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# Sexual Jealousy as a Facultative Trait: Evidence From the Pattern of Sex Differences in Adults From China and the United States

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Across two studies, 716 and 308 undergraduate students from the United States and mainland China, respectively, were administered a series of measures on jealousy, emotional responses to partner infidelity, family background, and personality. Across both studies for the U.S. and Chinese samples, a higher proportion of males than females reported more distress to a partner's imagined sexual infidelity than to emotional infidelity, whereas a higher proportion of females than males reported more distress to a partner's emotional infidelity than to sexual infidelity, consistent with theoretical expectations and previous empirical research. However, a much higher proportion of U.S. males and females reported more distress to sexual infidelity than their same-sex Chinese peers, suggesting that the tendency toward sexual jealousy might be facultatively influenced by sexual permissiveness in the general culture. The overall pattern of results is considered in terms of individual and contextual differences in the expression of jealousy, as well as in terms of the emotional and behavioral responses associated with jealousy reactions.

**KEY WORDS:** Sexual jealousy; Sexual selection; Sex differences; Cross-national comparisons.

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**T**he principles of natural and sexual selection have provided a useful framework for the development of models of human social behavior and cognition (Buss and Schmitt 1993; Cosmides 1989; Daly and Wilson 1983; Shepard 1994). One area of active research concerns the potential influence of sexual selection on the reproductive strategies of males and females, and any associated sex differences in mate preferences, jealousy, and sexual activity (Buss, 1988, 1989a, 1989b, 1992; Daly et al. 1982; Feingold 1992). Trivers (1972) argued that differences between male and female level of investment in offspring "governs the operation of sexual selection" (p. 141) and, as such, is the ultimate cause of any associated sex difference in reproductive

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strategies. The model predicts that the sex that invests the least in offspring will show, among other things, less discriminant mating and more intrasexual competition over access to the higher-investing sex. The higher-investing sex, in contrast, is expected to be much more discriminating in terms of choosing sexual partners, with discrimination focusing on potential partner's physical characteristics or behaviors that might benefit future offspring.

In most mammalian species, the male typically invests less in offspring than does the female (Trivers 1972). This is because males have the potential to reproduce with minimal levels of parental investment, whereas females do not have this option, due to internal fertilization and gestation. Trivers' (1992) theoretical model easily accommodates these and an array of associated sex differences across many species. Trivers' model also appears to be consistent with human sex differences in, among other things, sexual activity and preferences (e.g., preferred number of partners), attitudes toward casual sex, levels of aggression and violence, as well as levels of parental investment (Buss and Schmitt 1993; Daly and Wilson 1983; Draper 1989; Oliver and Hyde 1993; Symons 1979; Wilson and Daly 1985).

Despite the option for reproduction with minimal levels of parental investment, many human males do not or cannot exercise this option in their relationship with some females. In fact, many human males do make long-term investments in offspring, and it might in fact be in their best interest to do so (Buss and Schmitt 1993; Symons 1979). However, in order for a long-term mating strategy to be a viable option for males, the male must be certain that he is in fact the biological father of any resulting offspring; that is, paternity certainty should, and appears to be, a central concern of males in long-term heterosexual relationships. Indeed, the implicit male concern for certainty of paternity likely underlies pan-cultural male attempts to control the sexual behavior of females through persuasion, coercion, or violence (Betzig 1989; Daly and Wilson 1983, 1988; Flinn 1988; Mesquita and Frijda 1992). The ultimate reasons for the male concern for controlling the sexual behavior of females are implicit and likely reflect the fact that males with this concern almost certainly produced more offspring than their less vigilant competitors, who incurred the risk of being cuckolded (Symons 1979).

For females, in contrast, a central concern associated with a long-term mating strategy involves identifying and retaining a male who is willing and able to make a long-term investment in her and her future offspring (Betzig 1989; Symons 1979). Such a concern might have evolved for females because, given the protracted development of human children, females who were able to elicit male investment in offspring were likely to have more surviving offspring than females who did not demand such an investment (Feingold 1992; Lovejoy 1981; Smuts and Gubernick 1992). This is because throughout human evolution males likely controlled and in fact continue to control important material resources in most societies (Daly and Wilson 1983). Access to material resources, in turn, is linearly and positively related to reductions in the morbidity and mortality of all family members (Adler et al. 1994).

Jealousy is one psychological mechanism that appears to have evolved in

order to motivate these implicit concerns with the behavior of one's mate (Symons 1979). From this perspective, it is expected that both males and females will experience jealousy, but under different conditions. In theory, male jealousy should be elicited with the implied or actual sexual infidelity of their partner, in order to motivate behaviors designed to reduce the risk of cuckoldry. Female jealousy, in contrast, should be elicited when their partner diverts emotional or material resources from her to another female (Symons 1979). Female jealousy would, presumably, motivate engagement in behaviors designed to redirect male attention and resources to her and her offspring. Empirical research has generally supported these predictions (e.g., Buss and Schmitt 1993; Draper 1989; Flinn 1988). Buss and his colleagues, for instance, have found consistent sex differences in the relative degree of distress associated with the imagined sexual or emotional (i.e., diverted attention) infidelity of their partner; many more males than females report greater distress over imagined sexual infidelity, whereas many more females than males report greater distress over imagined emotional infidelity (e.g., Buss et al. 1992).

Although these empirical studies have confirmed the theoretically expected sex difference in jealousy reactions, jealousy reactions are also likely to be influenced by factors other than biological sex (DeKay and Buss 1992). In fact, it is possible that complex biosocial processes, such as jealousy, vary facultatively with contextual and developmental inputs (Belsky et al. 1991; Draper 1989; Symons 1979; Tooby and Cosmides 1990). It has been argued, for instance, that thresholds for the reactivity of any such biosocial systems are set by childhood experiences (Belsky et al. 1991; Draper 1989; Hall 1992; MacDonald 1992). On this view, the sensitivity of the cognitive and emotional mechanisms that react to social indicators of infidelity might vary across individuals and across contexts (Tooby and Cosmides 1990). Buss et al. (1992), for example, found that a much higher proportion of sexually experienced U.S. males reported more distress to their partner's sexual, relative to emotional, infidelity than their inexperienced peers. Presumably sexual experience will influence the perceived sexual activity of one's peers, and, as such, might influence the perceived risk of partner infidelity. Stated differently, in addition to the sex difference, the nature of jealousy reactions might also be expected to vary facultatively with the relative risk of partner infidelity or with certain childhood experiences (e.g., Belsky et al. 1991; Flinn 1988).

One approach that can be used to test the hypothesis that jealousy reactions vary facultatively is to examine the reactions of individuals from societies that differ in terms of cultural prohibitions against sexual activity between unmarried adults. If the nature of jealousy reactions varies facultatively, then individuals might be expected to show less intense reactions to imagined sexual infidelity in cultures where sexual activity is restricted, in comparison to individuals who live in less restrictive societies. Alternatively, one might argue that since sexual infidelity is a relatively rare event in societies where sexual activity is restricted, imagining a partner's sexual infidelity might elicit a very strong jealousy reaction. However, if one assumes, as we have, that any parameter setting associated

with the facultative expression of biosocial processes, such as jealousy, occurs more or less automatically, then any such systems should be "preset" based on typical social behavior or childhood experiences and not simply react to single events, even rare events (Tooby and Cosmides 1990).

The goal of examining the facultative expression of jealousy was achieved by means of a comparative study of the jealousy reactions of young adults from China and the United States. Relative to American culture, Chinese culture reflects strong formal and informal prohibitions against sexual activity between unmarried adults (Buss 1988). Therefore, the examination of the jealousy reactions (i.e., relative degree of distress over sexual or emotional infidelity) of Chinese and American adults should enable a determination of whether cultural mores might influence the expression of an important biosocial process. In both the United States and China, the relationship between jealousy reactions and specific childhood experiences was also examined, in order to test the possibility that any such experiences might be proximate influences on the facultative expression of jealousy (e.g., Belsky et al. 1991).

In addition to examining the pattern of jealousy reactions across cultures, we sought (1) to assess the patterns of reported emotional reactions associated with the imagined sexual and emotional infidelity of a partner, and (2) to conduct an exploratory assessment of the relation between sexual and emotional jealousy and personality as defined by the Big-Five Model (Goldberg 1992). The rationale for each of these secondary goals is briefly outlined following the section on childhood experiences and jealousy.

## **CHILDHOOD EXPERIENCES AND JEALOUSY**

In order to assess whether demographic features of family background might be related to jealousy reactions in adulthood, we assessed the relationship between family constellation (e.g., whether the individual lived with both parents or one parent as a child) and jealousy reactions. However, it is not likely that simple demographic factors will adequately capture any proximate childhood influences on the development of biosocial traits. So, in addition to demographic factors, we also examined the relationship between perceived parental warmth and jealousy reactions.

We assessed perceived parental warmth, because levels of parental warmth appear to serve important socialization functions (Hewlett 1992; Maccoby and Martin 1983; MacDonald 1988). According to MacDonald (1992), high levels of parental warmth set emotional parameters, which, in turn, influence the degree to which close cooperative social relationships are affectively rewarding (i.e., the extent to which social discourse is emotionally rewarding). MacDonald (1988, 1992) has argued further that a sensitivity to the affective rewards of social relationships is one proximate mechanism that underlies the maintenance of relatively long-term monogamous relationships and facilitates high-levels of paternal investment in children. More distant parent-child relationships, in contrast,

are thought to “shut down” these affective systems, and, as a result, these individuals are hypothesized to be more self-serving and antagonistic in later social and marital relationships. In other words, in the absence of emotional “rewards” for social cooperation, more self-serving social styles emerge.

Moreover, the degree of parental warmth appears to be facultative; that is, it appears to vary functionally with conditions in the wider context (e.g., Belsky et al. 1991). For example, in societies where polygyny is allowed, there tends to be relatively low levels of spousal warmth and more distant and cold father-child relationships, relative to societies with more monogamous mating systems (Draper 1989; Katz and Konner 1981; MacDonald 1988). Emotionally distant father-child relationships, in turn, are often associated with later aggressive and exploitative social relationships, especially for males (Stevenson and Black 1988). For males, antagonistic social styles might be functional in societies where polygyny is allowed (MacDonald 1988). This is because in such societies there is likely to be much more variability in the reproductive success of different males, in comparison to males in more monogamous societies (Symons 1979). The *potential* for greater gains and losses, reproductively speaking, might then serve to increase levels of male-male competition in such societies and exaggerate any associated sex differences. Levels of early parental warmth might then serve as one proximate mechanism for later sensitivity to intrasexual competition (MacDonald 1988). Extrapolating from this model, one might then argue that low levels of parental warmth might be associated with an increased male concern for sexual infidelity, as well as for other features of intrasexual competition.

On the other hand, given that spousal infidelity occurs even in monogamous societies and in the context of long-term sexual relationships, the pattern of sex differences for sexual and emotional jealousy might be independent of parental warmth. Stated differently, even if early socialization patterns, in particular parental warmth, influence the harmony of later heterosexual relationships (Biller 1981), the male concern over sexual infidelity and the female concern over emotional infidelity might be independent of levels of parental warmth, given the ubiquity of extramarital affairs and given that covert sexual infidelity might at times be advantageous to both males and females (Buss and Schmitt 1993; Daly and Wilson 1983; Symons 1979).

## EMOTIONAL RESPONSES AND JEALOUSY

It was noted earlier that the mechanisms governing jealousy are often implicit; that is, the behavior of males and females can reflect a concern over the potential sexual behavior of their mate without a conscious understanding why or how such a concern might arise. In the absence of a conscious understanding of what is in one's best reproductive interest, the evolved psychological system that governs jealousy must encompass a number of other cognitive (e.g., for mate monitoring) and emotional mechanisms to motivate mate retention. For example, emotional components of any such system are likely to be necessary in order to motivate engagement in mate retention tactics (Buss 1988; Campos et al. 1989).

Based on the finding that the actual or implied sexual infidelity of females often elicits strong feelings of sexual jealousy and violence in males (Daly and Wilson 1988; Daly et al. 1982), it was hypothesized that individuals who reported greater distress to sexual rather than to emotional infidelity would report, relative to emotionally jealous individuals, higher levels of anger to their partner's imagined emotional and sexual infidelity and report more aggressive responses to such infidelity (Flinn 1988; Wilson and Daly 1992).

## PERSONALITY AND JEALOUSY

At a very general level, individual differences in personality appear to be best represented by five broad dimensions: introversion-extraversion, agreeableness, dependability, emotional stability, and intellect (Goldberg 1993). *Introversion-extraversion* "contrasts such traits as talkativeness, assertiveness, and activity level with traits such as silence, passivity, and reserve" (Goldberg 1993, p. 27). *Agreeableness* contrasts socially cooperative with self-serving traits, while *dependability* contrasts "such traits as organization, thoroughness, and reliability with traits such as carelessness, negligence, and unreliability" (Goldberg 1993, p. 27). *Emotional stability* emphasizes the degree to which the individuals' behavior is moody and unpredictable. Finally, *intellect* reflects an intellectual curiosity and openness to new experiences and information, as opposed to a rather more shallow and unsophisticated approach to new information. Buss (1991) argued that these five dimensions of personality "may represent fundamental differences in the strategies humans use to accomplish species-typical goals . . . [or] the most important dimensions of the social landscape to which humans have had to adapt" (p. 471). For instance, the agreeableness dimension of personality might represent the extent to which individuals are likely to pursue important goals individually or within the context of social alliances.

Given the utility of the five-factor model for representing individual differences in the social behavior of humans, and given that the sexual behavior of one's mate represents a salient dimension of the "social landscape," it seemed worthwhile to explore the relation between sexual jealousy and a measure of personality derived from the Big-Five Model. We offer no hypotheses in this area, only an exploratory assessment.

## STUDY 1

The primary goals of this study were to test the hypothesis that sexual jealousy occurs less frequently in China than in the United States and to assess whether jealousy reactions vary with childhood experiences as well as with sexual experience (e.g., Buss et al. 1992). Of course, we also examined the pattern of sex differences in jealousy reactions for our samples of Chinese and American subjects. The relation between jealousy and personality is explored in Study 2.

## METHODS

### Subjects

The subjects were 413 (156 males, 257 females) undergraduate students from either the University of Missouri at Columbia, or Lincoln University, Jefferson City, Missouri, and 110 (57 male, 46 female, 7 did not answer the gender item) undergraduate students from Hangzhou University, Hangzhou, China. All subjects were recruited from undergraduate psychology courses and either received course-related credit or a small payment for participation. The mean age of the U.S. and Chinese samples was 21 and 20 years, respectively (respective *SDs* = 5.1, 1.3).

### Procedure

*Assessment measures.* The jealousy questionnaire included five sections. The first followed Buss et al. (1992) and asked the subjects to indicate whether a partner's sexual or emotional infidelity would create more distress. In the second section, subjects were asked to imagine their partner "forming a deep emotional relationship with another person," and then indicate the intensity of various emotional reactions that they might feel. For the first item in this section, the subjects rated the relative degree of hurt or angry feelings on a 5-point scale, ranging from -2 (Much more hurt than angry) to 2 (Much more angry than hurt). For the next three items, the intensity of their hurt feelings, anger, and jealous feelings, respectively, were rated on a 0 [Not hurt (angry, jealous) at all] to 4 [Extremely hurt (angry, jealous)] scale. After completing these items, the subjects were asked, using a forced-choice format, how they would respond to the "person your partner was involved with": ignore the person, confront the person, or retaliate against the person. Next, they were asked, again using a forced-choice format, how they would respond to their partner: not say anything, break off the relationship, try to make your partner more interested in you, discuss and try to work through the issue, or retaliate against your partner. In the third section, the subjects completed the same items, but only after imagining their "partner enjoying passionate sexual intercourse with another person."

The fourth section asked whether they had ever been involved in a committed romantic relationship, and, if so, whether this relationship was sexual. This yielded three categories: no previous committed relationships, a previous non-sexual committed relationship, and a previous committed sexual relationship. The final section concerned the subjects' relationship with their parents. The first question asked about the family situation as they were growing up (e.g., "Lived mostly with mother"), while the final two items asked subjects to indicate on a 0 (Distant and emotionally cold) to 4 (Emotionally close and supportive) scale the nature of their relationship with their mother and father as they were growing up.

**Translation.** The English version of the jealousy questionnaire was first translated into Chinese by an individual experienced in English to Chinese translations. The Chinese version was then back-translated by another experienced translator. Disagreements between the original English version and the back-translated version were then discussed between the first author and the two translators. The result of this discussion was a second Chinese version of the jealousy questionnaire. This version was then administered to two individuals (Chinese students studying in the U.S.) who were not familiar with either the Chinese or English versions. The few minor questions that they had about this version were incorporated into the third and final Chinese version of the questionnaire.

**Administration.** In both the United States and China, the questionnaire was administered to groups of students, and was completed in about 15 min.

## RESULTS

For ease of presentation, the results are discussed in six sections. The first presents sex and national differences in the pattern of jealousy reactions. In the second and third sections, the relation between jealousy reactions and sexual and childhood experiences, respectively, are presented. Reported emotional and behavioral responses to the imagined emotional and sexual infidelity of one's partner are reported in sections four and five, respectively. The final section presents a contrast of the reported emotional reactions of emotionally jealous and sexually jealous individual's following imagined partner infidelity. Due to the large number of analyses, a brief summary of the primary results is present at the end of most of the sections.

### Sex and National Differences in Jealousy

Sex and national differences in the proportion of subjects reporting more distress to their partner's sexual infidelity, as opposed to emotional infidelity, are shown in Figure 1. A Chi-square confirmed an overall (across nation) sex difference in the proportion of males and females who reported greater distress to sexual infidelity [ $\chi^2(1) = 32.2, p < .001, n = 480$ ], as well as a significant (across sex) effect of nation [ $\chi^2(1) = 15.6, p < .001, n = 487$ ]. Within-nation analyses revealed significant sex differences in both the U.S. [ $\chi^2(1) = 37.5, p < .001, n = 385$ ] and Chinese [ $\chi^2(1) = 4.7, p < .05, n = 95$ ] samples.<sup>1</sup> These results indicate that in the United States and China, a larger proportion of males report greater distress to sexual infidelity than females, while a larger proportion of females report greater distress to emotional infidelity than males. More important, the finding that a larger proportion of both males and females in the U.S. sample reported more distress to sexual infidelity than their Chinese peers confirmed the primary hypothesis of this study.

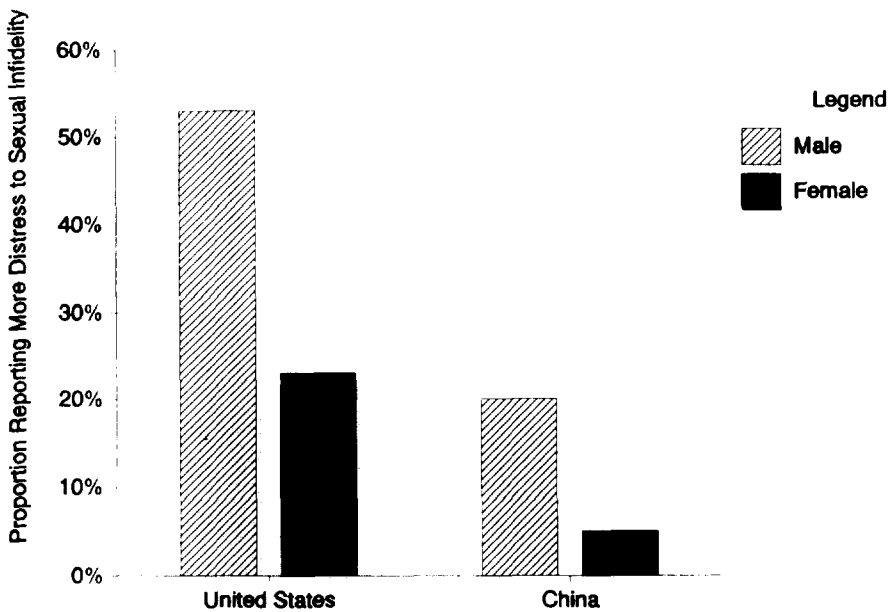


FIGURE 1. The proportion of U.S. and Chinese males and females, respectively, in Study 1 who reported more distress to a partner's sexual, as opposed to emotional, infidelity.

### Previous Relationships, Sexual Experience, and Jealousy Status

Rather large national differences in reported experience with committed and sexual relationships are shown in Table 1 [ $\chi^2(2) = 225.8, p < .001$ ]. Within-nation analyses indicated a significant sex difference in relationship experience in the U.S. [ $\chi^2(1) = 7.6, p < .05$ ] but not the Chinese [ $\chi^2(1) = 0.9, p > .50$ ] sample. Here, twice as many U.S. males as U.S. females reported no previous committed relationship. The overall pattern indicates that the majority of U.S. college students report engagement in a committed sexual relationship, whereas the majority of Chinese college students report no previous experience in a committed relationship, consistent with the earlier described cultural mores. Regardless, within each nation, the level of relationship experience was not related to jealousy status (i.e., whether the subject reported greater distress to sexual or emotional infidelity) [ $\chi^2(2)s = 0.8, 0.4$ , for the U.S. and Chinese samples, respectively,  $ps > .10$ ].

Table 1. Relationship Experiences Across Sex and Nation

Category	United States				China			
	Male		Female		Male		Female	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
No previous relationships	22	14	19	7	39	68	31	67
Committed relationship, no sex	15	10	42	16	17	30	15	33
Committed sexual relationship	118	76	194	76	1	2	0	0

## Parental Relationships and Jealousy Status

Recall, subjects rated their relationship with their mother and father on a 0 (distant and emotionally cold) to 4 (emotionally close and supportive) scale. Chi-square tests revealed that neither ratings of maternal nor paternal warmth were related to jealousy status for U.S. males or females or for Chinese males or females ( $ps > .10$ ,  $ns$  range between 41 and 232).

For both the U.S. and Chinese samples, the majority of individuals (> 60%) reported living with both parents as children, and either father worked and mother stayed at home, or both parents worked. Chi-square tests also revealed that these family constellations were not related to jealousy status for the U.S. males or females, or for the Chinese males ( $ps > .10$ ), but was significant for the Chinese females [ $\chi^2(4) = 10.2$ ,  $p < .05$ ,  $n = 41$ ]. Here, both of the sexually jealous Chinese females who responded to the family constellation item reported that father worked and mother stayed at home, while 13% of the emotionally jealous Chinese females reported the same family constellation; 46% of the emotionally jealous Chinese females reported that both father and mother worked. Nevertheless, given the small number of sexually jealous Chinese females, this difference needs to be interpreted very cautiously.

Overall, it appears that early family constellation (e.g., whether mother worked outside of the home) and perceived parental warmth are not related to the tendency toward sexual or emotional jealousy.

## Imagining Emotional Infidelity

The four items associated with the subjects' reported reactions to the imagined emotional infidelity of their partner were first submitted to a two (nation) by two (sex) Multivariate Analysis of Variance (MANOVA), using a least-squares solution to control for the effects of unequal cell sizes ( $n = 504$ ). The MANOVA revealed significant main effects for nation ( $F = 9.20$ ,  $p < .0001$ ) and sex ( $F = 360$ ,  $p < .01$ ), but a nonreliable nation-by-sex interaction ( $F = 1.37$ ,  $p > .10$ ). Univariate Analyses of Variance (ANOVAs) revealed significant ( $ps < .005$ ) national differences for reported intensity of hurt feelings (U.S. vs. China,  $Ms = 3.35, 2.81$ ), anger ( $Ms = 2.42, 1.98$ ), and jealousy ( $Ms = 2.61, 2.05$ ), as well as significant sex differences for intensity of hurt feelings (male vs. female,  $Ms = 3.00, 3.42$ ) ( $F = 13.19$ ,  $p < .005$ ), and jealousy ( $Ms = 2.29, 2.65$ ) ( $F = 3.82$ ,  $p = .051$ ).<sup>2</sup>

Recall, subjects were also asked to indicate how they would respond to the person their partner was involved with: ignore the person, confront the person, or retaliate against the person. The question was whether those individuals who reported greater distress to sexual infidelity would respond more assertively than those individuals who reported greater distress to emotional infidelity. These data

<sup>2</sup> The sample sizes differ across some of the analyses because of missing data, that is, because some subjects did not respond to all items.

were examined separately across jealousy status for males and females in the U.S. and Chinese samples. Chi-square tests revealed no significant differences across jealousy status for U.S. males ( $n = 141$ ) or for Chinese males ( $n = 54$ ) or females ( $n = 41$ ) ( $ps > .50$ ). However, a significant difference across jealousy status was found for U.S. females [ $\chi^2(2) = 10.8, p < .005, n = 244$ ]. Here, the majority of U.S. females who reported greater distress to sexual infidelity reported that they would confront the other person (sexual vs. emotional, 60% vs. 40%), while the majority of females who reported greater distress to emotional infidelity reported that they would ignore the other individual (sexual vs. emotional, 31% vs. 56%).

A similar analysis was conducted for the item asking subjects to indicate how they would respond to their partner: not say anything, break off relationship, increase partner's interest in you, discuss and work out, or retaliate. Chi-square tests indicated no significant differences across jealousy status for the U.S. females ( $n = 242$ ) or for the Chinese males ( $n = 54$ ) or females ( $n = 41$ ) ( $ps > .10$ ). However, a significant difference across jealousy status was found for the U.S. males [ $\chi^2(4) = 11.1, p < .05, n = 140$ ]. Here, 49% of the sexually jealous males reported that they would break off the relationship, as compared to 24% of the emotionally jealous males. In contrast, 62% of the emotionally jealous males reported that they would discuss and try to work out the relationship problem, as compared to 38% of the sexually jealous males. Less than 10% of the U.S. males fell into the three remaining categories: don't say anything, increase partner's interest, or retaliate.

In all, for the U.S. sample, the pattern of results provides some support for the argument that sexually and emotionally jealous individuals react differently to partner infidelity. When differences emerged, they suggested that sexually jealous individuals were more likely to react assertively (e.g., confront competitor) or break off the relationship than emotionally jealous individuals. Emotionally jealous individuals, in contrast, tended to report responses that appeared to be attempts to try to maintain the relationship following partner infidelity.

### Imagining Sexual Infidelity

The four items associated with subjects' reported reactions to the sexual infidelity of their partner were submitted to a two (nation) by two (sex) MANOVA ( $n = 505$ ). The MANOVA revealed significant main effects for nation ( $F = 34.90, p < .0001$ ) and sex ( $F = 2.47, p < .05$ ), as well as a marginally significant nation-by-sex interaction ( $F = 2.27, p = .061$ ). Univariate ANOVAs revealed significant effects for nation for all four items ( $ps < .005$ ). Again, the U.S. subjects reported

<sup>2</sup> The finding that the American subjects reported more intense emotional reactions to the imagined infidelity of their partners than their Chinese peers is consistent with previous research on the reported intensity of emotional reactions in Occidental and Asian individuals (Mesquita and Frijda 1992). Nevertheless, this result will not be given any further consideration because it is incidental to the general goals of this research.

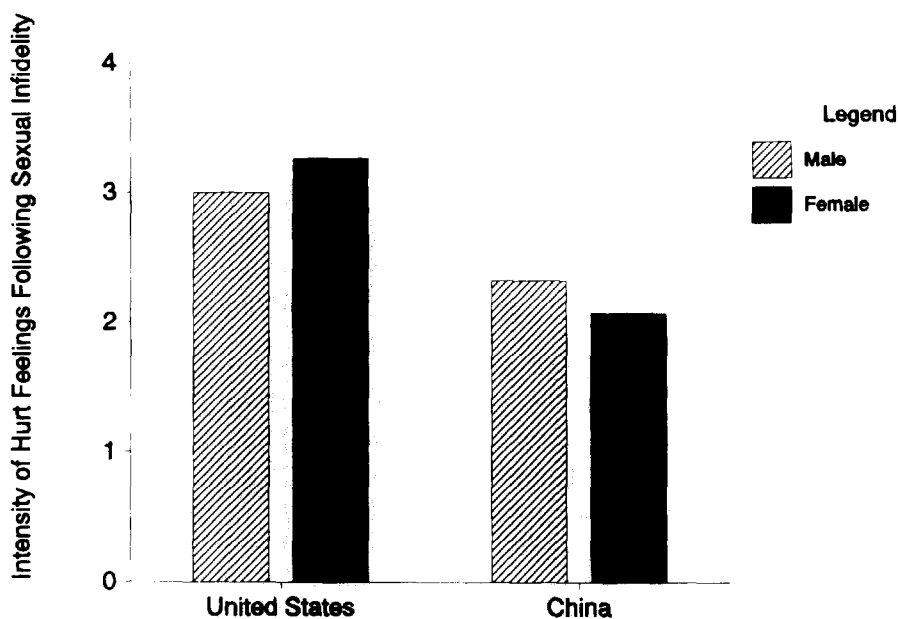
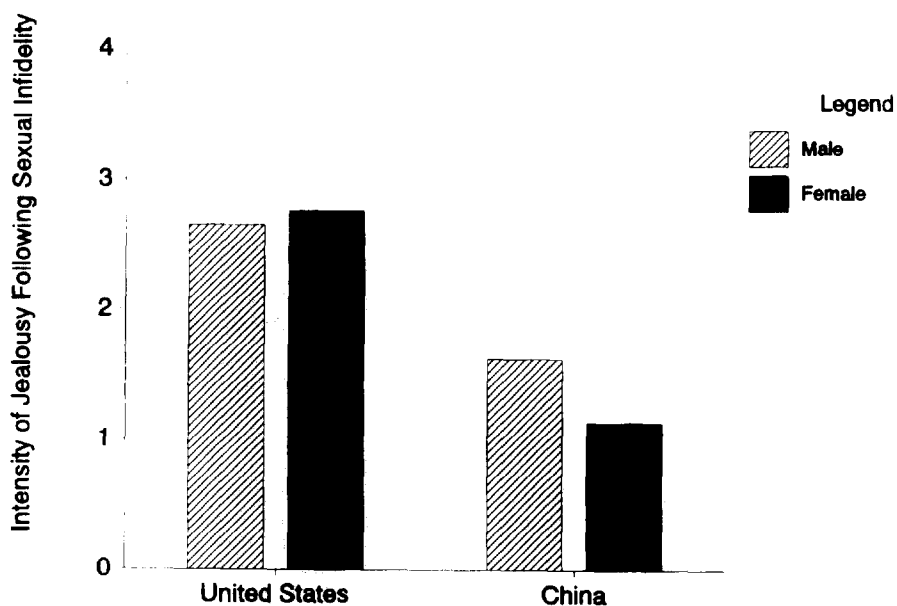


FIGURE 2. Mean ratings, across sex and nation, for the intensity of hurt feelings following a partner's sexual infidelity (Study 1).

more intense emotional reactions than their Chinese peers. The respective means for the U.S. and Chinese samples were 0.22 and 0.90 for relative degree of hurt/anger (positive values indicate more anger), 3.16 and 2.19 for intensity of hurt feel-

FIGURE 3. Mean ratings, across sex and nation, for the intensity of jealousy following a partner's sexual infidelity (Study 1).



ings, 3.19 and 2.83 for intensity of angry feelings, and 2.72 and 1.42 for intensity of jealousy (recall, the maximum value is 4.0). The ANOVAs also indicated that none of the main effects for sex were significant ( $ps > .05$ ), but the nation-by-sex interaction was significant for intensity of hurt feelings ( $F = 5.61, p < .05$ ) and intensity of jealousy ( $F = 5.74, p < .05$ ).

These cross-over interactions are depicted in Figure 2 for hurt feelings and Figure 3 for jealousy. Here, it can be seen that females reported more intense reactions in the U.S. sample, but males reported more intense reactions in the Chinese sample. However, examination of the mean scores for males and females within nations indicated that the U.S. females showed higher ratings than the U.S. males for all six of the emotional intensity items (Sign test,  $p < .05$ ) (across imagined emotional and sexual infidelity, but excluding the relative hurt/anger item). No such sex-related bias was found in the Chinese data, however, as males showed higher means on three of the six emotional intensity items. The systematic tendency of U.S. females to report more intense emotional reactions to all items indicates that the sex difference in the U.S. sample needs to be interpreted with caution. In other words, the difference might simply reflect a response bias rather than a significant sex difference, with U.S. females reporting higher scores across many scales. This interpretation is bolstered by the finding that U.S. females, but not Chinese females, reported consistently higher scores on the personality measure used in Study 2. Because there was no such systematic bias in the Chinese sample, the tendency of Chinese males to report more intense hurt feelings and jealousy than Chinese females should be considered more seriously (see Study 2.)

Indeed, univariate ANOVAs revealed that the sex difference in the reported intensity of jealous feelings was not significant for the U.S. sample ( $F < 1, p > .10$ ), but approached conventional significance levels for the Chinese sample ( $F = 3.26, p = .074$ ). However, the sex difference in the reported intensity of hurt feelings was not significant in either sample ( $ps > .10$ ).

Reported responses to the person with whom their partner had a sexual affair mirrored those reported above for emotional infidelity. Again, across jealousy status no differences were found for U.S. males ( $n = 140$ ), or for Chinese males ( $n = 54$ ) or females ( $n = 41$ ) ( $ps > .50$ ). In contrast, 64% of sexually jealous U.S. females ( $n = 243$ ) reported that they would confront the other person, relative to 46% of emotionally jealous U.S. females. At the same time, 49% of the emotionally jealous U.S. females reported that they would ignore the other person, relative to 25% of the sexually jealous U.S. females [ $\chi^2(2) = 11.4, p < .01$ ].

As for the reported response to partner, no significant differences across jealousy status were found for either the Chinese males ( $n = 54$ ) or females ( $n = 41$ ) ( $ps > .10$ ), but significant differences were found for U.S. males [ $\chi^2(4) = 20.0, p < .001, n = 139$ ] and U.S. females [ $\chi^2(4) = 9.5, p < .05, n = 243$ ]. Here, 76% of the sexually jealous U.S. males reported that they would break off the relationship, as compared to 40% of the emotionally jealous U.S. males. In contrast, 42% of the emotionally jealous U.S. males reported that they would try to work through the problem, as compared to 16% of the sexually jealous U.S.

males. The overall pattern was similar for U.S. females, although the differences across jealousy status were not as large. The percentages of sexually jealous and emotionally jealous U.S. females who reported that they would break off the relationship were 64 and 59, respectively, while the respective percentages reporting that they would try to work through the problem were 25 and 36. For both U.S. males and females, less than 10% of the individuals fell into the three remaining categories.

In all, the results revealed one rather interesting sex-by-nation interaction. Here, in response to imagined partner sexual infidelity, Chinese males reported much more intense feelings of jealousy than their female peers, whereas there was no such sex difference in the U.S. sample. Moreover, the results also provided some support for the hypothesis that sexually and emotionally jealous individuals tend to respond differently to partner infidelity. In particular, sexually jealous U.S. males and females reported that they were more likely to break off a relationship following their partner's sexual infidelity, relative to their emotionally jealous peers.

### **Jealousy Status and Emotional Reactions to Partner Infidelity**

If emotional reactions serve an important motivational function for engagement in evolutionarily important behaviors, then differences in the pattern of reported emotional reactions should be found across jealousy status. As noted earlier, the goal of the analyses reported in this section was to determine whether individuals who were more distressed at their partner's sexual infidelity reported more intense feelings of anger and jealousy to imagined emotional and sexual infidelity than individuals who reported greater distress to emotional infidelity. The associated analyses were only conducted for the U.S. sample due to the small number of sexually jealous Chinese individuals.

Initially, a two (sex) by two (jealousy status, sexual vs. emotional) MANOVA was conducted separately for the four imagined emotional and four imagined sexual infidelity items. For both MANOVAs, the results revealed significant main effects for sex ( $F_s = 7.94, 6.10$ , for imagined emotional and sexual infidelity, respectively,  $ps < .0001$ ), and jealousy status ( $F_s = 4.73, 8.13$ , for imagined emotional and sexual infidelity, respectively,  $ps < .001$ ), but nonsignificant sex-by-jealousy status interactions ( $F_s < 1, ps > .25$ ). As noted earlier, the main effect for sex was due to the tendency of U.S. females to report more intense emotional reactions than U.S. males. Because there were no significant sex-by-jealousy status interactions, the means for the emotional intensity variables were collapsed across sex and are shown in Table 2.

Examination of the top half of Table 2 indicates that when imagining their partner's emotional infidelity, both emotionally and sexually jealous individuals reported more hurt than anger, although the relative degree of hurt feelings was larger for the emotionally jealous individuals. In support of the above-noted hypothesis, sexually jealous individuals, male and female, reported more intense anger reactions than emotionally jealous individuals, while emotionally jealous

Table 2. Mean Emotional and Sexual Jealousy Ratings Across Jealousy Status

Item	Jealousy status				F test
	Emotional		Sexual		
	Mean	SD	Mean	SD	
Emotional infidelity <sup>a</sup>					
Relative degree of hurt/anger <sup>b</sup>	-1.18	0.95	-0.75	1.22	14.78***
Intensity of hurt feelings	3.48	0.69	3.22	0.89	11.14***
Intensity of angry feelings	2.34	0.98	2.56	1.13	3.90*
Intensity of jealousy	2.69	1.07	2.55	1.24	1.42
Sexual infidelity <sup>c</sup>					
Relative degree of hurt/anger	0.21	1.28	0.27	1.43	<1
Intensity of hurt feelings	3.08	0.94	3.35	0.85	6.82**
Intensity of angry feelings	3.09	0.98	3.47	0.88	13.42***
Intensity of jealousy	2.71	1.12	2.75	1.28	<1

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

<sup>a</sup>  $n = 250$  and  $128$ , respectively, for the emotional and sexual jealousy categories (i.e., jealousy status).

<sup>b</sup> Negative scores indicate more hurt than anger, while positive scores indicate more anger than hurt, on a 5-point -2 to 2 scale.

<sup>c</sup>  $n = 252$  and  $128$ , respectively, for the emotional and sexual jealousy categories (i.e., jealousy status).

individuals reported more intense hurt feelings than sexually jealous individuals. Examination of the bottom half of Table 2 indicates that both emotionally and sexually jealous individuals reported relatively more anger than hurt to their partner's imagined sexual infidelity. However, unlike imagined emotional infidelity, sexually jealous individuals reported more intense hurt feelings and more intense anger than emotionally jealous individuals for imagined sexual infidelity.

## DISCUSSION

The results of this study confirmed the sex difference in jealousy reactions that has been found in previous empirical studies (e.g., Buss et al. 1992; Daly et al. 1982) and extended this finding to young adults in China. The most important finding of this study, however, was that the proportion of sexually jealous individuals differed greatly across the U.S. and Chinese samples. As predicted, there was a larger proportion of sexually jealous males and females in the U.S. than in the Chinese sample, consistent with the view that the expression of sexual jealousy might be facultative. However, neither family constellation, perceived parental warmth, nor previous sexual experience were consistently related to jeal-

Table 3. Relationship Experiences Across Sex and Nation (Study 2)

Category	United States				China			
	Male		Female		Male		Female	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
No previous relationships	12	13	29	15	52	57	67	66
Committed relationship, no sex	14	15	16	8	36	40	33	33
Committed sexual relationship	70	73	149	77	3	3	1	1

ousy status in either the U.S. or Chinese samples, suggesting that these factors might not be important mediators in the facultative expression of sexual jealousy.

However, the null results reported here should not be taken as strong evidence against the argument that early relationship with parents might mediate later evolutionarily relevant social behavior (MacDonald 1988, 1992) because the parental closeness and family constellation items used in this study were crude and retrospective. The finding of no relationship between romantic and sexual experience and jealousy status, however, is likely to be more robust (presuming good memory of sexual experiences) and theoretically important (Buss et al. 1992). Specifically, the finding of no relation between sexual experience and jealousy status is inconsistent with the findings of the Buss et al. (1992, Study 3) study and, given this, will be assessed again in Study 2.

Study 1 also provided some support for the argument that the pattern of emotional responses to sexual and emotional infidelity would vary across sexually and emotionally jealous individuals. Even though the number of sexually and emotionally jealous individuals differed by sex, an interesting and unexpected finding was that sexually jealous males and females showed a similar pattern of emotional responses, as did emotionally jealous males and females. For both males and females, when significant differences were found they were generally consistent with the prediction that sexually jealous individuals would be more prone to anger/aggression. In contrast, emotionally jealous individuals tended to respond with hurt feelings and behavioral tactics designed to maintain the relationship. The one exception to this pattern was for the imagined sexual infidelity of their partner. Here, sexually jealous individuals reported more intense hurt feelings as well as more intense anger than emotionally jealous individuals.

One final and theoretically important result was the finding that Chinese males, relative to Chinese females, reported more intense feelings of jealousy to their partner's sexual, but not emotional, infidelity. This pattern is consistent with the evolutionary prediction that males should show an implicit concern with their partner's sexual behavior (e.g., Buss and Schmitt 1993). Here, such a concern was evident even in a context where the risk of female sexual infidelity is relatively low, and in a sample where about four out of five males reported that their partner's emotional infidelity would result in more distress than their partner's sexual infidelity.

## STUDY 2

The primary goal of Study 2 was to replicate the major finding of Study 1, that is, the national difference in the proportion of individuals reporting more distress to sexual as opposed to emotional infidelity, but to do so using a more projective assessment of jealousy. A more projective assessment of jealousy was used because asking direct questions about sexual matters is a rather sensitive issue in Chinese culture, and, as such, the direct measure of jealousy used in Study 1 might have biased the responding of the Chinese subjects. In Study 2, we also

administered more projective versions of the items that assessed subjects' emotional responses to a partner's imagined emotional and sexual infidelity. Again, the goal was to replicate the pattern of reported emotional responses across sexually and emotionally jealous individuals. The final goal, in keeping with the secondary goals presented in the introduction, was to conduct an exploratory assessment of the relation between jealousy status and personality, as defined by the Big-Five Model (Goldberg 1993).

## METHODS

### Subjects

The subjects were 303 (103 males, 200 females) undergraduate students from the University of Missouri at Columbia, and 198 (93 males, 104 females, 1 subject did not answer the gender item) undergraduate students from East China Normal University, Shanghai, China. All subjects were recruited from undergraduate courses from a variety of disciplines and either received course-related credit or a small payment for participation. The mean age for both the U.S. and Chinese samples was 20 years (respective *SDs* = 3.1, 1.3).

### Procedure

**Assessment measures.** The U.S. subjects were administered the Transparent Bipolar Inventory for the assessment of the big-five personality dimensions (Goldberg 1992), a general mood inventory, and a modified version of the jealousy measure used in Study 1. The Chinese subjects were administered Chinese versions of these same measures, as well as several additional social psychological measures. The focus of Study 2 is on the personality and jealousy measures.

For this study, the jealousy measure used in Study 1 was reduced and rewritten such that the items provided a less personal assessment of jealousy, as follows:

Please think of a serious committed romantic relationship that a person of your same age and sex has had in the past, that this person currently has, or that this person would like to have. Imagine that this person discovers that the person with whom they've been seriously involved became interested in someone else. What do you think would distress or upset this person more (*please circle only one*):

- (1) Imagining their partner forming a deep emotional attachment to that other person.
- (2) Imagining their partner enjoying passionate sexual intercourse with that other person.

As with Study 1, subjects were also asked to imagine how this person would react if their partner developed a deep emotional attachment to someone else, and image how this person would react if their partner was enjoying passionate sexual intercourse with someone else. Here, using the same 5-point scales used in Study 1, the subjects were asked to rate relative degree of hurt/anger, and inten-

sity of hurt feelings, anger, and jealousy. The final item asked the subjects if they had ever been involved in a committed romantic relationship, and, if so, whether this relationship was sexual.

The Transparent Bipolar Inventory for the assessment of the big-five personality dimensions is a 9-point scale presented in the following format, from Goldberg (1992, p. 42):

	Very	Moderately		Neither	Moderately		Very			
introverted	1	2	3	4	5	6	7	8	9	extraverted

The inventory includes 50 items: 10 items for each of the five personality dimensions, introversion-extraversion, agreeableness, dependability, emotional stability, and intellect.

**Translation.** The translation and back translation of the jealousy questionnaire followed the same format as was described for Study 1. For the personality inventory, the English version was first translated into Chinese by the same individual who had translated the jealousy questionnaires. The first Chinese version was then back-translated by the same individual who had back-translated the jealousy questionnaires. The first author and an expert in personality assessment (T. Trull) and the two translators then went through the back-translated version item by item. As a result of these discussions, a second Chinese version of the personality inventory was developed. This version was then administered to two individuals who were not familiar with either the English or the Chinese versions, nor were they familiar with the Big-Five Model. The first author and the two translators then discussed the few items that were not clear to one or both of these individuals. The resulting modifications yielded the third and final Chinese version of the personality inventory.

**Administration.** In both the United States and China, the questionnaires were administered to groups of students. The questionnaires were completed in about 15 min in the United States and about 40 min in China (due to the additional social psychological measures). The mood and personality inventories were administered first in both the United States and China. For the U.S. subjects, the jealousy questionnaire followed the personality inventory. For the Chinese subjects, several social psychological tests were presented in between the personality and jealousy questionnaires.

## RESULTS

For ease of presentation, the results are discussed in six sections. Sex and national differences in jealousy reactions are presented in the first section, while the relation between jealousy reactions and sexual experience is presented in the second section. Reported emotional reactions to imagined partner emotional and sexual infidelity are presented in sections three and four, respectively. Section five presents the pattern of emotional reactions to infidelity across sexually and

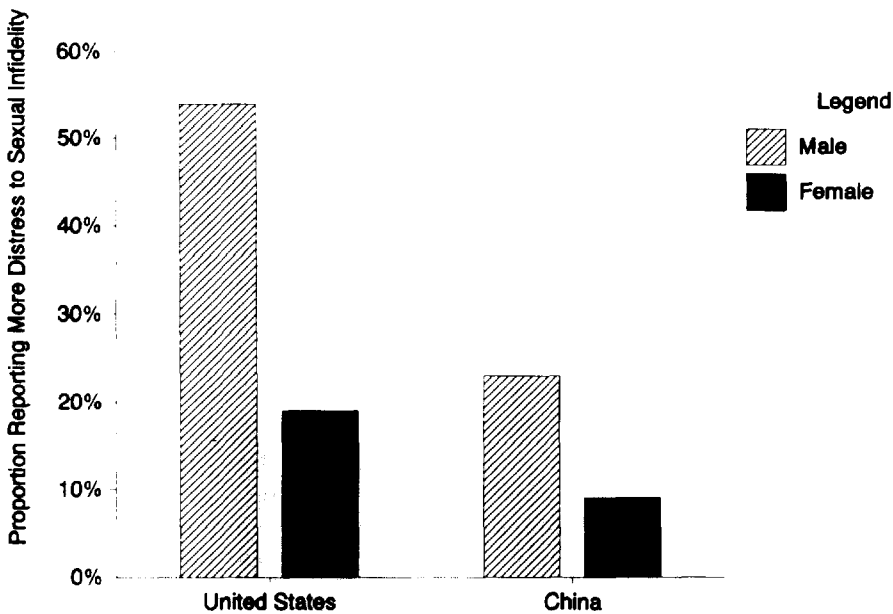


FIGURE 4. The proportion of U.S. and Chinese males and females, respectively, in Study 2 who reported more distress to a partner's sexual, as opposed to emotional, infidelity.

emotionally jealous individuals. The final section describes the relation between personality and jealousy reactions.

### Sex and National Differences in Jealousy

Sex and national differences in the proportion of subjects reporting more distress to sexual infidelity, as opposed to emotional infidelity, are shown in Figure 4. Inspection of Figure 4 reveals that the overall pattern of results was essentially the same as was found in Study 1. A Chi-square confirmed an overall (across-nation) sex difference in the proportion of males and females reporting greater distress to sexual infidelity [ $\chi^2(1) = 31.1, p < .001, n = 410$ ] as well as a significant effect of nation [ $\chi^2(1) = 11.2, p < .001, n = 411$ ]. Within-nation analyses again revealed significant sex differences in both the U.S. [ $\chi^2(1) = 34.6, p < .001, n = 273$ ] and Chinese [ $\chi^2(1) = 4.6, p < .05, n = 137$ ] samples.

### Previous Relationships, Sexual Experience, and Jealousy Status

As was found in Study 1, rather large national differences in reported experience with committed and sexual relationships were found (see Table 3) [ $\chi^2(2) = 252.0, p < .001$ ]. Within-nation analyses indicated no significant sex differences in relationship experience for either the U.S. [ $\chi^2(2) = 2.9, p > .10$ ] or Chinese [ $\chi^2(2) = 2.5, p > .10$ ] samples. Finally, jealousy status was not related to the relationship categories for either the U.S. [ $\chi^2(2) = 1.7, p > .10$ ] or Chinese [ $\chi^2(2) = 4.5, p > .10$ ] samples.

### Imagining Emotional Infidelity

The goal of the analyses described in this section was to attempt to replicate the basic findings for comparable items in Study 1. The four items associated with subjects' responses to imagined emotional infidelity were first submitted to a two (nation) by two (sex) MANOVA ( $n = 490$ ). The results revealed a significant main effect for nation ( $F = 11.80, p < .0001$ ), a nonsignificant sex effect ( $F = 1.14, p > .10$ ), and a significant nation-by-sex interaction ( $F = 3.23, p < .05$ ). Thus, the Study 1 finding that U.S. subjects reported more intense emotional reactions than their Chinese peers was replicated, but the sex effect was not. Moreover, the sex-by-nation interaction was not significant in Study 1, but is significant for this study. Examination of individual means indicates that the interaction was due to the consistent tendency of U.S. females to report more intense emotional reactions than their male peers, while Chinese males consistently reported more intense emotional reactions than their female peers. Because this pattern was not found in Study 1, it might be considered a characteristic of the Study 2 sample, rather than a consistent pattern of cross-national sex differences.

### Imagining Sexual Infidelity

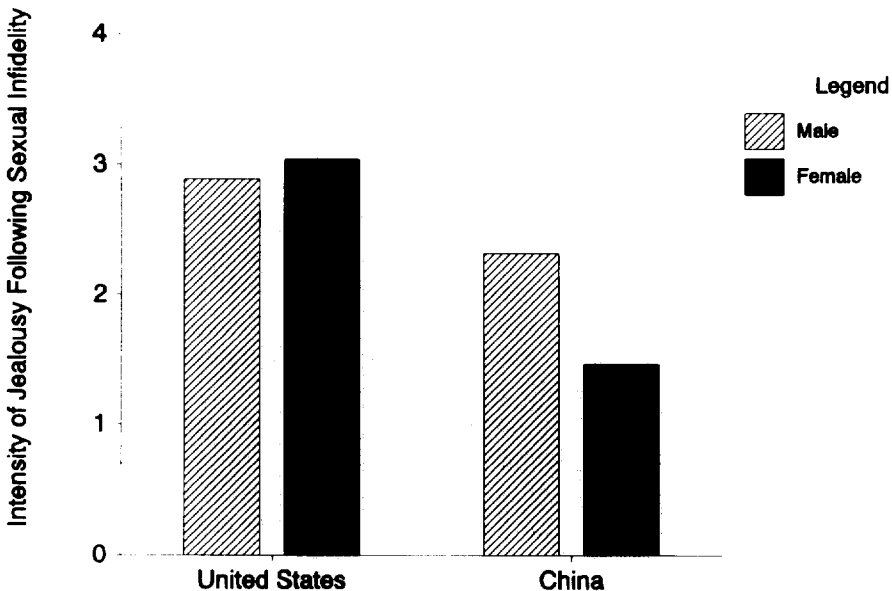
Again, the goal of the analyses described in this section was to attempt to replicate the basic findings for comparable items in Study 1. The four items associated with subjects' reported reactions to sexual infidelity were submitted to a two (nation) by two (sex) MANOVA ( $n = 483$ ). The results confirmed each of the effects found in Study 1; specifically, significant nation ( $F = 25.02, p < .0001$ ), sex ( $F = 4.25, p < .005$ ), and nation-by-sex ( $F = 5.90, p < .0001$ ) effects were found. Univariate ANOVAs revealed that the U.S. subjects reported more intense hurt feelings (U.S. vs. China,  $M_s = 3.0, 2.3$ ), anger ( $M_s = 3.2, 3.0$ ), and jealousy ( $M_s = 3.0, 1.9$ ) than their Chinese peers. The main effect for sex was significant only for intensity of jealousy ( $F = 9.58, p < .005$ ). Because this main effect was not found in Study 1, and because of a significant nation-by-sex effect for this item, it will not be considered further.

As was found in Study 1, significant nation-by-sex effects were found for intensity of hurt feelings ( $F = 7.11, p < .01$ ), and jealousy ( $F = 19.53, p < .001$ ), but not for relative degree of hurt/anger, or for intensity of anger ( $p_s > .05$ ). Examination of individual means confirms the pattern found for study 1; that is, for both items, U.S. females reported more intense reactions than U.S. males, whereas Chinese males reported more intense reactions than Chinese females. However, unlike Study 1, in this study Chinese males reported more intense reactions than Chinese females for five of the six emotional intensity items. Again, U.S. females reported more intense reactions than the U.S. males on all six items. Thus, the two significant interactions found in this study might reflect a general response bias, rather than actual differences that are *specific* to intensity of hurt feelings and jealousy.

In order to assess this possibility, a variable that represented the mean score for the six emotional intensity variables was created, intensity. The intensity variable was then entered into separate regression equations along with the nation and sex variables and their interactions, with the scores for the hurt and jealousy items serving as dependent measures in the respective equations. The resulting equations enabled us to partial any response bias from more substantive effects. The three-way intensity-by-nation-by-sex interaction was not significant for either the hurt or jealousy equations and was therefore dropped ( $ps > .10$ ). The equations were then recomputed without the three-way interaction. For the resulting equations, the nation-by-sex interaction was not significant for the hurt variable ( $F = 2.33, p > .10$ ), but was highly significant for the jealousy variable ( $F = 8.19, p < .005$ ). Thus, the nation-by-sex interaction for jealousy appears to be a significant effect, but it cannot be stated with any certainty whether the interaction for the hurt variable is a significant effect or simply reflects a general response bias. For this reason, we will only consider the interaction for the jealousy variable to be robust.

The mean scores across sex and nation for the jealousy variable are presented in Figure 5. Post-hoc orthogonal contrasts confirmed that the mean jealousy reaction of the Chinese females was significantly lower than that of the three remaining groups ( $F = 93.59, p < .0001$ ), while the mean jealousy reaction of the Chinese males was significantly lower than that of the U.S. males and females ( $F = 21.61, p < .0001$ ). A nonsignificant residual  $F$  ratio indicated that

**FIGURE 5.** Mean ratings, across sex and nation, for the intensity of jealousy following a partner's sexual infidelity (Study 2).



**Table 4. Mean Emotional and Sexual Jealousy Ratings Across Jealousy Status for U.S. Subjects**

Item	Jealousy status				<i>F</i> test
	Emotional		Sexual		
	Mean	<i>SD</i>	Mean	<i>SD</i>	
Emotional infidelity <sup>a</sup>					
Relative degree of hurt/anger <sup>b</sup>	- 1.12	0.98	- 0.95	1.10	1.34
Intensity of hurt feelings	3.37	0.71	3.27	0.68	1.08
Intensity of angry feelings	2.32	0.85	2.61	0.91	6.59*
Intensity of jealousy	2.79	0.99	2.90	1.08	<1
Sexual infidelity <sup>c</sup>					
Relative degree of hurt/anger	0.59	1.21	0.86	1.32	2.47
Intensity of hurt feelings	2.93	0.81	3.14	0.86	3.78
Intensity of angry feelings	3.16	0.91	3.55	0.68	12.23***
Intensity of jealousy	2.95	1.02	3.19	1.01	3.21

\*  $p < .05$ ; \*\*\*  $p < .001$ <sup>a</sup>  $n = 185$  and  $83$ , respectively, for the emotional and sexual jealousy categories (i.e., jealousy status).<sup>b</sup> Negative scores indicate more hurt than anger, while positive scores indicate more anger than hurt, on a 5-point -2 to 2 scale.<sup>c</sup>  $n = 186$  and  $78$ , respectively, for the emotional and sexual jealousy categories (i.e., jealousy status).

the mean difference between the U.S. males and U.S. females was not significant ( $F = 1.03$ ,  $p > .10$ ).

In all, the pattern of results confirms the Study 1 finding of more intense jealousy reactions in Chinese males than females in response to imagining a partner's sexual infidelity.

### Jealousy Status and Emotional Reactions to Infidelity

Following Study 1, a two (sex) by two (jealousy status) MANOVA was conducted separately for the four imagined emotional and four imagined sexual infidelity items for the U.S. sample. Consistent with the Study 1 results, both MANOVAs revealed significant main effects for sex ( $F_s = 4.88, 3.59$ , for imagined emotional and sexual infidelity, respectively,  $p_s < .01$ ), and jealousy status ( $F_s = 2.38, 4.72$ , for imagined emotional and sexual infidelity, respectively,  $p_s = .052, < .005$ ), but nonsignificant sex-by-jealousy status interactions ( $p_s > .10$ ). As was found for Study 1, the main effect for sex was due to the tendency of the U.S. females to report more intense emotional reactions than the U.S. males. Because there were not significant sex-by-jealousy status interactions, the means for the emotional intensity variables were collapsed across sex and are shown in Table 4. As can be seen in the table, only two effects were significant, sexually jealous individuals reported more intense feelings of anger for both emotional and sexual infidelity, relative to emotionally jealous individuals.

A parallel analysis was then conducted for the Chinese sample. The results revealed nonsignificant sex effects ( $F < 1, 1.69$ , for imagined emotional and sexual infidelity, respectively,  $p_s > .10$ ), marginally significant jealousy status effects ( $F_s = 2.08, 2.25$ , for imagined emotional and sexual infidelity, respectively,  $p_s = .09, .067$ ), and nonsignificant sex-by-jealousy status interactions ( $F_s = 1.79, < 1$ , for imagined emotional and sexual infidelity, respectively,  $p_s > .10$ ). Because

**Table 5. Mean Emotional and Sexual Jealousy Ratings Across Jealousy Status for Chinese Subjects**

Item	Jealousy status				<i>F</i> test
	Emotional		Sexual		
	Mean	<i>SD</i>	Mean	<i>SD</i>	
Emotional infidelity <sup>a</sup>					
Relative degree of hurt/anger <sup>b</sup>	-1.16	1.08	-0.57	1.29	5.75**
Intensity of hurt feelings	3.22	0.71	2.95	0.80	1.54
Intensity of angry feelings	1.92	1.02	2.40	0.94	3.84*
Intensity of jealousy	2.37	1.16	2.80	1.06	2.44
Sexual infidelity <sup>c</sup>					
Relative degree of hurt/anger	0.84	1.24	0.62	1.43	<1
Intensity of hurt feelings	2.23	1.20	2.95	1.07	7.93***
Intensity of angry feelings	3.03	0.94	3.15	0.81	<1
Intensity of jealousy	1.70	1.36	2.50	1.47	5.70**

\*  $p < .052$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$ .

<sup>a</sup>  $n = 115$  and  $20$ , respectively, for the emotional and sexual jealousy categories (i.e., jealousy status).

<sup>b</sup> Negative scores indicate more hurt than anger, while positive scores indicate more anger than hurt, on a 5-point -2 to 2 scale.

<sup>c</sup>  $n = 114$  and  $20$ , respectively, for the emotional and sexual jealousy categories (i.e., jealousy status).

the sex effects were not significant and the effects of jealousy status were marginally significant, the sex variable was dropped and the analyses were recomputed using only the jealousy status variable as the independent measure. These analyses revealed a marginally significant effect for imagined emotional infidelity ( $F = 2.22$ ,  $p = .07$ ), and a significant effect for imagined sexual infidelity ( $F = 2.58$ ,  $p < .05$ ).

Table 5 shows the mean emotional intensity scores across jealousy status for the Chinese sample. As was found for the U.S. subjects in both Study 1 and Study 2, the Chinese subjects reported more intense feelings of hurt than anger for imagined emotional infidelity, and more intense feelings of anger than hurt for imagined sexual infidelity. Examination of mean scores across emotionally and sexually jealous individuals for both U.S. samples and the Chinese sample reveals identical patterns for six of the eight items (i.e., for emotional infidelity: degree of hurt/anger, hurt feelings, and anger; for sexual infidelity: hurt feelings, anger, and jealousy). For imagined emotional infidelity, emotionally jealous individuals consistently report more intense hurt feelings than their sexually jealous cohorts, whereas sexually jealous individuals consistently report more intense anger. For imagined sexual infidelity, sexually jealous individuals consistently report more intense feelings of hurt, anger, and jealousy. Considering only the Chinese sample, these differences were statistically significant for four of these six items.

In all, the pattern of results for both the U.S. and Chinese samples is consistent with the view that the intensity and relative pattern of emotional reactions associated with partner infidelity differs for sexually and emotionally jealous individuals.

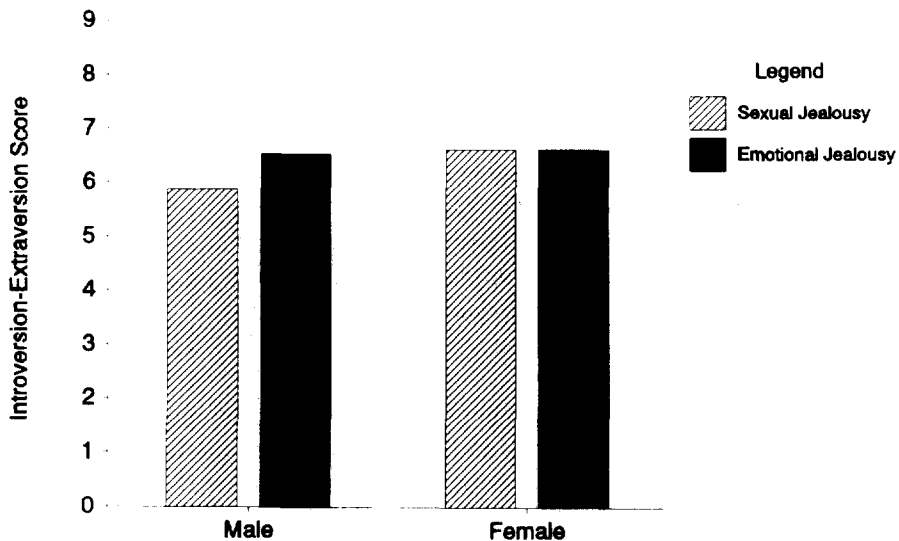
## Personality and Jealousy Status

The analyses of the personality data were conducted in two steps. First, the psychometric properties of the English and Chinese versions of the personality inventory were assessed. Second, scores for each of the five personality dimensions were related to jealousy status for both the U.S. and Chinese samples.

**Psychometric properties.** The first step in assessing the psychometric properties of the personality inventories involved determining whether that data fit the theoretically expected five-factor model. To achieve this end, covariance matrixes from the 50 items were separately fitted to a five-factor model by means of a confirmatory factor analysis for both samples (Jöreskog 1969). This procedure forced the 10 introversion-extraversion items to load on an introversion-extraversion factor, the 10 agreeableness items to load on an agreeableness factor, and so on. All nondefining factor loadings were forced to zero. The results revealed that in both the U.S. and Chinese samples, the value of all 50 factor loadings differed significantly from zero ( $ts > 4.0$ ,  $ps < .05$ ). Moreover, the median standardized factor loadings were consistently high in both samples. The respective median values for the U.S. and Chinese samples were .68 and .68 for the introversion-extraversion factor; .73 and .68 for the agreeableness factor; .66 and .70 for the dependability factor; .72 and .60 for the emotional stability factor; and .58 and .60 for the intellect factor. Moreover, only a single standardized factor loading was  $< .40$  for the U.S. sample and no loading was  $< .40$  for the Chinese sample.

The reliability of each of the five factors was assessed by means of Cronbach's alpha. These coefficients, which provide a measure of internal consistency

**FIGURE 6.** Mean introversion-extraversion scores for emotionally and sexually jealous U.S. males and females.



and an estimate of factor reliability, ranged from .86 to .91 in the U.S. sample, and .83 to .90 in the Chinese sample. Alpha coefficients were also consistently high when data were combined from the U.S. and Chinese samples (range .85 to .90), suggesting that the U.S. and Chinese subjects interpreted and responded to the items in a similar manner.

In all, the psychometric properties of the personality inventory were comparable for the English and Chinese versions and compare favorably to previous studies of the English version (e.g., Goldberg 1992).

**Jealousy status.** For each subject, a factor score was computed for each of the five personality dimensions by taking the mean of the 10 items that defined each respective factor. The resulting scores were then analyzed separately for the U.S. ( $n = 273$ ) and Chinese ( $n = 138$ ) samples by means of two (sex) by two (jealousy status) ANOVAs. For the U.S. sample, the jealousy status ( $F = 4.10, p < .05$ ) and the sex-by-jealousy status interaction ( $F = 3.95, p < .05$ ) for the introversion-extraversion scale were the only significant effects involving jealousy status and the personality scores (all other  $ps > .05$ ). For the Chinese sample, none of the main effects for jealousy or the sex-by-jealousy status interactions were significant ( $ps > .05$ ).

Figure 6 shows the mean introversion-extraversion factor scores across sex and jealousy status for the U.S. sample. As was found for the jealousy items, U.S. females consistently reported higher scores (for four of the five factors) than the U.S. males. Thus, the high score for the U.S. females on the introversion-extraversion scale should not be interpreted to mean that U.S. females are higher on this personality dimension than U.S. males. A post-hoc ANOVA confirmed that the sexually jealous males scored reliably higher on the introversion-extraversion scale, indicating more extraverted tendencies, than the emotionally jealous males. Analyses of individual introversion-extraversion items revealed that, even though the sexually jealous males showed higher mean scores for all 10 items, these differences were statistically significant for only the "bold," "active," and "assertive" items ( $ps < .05$ ).

## DISCUSSION

The pattern of sex and national differences in the relative degree of distress over sexual and emotional infidelity found in Study 1 was confirmed with Study 2. Also confirmed with Study 2 was the finding of no relation between jealousy status and experience in romantic or sexual relationships for either the U.S. or Chinese samples; again, inconsistent with the findings of Buss et al. (1992). The overall pattern bolsters the argument that sexual jealousy is facultative, but not simply related to sexual experience. In other words, sexual jealousy is more frequently expressed in the sexually permissive American culture than in Chinese culture, where strong social mores suppress the sexual activity of unmarried adults, but sexual experience in and of itself does not appear to explain this cross-national

difference. The finding, across both studies, that Chinese males reported more intense sexual than emotional jealousy than their female peers also appears to be consistent with the argument that sexual jealousy is facultative. This is because even though sexual jealousy was not frequently expressed in the Chinese samples, the relatively intensive sexual jealousy of the Chinese males suggests that the sexual behavior of a potential partner is still an implicit concern. Presumably, given this implicit concern, if the sexual behavior of Chinese females were to become more permissive, then a greater proportion of Chinese males would report more distress to the imagined sexual, as contrasted with emotional, infidelity of a partner.

The pattern of results across studies is also consistent with the view that affect might motivate engagement in mate retention behaviors, and that sexually jealous and emotionally jealous individuals might be pursuing different strategies in this respect. Even though the group comparisons were not always statistically reliable, across both studies and across the U.S. and Chinese samples a consistent pattern of reported emotional responses emerged for sexually and emotionally jealous individuals. Sexually jealous individuals, whether they were male or female, or Chinese or American, consistently reported more intense anger to a partner's emotional and sexual infidelity, consistent with the relation between sexual jealousy and violence (Daly and Wilson 1988). Moreover, in response to a partner's sexual infidelity, sexually jealous individuals also reported more intense hurt feelings and jealousy than their emotionally jealous peers. Furthermore, in Study 1, three out of four sexually jealous U.S. males reported that they would break off the relationship with their partner in response to their partner's sexual infidelity, and the majority of sexually jealous U.S. females reported that they would confront a female competitor, if their partner began to develop an attachment to this competitor. Emotionally jealous individuals, in contrast, consistently reported more intense hurt feelings to a partner's emotional infidelity. In Study 1, emotionally jealous males and females also tended to report behavioral responses that would appear to be designed to maintain, rather than break off, the relationship (e.g., discuss and try to work through the problem).

Finally, the overall results of Study 2 suggest little relationship between the tendency toward sexual or emotional jealousy and personality, as defined by the Big-Five Model (Goldberg 1993). Nevertheless, the relation between sexual jealousy and extraverted tendencies in the U.S. males is of interest and might merit further work. Here, the finding that extraverts tend to be more bold and assertive might be interpreted as consistent with the finding that sexual jealousy tends to be associated with a lower threshold for anger and more aggressive responses to one's partner. Alternatively, both relative degree of introversion-extraversion and tendency toward sexual or emotional jealousy might reflect individual differences in mating strategies, or might simply reflect a chance finding.

## CONCLUSION

The results of this study generally support evolutionary predictions about the pattern of sex differences in jealousy, as well as previous empirical research in

this area (Daly et al. 1982; Buss et al. 1992). In particular, the theoretical expectation that, on average, males would be more distressed than females over a partner's sexual infidelity, whereas females would be more distressed than males over a partner's emotional infidelity was supported by the pattern of sex differences in both sets of U.S. and Chinese samples. More important, however, was the finding that across both studies there was a much larger proportion of sexually jealous individuals, male and female, in the U.S. than in the Chinese samples. This pattern is consistent with the major thesis of this research, that the tendency toward sexual jealousy might be facultative. Stated differently, sexual jealousy appears to be much more prevalent in the sexually permissive American culture, relative to the more sexually restrictive Chinese culture. The consistent finding that jealousy status was not related to previous sexual experience in either of the U.S. or Chinese samples suggests that the national difference in the tendency toward sexual jealousy is not directly related to the national difference in sexual experience. Thus, the mechanism governing the national difference in the tendency toward sexual jealousy is not clear.

Nevertheless, the pattern is consistent with the view that cultural mores that act to suppress sexual activity will make sexual infidelity a less salient concern than might otherwise be the case. Even so, the finding that Chinese males reported much more intense jealousy reactions to a partner's imagined sexual infidelity than their female peers suggests that sexual infidelity is a much more emotionally salient issue for Chinese males than for Chinese females. Moreover, this sex difference in the intensity of sexual jealousy emerged even though the majority of Chinese males, like the majority of Chinese females, reported greater distress to emotional than to sexual infidelity in both studies. In all, one might interpret this pattern as suggesting that the suppression of sexual activity might make sexual infidelity a less salient issue for males, but the implicit (i.e., unexpressed) concern over a partner's sexual behavior does not disappear. The overall pattern of results suggests that the psychological system that supports jealousy is likely to be facultative, and, as such, is rather more complex than evolutionary models of central tendency sometimes imply (Buss et al. 1992; Trivers 1972).

The complexity of jealousy reactions was also reflected in responses to the imagined emotional and sexual infidelity of one's partner. Although both sexually and emotionally jealous individuals reported more hurt than anger over a partner's emotional infidelity and more anger than hurt over a partner's sexual infidelity, the intensity of reported emotional, as well as reported behavioral responses to partner infidelity differed for sexually and emotionally jealous individuals. As predicted, sexually jealous individuals reported more intense anger to partner infidelity, as well as a greater likelihood of confronting a competitor or breaking off the relationship. For sexual infidelity in particular, these individuals reported much more intense emotional reactions, for hurt feelings, anger and jealousy, than emotionally jealous individuals. For sexually jealous individuals, male or female, Chinese or American, sexual infidelity is a highly salient and emotional experience (Daly and Wilson 1988; Daly et al. 1982). Emotionally jealous individuals, although angered by a partner's sexual infidelity and hurt

by a partner's emotional infidelity, generally did not react as strongly as sexually jealous individuals and were more likely to report behavioral reactions designed to maintain the relationship, as opposed to the tendency of sexually jealous individuals to break off the relationship. These differences in the pattern of emotional and behavioral responses to partner infidelity appear to reflect important individual differences in jealousy reactions and potentially in mating strategies.

Finally, it is of interest that sexually jealous males and females, as well as emotionally jealous males and females, reported similar emotional and behavioral responses to a partner's emotional and sexual infidelity. For instance, sexually jealous females, like their sexually jealous male cohorts, reacted with intense anger to a partner's sexual infidelity, and in the U.S sample many of these females reported that they would confront a competitor. These similarities suggest that it might not be the emotional system per se that mediates the sex difference in the relative distress over sexual or emotional infidelity. Rather, it is possible that males, for example, are more sensitive than females to behavioral cues to sexual infidelity and when these cues are detected react accordingly (Flinn 1988). In other words, it might be cognitive rather than emotional aspects of the jealousy system that mediate the sex difference in the tendency toward sexual or emotional jealousy. Either way, these and other individual differences issues, such as the potential relation between extraversion and sexual jealousy, might be fruitful areas to explore in future studies.

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