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MONEY AND SEX, THE ILLUSORY UNIVERSAL SEX DIFFERENCE: Comment on Kanazawa

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Kanazawa tests the hypothesis, derived from Evolutionary Psychology, that men's income enhances their ability to engage in copulation with more partners and at a greater frequency. However, the results presented in Kanazawa's article fail to appropriately test for interaction effects and some of the analyses may suffer from sample-selection bias. I reestimate the equations appearing in Kanazawa's study and find (given the author's original methodological decisions) evidence in support of the evolutionary prediction in only two of the four original analyses. Had the same methodological decisions been consistently applied in the original study, then only one of the four analyses provides very weak evidence in favor of a sex difference in the returns to income. Furthermore, I conduct cross-national analyses with International Social Survey Program data from four other industrialized nations: Australia, Bulgaria, Ireland, and Poland. In only one of the nations (Ireland) and for only two of the four dependent variables is there any compelling evidence that men with higher incomes have more sex partners. Since the term "sex partner" may be ambiguous, I also use data from the National Health and Social Life Survey where detailed questions were asked that may better measure evolutionarily significant forms of copulation. The data are not consistent with the evolutionary psychological theory of sexual behavior.

> In science, the value of negative findings—failures—cannot be overemphasized. Usually they are not wanted, and often they are not published. But most of the time failures are how we get closer to the truth. (Shermer: 2002, p. 53)

Evolutionary Psychology (EP), an evolving descendant of sociobiology, has seen renewed attention from social scientists. In sociology, this is manifested by the recent and growing number of theoretical statements and empirical articles concerning EP (Biblarz and Raftery 1999; Freese and Powell 1999; Lopreato and Crippen 1999) and a doctoral dissertation on the topic being awarded the dissertation prize by the American Sociological Association (Freese 2000). Such is welcome, as the debates have moved away from differences in purely theoretical viewpoints and the attribution of malign political motives to the arena of empirical hypothesis testing.

RESOURCES AND REPRODUCTION IN POSTINDUSTRIAL SOCIETIES

One of the leading proponents of evolutionary psychological theory both within and outside of sociology is Kanazawa (e.g., Kanazawa and Still 2000; Kanazawa 2001; 2004).

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As such, Kanazawa (2003) tests a hypothesis derived from EP on the link between men's resources and their reproductive behavior. The need for this test stems from the observation by Vining (1986) of an inverse correlation between economic wealth and number of children in industrialized societies. Such a correlation appears, on its face, in direct opposition to one of the core theoretical predictions of EP such that Vining (1986) deemed it "the central theoretical problem of sociobiology." Using insights from EP, Perusse (1993) later investigated this hypothesis with a snowball sample of French Canadians at two universities in Quebec. The results of his study showed that high-status males did not have higher known fertility rates (greater numbers of offspring), but at ages less than 40, high-status males had a greater number of potential conceptions (sex partners). If modern contraception did not exist, then their greater number and frequency of sexual encounters with various partners would have resulted, probabilistically, in a greater number of offspring—the central measure of reproductive success (Perusse 1993).

Kanazawa (2003) identified three methodological deficits inherent in Perusse's analysis, which motivated his own analysis. Perusse used a snowball sample based on people from two universities in Quebec (sample selection bias), his sample size was very small (total sample size is 433 with analyses conducted on very small subsets of this sample), and the analysis used correlation coefficients (potential spuriousness). Kanazawa attempted to solve these problems by using seven consecutive waves of the General Social Survey (GSS) (random sample), pooling the waves to produce a sample size of several thousand, and using linear regression analysis with control variables to avoid the potential spuriousness of bivariate correlation analysis.

Kanazawa (2003) examined the influence of men's income on both the number of female sex partners and the frequency of sex in the previous 12 months.[1] From this analysis, Kanazawa concluded, "the results in Table 1 demonstrate that income increases both *n* (the total number of sex partners) and Pi (the number of coital acts per partner)" (Kanazawa 2003:296). In the next set of analyses reported in Table 2 of his article, Kanazawa estimated the impact of currently unmarried men's income on their number of sex partners in the past five years and number of sex partners in the past year. In Table 3, he presents the results for the same analyses for women as well. From these tests the author concluded, "Men's income has a significantly positive effect on both ($p < .01$ for 5 years, $p < .05$ for 12 months). Consistent with modern EP, currently unmarried women's income has no effect on the number of sex partners in the last 5 years or 12 months (Table 3)" (Kanazawa 2003:296).

GETTING THE RIGHT TYPE OF "SEX" AND TESTING FOR INTERACTION

While Kanazawa (2003) claimed there was a sex difference in the effects of income on number of sex partners and coital acts, the analyses reported in his article do not provide any formal statistical test to determine whether or not the difference is due to chance. An appropriate means of doing so would be to pool men and women into a common model, add a dummy for sex, and an interaction term for income by sex. If the interaction term

TABLE 1. The Effect of Men's and Women's Income on the Lifetime Number of Sex Partners and Frequency of Sex in the Last 12 Months, U.S. General Social Surveys, 1989–1996

	Lifetime Number of Opposite-Sex Sex Partners				Frequency of Sex in the Last 12 Months			
	Men (1)	Women (2)	Pooled (3)	Interaction (4)	Men (1)	Women (2)	Pooled (3)	Interaction (4)
Income × Male				0.224*				0.008
				(1.98)				(0.97)
Income	0.280*	0.155***	0.185**	0.082	.020**	0.015**	0.015***	0.012*
	(2.46)	(3.72)	(3.23)	(1.05)	(3.28)	(2.64)	(3.75)	(2.10)
Male			8.511***	5.772***			0.175***	0.080
			(14.36)	(3.84)			(4.18)	(0.75)
Age	0.305***	0.004	0.145***	0.143***	−.040***	−0.058***	−0.049***	−0.049***
	(6.82)	(0.26)	(6.18)	(6.10)	(17.04)	(24.97)	(30.02)	(30.04)
Race (black = 1)	5.624**	−1.393*	1.485	1.500	0.672***	0.181*	0.380***	0.380***
	(2.87)	(2.12)	(1.56)	(1.58)	(6.79)	(2.09)	(5.85)	(5.85)
Marital Status (Currently Married = 1)	−7.785***	−3.264***	−4.797***	−4.976***	1.080***	1.365***	1.264***	1.258***
	(6.76)	(7.66)	(8.25)	(8.45)	(17.75)	(23.77)	(30.65)	(30.17)
Catholic	−4.062*	−5.346***	−4.732***	−4.770***	−0.060	0.036	−0.029	−0.030
	(2.29)	(6.14)	(4.57)	(4.61)	(0.64)	(0.31)	(0.39)	(0.41)
Protestant	−5.508**	−4.244***	−4.954***	−5.016***	−0.206*	−0.070	−0.160*	−0.162*
	(3.42)	(5.22)	(5.20)	(5.26)	(2.41)	(0.65)	(2.36)	(2.39)
Jewish	10.825**	−1.492	4.703*	4.636*	0.128	0.267	0.173	0.171
	(2.75)	(0.87)	(2.15)	(2.12)	(0.60)	(1.16)	(1.11)	(1.10)
Other	4.393	−3.936**	0.501	0.408	0.067	0.020	0.035	0.031
	(1.47)	(2.86)	(0.29)	(0.24)	(0.42)	(0.11)	(0.29)	(0.26)
Constant	5.988	9.257	3.819	5.121	4.210	4.610	4.363	4.408
	(2.56)	(8.80)	(2.90)	(3.49)	(33.92)	(32.79)	(46.94)	(42.43)
R^2	0.040	0.036	0.063	0.063	0.150	0.260	0.211	0.211
BIC'			−341.529	−336.694			−1448.316	−1440.489
N	3,181	3,319	6,500	6,500	3,181	3,277	6,458	6,458

Note: Unstandardized regression coefficients |*t*-statistic| in parentheses. Columns with (1) duplicate results reported in Kanazawa (2003).
*p < .05, **p < .01, ***p < .001 (two-tailed tests).

TABLE 2. The Effect of Men's and Women's Income on the Number of Sex Partners in the Last Five Years, U.S. General Social Surveys, 1991–1996

	Currently Unmarried				All Marital Statuses			
	Men (1)	Women (2)	Pooled (3)	Interaction (4)	Men (5)	Women (6)	Pooled (7)	Interaction (8)
Income × Male				0.036**				0.002
				(2.75)				(0.24)
Income	0.035**	0.001	0.019**	0.002	.006	−0.005	−0.005	−0.006
	(3.08)	(0.17)	(2.76)	(0.17)	(0.88)	(1.14)	(1.29)	(1.11)
Male			0.947***	0.520**			0.673***	0.650***
			(13.31)	(3.04)			(16.62)	(6.22)
Age	−0.048***	−0.055***	−0.051***	−0.051***	−0.036***	−0.041***	−0.040***	−0.040***
	(9.75)	(17.64)	(18.51)	(18.56)	(13.81)	(21.71)	(24.51)	(24.50)
Race (black = 1)	1.028***	−0.113	0.317**	0.306**	0.784***	−0.513	0.278***	0.278***
	(5.57)	(1.08)	(3.25)	(3.14)	(7.30)	(0.73)	(4.45)	(4.44)
Marital Status (Currently Married = 1)					−1.426***	−0.755***	−1.044***	−1.046***
					(21.26)	(16.29)	(26.23)	(25.98)
Catholic	−0.399*	−0.519**	−0.450***	−0.457***	−0.336**	−0.438***	−0.381***	−0.381***
	(2.28)	(3.42)	(3.90)	(3.96)	(3.26)	(4.72)	(5.42)	(5.42)
Protestant	−0.549**	−0.563***	−0.547***	−0.553***	−0.360***	−0.427***	−0.407***	−0.407***
	(3.45)	(4.04)	(5.19)	(5.26)	(3.83)	(4.93)	(6.29)	(6.29)
Jewish	0.697	0.169	0.426	0.421	0.305	−0.010	0.160	0.160
	(1.59)	(0.53)	(1.60)	(1.58)	(1.29)	(0.05)	(1.08)	(1.08)
Other	−0.599	−0.336	−0.429*	−0.431*	−0.216	−0.313*	−0.270*	−0.270*
	(1.87)	(1.51)	(2.28)	(2.29)	(1.24)	(2.22)	(2.39)	(2.39)
Constant	4.777	4.710	4.264	4.467	4.644	4.129	4.130	4.141
	(21.04)	(26.46)	(28.51)	(26.81)	(33.83)	(36.26)	(45.77)	(40.82)
R^2	0.117	0.220	0.223	0.226	0.286	0.246	0.279	0.279
BIC'			−566.096	−565.839			−1644.453	−1635.938
N	1,114	1,372	2,486	2,486	2,572	2,702	5,274	5,274

Notes: Unstandardized regression coefficients |*t*-statistic| in parentheses. Columns (1) and (2) duplicate results reported in Kanazawa (2003).
*p < .05, **p < .01, ***p < .001 (two-tailed tests).

TABLE 3. The Effect of Men's and Women's Income on the Number of Sex Partners in the Last 12 Months, U.S. General Social Surveys, 1988–1996

	Currently Unmarried				All Marital Statuses			
	Men (1)	Women (2)	Pooled (3)	Interaction (4)	Men (5)	Women (6)	Pooled (7)	Interaction (8)
Income × Male				0.012				−0.002
				(1.48)				(0.47)
Income	0.015*	0.001	0.007	0.002	0.003	−0.001	−0.004	−0.003
	(1.98)	(0.26)	(1.77)	(0.31)	(0.84)	(0.48)	(1.74)	(0.96)
Male			0.585***	0.453***			0.342***	0.366***
			(14.02)	(4.61)			(15.97)	(6.82)
Age	−0.029***	−0.027***	−0.027***	−0.028***	−0.014***	−0.018***	−0.017***	−0.017***
	(9.22)	(17.84)	(17.30)	(17.35)	(9.75)	(20.41)	(20.33)	(20.30)
Race (black = 1)	0.719***	0.123*	0.339***	0.338***	0.458***	0.130***	0.246***	0.247***
	(6.05)	(2.36)	(5.96)	(5.95)	(7.65)	(3.89)	(7.42)	(7.41)
Marital Status (Currently Married = 1)					−0.557***	0.022	−0.237***	0.235***
					(15.01)	(0.99)	(11.27)	(11.06)
Catholic	−0.178	−0.318***	−0.242***	−0.243***	−0.121*	−0.251***	−0.180***	−0.180***
	(1.57)	(4.04)	(3.52)	(3.53)	(2.10)	(5.49)	(4.77)	(4.76)
Protestant	−0.357**	−0.318***	−0.324***	−0.326***	−0.168**	−0.244***	−0.213***	−0.213***
	(3.46)	(4.38)	(5.14)	(5.17)	(3.19)	(5.69)	(6.11)	(6.09)
Jewish	0.144	−0.245	−0.069	−0.070	0.052	−0.169*	−0.055	−0.055
	(0.50)	(1.59)	(0.45)	(0.46)	(0.39)	(1.97)	(0.70)	(0.69)
Other	−0.265	−0.442***	−0.354**	−0.354**	−0.151	−0.316***	−0.240***	−0.239***
	(1.28)	(3.71)	(3.09)	(3.10)	(1.55)	(4.40)	(3.88)	(3.86)
Constant	2.715	2.350	2.233	2.297	2.248	1.943	1.997	1.986
	(18.83)	(25.86)	(25.43)	(23.50)	(29.85)	(35.43)	(42.03)	(37.43)
R^2	0.078	0.162	0.161	0.161	0.127	0.113	0.121	0.121
BIC'			−569.889	−563.879			−933.663	−924.918
N	1,615	2,010	3,625	3,625	3,865	3,997	7,862	7,862

Notes: Unstandardized regression coefficients |*t*-statistic| in parentheses. Columns (1) and (2) duplicate results reported in Kanazawa (2003).
*p < .05, **p < .01, ***p < .001 (two-tailed tests).

is positive and statistically significant, then it supports the evolutionary account. If the interaction term is not significant, then there is no evidence at hand for this particular evolutionary claim.

Another problem is the use of data from a single national entity. American society may conform to some evolutionary psychological ideas more than other societies while it may conform less to still other patterns predicted by EP. Still some subsamples of American society may conform or fail to conform to various ideas derived from EP. In Kanazawa's analyses, a shift is made from estimating the equation on all male respondents, when the dependent variable is lifetime number of sex partners and frequency of sex in the last 12 months (Kanazawa 2003; Table 1), to restricting the sample to currently unmarried men and currently unmarried women in the analyses of number of sex partners in the last 5 years and last 12 months (Kanazawa 2003; Tables 2 and 3). Importantly, there is no theoretical reason or scope condition provided by the author for deciding to analyze the full sample for the first two dependent variables and the restricted (currently unmarried) sample for the other two dependent variables.[2] However, the author made a methodological improvement by using a large national random sample (GSS), which is better than the convenience samples available to previous researchers who have investigated this hypothesis.

A third problem is that some of the measures used by Kanazawa (2003) suffer from the potential problem of evolutionary relevance. The first measure the author uses seems defensible on EP grounds (men's lifetime number of *female* sex partners). Other measures do not provide information on the sex of sex partners (frequency of sex in the last 12 months, number of sex partners in the last 5 years and last 12 months). These latter three measures may pose problems because gay sex cannot produce offspring coupled with the empirical fact that gay men report high numbers of sex partners (Laumann et al. 1994).[3] Additionally, the term "sex partner" may have different connotations for different respondents. Some men may count fellatio as "sex" while women may discount such acts and only report vaginal intercourse (Stinchcombe 1995). In Laumann et al.'s (1992) National Health and Social Life Survey (NHSLS) the correlation coefficient between men's number of lifetime female sex partners and their lifetime number of vaginal intercourse partners is .332 ($p < .001$).[4] Such a weak correlation may suggest to some readers that lifetime sex partners may not be adequately capturing the form of intercourse that is most conducive to procreation. From an evolutionary perspective, vaginal intercourse seems to be the most germane behavioral expression of the cognitive mechanism under consideration. If women are explicitly selecting men who have large amounts of resources in industrial societies (high incomes), then we should expect men with high incomes to be engaged in vaginal intercourse with more partners than men with lower incomes.

TESTING FOR INTERACTION BETWEEN INCOME AND SEX

In the first section of this comment, I (1) duplicate Kanazawa's (2003) original analyses, (2) estimate the same equation for women, (3) estimate an equation for the pooled

sample of men and women including a dummy for sex, and then (4) test the hypothesis that men's income increases their number of sex partners and coital frequency by estimating an equation with an interaction term. All coding decisions and variable transformations are identical to those used by Kanazawa (2003).[5] In contrast to Kanazawa, for the analyses of the number of sex partners in the last 5 years and last 12 months, I provide estimates based not only on the sample restricted to currently unmarried respondents, but also provide comparison estimates based on the full sample to assess the impact of this impromptu analytical decision on the original study's conclusions.

Men's and Women's Income and Number of Sex Partners

Since the EP prediction suggests that income should enhance men's access to mates and should allow men to copulate more frequently (because women choose to mate with them), then in a pooled regression analysis of men and women, we should observe a positive coefficient for an interaction term between sex and income (where sex is a dummy variable for men). Table 1 presents the results from this exercise.

The first four models estimate the impact of income and control variables on the lifetime number of opposite-sex sex partners using GSS data. Column (1) presents Kanazawa's original results, estimating the impact of men's income on their number of lifetime female sexual partners. Column (2) in Table 1 presents this same equation estimated on the corresponding female sample. Though unreported in Kanazawa (2003), women's income also has a positive effect on their number of male sex partners since the age of 18. Column (3) estimates an equation on the pooled sample of men and women including a dummy for sex (Male = 1). The main effect is positive and statistically significant.

A stronger test of the evolutionary prediction that men's income enhances their number of sex partners since the age of 18 is to estimate a model with an interaction term. Column (4) in Table 1 tests the hypothesis that the effect of income on the number of sex partners varies by sex. Consistent with the EP prediction, the interaction term is positive and statistically significant. The slope for men equals .306 and .082 for women. Some critics might aver that the p-value for the interaction term is quite small, given the sample size of 6,500 cases. In fact, the p-value for the interaction term, corresponding to the *t*-statistic of 1.98 equals .047.

Another way to judge the marginal explanatory value of including the interaction term would be to use some criterion that assesses the predictive value of the model relative to the number of independent variables needed to achieve it. The popular criterion in sociology and statistics is the Bayesian Information Criterion (BIC, see Raftery 1995). Therefore, one might compare the BIC statistics between the pooled models with and without the interaction term.

I report the BIC' statistic to allow readers to gauge the marginal explanatory value of the interaction term compared to the restricted model (Column [3]). A lower value of BIC' indicates a superior model fit (Raftery 1995). Judged by the BIC' statistic, the pooled model without the interaction term is preferable to the model including the interaction term. If one valued parsimony and had to choose between these two models, then one

would choose the pooled model that includes the main effect of income that does not vary by sex (Column [3]). That the BIC' statistic rejects the model including the interaction term suggests the finding is rather weak.

In the next four columns of Table 1, the dependent variable is the frequency of sex in the last 12 months. Column (1) presents Kanazawa's original results showing the positive statistically significant effect of income on men's coital frequency. Column (2) presents the same analysis computed on the female sample. In this case, high-income women also report higher coital frequency. The main effect of income for men is quite similar to the main effect of income for women (.020 versus .015). Column (3) shows the results from a pooled model including an intercept for men. To test the hypothesis that men's income enhances their coital frequency, Column (4) contains the results from a model including an interaction term. The interaction term is not statistically significant and the BIC' indicates that the model including the main effect (Column [3]) is preferable to the model including the interaction term (Column [4]). Therefore, the evidence suggests that there is a positive *sex-invariant* effect of income on coital frequency.

Table 2 presents the results for the effect of income on the number of sex partners in the last five years. The first four columns show models where the sample is restricted to currently unmarried respondents. The models in Columns (1) and (2) duplicate Kanazawa's original analyses.

There is a positive effect of income for men on their number of sex partners in the last five years and no such effect for women. Column (3) shows the pooled estimate without an interaction term. Column (4) shows a model that includes the interaction term. Consistent with the evolutionary prediction, currently unmarried men's income has a positive effect on men's number of sex partners in the previous five years. This supports Kanazawa's original hypothesis (except the BIC' is indifferent between models and if income had a strong effect, then BIC' would strongly favor the model with the interaction term).

However, there is no reason provided in Kanazawa's original article for why he restricted the sample to the currently unmarried for these particular dependent variables. Such is important because it differs from the analytical strategy used in the first section of the article (where the full sample is analyzed including a dummy variable for whether the respondent is currently married or not).

Models 5 through 8 in Table 2 analyze all cases and include a dummy variable for currently married respondents (as per the analytical practice utilized in the first half of Kanazawa's analysis). Examining respondents of all marital statuses, there is no link between income and the number of sex partners in the last five years and no evidence of any interaction effect between sex and income.

Table 3 shows the results for income effects on the number of sex partners in the last 12 months. Columns (1) and (2) duplicate Kanazawa's original results and Columns (3) and (4) show the pooled model with and without the interaction term. Per Kanazawa's original results, Column (1), currently unmarried men's income has positive and slightly significant impact on the number of sex partners in the last 12 months (p-value corresponding to the *t*-statistic of 1.98 equals approximately .048).

For currently unmarried women, income has no effect. The pooled model (Column [3]) yields a main effect of 0.007 that is marginally significant ($t = 1.77$, $p = .078$), provided one relaxed their critical alpha level to $p < .10$. Column (4) adds an interaction term and it does not reach statistical significance. Furthermore, the BIC' statistic imposes a penalty for introducing this regressor and the preferred model remains the pooled model including only a main effect (Column [3]).

Columns (5) through (8) present models based on the full sample controlling on whether or not respondents are currently married. The effect of income on the number of sex partners in the last 12 months does not vary with income for either sex and the interaction term is not significant.

Cross-National Test of the Effect of Men's Income on Sexual Behavior

The same aforementioned questions on sexual behavior were also included in social surveys done in various countries. Specifically, Australia, Bulgaria, Ireland, and Poland all had survey instruments containing the same questions on sexual behavior as well as information on respondents' income (this is why these nations were selected for the current analyses). These data are available within the 1994 wave of the International Social Survey Program (ISSP) and distributed by the University of Michigan's Inter-Consortium for Political and Social Science Research (ICPSR).[6]

I generated the same variables as in the U.S. GSS following the same recoding procedures as in Kanazawa's (2003) original analysis. The models include an interaction term for male and income, a dummy for male, a main effect for income, dummy for marital status, and a variable for age. Since the respondent's income is a different variable (different currency, measured over different intervals, not always net of taxes) in a given country, I conduct the analyses separately within country. In the cross-national analyses, some of the subsamples are rather small (currently unmarried respondents in Poland); therefore I relax the critical alpha level to .10 in the cross-national analyses.

Table 4 presents the analysis of the effect of income by sex on the lifetime number of heterosexual sex partners. The interaction term is positive and statistically significant in the case of Australia, but for the three other countries considered, the interaction term is not statistically significant which suggests that men with higher incomes do not have a greater lifetime number of female sex partners in three of the four countries considered.

In fact, the BIC' statistic indicates that the best fitting model is the pooled model for Bulgaria, Ireland, and Poland (Columns [1] and [3]). In the case of Australia, the BIC' statistic is indifferent between the model with the interaction term and the pooled model without the interaction effect (showing a small preference for the simpler model). The basic empirical pattern, excluding Bulgaria, suggests that a sex-invariant effect of income is at operation here. Men and women with higher incomes, on average, report greater numbers of opposite-sex sex partners since the age of 18 in three of the four nations considered.

Table 5 shows equations estimating the impact of income on the frequency of sex in the preceding 12 months. In none of the four countries does the return to income vary by sex (no evidence of a significant interaction effect in any of these nations).

TABLE 4. Effect of Income on the Lifetime Number of Sex Partners in Four Nations, ISSP 1994

	Lifetime Number of Opposite-Sex Sex Partners							
	Australia (1)	Australia (2)	Bulgaria (3)	Bulgaria (4)	Ireland (1)	Ireland (2)	Poland (3)	Poland (4)
Income × Male		0.052**		0.013		−0.015		0.016
		(2.64)		(0.74)		(0.36)		(0.36)
Income	0.039***	0.010	0.012	0.003	0.065***	0.075**	0.037**	0.025
	(3.99)	(0.73)	(1.49)	(0.24)	(3.40)	(2.34)	(2.00)	(0.63)
Male	2.663***	1.399**	3.945***	3.407***	1.402***	1.626**	3.870***	3.352*
	(5.60)	(2.07)	(6.02)	(3.48)	(2.95)	(2.09)	(3.47)	(1.84)
Age	−0.056***	−0.054***	−0.099***	−0.100***	−0.035**	−0.034**	0.061	0.062
	(3.53)	(3.38)	(5.19)	(5.23)	(2.51)	(2.48)	(1.18)	(1.19)
Marital Status (Currently Married = 1)	−2.252***	−2.480***	−2.885***	−2.849***	−0.739	−0.701	−0.375	−0.376
	(3.99)	(4.36)	(4.15)	(4.09)	(1.58)	(1.45)	(0.28)	(0.28)
Constant	6.918	7.505	7.932	8.289	3.102	2.955	−0.728	−0.395
	(7.84)	(8.26)	(6.18)	(6.04)	(4.14)	(3.46)	(0.31)	(0.16)
R^2	0.063	0.068	0.081	0.081	0.094	0.094	0.057	0.058
BIC'	−61.910	−61.629	−54.462	−48.132	−14.107	−8.285	1.038	6.864
N	1,397	1,397	973	973	386	386	386	386

Notes: Unstandardized regression coefficients |*t*-statistic| in parentheses. Income and interaction coefficients for Australia scaled by 1,000, Bulgaria scaled by 100, Ireland scaled by 10, and Poland scaled by 100.

*p < .10, **p < .05, ***p < .01 (two-tailed tests).

TABLE 5. Effect of Income on the Frequency of Sex in the Last 12 Months in Four Nations, ISSP 1994

	Australia (1)	Australia (2)	Bulgaria (3)	Bulgaria (4)	Ireland (1)	Ireland (2)	Poland (3)	Poland (4)
Income × Male		0.004		−0.006		−0.0001		0.017
		(0.95)		(0.22)		(0.08)		(0.24)
Income	0.002	−0.000	0.030**	0.034	0.002***	0.002**	0.017	0.004
	(1.13)	(0.00)	(2.14)	(1.39)	(3.44)	(2.14)	(0.58)	(0.06)
Male	−0.068	−0.161	0.123	0.150	−0.115	−0.096	0.317*	0.265
	(0.74)	(1.20)	(1.10)	(0.90)	(0.67)	(0.34)	(1.90)	(0.96)
Age	−0.052***	−0.051***	−0.067***	−0.067***	−0.051***	−0.051***	−0.031***	−0.031***
	(16.29)	(16.16)	(20.71)	(20.64)	(10.03)	(10.01)	(4.07)	(4.05)
Marital Status (Currently Married = 1)	1.287***	1.269***	0.445***	0.443***	1.964***	1.967***	2.035***	2.035***
	(11.34)	(11.05)	(3.77)	(3.75)	(11.58)	(11.30)	(10.39)	(10.38)
Constant	4.552	4.596	4.611	4.594	3.239	3.226	2.781	2.815
	(26.72)	(26.02)	(21.16)	(19.73)	(11.88)	(10.37)	(7.78)	(7.30)
R^2	0.199	0.200	0.368	0.368	0.389	0.389	0.261	0.261
BIC'	−270.835	−264.537	−419.233	−412.401	−167.971	−162.014	−95.858	−89.934
N	1,350	1,350	973	973	389	389	396	396

Notes: Unstandardized regression coefficients |*t*-statistic| in parentheses. Income and interaction coefficients for Australia, Bulgaria, and Poland scaled by 1,000.

*p < .10, **p < .05, ***p < .01 (two-tailed tests).

In two nations, Bulgaria and Ireland, there is evidence of a sex-invariant main income effect on the frequency of coital acts in the previous 12 months.

Table 6 presents the effects of income on the number of sex partners in the last five years among the currently unmarried (following Kanazawa's original analyses of U.S. respondents). In Australia there is no evidence that the income effect varies by sex, as is the case for Bulgaria and Poland.

Ireland has a positive coefficient for the interaction term, consistent with the evolutionary prediction. In this case, the BIC' supports the inclusion of the interaction term (Column [2] for Ireland). Only one of the four countries has a statistically significant coefficient in the direction predicted by EP that is statistically strong enough to merit serious consideration.

Table 7 presents the effects of income on the number of sex partners in the last 12 months among the currently unmarried. In Australia and Poland there is no evidence that the effect of income on the number of sex partners varies by sex.

In Ireland, once again, there is evidence that income increases men's number of sex partners in the previous 12 months, but not women's (main effect is negatively sloped and not statistically significant). The interaction effect for Bulgaria is statistically significant. In two of the four nations the results are consistent with the EP prediction, but only strongly consistent in the case of Ireland because the BIC' supports the inclusion of the interaction term (while the BIC' suggests that including an interaction term for Bulgaria produces an over-fitted model).

Another way to think of the cross-national results is that in 16 of the equations testing for an interaction between the effect of sex and income, only 4 of them are statistically significant by the p-value. In only 2 of these 16 equations (Ireland Tables 6 and 7) does the BIC' statistic indicate that there is some marginal explanatory power to including the interaction term. On the other hand, of the 16 pooled equations containing the main effect, 8 of the coefficients for income are statistically significant and the BIC' statistic favors this restricted model. This indicates that there is slightly better evidence of a positive sex-invariant income effect on sexual behavior. The only caveat is that the sample sizes from the 1994 ISSP are smaller than the pooled GSS waves. Thus, some readers might place less weight on the cross-national results for this reason.

Evolutionarily Significant Copulation

As discussed above, "sex" may have different meanings for different people. Laumann et al.'s (1992) NHSLS included many questions on the *types* of sexual intercourse respondents may have engaged in (for details on this survey see Laumann et al. 1994). From 12 variables in the NHSLS data one can construct a measure representing the total number of vaginal intercourse (VI) partners respondents have had over a lifetime.[7] If income enhances men's fitness and "because women choose them as their sex partners" (Kanazawa 2003:296), then VI seems most salient as the behavioral outcome of the hypothesized cognitive mechanism. Anal sex, oral sex, and other practices may fall under the umbrella of "sex partner" but would not lead to offspring; therefore VI might be a more theoretically cogent measure to focus on.

TABLE 6. Effect of Income on the Number of Sex Partners in the Last Five Years among the Currently Unmarried in Four Nations, ISSP 1994

	Australia (1)	Australia (2)	Bulgaria (3)	Bulgaria (4)	Ireland (1)	Ireland (2)	Poland (3)	Poland (4)
Income × Male		−0.004		0.060		0.060**		−0.015
		(0.49)		(1.05)		(2.54)		(0.12)
Income	0.001	0.003	0.038	0.001	0.003**	−0.0002	0.004	0.050
	(0.26)	(0.52)	(1.29)	(0.01)	(2.53)	(0.13)	(0.66)	(0.46)
Male	0.361*	0.465	1.116***	0.876***	0.105	−0.735*	0.879***	0.925*
	(1.79)	(1.59)	(4.89)	(2.71)	(0.40)	(1.76)	(2.98)	(1.87)
Age	−0.031***	−0.031***	−0.058***	−0.058***	−0.037***	−0.038***	−0.018*	−0.018*
	(5.45)	(5.36)	(11.09)	(11.12)	(5.67)	(5.95)	(1.71)	(1.69)
Constant	2.747	2.687	3.948	4.079	2.427	2.934	1.608	1.586
	(9.18)	(8.30)	(11.89)	(11.51)	(6.21)	(6.78)	(3.27)	(3.00)
R^2	0.108	0.109	0.505	0.508	0.210	0.241	0.140	0.140
BIC'	−17.176	−11.717	−120.033	−115.897	−23.334	−24.745	0.049	4.524
N	299	299	193	193	164	164	89	89

Notes: Unstandardized regression coefficients |*t*-statistic| in parentheses. Income and interaction coefficients for Australia, Bulgaria, and Poland scaled by 1,000.

*p < .10, **p < .05, ***p < .01 (two-tailed tests).

TABLE 7. Effect of Income on the Number of Sex Partners in the Last 12 Months among the Currently Unmarried in Four Nations, ISSP 1994

	Australia (1)	Australia (2)	Bulgaria (3)	Bulgaria (4)	Ireland (1)	Ireland (2)	Poland (3)	Poland (4)
Income × Male		−0.003		0.084*		0.004**		−0.005
		(0.45)		(1.90)		(2.78)		(0.05)
Income	−0.001	0.001	0.046**	−0.006	0.001*	−0.0007	0.022	0.026
	(0.23)	(0.18)	(2.03)	(0.17)	(1.98)	(0.70)	(0.52)	(0.28)
Male	0.190	0.255	0.728***	0.391	0.051	−0.497**	0.638***	0.652*
	(1.44)	(1.31)	(4.09)	(1.56)	(0.33)	(2.00)	(3.11)	(1.80)
Age	−0.017***	−0.016***	−0.031***	−0.031***	−0.021***	−0.022***	−0.008	−0.008
	(4.38)	(4.28)	(7.54)	(7.63)	(5.46)	(5.79)	(1.08)	(1.07)
Constant	1.489	1.447	1.965	2.146	1.372	1.707	0.706	0.698
	(7.58)	(6.65)	(7.62)	(7.86)	(5.90)	(6.62)	(2.06)	(1.81)
R^2	0.074	0.075	0.370	0.381	0.185	0.223	0.135	0.135
BIC'	−5.548	−0.075	−72.779	−71.197	−18.419	−21.121	0.972	5.412
N	293	293	192	192	165	165	85	85

Notes: Unstandardized regression coefficients |*t*-statistic| in parentheses. Income and interaction coefficients for Australia, Bulgaria, and Poland scaled by 1,000.

*p < .10, **p < .05, ***p < .01 (two-tailed tests).

Table 8 presents reduced-form analogues to the models reported in Kanazawa (2003). I estimated models for the full sample and a sample restricted to currently unmarried respondents. Columns (1) through (4) in Table 8 present the results for all respondents.

Among the full sample, there is little evidence of a positive link between income and the total number of VI partners for either men or women. Again, the interaction effect is not statistically distinguishable from zero. Columns (5) through (8) restrict the sample to the currently unmarried and estimate the same equations on this subsample. Consistent with the EP prediction, currently unmarried men with higher incomes report a higher number of VI sex partners, and the effect is not significant for women. The pooled model with the interaction term approaches statistical significance, but one would have to adjust their critical alpha value to a .10 one-tailed test to reject the null hypothesis. At best, there seems to be a weak sex difference in the effect of income on men's lifetime number of VI sex partners. The results suggest that there is little or no relation between men's income and their number of VI sex partners, but among currently unmarried men, there may be weak evidence for such a link.

DISCUSSION

One of the merits of EP is the possibility of clear-cut hypotheses that may be subjected to rigorous empirical scrutiny. Kanazawa and other scholars (Biblarz and Raftery 1999; Freese and Powell 1999; Kanazawa and Still 2000) should be applauded for moving the debate between conventional social science hypotheses and evolutionary predictions to the grounds of empirical hypothesis testing. The movement to the empirical arena with publicly available data sets is an important advance for EP and allows social scientists a common means of judging the efficacy of hypotheses derived from such theoretical work.

In this comment, I used different data sources to test the hypothesis that men's income enhances their *proximate* means of achieving reproductive success both in the number of sex partners and coital acts. From the view of the United States between 1988 and 2000, the link between men's income and having greater numbers of sex partners and frequency of coital acts is excessively weak. With respect to four countries (Australia, Bulgaria, Ireland, and Poland) the evidence in favor of the EP prediction is also rather weak; for a given dependent variable, and in the best-case scenario, only one of the four countries yields strong evidence for the empirical relation predicted by EP.

Evolutionary psychologists seek to start something akin to a Copernican revolution in the social sciences (cf. Cosmides, Tooby, and Barkow 1992; Barrett, Dunbar, and Lycett 2002). Most sociologists only have a passing familiarity with sociobiology and many simply apply arguments against sociobiology to modern EP. However "recycling" the arguments used against the sociobiology of the 1970s is fraught with logical error (Freese 2000). When possible, EP may imply hypotheses different than other theoretical frameworks and in these cases it is worth testing such hypotheses with empirical data.

Additionally, when studying evolutionary claims, we should try to amass as much cross-societal data as possible to test our hypotheses. If the predicted empirical relation holds across various societies, then we may be even more confident about the claim and

TABLE 8. Effect of Income on the Lifetime Number of Vaginal Intercourse Partners in the United States, NHSLS 1992

					Currently Unmarried			
	Men (1)	Women (2)	Pooled (3)	Interaction (4)	Men (5)	Women (6)	Pooled (7)	Interaction (8)
Income × Male				−0.090				0.520
				(0.34)				(1.56)
Income	−0.292	0.094	−0.134	−0.077	0.363*	−0.045	0.213	−0.127
	(1.42)	(0.00)	(0.99)	(0.36)	(1.71)	(0.18)	(1.30)	(0.47)
Male			2.840***	3.092***			0.878	−0.348
			(4.65)	(3.20)			(1.23)	(0.33)
Age	0.023	−0.027	0.007	0.007	0.066	−0.037	0.030	0.032
	(0.53)	(0.87)	(0.25)	(0.25)	(1.39)	(0.64)	(0.82)	(0.87)
Marital Status (Currently Married = 1)	1.771*	−1.283**	0.394	0.415				
	(1.88)	(2.35)	(0.67)	(0.70)				
Constant	5.277	4.556	3.017	2.886	1.887	4.941	2.576	3.182
	(3.54)	(5.04)	(3.24)	(2.86)	(1.22)	(3.03)	(2.30)	(2.68)
R^2	0.010	0.024	0.027	0.028	0.024	0.003	0.014	0.020
BIC'			3.594	10.212			11.925	15.553
N	498	341	839	839	254	179	433	433

Notes: Unstandardized regression coefficients |*t*-statistic| in parentheses. Income coefficient for women in Column (2) scaled by 1,000.
*p < .10, **p < .05, ***p < .01 (two-tailed tests).

its supposed evolutionary origins. At a general level, however, we must be careful about drawing conclusions about human behavior, human evolutionary history, and the human brain on the basis of sometimes arbitrary statistical correlations computed from social survey data, where the possibility of rejecting a true null hypothesis with large data sets is all too common an occurrence.

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NOTES

[1]Kanazawa also examines the impact of men's income on their probability of never being married. The bulk of Kanazawa's article examines the relation between men's income and their sexual behavior; therefore this comment focuses on this particular outcome.

[2]One might speculate that Kanazawa (2003) decided to do this because Perusse (1993) reported a stronger correlation between status and number of sex partners among currently unmarried men between the ages of 30 and 39. This begs the question of why the author did not restrict the analyses to this subsample in the figures reported in Table 1 (Kanazawa 2003:296).

[3]In a reply to another scholar, Kanazawa noted (about gay men having high numbers of partners), "This is why gay men have significantly more sex partners and have sex significantly more frequently than straight men, because there are no women in their relationships to say no (Laumann et al. 1994:313–16, Table 8.4)" (Kanazawa 2001).

[4]The wording of the survey question according to the NHSLS codebook: "Now I will ask you some questions about vaginal intercourse. By vaginal intercourse, we mean when a man's penis is inside a woman's vagina."

[5]Some analysts may have made alternative decisions about how to code the data. For instance, the count of lifetime number of sex partners might be better assumed to follow a Poisson distribution or one might add a small constant and then take the logarithmic transformation to achieve a normal distribution. With respect to the independent variable of interest, instead of using the arbitrary integers that the National Opinion Research Center attaches to people who fall within a given income range, one might instead use the midpoints of the income categories and use a Pareto-curve multiplier to estimate the mean of the upper income category. Nonetheless, in this comment I follow Kanazawa's protocols.

[6]The ISSP surveys are made available to the ICPSR by the Central Archive for Empirical Social Research at the University of Cologne, Germany (*Zentralarchiv fuer Empirische Sozialforschung*).

[7]These variables are "v18rels1" through "v18rels9" and the measure used in this article is obtained by summing these variables after deleting cases with missing values.

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