). Further, the notion that there were stronger selection pressures for men to become competitive does not follow EP's logic because women also needed to compete for mates. Indeed, EP argues that women are more particular about their mates; therefore, the competition for the "best" men should have been fiercer than the competition among men for women! On the other hand, there were strong selection pressures for both sexes to develop cooperative tendencies—women needed to maximize their access to necessary resources and men needed to maximize their access to women.

The point is that there are numerous ways to solve adaptive challenges, and unless there is strong empirical evidence for a specific solution for a particular challenge, then the stories we tell of sex differences are speculation and not logical necessities. Evolutionary psychologists are currently in the process of empirically testing their predictions regarding the particular manner in which we met adaptive challenges. However, the human-centered studies, unlike the many carefully and thoroughly conducted studies of the evolution of animal social behaviors, are relatively weak, and some predictions have been inconsistently supported. For example, the notion that male jealousy is triggered by cues related to sexual infidelity, whereas female jealousy is linked to emotional infidelity has been questioned on both theoretical and empirical grounds (Grice & Seely, 2000; Harris, 2000; Harris & Christenfeld, 1996).

We also have to ask whether EP has correctly identified the adaptive challenges that each sex faced during evolutionary history. The fossil record tells us little about the early hominid psyche and behavior, and the assumption that modern hunter-gatherer societies are reasonably good reflections of ancient communities is questionable. Modern hunter-gatherer societies may have changed as much as our modern agricultural, technology/information-based societies from the culture of evolution. Some paleoanthropologists have also questioned our current descriptions of ancient human cultures. The standard description views men as individual, silent hunters, political leaders, and major forces in agricultural and technological development, whereas women have a more constrained position as foragers and childrearers. However, at least in some prehistoric cultures (e.g., the buffalo hunters of the North American plains) hunting appears to have been a community activity involving both sexes (Choi, 1999;

Noss, 1997). Other studies suggest that the major source of nutrition came from foraging, not hunting, and that both men and women, including postmenopausal women, took part in this activity (e.g., Hawkes, et al., 1997). If women played a more significant role in economic production than has previously been assumed (e.g., by providing most of the food), then this provides a motive for women's role in technological development (e.g., agriculture and tools), and a reason for women to hold status and power in their communities (Ehrenberg, 1989). Our understanding of the "environment of evolution" and the adaptive challenges that humans faced is clearly very limited.

The EP story of human sex differences, and the stereotypical patterns it justifies, is more than a serious scientific theory supported by empirical observations. It projects into the past such modern North American cultural values as individualism and ambivalence about sexuality and monogamy, which fit uneasily with the likely dynamics of small, nomadic, close-knit communities in which everyone is familiar and mate selection is limited. This context is unlikely to select traits such as sexual jealousy and severe mate competition. I also see the powerful workings of the "lenses of gender" (Bem, 1993), which create an expectation of profound sex differences and assumptions about their nature. This can lead to systematically biased methodology and interpretation.

Perhaps the most obvious methodological problem with EP research is a strong confirmation bias. Although this is not unique to EP, many EP studies are designed in a manner to virtually guarantee support for their hypotheses. For example, participants are asked to rank, using a list generated by the researchers or from prior studies, desired mate characteristics in the abstract; to respond to dramatizations of hypothetical situations designed to fit EP assumptions about the dynamics of sexual relationships; or to engage in forced-choice procedures where participants must select from a limited set of contrived situations (e.g., Buss, 1989; Dijkstra & Buunk, 1998; Thornhill & Thornhill, 1992). While not all EP studies fall into this trap, it is relatively rare to find a study that looks for or acknowledges the presence of disconfirming evidence.

When participants are asked to respond to abstract or hypothetical situations, the results represent what people say that they would do or would prefer to do, not what they actually do. Evolutionary

psychologists argue that this is necessary because they wish to assess brain-based motives and desires, and actual behavior is often constrained by cultural contexts that differ radically from the environment of evolution. However, it is equally possible that these responses also reflect enculturation rather than genetically-based predispositions. The young adult participants—for whom mate choice is a current issue—that EP researchers prefer are thoroughly enculturated with sexual stereotypes and, therefore, they are as likely to respond to hypothetical situations based on their own cultural lenses of gender than by triggering some genetically-determined, naturally-selected mental module.

Forced-choice procedures, which require a participant to select one of two or more constrained options, do not permit participants to reveal any contextual issues or qualifiers that could facilitate interpretation of their choices. For example, in a study by Buss, Larsen, Westen, and Semmelroth (1992), participants had to decide which of two distressing events would be more upsetting to them: (a) their partner had sexual intercourse with another person, or (b) their partner becomes emotionally involved with another person. Buss et al. (1992) interpret the fact that female respondents were more than twice as likely as male respondents to select emotional infidelity as more upsetting, whereas the reverse was true for sexual infidelity, as evidence for differentially evolved innate sensitivities. However, it is also possible that women are acutely aware of the fact that abandonment by a mate has far more significant negative social and economic consequences for women than for men. Thus, they find emotional infidelity more upsetting because it is more likely to lead to such abandonment than "pure" sexual infidelity. In any case, the point is that using such forced-choice procedures without careful assessment of the reasons behind the choices means alternative explanations for the pattern of choices cannot be ruled out.

Another methodological concern is the circular reasoning that occurs in much EP theorizing. Modern sexual stereotypes are, perhaps unconsciously, projected into our evolutionary past and shape the story EP tells of the adaptive problems we must have faced. Then evolutionary adaptive challenges are used to explain the presence of modern sex differences. There is little independent corroboration of the nature of the adaptive challenges we faced apart from this self-justifying circle. Finally, because evolutionary psychologists "treat the truth and sufficiency

of selection not as a hypothesis to be tested but as a given" (Schloss, 1998, p. 254), they are forced to interpret observations in a manner that supports their theory. If one is sufficiently creative, one can always explain how a particular, apparently universal human trait must have been adaptive. Although EP does generate testable predictions, when the observations used to support the predictions are vague and/or incomplete (e.g., attempting to determine the nature of the environment of evolution), then it is all too easy to select the preferred interpretation over equally good alternatives.

Another weakness in the EP theory of sex differences is the assumption that "real"—according to EP, this means genetically-based, naturally-selected—change can only occur over tens of thousands of years. The roughly 12,000 years since the beginning of agriculture have been insufficient, they argue, to produce significant evolutionary change. Why should we assume that human nature has remained essentially unchanged since we lived exclusively on the savanna, when animal breeders and observers of wild populations have regularly noted trait shifts over a few generations during periods of environmental change? Significant environmental changes due to location, climate, and culture would have created new selection pressures and altered the development of some human traits. With respect to sex differences: Why should we presume that a stable, unvarying female and male nature developed on the African savanna and has remained unchanged through enormous changes in environments that would have necessitated significant shifts in gender roles?

A key tenet of evolutionary theory is that genetic and phenotypic *variations* are essential for natural selection to occur. Environmental alterations could rapidly wipe out a homogeneous species; in a heterogeneous species, at least some will survive or even thrive in a new environment, and pass on their traits. However, this process does not produce increasing homogeneity because environments are not sufficiently stable and, in sexually reproducing species, genetic recombination during gamete production ensure that the next generation will show trait variation. EP ignores this basic tenet when it argues for a universal human nature and a genetically determined female and male nature. In fact, humans vary widely from one another, across generations, and over individual lifespans (Fausto-Sterling, 2000). Much of this variation is random

because genetic recombinations are random. And some of this variation cannot be attributed to genetic variation. Women and men both show a variety of traits and behaviors, but this vital variation is ignored in EP theorizing about sex differences.

Finally, evolutionary psychologists insist that most human psychological traits, including sex differences, result from the genetically-determined organization of brain modules, each selected to meet a specific adaptive challenge (Cosmides & Tooby, 1994). They resist the idea that human brains might consist of a few general-purpose mechanisms that permit adaptability, flexibility, and creativity even within an individual's lifespan. Although they acknowledge the existence of learning abilities, they argue that learning depends upon cognitive modules, which are specialized for particular kinds of tasks, such as "cheater detection" and language (Cosmides & Tooby, 1997). Even though there is empirical support for this modularity of mind, there is also considerable evidence that we humans are remarkably adaptable, flexible, and creative (Karmiloff-Smith, 2000). We are not only passive creatures who automatically activate module subsets in response to environmental cues; we are active shapers of our world and of our identity. Although behaviorism tends to exaggerate our flexibility, EP tends to minimize it.

Evolutionary psychology is an approach to understanding human behavior that has considerable potential. Humans are not exempt from the natural processes that affect the rest of creation. Also, we know that all of our traits and behaviors are genetically influenced in some direct and numerous indirect ways. It is unfortunate that the application of EP to the field of sex differences has been so unreflectively filtered through our cultural "lenses of gender," and that it is so riddled with logical and methodological problems. Some argue that these problems will be addressed as EP moves from its current infancy into a more mature and well-developed field. Indeed, some EP proponents have done beautiful philosophical, theoretical, and empirical work (e.g., Holcomb, 1993). Others, however, argue that EP will never stand on its own as a complete theory of human behavior.

## A BRIEF LOOK AT SOCIAL CONSTRUCTIONISM

One such group of scholars is the social constructionists. They believe that human nature is

extremely flexible. Our perceptions, knowledge, worldviews, expectations, and behaviors are powerfully shaped by our historical and cultural contexts. Even in our scientific activities we cannot help but interpret our observations through the filters—the concepts, language, and values—of our culture. The SC approach has the advantage over EP by having decades of theoretical and methodological development to produce convincing accounts for the multitude of sex- and gender-related variations within and across cultures and historical periods. SC has long addressed the same questions of sex differences that arise in EP, and has accounted for them in a very different, but also a scientifically adequate manner (Condry & Condry, 1976; Epstein, 1988; Hawkesworth, 1997; Kessler & McKenna, 1978).

However, SC also has its limitations. One is that SC cannot adequately account for the few universal sex differences that have been consistently documented: Men's preference for young, beautiful, virgin females, and their greater competitiveness and physical aggression; women's preference for high-status males. Although there is considerable variation among individual men and women in even these traits, cross-cultural and historical research supports these overall patterns. Such universals are unlikely if these traits are entirely culturally-determined. A second limitation of SC is its unwillingness to take seriously the fact that we are embodied, that we have genes, and that we are subject to the same natural processes as the rest of creation. We cannot avoid, nor can we infinitely shape our physical creatureliness. Third, underneath SC, as with EP, lies a set of deep assumptions. While SC is silent on questions of being (i.e., ontology) and purpose (i.e., teleology), SC theorists generally believe that there simply is no human nature: Everything is relative, modifiable, and humanly created. Finally, SC is just as deterministic as EP, but the cause that determines us is culture, not natural selection.

### INTELLIGENT DESIGN: ALTERNATIVE OR COMPLEMENTARY APPROACH?

Some thoughtful scholars have begun to reflect on alternative approaches to understanding human nature. These approaches attempt to combine the strengths of EP and SC, while transcending and avoiding the limitations, narrow focus, and

dichotomies of both (e.g., Rose, 2000; Shakespeare & Erickson, 2000). However, many of these approaches remain deterministic; instead of one factor, there are simply two or more (Peters, 1997). Does human nature transcend such causal systems? Is there an element of true freedom? In a closed universe, without a spiritual or supernatural dimension, it is difficult to even consider such possibilities. There is another alternative, however, that embraces a supernatural dimension and directly tackles the naturalism found in most of the evolutionary theory: the intelligent design (ID) approach. "The fundamental claim [of ID] is that intelligent causes are necessary to explain the complex, information-rich structures of biology and that these causes are empirically detectable" (Dembski, 1998, pp. 16-17). ID counters the belief that random, purposeless selection processes are sufficient to account for behavior by claiming that such processes simply could not produce the observed structural and behavioral complexities. Just as a paleoanthropologist examines fractured stones or marks on fossilized animal bones and discerns the intelligent action of an ancient hominid making a tool or butchering prey, an ID scholar discerns purposeful, intelligent action in natural phenomena.

ID has not previously been compared and contrasted directly with EP. The key difference between ID and EP is philosophical: EP assumes naturalism, whereas ID assumes supernaturalism. Both approaches lead their proponents to interpret empirical observations of the natural world in a manner that supports their foundational assumption. The question I wish to address is: Will our examination of human sexuality be illuminated and more complete if we assume, *a priori*, that there is an intelligent, purposeful cause shaping our sexuality, instead of random, purposeless processes? Will this assumption lead to a more fruitful and perhaps a more complete understanding of sexuality than provided by either EP or SC?

Dembski (1998) suggests that we should work inductively from empirical observations toward a design theory. Do our observations of human sexuality compel us to conclude that sexuality must have been designed? As noted, EP reduces our sexuality to universals that were adaptive in the environment of evolution and in the process, it is forced to discount or trivialize sexuality's diverse complexity. However, to argue that phenomena related to human sexuality that cannot be explained by current naturalistic theo-

ries must therefore be evidence of intelligent design is to move dangerously close to a "God of the gaps" approach. Surely the hand of a designer is evident in both the processes we can and cannot explain. Also, the SC approach accounts for sexual diversity without invoking an intelligent designer: Therefore, it is not clear whether ID can give a better account than SC or just merely a different one.

An alternative is to work deductively. Instead of *inferring* a designer from observations of human sexuality, *postulate* a designer and generate predictions about human sexuality based on this postulate. Schloss (1998) suggests this as an ID approach to the study of human altruism. An openness to the possibility of intelligent design means that we are not forced to interpret our observations in purely naturalistic terms. We can postulate that humans were made for particular purposes, and that our emerging, evolving nature contributes to our ability to manifest those purposes. We do not have to reduce human sexuality to the machinations of selfish genes trying to propagate. Instead, we can reconceptualize our sexuality in light of a belief that we were designed to be in a loving relationship in order to develop our potential as humans through intimacy, vulnerability, and unconditional love. This enables us to generate a number of testable predictions about mate selection and to interpret several observations puzzling to EP. These include the fact that we do not always select our mates merely on the basis of EP criteria, and we usually do not seek another mate if a particular pairing produces no offspring. Also, some couples choose not to have children at all, some people select mates from their own sex, and we often stay together long after the child-rearing years. EP claims that such observations constitute exceptions, special cases, or indirectly adaptive patterns, but that our *real*, albeit unconscious, motive is gene propagation. EP states that this is revealed in universal trends in mate selection and the dynamics of sexual relationships, including jealousy, divorce, extra-marital affairs, and serial monogamy. However, within an ID framework, we no longer discount such cases as "noise" or "random variation." Thus, an ID framework has the potential to embrace and take seriously the variability we observe in human sexual relationships.

Of course, intimacy, vulnerability and unconditional love are not just potential characteristics of sexual relationships, but they are also characteristics of relationships between parents, children, and friends. Thus, we have yet to give an account of sex. Could ID

suggest other purposes, apart from gene propagation, for this apparent bifurcation of the human species? It is obvious that a sexual dichotomy enables us to reproduce genetically varied offspring, which reduces the risk of species extinction due to environmental change. If this is the only reason to have female and male human beings, then ID theory cannot add anything to EP except a belief that this phenomenon was intelligently designed. If we cannot generate specific predictions that empirically distinguishes ID from EP, then the major difference between these theories lies solely in the *a priori* assumptions about naturalism or supernaturalism that affect interpretation of observations. Further, ID must convincingly demonstrate the necessity of postulating a supernatural designer to counter the accusation of lack of parsimony.

What alternatives might ID theory provide? One possibility is that humans were designed to cultivate their full potential by maintaining an enduring, intimate relationship with a partner of the opposite sex and any children resulting from this relationship. This leads to the prediction that spouses and their children would show greater well being when their partners remain in a faithful, committed, loving relationship than when they do not. Empirical studies of this question within the North American culture have generally supported this prediction (Mason, 1998; Wallerstein, 1998). This prediction also implies that the variety of family structures throughout history were less conducive to well being than the 1950's American-style nuclear family. However, contradictory evidence can be found in cross-cultural research that includes more communal cultures and very different family structures, such as polygyny. Further, this prediction could equally well be made from EP theory, based on arguments of genetic self-interest. Thus, this particular hypothesis about the designer's purpose in creating human sexuality is neither empirically supported nor able to falsify EP.

Returning to the idea that an intelligent designer made humans for loving relationships, we could ask whether being made female and male in some manner facilitates or enhances our ability to engage in such relationships. Perhaps our erotic attraction to one another draws us together and provides the initial bonds upon which a deeper and broader intimacy and vulnerability can be built. This does not deny the vital importance of sexual relations in order to produce children, but suggests that there is more to

being gendered and sexual than reproduction. Perhaps learning about the potential richness of loving relationships in the context of a sexual relationship enhances our ability to develop and express intimacy, vulnerability, and unconditional love to others. This theory would account for the fact that people experience, consciously and unconsciously, many significant benefits to being in intimate relationships apart from reproductively fit and well-nourished offspring. It would also account for the misery of those who behave in sexual relationships using the script that EP has claimed would be most adaptive: Rich, high-status men marrying a series of young, fertile women; abusive relationships based on jealousy and control; poor men raping women; serial monogamy followed by divorce when the sexual passion dies down; the loneliness of spouses in relationships where the only intercourse they have is sexual, etc. If sexual relationships are intended for more than the gratification of unconscious, genetically-determined drives to produce offspring, it is no wonder that these people are so unhappy.

This theory also accounts for the fact that many people choose not to engage in sexual relationships with the other sex. If we view humans as fundamentally relational and communal, then there are other ways in which these aspects of our humanity may be experienced and expressed, including in friendships, through committed celibacy and service in religious communities, and between parents and children. The presence within a community of many people who are exploring the potential depths of human relationships through committed sexually intimate partnerships can provide knowledge and models for everyone in the community, including those not engaged in this type of relationship. Intimacy, vulnerability, and unconditional love are not limited to husbands and wives.

This theory also does not require a host of universal, constant sex differences. The meaning of femaleness and maleness can shift throughout the lifespan, across cultures, and over generations. What remains constant is the need for relationships characterized by intimacy, vulnerability, and unconditional love, as well as the need to produce offspring. As the SC scholars have shown us, significant variations in the meanings and experiences linked with sexual relationships exist. An ID approach might finally free us from our endless attempts to define, once and for all, an essential female or male nature. If sexuality is about producing children and, equally importantly,

facilitating loving relationships throughout the community, then we can celebrate it without absolutizing it. We can acknowledge that sexuality is shaped by reproductive roles, but we can also recognize that the purposes for which sexuality was designed can be expressed in many different ways.

So far, however, I have simply woven a story, just as evolutionary psychologists do. As I have tried to show, this story/theory can account for observations about female/male relationships that EP is forced to dismiss. However, it is possible that a naturalistic evolutionist could, with considerable creativity, develop an adaptive account for the observations EP currently ignores. What is needed is further development of this ID-based theory so that we can generate empirically testable predictions that could enable us to discriminate between naturalistic and ID accounts of human sexuality. For example, we could ask open-ended questions of people about the characteristics they look for in a life partner, instead of asking them to rank order a pre-generated list that is biased toward those characteristics predicted by EP. We could also examine the physical and psychological characteristics of the mates women and men actually choose, especially in relationships that are stable and happy.

EP insists that most of our evolved motives are unconscious, while our conscious stories are mostly rationalizations and justifications enabling us to avoid the unpalatable truth that we are ultimately gene-propagation machines. Analogously, if my tentative ID theory is correct, then it is likely that humans are unconsciously motivated to seek the fulfillment of true intimacy, vulnerability, and unconditional love in their relationships. Hence, I would expect to find evidence that people seek more than the reproduction-related characteristics predicted by EP. I would also predict that older people who reflect on their past would recognize the action of such unconscious motives. They may have discovered through intimate relationships greater richness and value than they knew to expect when they were younger. Another possibility is that they learned that relationships solely based on erotic attraction, sex, and child-rearing left a sense of incompleteness and loss.

These predictions require the use of more qualitative, open-ended research methods than the more quantitative approaches preferred by many psychologists. These data are equally empirical and scientifically valid, and such methods are more appropriate

to questions of the nature and purposes of gender and sexuality.

### CONCLUSION: EVOLVED, CONSTRUCTED, AND DESIGNED

In summary, I believe that ID has the potential to provide us with a theoretical framework that might enable a more complete account of the richness and complexity of human sexuality than a naturalistic version of EP. It does so primarily because it presumes the existence of an intelligent designer rather than philosophical naturalism. This enables us to theorize about the purposes for human sexuality, which can lead to testable predictions about sex differences and similarities. This framework could, with considerably more fine-tuning and empirical verification, help us interpret much data already available on sexuality and provide some novel predictions that neither EP nor SC theories could generate.

Another strength of ID is that it embraces our embodied nature. While ID is certainly open to a vital spiritual dimension in creation, ID theorists also see the hand of a designer in the *physical* creation. We are therefore invited to explore the evolution of human nature through processes like natural selection without having to accept philosophical naturalism. We also must take seriously the roles of genes and other aspects of biology in human sexuality, rather than attributing traits to disembodied minds or entirely to social cultivation. Yet, as a result of the ID's belief in a purposive intelligence behind creation, we do not have to reduce ourselves to "mere biology." The existence of a spiritual/supernatural intelligence, and the possibility of purpose, open up potentials that both embrace and transcend biology. At the same time, we must also examine the social, cultural, and spiritual functions of our sexuality.

However, I also believe that ID, in and of itself, is too limited to provide a complete accounting of human sexuality. Although I do not wish to argue that the postulated intelligent designer is a "blind watchmaker" (Dawkins, 1986) who simply put into place natural processes and subsequently let them unfold without any guidance or sustenance, it is the case that such a designer could have, by definition, created those natural processes, including evolution by natural selection. As Padgett argues, "evolution is based on design" (2000, p. 32). Our study of human sexuality must, therefore, be informed by

theories that take evolution by natural selection seriously. Convincing explanations of certain aspects of human sexuality within an evolutionary framework do not require us to dismiss our belief in an intelligent designer. When evolutionary psychologists see the blind hand of naturalism in these explanations, they are engaging in faith-based interpretation of the data as much as are scientists who see the hand of an intelligent designer in the same evidence. EP has much to offer, and many of the criticisms of EP can be addressed without dismissing the theory entirely.

As well, ID theories of human sexuality will have to avoid the trap of "designer determinism," which is really no different from the biological or genetic determinism found in EP. The view that gender and sexuality were designed in a *particular manner* for particular purposes implies a universality and stability that discounts the constantly shifting diversity that we observe and experience. Social constructionism is a rich, mature source of theorizing and data on this sexual diversity from which ID theory would benefit greatly.

In conclusion, intelligent design theory provides a set of lenses that enable us to interpret and understand human sexuality in ways that are potentially richer and more complete than the lenses of naturalism. Naturalism forces us to interpret human sexual behavior without reference to supernatural or intelligent purposes. Ultimately these behaviors must be understood in biologically deterministic, reductionistic, adaptive terms. ID broadens the range of possibilities by providing insights into and predictions relating to the purposes and functions of human sexuality beyond mere gene propagation. In contrast to social constructionism, however, it does so without dismissing the role of biological structures and systems. What ID cannot do is generate specific hypotheses regarding the *means* by which those purposes and functions are developed or fulfilled. Intelligent design can provide a key foundation and a broad framework for studying sexuality. In this context, we can develop theories, hypotheses, and empirical studies that draw significantly from, but also transcend, the contributions of social constructionism and evolutionary psychology.

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## AUTHOR

LOOY, HEATHER. Address: The King's University College, 9125-50th St., Edmonton, Alberta, Canada T6B 2H3. Title: Associate Professor of Psychology. Degree: PhD, McMaster University. Specializations: Gender and sexuality, sexual orientation, and intersexuality; food preferences, disgust, and morality; ecopsychology, evolutionary psychology, behavior genetics, and feminist psychology.



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