

# Sociosexuality from Argentina to Zimbabwe: A 48-nation study of sex, culture, and strategies of human mating

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**Abstract:** The Sociosexual Orientation Inventory (SOI; Simpson & Gangestad 1991) is a self-report measure of individual differences in human mating strategies. Low SOI scores signify that a person is sociosexually *restricted*, or follows a more monogamous mating strategy. High SOI scores indicate that an individual is *unrestricted*, or has a more promiscuous mating strategy. As part of the International Sexuality Description Project (ISDP), the SOI was translated from English into 25 additional languages and administered to a total sample of 14,059 people across 48 nations. Responses to the SOI were used to address four main issues. First, the psychometric properties of the SOI were examined in cross-cultural perspective. The SOI possessed adequate reliability and validity both within and across a diverse range of modern cultures. Second, theories concerning the systematic distribution of sociosexuality across cultures were evaluated. Both operational sex ratios and reproductively demanding environments related in evolutionary-predicted ways to national levels of sociosexuality. Third, sex differences in sociosexuality were generally large and demonstrated cross-cultural universality across the 48 nations of the ISDP, confirming several evolutionary theories of human mating. Fourth, sex differences in sociosexuality were significantly larger when reproductive environments were demanding but were reduced to more moderate levels in cultures with more political and economic gender equality. Implications for evolutionary and social role theories of human sexuality are discussed.

**Keywords:** culture; gender; mating; reproduction; sex differences; sex roles; sexual strategies; sociosexuality

Over a decade ago, Simpson and Gangestad (1991) introduced a self-report measure of human sexuality called the Sociosexual Orientation Inventory (SOI; see also Gangestad & Simpson 1990; Simpson 1998). Originally designed to capture variability in the willingness to have sex outside of a committed pair-bond, the SOI contains numerous questions about human mating behavior, romantic fantasies, relational emotions, and attitudes toward casual sex. Responses to the SOI are typically used to differentiate people along a single strategic dimension of human mating called *sociosexuality* (Simpson & Gangestad 1991). Those who score relatively low on this dimension are said to possess a *restricted* sociosexual orientation – they tend toward monogamy, prolonged courtship, and heavy emotional investment in long-term relationships. Those residing at the high end of sociosexuality are considered more *unrestricted* in mating orientation, they tend toward promiscuity, are quick to have sex, and experience lower levels of romantic relationship closeness<sup>1</sup> (Simpson & Gangestad 1991).

Since its introduction, the SOI has become an increasingly popular tool for measuring individual differences in basic human mating strategies (Hebl & Kashy 1995; Jones 1998; Seal et al. 1994; Simpson 1998; Simpson et al. 2004; Stephan & Bachman 1999; Wright & Reise 1997). Indeed,

it appears to have become the measure of choice when attempting to relate human mating strategies to other sex-related phenomena (Allen 2000; Bleske-Rechek & Buss 2001; Clark 2004; Gangestad & Thornhill 1997; Isaacson 2001; Reise & Wright 1996; Schmitt 2005; Seal & Agostinelli 1994; Simon 1997; Simpson et al. 1999; Townsend & Wasserman 1988). Despite its widespread use, very little is known about the cross-cultural utility of the SOI, with only a handful of studies directly measuring sociosexuality outside the United States (e.g., Bailey et al. 2000). This is es-

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pecially unfortunate because a cross-culturally validated measure of human mating strategies would help to address many recent developments in evolutionary psychology and social role theory (e.g., Gangestad & Simpson 2000; Wood & Eagly 2002).

In the current study, the SOI was translated from English into 25 additional languages and administered to samples from 48 nations as part of the International Sexuality Description Project (ISDP; Schmitt et al. 2003a). The resulting ISDP database on sociosexuality was used to address four main issues. First, the psychometric properties of the SOI were examined in cross-cultural perspective. Second, theories concerning the distribution of sociosexuality across cultures were evaluated (Belsky et al. 1991; Gangestad & Simpson 2000; Pedersen 1991). Third, the cultural universality of sex differences in sociosexuality was investigated (Buss & Schmitt 1993; Symons 1979; Trivers 1972). Fourth, theories concerning the degree of sexual differentiation in sociosexuality across cultures were examined (Buss & Barnes 1986; Eagly & Wood 1999; Kasser & Sharma 1999; Wood & Eagly 2002). Because national profiles of men's and women's sociosexual mating strategies would have little value if the SOI were not reliable and valid across cultures, a review of the psychometrics of the SOI will be addressed first.

## 1. Psychometrics of the SOI

Simpson and Gangestad (1991) conducted several studies to evaluate the psychometric qualities of the SOI. In their original study, 204 women and 202 men from Texas A&M University completed an initial pool of 11 items related to a conceptual definition of sociosexuality. Using principal axis factor analysis, Simpson and Gangestad documented that seven of these items – the seven items eventually included in the SOI – formed a coherent unitary factor structure. They also found that the resulting seven-item SOI scale possessed adequate levels of internal reliability ( $\alpha = 0.73$ ). In an unpublished study, Simpson and Gangestad (1989) documented the high temporal reliability of sociosexuality ( $r = +0.94$ ) over a two-month test-retest period.

Simpson and Gangestad (1991) evaluated the validity of the SOI using standard construct validation techniques (Cronbach & Meehl 1955). In a validation study involving 144 romantic couples, participants were asked to complete the SOI along with other measures concerning their relationships. Simpson and Gangestad found that sociosexuality was related to how early in the relationship the couple had engaged intercourse, and SOI scores converged with established measures of human sexuality in predictable ways. For example, those who scored as more restricted on the SOI tended to score higher on Lund's Commitment Scale (Lund 1985), Rusbult's Investment Scale (Rusbult 1980), and Rubin's Love Scale (Rubin 1970). Data from these same couples also showed that the SOI possessed discriminant validity, in that sociosexuality was unrelated to sex drive per se. In additional studies, Simpson and Gangestad (1991) have shown that the SOI predicts whether someone has engaged in sex with more than one partner in a given time period – a key conceptual element of the unrestricted or promiscuous mating strategy (Baker & Bellis 1994; Barash & Lipton 2001; Schmitt et al. 2001b).

Although the majority of SOI validation research has proven highly supportive in American samples, it remains unclear whether the psychometric soundness of the SOI generalizes to other languages and cultures. Do the seven items of the SOI form one coherent dimension within all cultures, or do sociosexual attitudes and behaviors become disconnected in certain regions of the world? Can sociosexuality be accurately gauged using self-report methods across all cultures, or does the validity of the SOI fluctuate across language, geography, ethnicity, history, politics, economics, or religion? Do responses to the SOI correlate with similar psychological and physical attributes across different cultures, or does sociosexuality take different anthropometric forms around the world? If the SOI were proven reliable and valid across cultures, this could have important implications for advancing our understanding of the links between culture and human mating strategies. However, no study has evaluated the psychometrics of the SOI in a language other than English, nor has the SOI been administered to samples from non-Western cultures. In the current study, the reliability and validity of the SOI were evaluated across 26 languages and 48 nations, including multiple cultures from North America, South America, Western Europe, Eastern Europe, Southern Europe, the Middle East, Africa, Oceania, South/Southeast Asia, and East Asia.

## 2. Sex differences in sociosexuality

On average, men tend to possess more positive attitudes toward casual, low-investment sex than women do (Carroll et al. 1985; Fisher et al. 1988; Hendrick et al. 1985; Oliver & Hyde 1993; Townsend 1995; Wilson 1987). Men also report that they fantasize about having sex with multiple partners more than women do (Ellis & Symons 1990; Malamuth 1996), and men behaviorally seek short-term mateships more than women do (Blumstein & Schwartz 1994; Eysenck 1976; Laumann et al. 1994; Wiederman 1997). Experimental tests have further confirmed that men are more likely than women to consent to sex with a stranger when approached in a community setting (Clark & Hatfield 1989), even when the stranger is "vouched for" by a participant's same-sex friend (Clark 1990).

This pervasive pattern of sexual differences – across attitudes, fantasy, and behavior – implies that men should be higher or more unrestricted on sociosexuality than women. Indeed, the direct evidence on this point is unequivocal, at least in United States. In every study published to date, American men report higher levels of sociosexuality than American women based on responses to the SOI. What remains unknown is whether sex differences in sociosexuality persist beyond the borders of the United States, especially across non-Western cultures. Perhaps some cultures are so generally restrained in sexual matters that sex differences in sociosexuality have become muted. Other cultures could be sexually unrestrained to the point that a ceiling effect occurs, and both sexes "max out" on the SOI. Certainly, sociosexual sex differences will vary to some degree across cultures, and this variability itself may be of interest. Nevertheless, there are strong theoretical reasons why men are expected to sexually think, feel, and behave in a more unrestricted manner than women do across most cultures.

### 2.1. Parental investment theory

From an evolutionary perspective, sex differences in sociosexuality should be consistently observed across human cultures, in part because of fundamental differences in the evolved reproductive strategies of men and women. According to parental investment theory (Trivers 1972), the relative proportion of parental investment – the time and energy devoted to the care of individual offspring – varies across the males and females of different species. In some species, males tend to provide more parental investment than females (e.g., the Mormon cricket; Gwynne 1984). In other species, females possess the heavy-investing parental burdens (Alcock 1993; Trivers 1985).

Importantly, Trivers (1972) noted that sex differences in obligatory parental investment burdens are systematically linked to the processes of sexual selection in ways that may influence reproductive strategies or sociosexual orientations. Namely, the sex that typically invests less in offspring normally shows a greater eagerness to engage in mating, incurs greater costs through more intense intrasexual mating competition, and is intersexually less discriminating in mate choice than the heavier-investing parent (Andersson 1994; Bateson 1983; Clutton-Brock 1991; Maynard Smith 1977). In short, the lesser-investing sex is usually more unrestricted in sociosexual orientation than the heavier-investing sex. In support of parental investment theory applying to humans, numerous studies have shown that men possess a greater eagerness to engage in mating (Baumeister et al. 2001; Clark & Hatfield 1989; Schmitt et al. 2003b); men incur greater costs through more intense intrasexual mating competitions (Alexander & Noonan 1979; Archer & Loyd 2002; Daly & Wilson 1988); and men's mate preferences are less discriminating than women's, especially in the context of promiscuous or short-term mating (Buss & Schmitt 1993; Kenrick et al. 1990; Regan 1998a; 1998b; Regan & Berscheid 1997; Simpson & Gangestad 1992).

Human males also experience lower levels of *minimum* parental investment in offspring than females do. That is, men are not obligated to invest as much as women do in parenting to produce viable progeny (Symons 1979). Women must incur the differential costs of internal fertilization, placentation, and gestation to reproduce. All female mammals carry additional investment burdens associated with lactation. In humans, lactation can last several years in a foraging environment (Kelly 1995), years during which it is harder for women to reproduce and invest in additional offspring. Men are minimally required to do much less to reproduce. This investment differential is perhaps most conspicuous in the case of mate poaching, where a man can mate with a married woman and then have the woman's husband provide extended paternal investments to the child (Schmitt & Buss 2001). For a woman seeking to poach a married man, a similar shift of her minimum investment burdens to his wife would have been unattainable in our ancestral past. Of course, many men do invest heavily in their own children, but in all known cultures women spend much more time and effort in actively raising children than men do (Low 1989; Munroe & Munroe 1997; Quinn 1977).

According to parental investment theory, these asymmetries in men's and women's parental investment levels should lead women to have less to gain in reproductive output by engaging in indiscriminate, short-term sex with large numbers of partners (see Bjorklund & Shackelford 1999;

Gear 1998; Hinde 1984). Indeed, the differences between men's and women's potential reproductive benefits from unrestricted, promiscuous mating may be substantial. Consider that one man can produce as many as 100 offspring by repeatedly mating with 100 women in a given year, whereas a man who is monogamous will tend to have only one child with his partner during that same time period. In evolutionary currencies, this represents a strong selective pressure on men's mating strategies to favor at least some unrestricted desires for multiple partners (Barash & Lipton 2001; Buss & Schmitt 1993). Of course, 100 instances of only one-time mating between a man and 100 women would rarely, if ever, produce precisely 100 offspring (Fletcher & Stenswick 2003). However, this selective pressure remains potent because a man mating with 100 women over the course of a year – particularly repeated matings when the women are nearing ovulation and are especially interested in short-term mating (Gangestad 2001) – would likely have *significantly more* offspring than a woman mating repeatedly with 100 men over the course of a year. Historically, this appears to have been the case with those men having especially large numbers of mating partners greatly outproducing their intrasexual (and intersexual) contemporaries (Betzig 1986). This is also true among foraging cultures, the vast majority (over 80%) of whom practice some form of polygyny (Murdock 1967), whereby high-status men who mate with multiple partners have greater reproductive success than those who do not (though see Low 1988). Whether a woman mates with 100 men or is monogamously bonded with only one man, she will still tend to produce only one child in a given year. The potential reproductive benefits from desiring promiscuous or multiple mating, therefore, appear to be much higher for men than women (Symons 1979).

According to sexual strategies theory (Buss & Schmitt 1993), women can reap some evolutionary benefits from multiple mating (see also Gangestad 2001; Hrdy 1981; Shackelford & LeBlanc 2001). In Amazonian cultures that believe in partible paternity, for example, a woman can receive the extended benefits of protection and resources from multiple men by mating with them while she is pregnant (Beckerman & Valentine 2002). A woman who engages in multiple mating can also obtain immediate resources, secure a child if her current long-term mate is infertile, and gain access to high-quality genes by short-term mating with a man who is not her husband (Fedorka & Mousseau 2002; Greiling & Buss 2000; Smith 1984). Many married women appear to desire physically attractive men when having affairs, affairs that may be one source for attractive men to especially benefit from short-term mating by having their offspring raised by cuckolded husbands (Schmitt & Shackelford 2003). In short, women can reproductively benefit from promiscuous or multiple short-term mating. The pivotal sex difference in sociosexual mating psychology is *not* that women are solely designed for long-term monogamy. Instead, women possess all the hallmarks of having evolved a short-term mating strategy (Gangestad 2001; Schmitt et al. 2001a). It is, however, a strategy based on selectively desiring men of high status, dominance, and genetic quality (Gangestad & Thornhill 1997; 2003; Thornhill & Gangestad 2003). Men's short-term strategy, in contrast, is focused on more indiscriminate desires that lead to obtaining numerous sex partners in high-volume quantity (Schmitt et al. 2003b).

A clear implication of parental investment theory and sexual strategies theory is the following hypothesis: *Men should possess more unrestricted sociosexual orientations than women across human cultures.* There have been cross-cultural studies that show men possess less restrictive mate preferences than women (Buss 1989; Buunk et al. 2002) and desire multiple short-term sex partners more than women do (Schmitt et al. 2003b). However, sex differences in sociosexuality have never been directly tested across large numbers of cultures. Indeed, no studies have been conducted where the sociosexuality of both men and women were assessed in non-Western cultures. One of the objectives of the present study was to evaluate whether sex differences in sociosexuality are robust across the broad range of human cultures represented in the ISDP. Finding universal sex differences in sociosexuality would support parental investment theory (Trivers 1972), as well as other evolutionary perspectives on human mating (Alexander & Noonan 1979; Buss & Schmitt 1993; Gangestad & Simpson 2000; Hinde 1984; Symons 1979; Wilson 1987).

### 3. Cultural influences on sociosexuality

In addition to differences between men's and women's sociosexuality, human mating strategies also appear to vary across different forms of human culture (Broude 1983; Broude & Greene 1976; Ember 1974; Hartung 1985; Jankowiak et al. 2002; Lancaster 1989; Low 2000; Whiting & Whiting 1975). Perhaps the most well-documented links between culture and human mating strategies are those involving marriage systems. For example, Low (1990) has shown that tribal cultures with higher pathogen stress are more likely to have polygynous marriage systems (see also White & Burton 1988). Monogamous mating systems, in contrast, are relatively absent in high-pathogen environments. Marlowe (2003) recently demonstrated that monogamy is especially prevalent in cultures with low levels of pathogens and when men contribute more calories to the local diet. Indeed, anthropologists have suggested that many aspects of tribal culture – particularly warfare, kinship, residence, and inheritance patterns – are systematically related to marriage systems, as well as to rules governing premarital sex, adultery, jealousy, divorce, postpartum sex taboo, and incest avoidance (Frayser 1985; Pasternak et al. 1997).

Theories that link cultural variation with the monogamy–promiscuity dimension of sociosexuality have also been proposed. For example, Pedersen (1991) has postulated that the relative number of men versus women in a given culture should affect sociosexual attitudes and behavior. Chisholm (1996; 1999a) has argued that high mortality rates in local cultures should be associated with more promiscuous mating strategies. Gangestad and Simpson (2000) have theorized that demanding reproductive environments should increase the desire and pursuit of biparental, monogamous partnerships. To date, however, no study has examined sociosexuality across multiple cultures in a way that would reveal direct links between cultural environments and the dimension of sociosexuality. In the current study, three theories concerning culture and its effects on sociosexuality were evaluated: sex ratio theory (Pedersen 1991), developmental-attachment theory (Belsky et al. 1991; Chisholm 1996), and strategic pluralism theory (Gangestad & Simpson 2000).

### 3.1. Sex ratio theory

Operational sex ratio can be defined as the relative balance of marriage-age men versus marriage-age women in the local mating pool (Pedersen 1991; Secord 1983), although other formulations have been proposed (Clutton-Brock & Parker 1992; Hardy 2002; Parker & Simmons 1996). When computing operational sex ratios, marriage age is usually treated as between 15 and 49 years (Guttentag & Secord 1983). Sex ratios are considered high when the number of men significantly outsize the number of women in a local culture. Conversely, sex ratios are considered low when there are relatively more women than men in the mating market. In most cultures women tend to slightly outnumber men, largely because of men's greater mortality rate (Daly & Wilson 1988). Nevertheless, significant variation often exists in sex ratios across cultures and within cultures when viewed over historical time (Guttentag & Secord 1983; Lazarus 2002).

Pedersen (1991) argued that a combination of sexual selection theory (Darwin 1871) and parental investment theory (Trivers 1972) leads to a series of predictions concerning the effects of sex ratios on human mating strategies. According to sexual selection theory, when males desire a particular attribute in potential mating partners, females of that species tend to respond by competing in the expression and provision of that desired attribute. Among humans, Pedersen had the insight that when sex ratios are especially low (i.e., there are many more women than men), men become an especially scarce resource that women must compete for with even more intensity than normal (see also Guttentag & Secord 1983). When combined with the parental investment notion described earlier in which men tend to desire promiscuous sex (Buss & Schmitt 1993; Symons 1979; Trivers 1972), this leads to the following hypothesis: *Cultures with lower sex ratios (i.e., more women than men) should possess higher levels of sociosexuality (i.e., more promiscuity).* The logic of Pedersen's theory is that in cultures with many more women than men, men are scarce and can afford to demand from interested women that men's greater desires for promiscuous sex be fulfilled. As a result of these mating market forces, the culture as a whole should become more unrestricted in sociosexual orientation (see also Barber 2000; Ember 1974).

Conversely, when sex ratios are high and men greatly outnumber women, men must enter into more intense competition for the limited number of potential female partners (Bateman 1948). Women's preferences for long-term monogamous relationships become the key desires that must be responded to if men are to remain competitive in the courtship marketplace. In this case, Pedersen's (1991) logic suggests that *cultures with higher sex ratios (i.e., more men than women) should possess lower levels of sociosexuality (i.e., should be more monogamous).* In this article, Pedersen's series of insights will be referred to as "sex ratio theory."

Using data from sex ratio fluctuations over time within the United States, Pedersen (1991) marshaled a compelling case for a causal link between sex ratios and human mating strategies (see also Guttentag & Secord 1983). For example, high sex ratio fluctuations have been historically associated with increases in monogamy, as evidenced by lower divorce rates and men's greater willingness to invest in their children. Low sex ratios have been historically associated

with indexes of promiscuity, such as an increase in divorce rates and a reduction in what he termed female “sexual coyness.” National sex ratios were related to sociosexuality across the 48 nations of the ISDP, enabling sex ratio theory to be evaluated from a cross-cultural perspective.<sup>2</sup>

### 3.2. Developmental-attachment theory

Several combinations of life history theory (Low 1998) and attachment theory (Bowlby 1969) have suggested that certain critical experiences during childhood play a role in the development of human mating strategies (Belsky 1999; Draper & Harpending 1988; MacDonald 1997). Perhaps most prominent among these is a lifespan model developed by Belsky et al. (1991). According to this model, early social experiences adaptively channel children down one of two reproductive pathways. Children who are socially exposed to high levels of stress – especially insensitive or inconsistent parenting, harsh physical environments, and economic hardship – tend to develop insecure attachment styles. These children also tend to physically mature earlier than those children who are exposed to less stress. According to Belsky and his colleagues, attachment insecurity and early physical maturity subsequently lead to the evolutionary-adaptive development of what is called an “opportunistic” reproductive strategy in adulthood (i.e., unrestricted sociosexuality). An opportunistic strategy, it is argued, will lead to higher levels of fitness in high-stress reproductive environments. In cultures with inconsistent or stressful social relations, therefore, children adaptively respond by developing the more viable reproductive strategy of unrestricted sociosexuality.

Conversely, those children exposed to lower levels of stress and less environmental hardship tend to be more emotionally secure and to physically mature later. These children are thought to develop a more “investing” reproductive strategy in adulthood (i.e., restricted sociosexuality) that pays higher evolutionary dividends in low-stress environments. All children come equipped with the potential for unrestricted or restricted sociosexuality, in this view, and psychological adaptations that are sensitive to local environments influence sociosexual desires and behaviors in adaptive ways. Although the causal mechanisms that influence sociosexuality are most prominently located within the family, this model also suggests that certain aspects of culture may be related to sociosexual variation. Namely, this model leads to the following hypothesis: *In cultures where families are under more stress and have fewer resources, sociosexual levels should be higher than in cultures with lower stress and ample resources.*

A closely related theory has been proposed by Chisholm (1996; 1999a). Chisholm argues that local mortality rates – presumably related to high stress and inadequate resources – act as cues that contingently shift human mating strategies in evolutionary-adaptive ways (see also Weinrich 1977). In cultures with high mortality rates and unpredictable resources, the optimal mating strategy is to reproduce early and often, a strategy related to insecure attachment, short-term temporal orientations, and unrestricted sociosexuality (Chisholm 1999b). In cultures that are physically safe and have abundant resources, mortality rates are lower and the optimal strategy is to invest heavily in fewer numbers of offspring. In safer environments, therefore, one should pursue a long-term mating strategy associated with more re-

stricted sociosexuality. This theory leads to the following basic hypothesis: *Cultures with higher mortality rates, earlier reproduction, and more prolific reproduction should have higher levels of sociosexuality than cultures with low mortality, late reproduction, and limited reproduction.* Collectively, the Belsky et al. (1991) and Chisholm (1996; 1999a) theories will be referred to as a “developmental-attachment theory” of sociosexuality. To test this theory, various indexes of familial stress, economic resources, mortality, and fertility were related to sociosexuality across the 48 nations of the ISDP.

### 3.3. Strategic pluralism theory

In direct contrast to developmental-attachment theory, Gangestad and Simpson (2000) have proposed strategic pluralism theory. According to strategic pluralism theory, humans possess a menu of alternative mating strategies that they can follow (see also Buss & Schmitt 1993; Gross 1996; Simpson & Orina 2003; Thiessen 1994). Which strategy individuals follow depends on the condition of local environments. When local environments are demanding and the difficulties of rearing offspring are high, the adaptive need for biparental care increases. Because both men and women are needed to successfully raise viable offspring in more demanding environments, Gangestad and Simpson argue that the importance of fidelity and heavy family investment should correspondingly increase: “In environments where male parenting qualities are needed and valued, women should be less likely to engage in short-term mating and extra-pair mating. In response to this, men should devote greater effort to parental investment” (p. 585). If true, this would suggest the following hypothesis: *In cultures with more demanding environments (e.g., higher stress, fewer resources, higher mortality), sociosexual levels should be lower (i.e., people should be more monogamous).*

Conversely, in cultures where biparental care is less necessary for successful child-rearing, Gangestad and Simpson (2000) expect that monogamy would be less prevalent. They postulate that in cultures with lower stress and adequate resources, human psychological adaptations should facultatively cause sociosexuality to increase (i.e., people should be more promiscuous). Gangestad and Simpson reason that in ancestral environments when biparental care was not as crucial, men could have afforded to channel more of their reproductive effort into short-term mating and unrestricted sociosexuality. Women also could have benefited from short-term mating (via access to high-quality genes; Gangestad 2001) given the collateral reduction in their dependence on a long-term male’s resources and investment. In this study, various indexes of environmental demand (e.g., life expectancy, gross domestic product per capita, human development) and reproductive difficulty (e.g., low birth weights, child malnutrition, infant mortality) were related to sociosexuality across the 48 nations of the ISDP.

## 4. Culture and sex differences in sociosexuality

As noted earlier, it follows from most evolutionary theories of human sexuality anchored in the theory of parental investment that men should score higher than women on sociosexuality (Buss & Schmitt 1993; Symons 1979; Trivers

1972). However, there may be certain aspects of culture that influence our evolved psychology in ways that accentuate or attenuate sex differences in sociosexuality. Just as the degree of sexual differentiation in body size is influenced by local diet and altitude (Gaulin & Boster 1985; Jurmain et al. 2000; Wolfe & Gray 1982), the degree of sexual differentiation in sociosexuality may vary with local ecological conditions. At times, this variability may be functional and reflect psychological adaptations specifically designed to moderate sex differences in response to particular ecological conditions.

#### 4.1. Strategic pluralism theory

An implication of strategic pluralism theory (Gangestad & Simpson 2000) is that women's sociosexuality should be more sensitive than men's to the demands and stressors of local environments. In demanding environments that require biparental care, women's sociosexuality facultatively shifts, and they become much more restricted. Only some men react to women's sociosexual shifts, however, and become restricted themselves. Other, more robust men were "able to carry out short-term tactics successfully at all times, regardless of the environmental factors to which women were responding" (Gangestad & Simpson 2000, p. 586). Therefore, women – as a group – should be more responsive than men are to environmental influences on sociosexuality.

Several findings would seem to confirm the notion that women's sexuality is more responsive to environmental factors. For example, Barry and Schlegel (1984) examined the 186 preindustrial societies of the Standard Cross-Cultural Sample and found on nearly all measures of sexual behavior that adolescent women were more variable than adolescent men. If sexual behaviors are adaptively responsive to local ecological conditions in natural environments, therefore, the responsiveness appears to be greater for women. Baumeister (2000), in a massive review of the literature on sex and sexuality, found that the effects of acculturation, education, politics, religion, and family life on sexual attitudes and behaviors were all more potent among women than men. He concluded that "men's sexuality revolves around physical factors, in which nature is predominant and the social and cultural dimension is secondary. For women, social and cultural factors play a much larger role" (Baumeister 2000, p. 368).

Similarly, strategic pluralism theory postulates that women's sociosexuality should be highly dependent on environmental demands across cultures, but men's sociosexuality should be less correlated with environmental harshness. If true, this leads to the following hypothesis: *The demanding nature of local environments should be more closely correlated with women's sociosexuality than with men's.* Moreover, because men tend to be more oriented toward short-term mating in general (Buss & Schmitt 1993; Schmitt et al. 2002), the following hypothesis also can be derived: *The size or magnitude of the difference between men and women should be smaller in nondemanding environments.* This is because in nondemanding environments women's sociosexual shifts bring them closer to men's normally higher levels of unrestricted sociosexuality. Men may shift as well, but their overall average on sociosexuality will not shift as prominently. These hypotheses were evaluated by correlating various indicators of environmental demands

with men's sociosexuality, women's sociosexuality, and the effect size of sex differences in sociosexuality across cultures.

#### 4.2. Social structural theory

Even if sex differences in the willingness to have uncommitted sex were found to be culturally universal, the differences may not result from adaptations to sociosexuality per se. It could be the case that sex differences in sociosexuality are a side effect of some other evolved sex difference – such as sex differences in physical size (Gaulin & Boster 1985), sex differences in general sex drive (Baumeister et al. 2001), or perhaps the external location of human male genitalia (Gagnon & Simon 1973). It also could be that certain sexual trends pervade all cultures because of sociohistorical factors that are relatively unrelated to the evolutionary biology of men and women (Harris 1993; MacKinnon 1988).

According to the social structural or "biosocial" theory of Eagly and Wood (1999; see also Wood & Eagly 2002), the minds of men and women are not likely to contain sex-differentiated adaptations that are specifically designed to produce universal sex differences in sexuality per se. Instead, Eagly and Wood assume that "differences in the minds of men and women arise primarily from experience and socialization" (p. 414). Thus, when men and women appear to differ, it is because they have received dissimilar socialization throughout development – particularly those experiences and expectations associated with a society's bifurcated sex roles and manifest degree of patriarchy (Buss & Barnes 1986; Eagly 1987; LaFrance et al. 2003; Maccoby 1998; Reiss 1986).

Eagly and Wood's (1999) social structural account is still an evolutionary theory of human mating, in that it views men's evolutionary history as hunters and meat providers (among other selective factors) as having led to men's greater size, strength, and speed. In contrast, women's evolutionary history of giving birth and prolonged lactation, among other selective factors, are thought to have led to women's prominence in child rearing. These and other evolved physical features of men and women, it is argued, ultimately lead to divisions of labor (see Joseph 2000) and, in socioeconomically complex societies, to patriarchal aspects of culture (see also Lerner 1986; Smuts 1995). According to Eagly and Wood (1999), it is these divisions of labor and the regular emergence of patriarchy (including political, economic, and sexual forms of controlling women) that, in turn, give rise to sex role ideologies and social expectations that are the more proximate causes of psychological differences between the sexes.

Wood and Eagly (2002) recently extended this line of reasoning and offered a compelling rationale for why some cultures have more bifurcated or "traditional" sex role ideologies, whereas other cultures have more flexible or "progressive" ideologies. They argue that in some cultures the value of men's hunting skills, their ability to wage war, and the need for women to stay close to children, among other features of culture, are especially acute. In these cultures, the local ecological and social conditions give rise to an economy that favors men's skills of production and, as a result, provides men with social and political power that often culminates in patriarchy and more traditional sex role ideologies. Polygyny and warfare are frequently – though

not always – associated with this cluster of cultural attributes (Divale & Harris 1976; White & Burton 1988), and the advent of agriculture, industrialization, and greater cultural complexity may further exacerbate this more traditional form of sex role socialization (Korotayev & Kazankov 2003; Wood & Eagly 2002).

In many other cultures, however, women contribute a relatively greater proportion of calories to the local diet, have greater resource control and political power (e.g., as a consequence of matrilineal residence and matrilineal descent), and have greater reproductive freedom through increased contraception, the benefit of nursemaids, and other factors (Barry & Yoder 2002; Murphy 2003; Whyte 1978). In these cultures, the local ecological and social conditions give rise to an economy that favors women's skills of production more heavily and ultimately culminates in a certain degree of gender egalitarianism and more progressive sex role socialization. In essence, Wood and Eagly (2002) argue that humans have evolved to be exquisitely sensitive to local economic and sociopolitical circumstances and respond by varying the degree of sex role socialization in ways that may influence sex differences in human mating psychology. The existence of sex roles is still an evolved feature of human psychology from this perspective (see also Alexander 2003), but the degree of disparity in sex role socialization (and the degree of patriarchy) can vary in important and systematic ways across cultures.

From this social structural perspective, sex differences in sociosexuality – when they do exist – ultimately result from evolved features of human psychology that sometimes lead to patriarchy and sexual divisions of labor. More proximately, this perspective views sex differences in sociosexuality as flowing from the disparate sex role socialization that results from patriarchy and divisions of labor (Eagly & Wood 1999), “sex differences in social behavior arise from the distribution of men and women into social roles within a society” (Wood & Eagly 2002, p. 701). This social structural perspective can be used to generate the following hypothesis: *In cultures with traditional sex role ideologies (where women are more constrained in terms of economics, politics, and reproductive freedom), sex differences in sociosexuality should be larger.* Again, this is because men and women have experienced bifurcated sex roles and social constraints in these societies, with women experiencing sociosexually restricted sex roles and patriarchal social constraints (Buss & Barnes 1986; Sprecher et al. 1987). Within cultures that possess more progressive sex role ideologies – where women have more access to money, power, and the ability to make their own reproductive decisions – women are allowed to explore a wider array of social roles. Indeed, both men and women enjoy less burdensome and gender-constraining social structures in cultures with modern sex role ideologies (Williams & Best 1990), and “when men and women occupy the same specific social role, sex differences would tend to erode” (Eagly & Wood 1999, p. 413). Thus, *sex differences in sociosexuality should be smaller, or perhaps even absent, in cultures with more progressive sex role ideologies (where women have more equitable amounts of economic, political, and reproductive freedom).*

It is important to note that the primary objective of social structural theory was to explain the origins of sex differences in human mate preferences, not sex differences in sociosexual mating strategies per se (Eagly & Wood 1999; Johannesen-Schmidt & Eagly 2002; Wood & Eagly 2002).

Nevertheless, the founding logic of social structural theory clearly leads to the preceding predictions, with progressive sex role cultures expected to exhibit smaller sex differences than traditional sex role cultures. It also should be noted that some of these predictions were first proposed over 15 years ago, in what was termed the structural powerlessness hypothesis (Buss & Barnes 1986). For example, in the context of mate preferences, Buss and Barnes (1986) predicted that “men and women who have been subjected to less traditional sex role socialization will not show this [mate preference] sex difference as strongly as will those raised more traditionally” (p. 569), and “sex differences in [mate] preferences should diminish as the power balance in society approaches equity between sexes” (p. 569). Others have used similar theorizing to make predictions concerning women's relative status and the degree of sexual differentiation in a culture (Kasser & Sharma 1999), though not always with supportive results (Fletcher 2002). In the current study, social structural theory was evaluated by correlating various indicators of gender equality (political and economic), reproductive freedom, and sex role ideology with the magnitude of sex differences in sociosexuality across cultures.

## 5. Method

### 5.1. Samples

The research reported in this target article is a result of the International Sexuality Description Project (ISDP; Schmitt et al. 2003b), a collaborative effort of over 100 social, behavioral, and biological scientists. The full range of the ISDP originally comprised 56 nations. However, in eight of these nations either the SOI was not administered (i.e., India, Jordan, and South Africa), or too few participants fully completed the SOI (i.e., fewer than 25 men or fewer than 25 women; Chile, Cyprus, Indonesia, Malaysia, and Tanzania). At least 25 men and 25 women were needed to achieve the necessary statistical power for evaluating sex differences in sociosexuality (when setting  $\beta = .80$ ,  $\alpha = .05$ , and looking for an effect moderate to large in size; Cohen 1988).

As seen in Table 1, a total of 48 nations from the ISDP were used in the present analyses. Three nations were sampled from North America. The Canadian national sample included three independent, English-speaking subsamples from the Canadian provinces of Ontario, Alberta, and British Columbia, and one French-speaking subsample from Quebec. The French-speaking participants were administered the ISDP survey as translated/back-translated into French. The translation and back-translation procedures will be addressed later. Thirteen subsamples were obtained from the United States. This included at least one subsample from the states of New York, Illinois, Kentucky, South Carolina, Florida, Alabama, Texas, New Mexico, Idaho, California, and Hawaii. The subsamples from mainland United States consisted of 66% European-American (non-Hispanic), 10% African-American, 8% Hispanic-American, 5% Asian-American, 2% Native-American, and 9% who either identified themselves as “other” or did not specify their origin. The North American world region was also represented by a sample from Mexico, mainly general community members who volunteered for the study. Community samples in the ISDP tended to be related to colleges and universities (e.g., many were employed by the local educational institutions), and so should not be considered as



completely independent of the college-related limitations of most ISDP national samples.

Four nations were sampled from the world region of South America, including Peru, Bolivia, Argentina, and Brazil. Eight nations from Western Europe were sampled as part of the ISDP, including one sample each from Finland, the Netherlands, Belgium (Flanders region), France, and Switzerland (German-speaking region). Multiple subsamples were collected from the United Kingdom (including Northern Ireland and multiple England samples), Germany, and Austria. The subsamples from England, Germany, and Austria included both college students and general community members. Eleven nations from Eastern Europe were sampled in the ISDP: one sample each from Estonia, Latvia, Lithuania, Poland, the Czech Republic, Slovakia, Ukraine, Romania, Serbia, Croatia, and Slovenia. The ISDP had five nations sampled to represent the world region of Southern Europe: Portugal, Spain, Italy, Malta, and Greece.

Three national samples from the Middle East world region were included in the ISDP: Turkey, Lebanon, and Israel. Five nations from Africa were sampled as part of the ISDP, including college students from Botswana, the Democratic Republic of the Congo, Ethiopia, Morocco, and Zimbabwe. Three nations from Oceania were sampled for the ISDP; they included two subsamples from Australia (one from eastern Australia containing college students and one from western Australia that included both college students and community members), one sample from New Zealand, and one sample from Fiji. Two nations from South/Southeast Asia were part of the ISDP, including national samples from Bangladesh and the Philippines. Four national samples from East Asia were included: one sample each from Hong Kong (now a part of the People's Republic of China), Taiwan (Republic of China), and Japan; and two subsamples were accumulated from the Republic of (South) Korea.

Overall, this collection of national samples represented a diverse array of ethnic, geographic, and linguistic categories. In total, SOI scores from the ISDP represent 6 continents, 10 islands (Malta, Fiji, New Zealand, the Philippines, Hong Kong, Japan, Taiwan, Hawaii, Ireland, and Britain), 26 languages, and 48 nations (see Table 1). Most samples were recruited as volunteers, some received course credit for participation and others received a small monetary reward for their participation. All samples were administered an anonymous self-report survey, most surveys were returned via sealed envelope and/or the usage of a drop-box. Return rates for college student samples tended to be relatively high (around 95%), although this number was lower in some cultures. Return rates for community samples were around 50%. Further details on the sampling and assessment procedures within each of the world regions and national samples are provided elsewhere (Schmitt et al. 2003a; 2003b) and are available from the author on request.

## 5.2. Procedure

All collaborators were asked to administer an anonymous nine-page survey to at least 100 men and 100 women. Some nations, such as the United States and Canada, contained numerous convenience samples, and so the national sample size was much larger than 200. All participants were

provided with a brief description of the study, including the following written instructions:

This questionnaire is entirely voluntary. All your responses will be kept confidential and your personal identity will remain anonymous. No identifying information is requested on this survey, nor will any such information be added later to this survey. If any of the questions make you uncomfortable, feel free not to answer them. You are free to withdraw from this study at any time for any reason. This series of questionnaires should take about 20 minutes to complete. Thank you for your participation.

The full instructional set provided by each collaborator varied, however, and was adapted to fit the specific culture and type of sample. Details on incentives and cover stories used across samples are available from the author.

## 5.3. Measures

**5.3.1. Translation procedures.** Researchers from nations where English was not the primary language were asked to conduct a translation/back-translation procedure and administer the ISDP measures, including the SOI, in their native language. This process typically involved the primary collaborator translating the measures into the native language of the participants, and then having a second person back-translate the measures into English. Differences between the original English and the back-translation were discussed, and mutual agreements were made on the most appropriate translation. This procedure tries to balance the competing needs of making the translation meaningful and naturally readable to the native participants while preserving the integrity of the original measure and its constructs (Brislin 1980), and it is generally regarded as an "etic" approach to cross-cultural psychology (Church 2001).

As seen in Table 1, this process resulted in the survey being translated into 26 different languages. Samples from Ethiopia, Fiji, Hong Kong, Morocco, and the Philippines were administered the survey in English, but certain terms and phrases were annotated to clarify what were thought to be confusing words for the participants. The translation of the ISDP survey into the Flemish dialect of Dutch used only a translation procedure, because this involved mainly word variant changes from the original Dutch. Finally, pilot studies were conducted in several testing sites, in part to clarify translation and comprehension concerns.

**5.3.2. Demographic measure.** Each sample was first presented with a demographic measure entitled "Confidential Personal Information." This measure included questions about sex (male, female), age, sexual orientation (heterosexual, homosexual, bisexual), current relationship status (married, cohabiting, dating one person exclusively, not currently involved with anyone), and current socioeconomic status (upper, upper-middle, middle, lower-middle, lower).

**5.3.3. Sociosexual Orientation Inventory (SOI).** The SOI is a seven-item self-report survey designed to measure a single strategic dimension – restricted versus unrestricted sociosexuality (Simpson 1998; Simpson & Gangestad 1991). The first three items of the SOI are intended to capture overt behavioral expressions of sociosexual variation. Item 1 is: "With how many different partners have you had sex (sexual intercourse) within the past year?" Item 2 is: "How many different partners do you foresee yourself having sex



Table 1. *Sample size and language of administration for men and women who completed the Sociosexual Orientation Inventory across 48 nations of the International Sexuality Description Project*

Nation	Men	Women	Total	Language
Argentina	110	136	246	Spanish
Australia	183	265	448	English
Austria	173	225	398	German
Bangladesh	73	59	132	Bangla
Belgium	129	285	414	Dutch (Flemish)
Bolivia	70	56	126	Spanish
Botswana	94	115	209	English
Brazil	39	49	88	Portuguese
Canada	335	626	961	English/French
Congo, D.R.	91	50	141	French
Croatia	101	100	201	Croatian
Czech Rep.	76	104	180	Czech
Estonia	61	84	145	Estonian
Ethiopia	107	68	175	English <sup>a</sup>
Fiji	66	53	119	English <sup>a</sup>
Finland	28	72	100	Finnish
France	47	54	101	French
Germany	229	379	608	German
Greece	39	154	193	Greek
Hong Kong	90	94	184	English <sup>a</sup>
Israel	139	170	309	Hebrew
Italy	92	108	200	Italian
Japan	125	86	211	Japanese
Latvia	77	78	155	Latvian
Lebanon	106	120	226	English
Lithuania	40	38	78	Lithuanian
Malta	104	119	223	English
Mexico	90	100	190	Spanish
Morocco	60	74	134	English <sup>a</sup>
Netherlands	94	111	205	Dutch
New Zealand	104	152	256	English
Peru	87	91	178	Spanish
Philippines	94	118	212	English <sup>a</sup>
Poland	214	381	595	Polish
Portugal	99	131	230	Portuguese
Romania	100	106	206	Romanian
Serbia	92	95	187	Serbian
Slovakia	55	70	125	Slovak
Slovenia	44	41	85	Slovenian
South Korea	189	289	478	Korean
Spain	81	157	238	Spanish
Switzerland	57	95	152	German
Taiwan	114	88	202	Mandarin
Turkey	190	188	378	Turkish
Ukraine	100	100	200	Ukrainian
United Kingdom	121	275	396	English
United States	948	1,707	2,655	English
Zimbabwe	96	90	186	English
Total ISDP sample	5,853	8,206	14,059	26 languages

Note: <sup>a</sup> = some English items were annotated for greater comprehension.

with during the next five years? (Please give a specific, realistic estimate)." Item 3 is: "With how many different partners have you had sex on one and only one occasion?" Open-ended blanks are provided after each of the first three questions of the SOI. The fourth item was designed to measure covert sociosexual behavior: "How often do

(did) you fantasize about having sex with someone other than your current (most recent) dating partner?" This item was followed by an 8-point scale, ranging from 1 (never) to 8 (at least once a day).

Items 5, 6, and 7 were designed to measure sociosexual attitudes. Item 5 is: "Sex without love is OK." Item 6 is: "I

