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ORIGINAL ARTICLE

The "Problem of Number" Revisited: The Relative Contributions of Psychosocial, Experiential, and Evolutionary Factors to the Desired Number of Sexual Partners

Chuck Tate

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Abstract Three studies (N=329) using U.S. community samples examined the relative contributions of self-reported "sex," gender identity, and actual number of sexual partners to the question how many sexual partners individuals desire over the lifetime. In Study 1, the more "feminine" a participant identified, not self-reported sex, was significantly related to the desired number of sexual partners. Study 2a showed that a person's actual number of sexual partners also correlated with the desired number. In Study 3, Bem Sex Role Inventory (BSRI) (Bem Psychological Review, 88: 354–364 1981) femininity scores and actual number of sexual partners significantly predicted desired number of sexual partners separately for men and women. These results suggest that non-evolutionary variables drive the "problem of number" in mate preference.

Keywords Gender identity · Problem of number · Sexual strategies · Femininity · Bem Sex Role Inventory · Sexual partners

Introduction

The purpose of this paper was to examine the relative contributions of psychosocial, experiential and evolutionary influences on one aspect of mate preference—the "problem of number" (Symons 1979) or desired number of sexual partners (Buss and Schmitt 1993). Differences between men and women in their desired numbers of sexual partners have been used as evidence for the operation of evolved behavioral strategies based on presumed genetic differences between the two groups (see Buss and Schmitt 1993). The three studies presented below tested the evolutionary explanation against alternative explanations which argue that gender identity (a psychosocial variable) and a person's actual number of sexual partners (an experiential variable) may contribute more to the desired numbers of sexual partners than presumably evolved mechanisms. Study 1 explored the relative contributions of gender identity and self-reported sex to the desired number of sexual partners to establish which had a stronger contribution. Study 2a included actual number of sexual partners as another potential contributor. Based on the results of Study 1 and 2a that gender identity was a stronger contributor to desired number of sexual partners than self-reported sex, Study 2b determined which aspect of gender identity (i.e., endorsement of either masculine or feminine U.S. cultural stereotypes) was actually correlated with the desired number. Finally, Study 3 showed that greater endorsement of feminine gender stereotypes predicted desiring fewer sexual partners separately for both men and women, and to the same degree within each group. All studies were conducted on U.S. community samples and therefore any generalizations from this investigation may only apply to the United States and Canada. Cross-cultural research would be needed to test these effects in different cultures.

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C. Tate
California State University, Bakersfield,
Bakersfield, CA, USA

C. Tate (✉)
Department of Psychology, San Francisco State University,
1600 Holloway Ave.,
San Francisco, CA 94132, USA
e-mail: ctate2@sfsu.edu

Background

In the past two decades, evolutionary approaches to explaining human social behavior have gained popularity

and apparent empirical support. Some of the strongest support for the evolutionary approaches has come from the area of mate selection, which concerns all aspects of seeking sexual partners. For instance, Buss (1989) and Buss and Schmitt (1993) found differences between men and women in the qualities each group looks for in a sexual partner in both short-term and long-term relationships. The differences tend to be that men prefer multiple partners in the short-term and have lower criteria for choosing a sexual partner at that time as compared to women (e.g., Buss and Schmitt 1993). These differences are attributed to genetic influences because men and women have different sex chromosomes. Since Buss's studies, there have been attempts to explain the same findings using a biosocial (Wood and Eagly 2002) or social role account (Eagly 1987, 1997; Eagly and Wood 1999; Eagly et al. 2000). This alternative account argues that observed differences between men and women do not have to be the result of different selective pressures that resulted in different genetically evolved strategies. Instead, differences between men and women in the qualities desired for sexual partners might result from differences in how women and men are socialized and how they accept this socialization. Of course, the biosocial aspect of this account admits that *physical differences* (not necessarily genetic differences) between men and women might help create regular social differences between women and men across cultures, but one does not need to invoke a genetic argument to account for behavioral differences (Wood and Eagly 2002).

Despite the debate between the evolutionary and biosocial/social role accounts, in which genetic and societal influences are seen as largely independent, some theorists (e.g., Archer 1996; Kenrick et al. 1993) have argued that evolutionary theories and socio-cultural theories are compatible. These theorists argue that evolutionary accounts subsume socio-cultural accounts. The subsuming of socio-cultural variables into evolutionary accounts occurs at the theoretical level (Archer 1996) and at the empirical level, wherein measures of self-relevant gender-stereotype endorsement are not importantly correlated with mate preferences (Kenrick et al. 1993) or wherein different cultures show the similar patterns of mate preference judgments (Buss 1989; Buss et al. 1990; Schmitt 2003). The empirical results are interpreted as indicating that cultural variables do not account for more variance in mate preference than self-reported sex.

To counter the claims of subsumption, the biosocial accounts have argued that the social variables are more important than self-reported sex differences. Empirical studies using this approach often employ either meta-analysis or the inclusion of other variables (e.g., sexism measures or social indicators) to argue that genetics are not the most influential factor. For example, Eagly and Wood (1999) used a meta-analysis to show that there is variability across cultures in mate preference, and that this variability correlates with measures of gender equity. Similarly, Harris (2003) used a meta-analysis to show that reactions to infidelity and the kinds of jealousy expressed in sexual relationships are not as strongly correlated with self-reported sex as evolutionary psychologists believe. In a set of empirical studies, Johannesen-Schmidt and Eagly (2002) examined the extent to which males and females endorsed hostile or benevolent sexist beliefs (see Glick and Fiske 1996, 1999) and showed *within each group* that higher endorsement of either kind of sexist belief correlated with stereotypic qualities desired in a sexual partner. Similarly, Kasser and Sharma (1999) re-analyzed the 37 cultures data set collected by Buss et al. (1990) using social indicators from the World Health Organization and showed that the levels of reproductive freedom and education for women are the strongest predictors of whether women will prefer males who will provide resources for them. Kasser and Sharma (1999) argue against an evolutionary explanation stating: "the extent to which an environment supports or impedes a female's attempts to direct her own destiny affects what she values in mates" (p. 376).

The foregoing survey of the literature reveals that, with the exception of the Kenrick et al. (1993) study, few studies have examined the *relative* contributions, in the statistical sense, of socio-cultural and presumed genetic variables to the question of mate preference by collecting both measures for the same participants. Moreover, the mate preference literature focuses largely on specific qualities associated with potential sexual partners (e.g., youth, resources) even though Buss and Schmitt's (1993) analysis identifies other questions such as the "problem of partner number" (p. 206) as important to consider.

The present research therefore attempts to accomplish two goals. The first is to offer a methodological and statistical approach to examine the relative importance of psychosocial and presumed genetic factors to mating strategies. This goal was accomplished by using the existing statistical method of multiple regression analysis when both psychosocial and presumed genetic variables are assessed for all participants in the same study. The second goal was to explore the so-called "problem of number," an understudied aspect of the mate preference literature. The problem of number was identified by Symons (1979) as the number of mates obtained (or desired) within any species. This "problem" is a cornerstone of evolutionary psychological theorizing because it can be a standardized comparison measure across species. The specific desired qualities in mates may differ profoundly across species, but number of mates is an easily comparable value. Comparative studies of non-human animals show that there are reliable asymmetries between males and females across

mammalian species such that males tend to mate with more partners than females do (Trivers 1972, 1985). Given the evidence across mammals, it might seem that any observed asymmetry in desired number of sexual partners in humans is attributable to genetics (Buss and Schmitt 1993), not psychosocial factors. The Buss and Schmitt (1993) study was one of the first to demonstrate such an asymmetry between human males and females but few studies since have focused on this result. One notable exception was research conducted by Pedersen et al. (2002). The Pedersen et al. (2002) investigation underscored the need for better statistical methods to assess the differences between self-reported sexes as compared to the winsorized procedure used by Buss and Schmitt (2003). The Pedersen et al. (2002) analysis used median tests, which corrected for skewness in the Buss and Schmitt (1993) data, to show that there was little difference between men and women in their desired number of sexual partners over the lifetime (Study 1) and even in the short-term (Study 2). The Pedersen et al. (2002) investigation showed no support for Buss's Sexual Strategies Theory (SST; the account that differences in human mate preference are the result of different selective pressures on men and women in the ancestral past) based on the lack of difference between the self-reported sexes. However, explanations of the Pedersen et al. (2002) data did not articulate an alternative psychological explanation for the original findings. To the extent that Buss and Schmitt's (1993) "problem of number" findings could be replicated with appropriate statistical analyses that do not capitalize on skew in the data, it would be prudent to test this explanation against an alternative, non-evolutionary psychological account.

One possible explanation for asymmetries in the "problem of number" in humans could be psychosocial factors. In the U.S. and Canada, at least, theorists have identified a sexual double-standard (Laumann et al. 1994; Leitenberg and Henning 1995; Milhausen and Herold 1999) in which sexual activity for men is seen as conquest and accruing experiences, whereas sexual activity for women is viewed as bonding and intimacy. Given this double-standard, one could imagine that gender identity is an important contributor to desired number of sexual partners. One might expect, for instance, that the more "masculine" a person identifies, the more this individual might view sexual behavior as conquest or accruing experiences and thus desire more sexual partners than others. Similarly, the more a person identifies with being "feminine," the fewer sexual partners this individual may desire because sexual activity may be viewed as bonding in a relationship. Moreover, several theorists have argued that masculine and feminine gender identification can occur across self-reported sex (e.g., Ashmore 1990; Bem 1981, 1985; Spence 1984, 1985). Accordingly, individual men and women may be more or less masculine-identified and feminine-identified from a psychosocial perspective.

While the above speculation can be easily turned into a theoretical account that takes precedence over evolutionary factors or, alternatively, is subsumed by them, it is prudent to note that the competing hypotheses can be examined empirically. To the extent that researchers can assess both psychosocial and presumed genetic factors within the same individual, one can statistically assess which accounts for more variability in the desired number of sexual partners using multiple regression. As a result, this investigation examines *gender identity* (i.e., how a person identifies with respect to the social conceptions of "masculine" and "feminine") and *self-reported sex* (i.e., whether a person indicates that they are "female" or "male") in relation to the number of sexual partners desired over the lifetime. From Buss and Schmitt's evolutionary perspective, gender identity should not contribute above and beyond self-reported sex because genetic differences between men and women are the properties presumed to drive the disparity in desired number of partners.

However, self-reported sex is an impoverished proxy for genetic differences because no actual genes are being examined. Implicit in virtually all evolutionary psychology accounts of so-called "sex differences" (which may be better described as "gender differences") is the assumption that asking participants to self-report their sex will measure underlying XX and XY sex chromosome differences for women and men, respectively. In actuality, people's self-reported sex is likely a combination of several factors, including referents to anatomy (e.g., genitalia). Anatomical differences (esp. genitalia) are influenced partly by genetics and partly by hormones and hormone-sensitivities (e.g., Clarnette et al. 1997). The fact that self-reported sex is influenced by factors other than XX, XY differences introduces the possibility that assessing self-reported sex results in the accumulation of *nonrandom* (i.e., systematic) error variance. Although the XX and XY sex chromosome pairs are quite common, there are notable exceptions to these configurations. In biological research there are several types of sex chromosome arrangements that include multiple X and Y chromosomes combinations (e.g. XXY, XXX, XYY) and single chromosome arrangements (i.e., X0) (Levitan and Montagu 1977; see also Gravholt et al. 1998; Kruse et al. 1998; Thomas et al. 2001). Each alternate configuration has important biological consequences for internal and external anatomical development that can affect gender assignment at birth and later self-reports of sex and gender identity (Gravholt et al. 1998; Kruse et al. 1998). Similarly, differences in hormone sensitivity (e.g., androgen-insensitivity syndrome, DHT-deficiency, fetal androgenization in females) affect one's gender assignment at birth (Imperato-McGinley et al. 1979) as well as how

individuals later identify with gender in their cultures (see also Hines et al. 2003; Zucker et al. 1996). While each individual genetic configuration and hormone-(in)sensitivity has a low incidence, each is virtually independent of the others. Thus, these independent probabilities become additive. As a consequence, asking participants to self-report their sex lacks measurement precision with respect to the underlying dichotomous genetic variations that are presumably important for existing evolutionary accounts because systematic error variance from genetic and physiological sources can accumulate using this procedure.

Gender identity, in contrast, has comparatively more measurement precision in its assessment because it does not suffer from the accumulation of systematic (nonrandom) error variance. Although there are debates about how best to assess gender identity for research (Ashmore 1990; Edwards and Spence 1987; Hoffman and Borders 2001; Myers and Gonda 1982; Spence 1985), there is little debate about its constituents. Most theorists agree that gender identity is comprised of separable masculinity and femininity dimensions that can vary independently of each other (e.g., Bem 1974, 1981; Markus et al. 1982; Spence 1984). Thus a person can be high on both dimensions, high on one dimension and low on the other, or low on both dimensions. These variations can be captured by existing scales such as the Bem Sex Role Inventory (Bem 1974, 1981) and the Personal Attributes Questionnaire (Spence et al. 1975), even though the psychological meanings and labels differ among the specific scales. Like any measurement tool in psychological research, scales designed to assess the two underlying dimensions of gender identification suffer from measurement error. However, this measurement error is presumed *random* to the extent that instruments have been tested for reliability and validity. *Nonrandom* sources of error variance would create unacceptable decrements in measures of reliability (e.g., alphas below .70), but both the Bem Sex Role Inventory and the Personal Attributes Questionnaire show acceptable reliability statistics (Bem 1981; Hoffman and Borders 2001; Spence et al. 1975).

Overview of the Studies

Given the comparative precision with which gender identity is measured when compared to genetic sex in psychological research, it would be unfair both methodologically and statistically to compare the two using their common methods from the outset. As a result, in Study 1 and 2a, I examined an impoverished proxy for gender identity—not its measurement on a traditional two-factor scale. The impoverished proxy conflated the two separate dimensions of gender identity (masculinity and femininity) into a single, bipolar scale ranging from "very feminine" to "very masculine," with "equally masculine and feminine" in the middle. This bipolar assessment recapitulates earlier research on gender identity (see Constantinople 1973) that was largely rejected in favor of the more theoretically and methodologically precise two-factor theory (see also Edwards and Spence 1987). Accordingly, this bipolar assessment is an appropriate impoverished proxy for gender identity that should create a fairer test of gender identity effects as compared to the impoverished genetic sex proxy of self-reported sex. In effect, this impoverished proxy for gender identity reintroduces systematic (nonrandom) error variance into the assessment of this construct. In this manner, two measures with systematic error variance were used to assess the central constructs of interest. A measure of two-factor gender identity was used in Study 2b and 3 to more precisely examine gender identity effects on desired number of sexual partners and clarify the results of Studies 1 and 2a.

In order to examine the relative contributions of the psychosocial and presumed genetic factors, I sought to replicate and extend Buss and Schmidt's (1993) findings on the differences between self-reported sexes for desired number of sexual partners over the lifetime. For this test, I used U.S. community samples from different regions (i.e., Pacific Northwest and southern California). I followed Buss and Schmidt's original procedure but modified the questionnaire to ask about psychosocial (Studies 1, 2a, and 3) and experiential factors (Study 2a and 3) in addition to self-reported sex (all studies). Additionally, I took inspiration from the Pedersen et al. (2002) investigation and used non-parametric methods to better assess any differences between self-reported sexes. The median tests used by Pedersen et al. (2002) lacked a measure of variability. Consequently, I followed the same general idea of using alternatives to the *t*-test by using ranks tests to preserve variability estimates (which are the possible permutations of the ranks). The use of ranks as responses allows one to employ statistical tests that require variability for analysis.

Finally, this investigation does not follow the common hypotheico-deductive model of scientific inquiry. As argued at the outset, such reasoning usually leads to subsuming one theoretical account into another or otherwise downplaying important alternative accounts. Instead, this investigation relies on an abductive model of scientific inquiry (see Rozenboom 1997; cf. McGuire 2004) in which models are tested against each other with few or no *a priori* (deductive) hypotheses about effects that should be expected. In this way, this investigation attempts to uncover the relative contributions of variables without biasing the predictive space from the outset. Results are therefore described with respect to the variables being considered, not hypotheses.

Study 1

Study 1 examined whether self-reported sex (presumed genetic factor) accounted for more variability in responses to the desired number of sexual partners over the lifetime than did gender identity (psychosocial factor). As indicated above, self-reported sex and bipolar gender identity were used as relatively equally impoverished proxies for each variable.

Method

Participants

Participants were 87 people (44 women, 43 men) from a community sample in Eugene, OR, USA (Pacific Northwest region). All identified as heterosexual. Participants ranged in age from 19 to 54 years old (M=25.7, Mdn=23, SD=7.74). Participants were acquaintances, friends or relatives of students enrolled in a human sexuality course. No information was collected on the ethnic or racial identity of the participants as this information was not reported in the two studies most relevant to this research (i.e., Buss and Schmitt 1993; Pedersen et al. 2002).

Materials and Procedure

Students enrolled in a human sexuality class taught by the author were instructed to give the questionnaires to two individuals—one male, one female—with whom they had some relationship (e.g., friends, relatives) in the surrounding area after getting the participant's consent to be in the study. Students were completely unaware of any hypotheses or underlying research questions. Instead, this author explained that purpose of this activity was to acquaint the students with how research in human sexuality is conducted. Students were instructed to distribute sealed materials to each participant and receive the completed questionnaires in a sealed envelope that should not be opened. The participants completed a questionnaire modeled after the measure used by Buss and Schmitt (1993) in a private setting and were not observed by anyone. All directions on how to complete the materials were included for the participant so that it was not necessary for the participant to consult the student who distributed the materials. Additionally, a cover sheet instructed the participants not to interact with the student while completing the measures. Once completed, participants sealed their materials and gave the sealed envelope to the student. Students then returned the sealed questionnaires and separate consent forms from their two participants to their instructor. Students received credit for turning in the sealed envelopes and consent forms. The data were analyzed and results were presented to the students only after all questionnaires were collected.

On the questionnaire itself, directions informed participants not to place any identifying marks on the questionnaires and to return their completed measures in a sealed envelope to the student who distributed them. Participants completed questions in the order listed here. First, participants circled "male" or "female" when asked: "What is your sex?" Next, participants read a preamble that was designed to lessen the demand characteristic (especially for women) to underreport one's desired number of sexual partners: "Imagine a world in which there were no sexually transmitted diseases and no social stigma attached to having multiple partners but pregnancy was still a possibility." To the extent that one can argue the sexual double-standard is diminishing and that desiring multiple sexual partners is not seen as appropriate for either men or women (see Marks and Fraley 2005; O'Sullivan 1995), these directions should lessen demand characteristics to under-report true desires. Moreover, given the argument that culture provides noise that obscures the signal from the evolved mechanisms (Buss 1995), these directions should boost the signal relative to noise. After reading the preamble, participants then listed the number of sexual partners they would desire over their lifetime. Finally, participants indicated how they identified themselves on a 7-point scale, bipolar gender identity continuum, with one anchor representing "very feminine" and the other anchor representing "very masculine." The middle value represented "equally masculine and feminine." Each point was labeled from the middle value to the anchors as "somewhat masculine/feminine," then "masculine/feminine" then to "very masculine/feminine." Participants sealed their responses in an envelope and returned it to the student who gave it to them. That sealed envelope was only opened by this author.

Participants listed the number of desired sexual partners in a free-response format and responses ranged from "1" to "200+". Given the wide variability and open-ended responses, the data were converted to ranks for analysis. For ease of comparison to the Pedersen et al. (2002) investigation, the raw free-response values were also pseudo-winsorized by converting all responses of 100 or greater to 99. These pseudo-winsorized means are presented in Table 1 for all studies presented in this paper. Replicating the Pedersen et al. (2002) results, all samples showed some evidence of positive skew in their responses, rendering the t-test unreliable and the proceeding ranks tests more appropriate.

Finally, because this study used a community sample with a larger age range than previous studies, I examined the correlations age had with relevant predictor variables. Across all studies, age did not significantly correlate with any predictor variables.

Table 1 Pseudo-winsorized means for desired number of sexual partners over the lifetime by self-reported sex for studies 1, 2a, and 3.

	Men			Women		
	Mean	Percentage below mean	Skew	Mean	Percentage below mean	Skew
Study 1	31.50	71.4	1.06	19.15	71.1	1.95
Study 2a	38.10	61.0	.67	22.66	73.8	1.74
Study 3	45.78	53.6	.35	12.15	75.0	2.85

Results and Discussion

Self-Reported Sex Differences

A Mann-Whitney test was conducted on the rank data for desired number of sexual partners over the lifetime. Consistent with Buss and Schmitt's (1993) prediction and results, males (M_R=43.00) reported desiring more sexual partners over the lifetime than females (M_R=33.13), Z=1.98, p=.023, one-tailed.

Contributions of Self-Reported Sex and Bipolar Gender Identity

Self-reported sex and bipolar gender identity were entered simultaneously into an optimal scaling regression model as predictors of the desired number of sexual partners over the lifetime. In the optimal scaling model (using the SPSS CATREG procedure), desired number of sexual partners was entered on an ordinal scale as ranks (using the spline procedure; Friedman 1991), self-reported sex was entered on a nominal scale, and bipolar gender identity was entered on an interval scale, ascending from "very feminine" to "very masculine." The model containing both predictors accounted for a significant amount of variability in desired number of sexual partners, $F(2,72)=6.63$, p=.002, R^2 =.156. In this model, bipolar gender identity was the only significant predictor of desired number of sexual partners, β=.516, $F(1)=5.77$, p=.019, part correlation=.260. The correlation indicates that the more feminine a participant identified, the fewer sexual partners she or he desired over the lifetime. Self-reported sex was not a significant predictor of desired number of sexual partners, β=.150, $F(1)$=.488, p=.48, part correlation=.076. The tolerance between the two predictors in this model was .254.

Correlations Between Predictors

Examining the tolerance, descriptive analyses showed that gender identity and self-reported sex were highly correlated, $r_s(85)$=.849, p<.001, but diagnostics for the regression analysis revealed no *severe* collinearity problems (using a tolerance of .10 as a cut-off). When one examines the midpoint of the gender identity scale (i.e., "equally masculine and feminine"), descriptives on the ranks for desired number of sexual partners show that females (M_R=7.40) desired more sexual partners than males (M_R=5.86), illustrating that the effect is not driven solely by males identifying with masculinity and females identifying with femininity.

Conclusions

These results reveal two important findings. One, when put into direct comparison in the same analysis for the same individuals, a psychosocial factor (self-reported, bipolar gender identity) has a significant contribution to one aspect of mating strategies (desired number of sexual partners), whereas a presumed genetic factor (self-reported sex) does not. Two, these results generate an interesting hypothesis concerning Buss and Schmitt's (1993) findings. Specifically, the strong empirical correlation between self-reported sex and gender identity suggests that the relationship between self-reported sex and desired number of sexual partners may be a spurious correlation.

Study 2

Study 2 had two purposes, and each was addressed by a separate sample. Study 2a sought to replicate the findings concerning the relative contributions of genetic and psychosocial factors to mating strategies in Study 1 and examined whether an experiential variable also contributed to these results. Study 2b probed the psychometrics of the bipolar masculinity-femininity scale by correlating it with an established two-factor gender identity scale, the Bem Sex-Role Inventory (BSRI) (Bem 1981).

Study 2a Overview

In Study 2a, I examined whether an experiential factor (the actual number of sexual partners an individual has had to date) also accounted for variability in responses, and what amount relative to bipolar gender identity (psychosocial factor) and self-reported sex (presumed genetic factor). The inclusion of the experiential factor provides an important third source of variability, namely an individual's actual experiences with sexuality (rather than their self-concepts with respect to masculinity-femininity and self-reported sex, neither of which are direct experiences with sexual behavior).

Study 2a Method

Participants were 90 people (45 women, 45 men) from a community sample in Eugene, OR. All identified as heterosexual. Participants ranged in age from 18 to 57 years old (M=25.13, Mdn=21, SD=9.51).

The procedure was the same as in Study 1, but an additional free-response question was added to the mate preference questionnaire: "How many sexual partners have you had until now?" Participants listed the number in the space provided. This question was asked after the desired number of sexual partners but before the bipolar gender identity question.

Study 2a Results and Discussion

Self-Reported Sex Differences

A Mann-Whitney test was performed on the ranks of the desired number of sexual partners over the lifetime data. Replicating Study 1 and consistent with Buss and Schmidt's (1993) findings, males (M_R=46.73) reported desiring more sexual partners over the lifetime than females (M_R=37.38), Z=1.77, p=.035, one-tailed.

Also, men (M=8.00, SD=10.96) and women (M=7.95, SD=13.16) did not significantly differ in the average number of actual sexual partners they had to date, $t(88)$= .03, p=.97, Cohen's d=.0058.

Simple Correlations Among Predictors

Simple correlations showed that self-reported sex and gender identity were again highly correlated $r_s(79)$=.799, p<.001, but neither variable was highly correlated with the actual number of sexual partners to date, see Table 2.

Table 2 Simple correlations among self-reported sex, bipolar gender identity, and actual number of sexual partners, and desired number of partners for Study 2a.

Measure	2	3	4
1. Desired number of sexual partners	.157	.510**	.290**
2. Self-reported sex		−.024	.799**
3. Actual number of sexual partners			.136
4. Bipolar gender identity			

Self-reported sex was coded as female=0, male=1. Gender identity was scored ascending from "very feminine" (1) to "very masculine" (7). Actual number of partners was coded in ascending order. Desired number of sexual partners was coded in ascending order based on ranked data. The correlation coefficients are therefore derived from Spearman's rank correlation test (r_s). **Correlations are significant at p<.01 (two-tailed)

Contributions of Self-Reported Sex, Gender Identity, and Actual Number of Sexual Partners

Using Study 1's optimal scaling procedure, the three predictors of self-reported sex (nominal), actual number of sexual partners (ratio), and strength of gender identity (interval) were entered simultaneously into a regression analysis, predicting desired number of sexual partners (ordinal). The overall model was significant, $F(3,78)$=12.58, p<.001, Adjusted R^2=.30. Specifically, the actual number of sexual partners to date significantly predicted the desired number over the lifetime, β=.456, $F(1)$=32.50, p<.001, part correlation=.45, tolerance=.963, such that higher numbers of actual partners were related to higher numbers of desired partners. Bipolar gender identity was again significantly related to the desired number of sexual partners over the lifetime, β=.403, $F(1)$=7.36, p=.008, part correlation=.278, tolerance=.348, such that the more feminine a person identified, the fewer sexual partners he or she desired. Self-reported sex was again not significantly related to desired number of sexual partners, β=.186, $F(1)$=.78, p=.38, part correlation=.12, tolerance=.352.

Similar to Study 1, for this study at the midpoint on the bipolar gender identity scale (i.e., "equally masculine and feminine") females (M_R=7.25) desired more sexual partners than males (M_R=4.50), again illustrating that the observed correlation is not driven by men only identifying with masculinity and women only identifying with femininity.

Conclusions

Self-reported sex was again not significantly related to the desired number of sexual partners, and, moreover, showed a similar near-zero contribution to accounting for variance in this outcome as measured by the part correlation. Accordingly, it appears that self-reported sex is offering little to our understanding of this phenomenon. As the Study 2a results show, both the actual number of sexual partners to date and how strongly one identifies with masculinity-femininity both have significant relationships to the desired number of sexual partners. Relative to each other, the actual number of sexual partners to date has a larger contribution to this outcome (as measured by the part correlations) than bipolar masculine-feminine gender identity.

Study 2b Overview

Even though the bipolar gender identity effects from Study 1 replicated in Study 2a, and showed a statistically significant contribution to the desired number of sexual partners, the question remains: What exactly is the bipolar masculinity-femininity scale measuring? In order to answer this question, 90 participants completed both the bipolar

gender identity scale and a validated, two-dimensional gender identity scale, the Bem Sex Role Inventory (BSRI) (Bem 1981). As argued in the introduction, most theorists of gender identity recognize that masculinity and femininity are separate dimensions with independent variability possible on each. Accordingly, it is possible that using the purposefully impoverished bipolar scale assesses one of these dimensions more than the other.

Study 2b Method

Participants

Participants were 90 people (35 women, 33 men, 22 unspecified) from Eugene, OR. Participants were recruited from the surrounding community by students in a human sexuality class. No age information was collected for this sample.

Materials

Bem-Sex Role Inventory short form (BSRI) The BSRI short form is a 30-item questionnaire designed to assess participant's gender identity via a stereotype endorsement method (Bem 1981). Ten items measure the participant's personal endorsement of feminine stereotypes (e.g., "compassionate," "sympathetic") as part of one's self-concept, ten items measure the participant's personal endorsement of masculine stereotypes (e.g., "forceful," "independent") as a part of one's self-concept, and ten items are filler (e.g., "adaptable," "conceited") as a part of one's self-concept. Participants respond to each item on a 7-point likert scale, from 1 (*never or almost never true*) to 7 (*always or almost always true*). Different scoring strategies exist for the BSRI in order to create groups based on how gender schematic a person is (e.g., sex-typed, androgynous) (see Hoffman and Borders 2001). The proceeding analysis used the separate femininity and masculinity scores for each participant as two independent dimensions of gender identity, without creating groups of participants.

Bipolar Masculinity-Femininity Scale This scale is the same one used in both Study 1 and Study 2a. Participants simply indicated their position on a scale from "very feminine" to "very masculine."

Procedures

As in Studies 1 and 2a, participants in Study 2b were recruited by members of a human sexuality class. Based on pre-packaged distribution of the measures by this author to the students, half the participants completed the BSRI then bipolar masculinity-femininity scale, while the other half completed the bipolar masculinity-femininity scale then the BSRI. As based on directions to recruit one male and one female participant (see Study 1 Method), the order of completion was balanced across self-reported sex. Order of completion did not influence the results, $t<1$; consequently, the results are presented across order.

Study 2b Results and Discussion

Independence of Masculinity and Femininity Dimensions on the BSRI

In order to assess the assumption that masculinity and femininity are independent dimensions (Bem 1981), the subscales were correlated. Across the entire sample, masculinity and femininity scores on the BSRI were correlated near zero, $r(88)=.042$, $p=.63$, suggesting that the subscales are truly independent.

Relation of BSRI Subscales to the Bipolar Masculinity-Femininity Scale

A regression analysis was performed using the bipolar masculinity-femininity scale as the outcome and the separately scored masculinity and femininity scales from the BSRI as the predictor variables. The set of BSRI subscales significantly predicted responses on the bipolar masculinity-femininity scale, $F(2,85)=6.02$, $p=.004$, $R^2=.356$. Specifically, femininity scores on the BSRI were negatively correlated with the bipolar scale (which is scored ascending toward masculinity), $\beta=-.36$, $p=.001$, part correlation$=-.36$. Masculinity scores on the BSRI, however, were not significantly related to scores on the bipolar gender scale, $\beta=.004$, $p=.97$, part correlation$=.004$. Additionally, there was no collinearity issue with the BSRI subscales, tolerance$=.998$.

Furthermore, splitting the data by self-reported sex showed the same pattern of significant results for the BSRI femininity scale $\beta=-.51$ (women), $\beta=-.34$ (men) and the bipolar gender scale, though slightly stronger correlations were found for women than men. Likewise, splitting the data by self-reported sex showed the same non-significant correlation between BSRI masculinity scores and the bipolar scale, $\beta=.029$ (women), $\beta=.110$ (men).

It therefore appears that the bipolar masculinity-femininity scale is actually measuring feminine-identification for all participants more than masculine-identification. The results from Studies 1 and 2a can be clarified as illustrating the relationship between feminine-identification and the desired number of sexual partners. The more "feminine" a participant identifies, the fewer sexual partners she or he desires over the lifetime.

Study 3

In order to more convincingly demonstrate this relationship between feminine- identification and desired number of sexual partners, a new sample was recruited to complete the BSRI and the mate preference questions from Studies 1 and 2a. Masculine- identification might also contribute to the desired number of sexual partners, but this relationship cannot be examined in Study 1 or 2a because the bipolar scale used measured feminine-identification, not masculine-identification (see Study 2b). Using separate measures of masculine- and feminine-identification from the BSRI was therefore the best strategy to examine the relative relationships of gender identity to the "problem of number."

Method

Participants

Participants were 62 people (32 women, 28 men, 2 unspecified) from Lancaster, CA, Palmdale, CA, and surrounding areas in southern California. As in the previous studies, participants were recruited by students in a human sexuality class. The participants ranged in age from 18 to 64 years (M=35.4, Mdn=32, SD=13.4).

Materials

Bem Sex Role Inventory (BSRI) This 30-item scale measures participants' personal endorsement of masculine and feminine U.S. gender stereotypes as a measure of their gender identity. Separate femininity and masculinity scores were derived from responses (see Materials section of Study 2b for complete details).

Mate Preference Questionnaire Participants completed the questionnaire modeled after the measure used by Buss and Schmitt (1993) used in Studies 1 and 2a (see Method section for Study 1). The measure was exactly the same as in Study 2a, with the important exception that the bipolar gender identity scale was removed. The order of questions and the preamble remained the same.

Procedures

The procedure was identical to Studies 1 and 2a wherein participants privately completed the measures at their leisure and returned their responses in sealed envelopes separate from their consent forms to the student who approached them (See Study 1 Method for complete details). Based on pre-packing the questionnaires for distribution by this author, half the participants completed the BRSI before completing the mate preference questions and the other half completed the mate preference questions before completing the BSRI. Order was crossed by participant gender. Results showed that order of completion did not have any significant relationship to the response patterns. Accordingly, results are presented across the order variable.

As with Studies 1 and 2a, participants listed the number of desired sexual partners in a free-response format and responses ranged from "1" to "300+." Given the wide variability and open-ended responses, the data were converted to ranks for analysis.

Study 3 Results and Discussion

Desired number of Sexual Partners

Replicating Studies 1 and 2a, men and women differed in their desired number of sexual partners over the lifetime. Examining the ranks, men (M_R=38.89) indicated a significantly higher number of desired sexual partners than did women (M_R=23.16), Z=3.52, p<.001, one-tailed.

Actual Number of Sexual Partners to Date

Replicating Study 2a, men (M=9.82, SD=8.90) and women (M=7.15, SD=8.55) did not significantly differ in terms of their reported actual number of sexual partners to date, t(58)=1.18, p=.24, two-tailed.

Gender Identity and Actual Number of Sexual Partners Effects

In order to more stringently test the hypothesis that gender identity is driving, in part, the desired number of sexual partners over the lifetime, separate regression analyses were conducted for men and women. As with Study 2b, the BSRI femininity and masculinity subscales were correlated near zero in this sample, r(60)=−.062, p= .63, indicating that the dimensions are in fact independent. Regression results are presented below, separately for both men and women.

For men, the set of predictors was significantly related to the desired number of sexual partners, F(3,22)=6.88, p=.002, adjusted R^2=.414. Specifically, replicating Study 2a, the actual number of sexual partners to date was positively correlated with desired number of sexual partners, β=.679, F(1)=15.83, p=.001, part correlation=.609. As the number of actual sexual partners increased so did the number of desired sexual partners. Femininity scores on the BSRI were negatively correlated with desired number of sexual partners for male participants, β=−.421, F(1)=6.69, p=.017,

Table 3 Predictors of desired number of sexual partners over one's lifetime for Study 3.

Predictor	β	*F*	*sr*
Men			
Actual number of sexual partners	.679	15.83***	.609
Femininity score (BSRI)	−.421	6.69**	−.396
Masculinity score (BSRI)	−.397	5.79**	−.369
Women			
Actual number of sexual partners	.332	4.25*	.331
Femininity score (BSRI)	−.391	5.84**	−.338
Masculinity score (BSRI)	.096	.35	.096

Standardized beta weights (β), *F* values and semipartial correlations (*sr*) for each effect are listed for men and women separately. ***Effects are significant effect at $p<.001$. **Effects are significant effect at $p\leq.025$. *Effects are significant effect at $p<.05$. *BSRI* Bem Sex-Role Inventory

part correlation=−.396. As BSRI femininity scores increased, the number of desired sexual partners decreased. This finding replicates those from Studies 1 and 2a by showing that stronger feminine-identification predicts desiring fewer sexual partners. Finally, masculinity scores on the BSRI were negatively correlated with the desired number of sexual partners for male participants, β=−.397, $F(1)=5.79$, $p=.025$, part correlation=−.369. That is, as masculine-identification increased, desired number of sexual partners decreased (see Table 3).

For women, the set of predictors was also significantly related to the desired number of sexual partners, $F(3,27)=3.93$, $p=.019$, adjusted $R^2=.227$. Specifically, the actual number of sexual partners to date positively correlated with the desired number of sexual partners, β=.332, $F(1)=4.25$, $p=.049$, part correlation=.331. As the actual number of sexual partners increased so did the desired number of sexual partners. Femininity scores on the BSRI also negatively correlated with the desired number of sexual partners, β=−.391, $F(1)=5.84$, $p=.023$, part correlation=−.388. This finding also replicates those from Studies 1 and 2a by showing that stronger feminine-identification predicts desiring fewer sexual partners. Finally, masculinity scores on the BSRI were unrelated to desired number of sexual partners for female participants, β=.096, $F(1)=.35$, $p=.556$, part correlation=.096 (see Table 3).

Conclusions

Study 3 demonstrated that feminine gender identification appears to be the only gender identity dimension that is consistently correlated with desired number of sexual partners for both men and women. Masculine gender identification was not consistently related to desired number of sexual partners controlling for feminine-identification and actual number of sexual partners to date. For males, masculinity scores showed a significant negative correlation with desired number of sexual partners, but this effect was not as strong as the femininity scores or the actual number of sexual partners to date (as measured by the part correlation effect sizes). This negative correlation between masculine-identification and desired number of sexual partners was unexpected. However, one clue to the relationship may be the composition of the sample in Study 3. Most of the Study 3 sample (55.2%) identified as Christian, Jewish, or Muslim, while the remaining (44.8%) indicated no religious affiliation (i.e., atheist, agnostic, or none). For comparison, in Study 1 the religious affiliation as Christian, Jewish, or Muslim was only 32.8% with the remaining 68.2% indicating no religious affiliation. Aspects of religiosity have been found to moderate the relationship between masculine-identification and forgiveness (Hammond et al. 2006), for instance, in which men are more willing to engage in forgiveness as religiosity increases. It would not be surprising if a similar effect existed for desired number of sexual partners, even while the traditional sexual double standards that would predict masculine-identification would have a positive relationship to number of desired sexual partners (see Introduction). It may be that religiosity mediates the relationship between masculine identification and desired number of sexual partners, as it does for forgiveness and masculine identification. However, because no measures of masculine identification were given Studies 1 or 2a, this analysis is not possible with the current data sets.

Returning to the hypothesis that the self-reported sex differences in mean ranks are really a spurious correlation, one can examine men's and women's average scores on the BSRI femininity and masculinity subscales for this sample. For femininity scores, women ($M=5.48$, $SD=.94$) had a significantly higher average than men ($M=4.99$, $SD=.76$), $t(58)=2.21$, $p=.031$, two-tailed, Cohen's $d=.57$. For masculinity scores, women ($M=4.76$, $SD=.90$) and men ($M=4.98$, $SD=.75$) did not significantly differ, $t(58)=-1.03$, $p=.30$, two-tailed. Consequently, the mean rank differences by self-reported sex only indicate a difference in the *extent* to which the process is at work—no difference in the process itself. Because women *on average* have higher feminine-identification scores, the effect is most pronounced for this group, thereby creating the mean rank difference by self-reported sex. However, the regression results within each group show that feminine-identification negatively correlates with desired number of sexual partners for both men and women with comparable effect sizes (part correlations −.388 [women] and −.396 [men]). The self-reported sex differences in desired number of sexual partners is therefore only an artifact of feminine-identification being higher on average in female participants, which may be a further artifact of the BSRI itself.

General Discussion

Across Studies 1 and 2a, self-reported sex was not significantly related to the desired number of sexual partners when feminine-identification (as measured by the bipolar masculinity-femininity scale) (Studies 1 and 2a) or actual number of sexual partners (Studies 2a and 3) was taken into account. Furthermore, when two-dimensional gender identity as measured by the BSRI (Study 3) were considered, feminine gender identification predicted desired number of sexual partners over the lifetime in both male and female participants. Buss and Schmitt's (1993) evolutionary model cannot account for the pattern of findings obtained here. Even though Buss (1998), in what he calls an evolutionary-interactionist account, claims that culture can suppress the activation of evolved strategies, this reasoning would still predict a non-zero β and higher part correlation than .076 or. 12. That is, when taking "culture" into account and partialling out variance due to it, there should be some meaningful relationship of self-reported sex to this outcome. Yet, in order to save this account, one might argue that the high simple correlations between strength of bipolar gender identity and self-reported sex across Studies 1 and 2a (r_s=.849 and .799, respectively) mask the true effect of the latter. In response to this argument, there are two counterpoints. First, even if one believes that bipolar gender identity cannot be sufficiently disentangled from self-reported sex, the results of Study 2a provide damning evidence against self-reported sex effects. The actual number of sexual partners to date did not meaningfully differ by self-reported sex (Cohen's d=.0058) and the two variables were only correlated at .075 (see Table 2) with a tolerance of .963. Thus, the experiential variable appears to be a more important factor than the presumed genetic one, as it accounts for more variability in the desired number of sexual partners than either bipolar gender identity or self-reported sex. Experiential factors are arguably not part of an evolutionary account because they are acquired characteristics during the lifespan of the organism and therefore not heritable. Even though Buss et al. (1992) argue that experience can activate jealousy-specific evolved mechanisms, the collection of arguments put forth then and in later writings (e.g., Buss 1998) are not clear about when or which experiences activate or suppress these mechanisms. In this case, it is advisable to treat experiences as separable from genetic activations until accounts of their relationships can be adequately defined and tested.

Second, Study 3 showed that *within* self-reported sex increasing personal endorsement of feminine gender stereotypes as measured by the BSRI was negatively related to the desired number of sexual partners for both men and women (even while actual number of sexual partners had a stronger relationship for both men and women). Accordingly, the same psychosocial process has been illustrated for both men and women at comparable effect sizes. These results therefore suggest that self-reported sex does little to help us understand the desired number of sexual partners over a person's lifetime when considering experiential and psychosocial variables, and may in fact mask important relationships.

Considering the masking of relationships, the studies presented above also provide an alternative explanation to Buss and Schmitt's (1993) interpretation of the role of self-reported sex in the problem of number. Specifically, because (a) bipolar gender identity tends to correlate highly with self-reported sex (Studies 1 and 2a), (b) women and men differ on average in terms of feminine-identification on the BSRI (Study 3), and (c) feminine-identification accounts for differences in desired number of mates better than self-reported sex overall (Studies 1 and 2a) and within both male and female participants (Study 3, see Table 3), a spurious correlation has been demonstrated. Buss and Schmitt (1993) appear to have incorrectly concluded that the difference between men and women in their data was due to the presumed genetic differences in sex chromosomes. Instead, the Buss and Schmitt (1993) findings may result from a gender identity difference in terms of average endorsement of feminine gender stereotypes.

The demonstration of the correlation between gender identity and self-reported sex illustrates the importance of conducting research that examines both psychosocial and presumed genetic factors simultaneously. Without simultaneous assessment, uncovering this correlation would be impossible, and, consequently, researchers would not have a nuanced understanding of the relationship between psychosocial and (presumed) genetic factors. Future research should examine how gender identity is related to other topics within evolutionary psychology. For instance, are self-reported sex differences in short-term mating strategies more attributable to gender identity (e.g., high femininity identification) or to presumed genetic sex differences? Are differences between self-reported sexes on jealousy measures also evidence of a spurious correlation with gender identity?

In addition to showcasing the importance of psychosocial variables, the present investigation also highlights the importance of experiential factors (e.g., actual number of sexual partners to date) in predicting aspects of mate preference. Studies 2a and 3 show that the actual number of sexual partners people reported having to date predicted their desired number of sexual partners better than the psychosocial variable of feminine gender identification. Moreover, there was no difference between men and women in the average number reported (Studies 2a and 3), and this variable predicted desired number of sexual partners for both men and women separately (Study 3). Accordingly, the interplay of actual experiences and

identities appears important for characterizing mate preference. Experiential factors should be further probed for their potential relationships to other topics in the mate preference literature.

Reaction to Potential Evolutionary Psychology Critiques

One might critique this investigation by pointing out the asymmetry between the focus on psychosocial and presumed evolutionary variables. In particular, one could argue that gender identity was assessed using validated scales with relatively better measurement precision than the bipolar scale in the subsequent studies but that self-reported sex was not given a comparably more precise measurement (e.g., actual genetic analysis). While this point is true, two important counterpoints are offered. One, the results of this investigation pointed toward more specific probing of gender identity from the outset by the strong and replicated effects of even the impoverished proxy of the bipolar masculine-feminine scale in Studies 1 and 2a. Self-reported sex, in contrast, continued to show near zero correlations with outcome. It would be unscientific to not further probe significant relationships.

Two, although Sexual Strategies Theory (Buss 1998; Buss and Schmitt 1993) argues that men and women have evolved different mating strategies and that these strategies are genetically encoded, it offers no precise predictions as to the locus of these genetic effects. One might reasonably assume that sex chromosomes are the locus (as these are regularly the implied referent), however what predictions should one expect in terms of XX/XY differences? Are mate preferences Y-chromosome linked or X-chromosome linked? If "male-type" preferences (e.g., desires for youthful sexual partners) are X-chromosome linked and expressed because the Y-chromosome does not provide an arm with a different allele to suppress expression, then it should be possible for women to express these same preferences if they have two copies of the appropriate allele on both X-chromosomes. Until models such as Sexual Strategies Theory make more precise predictions about the locus of genetic differences, it would be premature to examine such a level of analysis.

The findings of the present investigation and other studies (e.g., Eagly et al. 2004; Kasser and Sharma 1999; Strasberg and Holty 2003) provide an impetus for evolutionary theories of gender differences to be more precise with their genetic models and corresponding genetic predictions. It has never been tenable for such positions to be so imprecise (see Miller et al. 2002); yet, now, precision in models of evolutionary psychology is timely because a growing body of research on psychosocial and sociocultural variables is providing efficacious alternative accounts to presumed evolutionary effects. Moreover, with improved precision, evolutionary accounts would avoid certain falsification critiques and might even converge on the same behavioral effects as psychosocial positions but via genetic relationships (cf. Miller et al. 2002).

Coda

In summary, distinguishing between gender identity and self-reported sex, and including both variables in the research design and analysis, provides a useful method to test claims about evolutionary, psychosocial, and experiential processes. Such simultaneous inclusion identifies the relative contributions of each variable within the same individuals in the same investigation. In this way, researchers can merge theory and method to create a coherent and sophisticated understanding of how biology, culture, and individual experience operate independently and together to create the complexities of human mate preferences.

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References

Archer, J. (1996). Sex differences in social behavior: Are the social role and evolutionary explanations compatible? *American Psychologist, 51*, 909–917.

Ashmore, R. D. (1990). Sex, gender, and the individual. In L. A. Pervin (Ed.), *Handbook of personality theory and research* (pp. 486–526). New York: Guilford.

Bem, S. L. (1974). The measurement of psychological androgyny. *Journal of Consulting and Counseling Psychology, 42*, 155–162.

Bem, S. L. (1981). Gender schema theory: A cognitive account of sex typing. *Psychological Review, 88*, 354–364.

Bem, S. L. (1985). Androgyny and gender schema theory: A conceptual and empirical integration. In T. B. Sonderegger (Ed.), *Nebraska symposium on motivation: Psychology of gender* (pp. 179–226). Lincoln: University of Nebraska Press.

Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Brain and Behavioral Sciences, 12*, 1–14.

Buss, D. M. (1995). Psychological sex diffences: Origins through sexual selection. *American Psychologist, 50*, 164–168.

Buss, D. M. (1998). Sexual strategies theory: Historical origins and current status. *The Journal of Sex Research, 35*, 19–31.

Buss, D. M., Larsen, R. J., Westen, D., & Semmelroth, J. (1992). Sex differences in jealousy: Evolution, physiology, and psychology. *Psychological Science, 3*, 251–255.

Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review, 100*, 204–232.

Buss, D. M., et al. (1990). International preferences in selecting mates: A study of 37 cultures. *Journal of Cross-Cultural Psychology, 21*, 5–47.

Clarnette, T., Sugita, Y., & Hutson, J. (1997). Genital anomalies in human and animal models reveal the mechanisms and hormones governing testicular descent. *British Journal of Urology, 79*, 99–112.

Constantinople, A. (1973). Masculinity-femininity: An exception to the famous dictum? *Psychology Bulletin, 80*, 389–407.

Eagly, A. H. (1987). *Sex differences in social behavior: A social-role interpretation*. Hillsdale: Erlbaum.

Eagly, A. H. (1997). Sex differences in social behavior: Comparing social role theory and evolutionary psychology. *American Psychologist, 52*, 1380–1383.

Eagly, A. H., & Wood, W. (1999). The origins of sex differences in human behavior: Evolved dispositions versus social roles. *American Psychologist, 54*, 408–423.

Eagly, A. H., Wood, W., & Diekman, A. (2000). Social role theory of sex differences and similarities: A current appraisal. In T. Eckes & H. M. Trautner (Eds.), *The developmental social psychology of gender* (pp. 123–174). Mahwah: Erlbaum.

Eagly, A. H., Wood, W., & Johannesen-Schmidt, M. C. (2004). Social role theory of sex differences and similarities: Implications for the partner preferences of women and men. In A. H. Eagly, A. Beall, & R. J. Sternberg (Eds.), *The psychology of gender* (2nd ed., pp. 269–295). New York: Guilford.

Edwards, V. J., & Spence, J. T. (1987). Gender-related traits, stereotypes, and schemata. *Journal of Personality and Social Psychology, 53*, 146–154.

Friedman, J. H. (1991). Multivariate adaptive regression splines. *Annals of Statistics, 19*, 1–141.

Glick, P., & Fiske, S. T. (1996). The Ambivalent Sexism Inventory: Differentiating hostile and benevolent sexism. *Journal of Personality and Social Psychology, 70*, 491–512.

Glick, P., & Fiske, S. T. (1997). Hostile and benevolent sexism: Measuring ambivalent sexist attitudes toward women. *Psychology of Women Quarterly, 21*, 119–135.

Glick, P., & Fiske, S. T. (1999). The Ambivalence toward Men Inventory: Differentiating hostile and benevolent beliefs about men. *Psychology of Women Quarterly, 23*, 519–536.

Gravholt, C., Juul, S., Naera, R., & Hansen, J. (1998). Morbidity in Turner syndrome. *Journal of Clinical Epidemiology, 51*, 147–158.

Hammond, W. P., Banks, K. H., & Mattis, J. S. (2006). Masculinity ideology and forgiveness of discrimination among African American men: Direct and interactive relationships. *Sex Roles, 55*, 679–692.

Harris, C. R. (2003). A review of sex differences in sexual jealousy, including self-report data, psychophysiological responses, interpersonal violence, and morbid jealousy. *Personality & Social Psychology Review, 7*, 102–128.

Hines, M., Ahmed, S., & Hughes, I. (2003). Psychological outcomes and gender-related development in complete androgen insensitivity syndrome. *Archives of Sexual Behavior, 32*, 93–101.

Hoffman, R. M., & Borders, L. D. (2001). Twenty-five years after the Bem Sex-Role Inventory: A reassessment and new issues regarding classification variability. *Measurement and Evaluation in Counseling and Development, 34*, 39–55.

Imperato-McGinley, J., Peterson, R., Gautier, T., & Sturla, E. (1979). Androgens and the evolution of male gender identity among male pseudohermaphrodites with 5-alpha-reductase deficiency. *New England Journal of Medicine, 300*, 1233–1237.

Johannesen-Schmidt, M. C., & Eagly, A. H. (2002). Another look at sex differences in preferred mate characteristics: The effects of endorsing the traditional female gender role. *Psychology of Women Quarterly, 26*, 322–328.

Kasser, T., & Sharma, Y. S. (1999). Reproductive freedom, education equality, and females' preference for resource-acquisition characteristics in mates. *Psychological Science, 10*, 374–377.

Kenrick, D. T., Groth, G. E., Trost, M. R., & Sadalla, E. K. (1993). Integrating evolutionary and social exchange perspectives on relationships: Effects of gender, self appraisal, and involvement level on mate selection criteria. *Journal of Personality and Social Psychology, 64*, 951–969.

Kruse, R., Guttenbach, M., Schartmann, B., Schubert, R., van der Ven, H., Schmid, M., et al. (1998). Genetic counseling in a patient with XXY/XXXY/XY mosaic Klinfelter's syndrome: Estimates of sex chromosome aberrations in sperm before intracytoplasmic sperm injection. *Fertility and Sterility, 69*, 482–485.

Laumann, E., Ganon, J., Michael, R., & Michael, S. (1994). *The social organization of sexuality: Sexual practices in the United States*. Chicago: University of Chicago Press.

Leitenberg, H., & Henning, K. (1995). Sexual fantasy. *Psychological Bulletin, 117*, 469–496.

Levitan, M., & Montagu, A. (1977). *A textbook of human genetics* (2nd ed.). New York: Oxford University Press.

Marks, M. J., & Fraley, R. C. (2005). Sexual double-standard: Fact or fiction? *Sex Roles, 52*, 175–186.

Markus, H., Crane, M., Bernstein, S., & Siladi, M. (1982). Self-schemas and gender. *Journal of Personality and Social Psychology, 42*, 38–50.

McGuire, W. J. (2004). A perspectivist approach to theory construction. *Personality and Social Psychology Review, 8*, 173–182.

Milhausen, R., & Herold, E. (1999). Does the sexual double standard still exist? Perceptions of university women. *Journal of Sex Research, 36*, 361–368.

Miller, L. C., Putcha-Bhagavatula, A., & Pedersen, W. C. (2002). Men's and women's mating preferences: Distinct evolutionary mechanisms? *Current Directions in Psychological Science, 11*, 88–93.

Myers, A. M., & Gonda, G. (1982). Empirical validation of the Bem Sex Role Inventory. *Journal of Personality and Social Psychology, 43*, 304–318.

O'Sullivan, L. (1995). Less is more: The effects of sexual experience on judgements of men's and women's personality characteristics and relationship desirability. *Sex Roles, 33*, 159–181.

Pedersen, W. C., Miller, L. C., Putcha-Bhagavatula, A. D., & Yang, Y. (2002). Evolved sex differences in the number of partners desired? The long and the short of it. *Psychological Science, 13*, 157–161.

Rozenboom, W. W. (1997). Good science is abductive, not hypothetico-deductive. In L. L. Harlow, S. A. Mulaik, & J. H. Steiger (Eds.), *What if there were no significance tests?* (pp. 335–392). Mahwah: Lawrence Erlbaum.

Schmitt, D. P. (2003). Universal sex differences in desire for sexual variety: Tests from 52 nations, 6 continents, and 13 islands. *Journal of Personality and Social Psychology, 85*, 85–104.

Spence, J. T. (1984). Masculinity, femininity, and gender-related traits: A conceptual analysis and critique of current research. In B. A. Maher & W. Maher (Eds.), *Progress in Experimental Research* (Vol. 13, pp. 2–97). New York: Academic.

Spence, J. T. (1985). Gender identity and its implications for the concepts of masculinity and femininity. In T. B. Sonderegger (Ed.), *Nebraska symposium on motivation: Psychology of gender* (pp. 59–96). Lincoln: University of Nebraska Press.

Spence, J. T., Helmreich, R. L., & Stapp, J. (1975). Ratings of self and peers on sex role attributes and their relations to self-esteem and concepts of masculinity and femininity. *Journal of Personality and Social Psychology, 32*, 29–39.

Strasberg, D. S., & Holty, S. (2003). An experimental study of women's Internet personal ads. *Archives of Sexual Behavior, 32*, 253–260.

Symons, D. (1979). *The evolution of human sexuality*. New York: Oxford University Press.

Thomas, N. S., Ennis, S., Sharp, A. J., Durkie, M., Hassold, T. J., Collins, A. R., et al. (2001). Maternal sex chromosome non-disjunction: Evidence for X-chromosome specific risk factors. *Human Molecular Genetics, 10*, 243–250.

Trivers, R. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man* (pp. 136–179). Chicago: Aldine-Atherton.

Trivers, R. (1985). *Social evolution*. Menlo Park: Benjamin/Cummings.

Wood, W., & Eagly, A. H. (2002). A cross-cultural analysis of the behavior of men and women: Implications for the origins of sex differences. *Psychological Bulletin, 128*, 699–727.

Zucker, K., Bradley, S., Oliver, G., Blake, J., Fleming, S., & Head, A. (1996). Psychosexual development of women with congenital adrenal hyperplasia. *Hormones and Behavior, 30*, 300–318.