"Her Support, His Support: Money, Masculinity, and Marital Infidelity" *American Sociological Review* 80(3):469-95.

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In the above paper, I made several errors related to the coding of missing data. Upon discovery, I contacted the editors who asked me to prepare a short memo explaining the errors and to replicate the analyses exactly as presented in the original article. These analyses have been published in ASR. As suggested by a reviewer, however, modeling decisions that may have been appropriate using the previous version of the data may not be appropriate using the corrected version. In the following memo, I revisit modeling decisions and present alternative models.

Errors

I made an error in the coding of the dependent variable, infidelity. Persons with the same spouse in consecutive years, who reported more than one sex partner since the date of the last interview, were defined as unfaithful. However, because Stata treats missing values as positive infinity, I inadvertently coded 246 cases in which the respondent was missing a sex partner count as adulterous.[1] Unfortunately, missing responses on this variable are not random (i.e., persons who failed to answer are more likely to have cheated) (Munsch 2012; Whisman and Snyder 2007). In order to minimize the bias that can be introduced by ignoring non-random missing observations (Allison 2001; Little and Rubin 2002; Porter and Ecklund 2012), I coded 48 respondents (57 observations) with the same spouse in consecutive years *who explicitly refused to disclose their number of sex partners since the last interview* as unfaithful. All other sources of missing data (e.g., non-interview, valid skips) retained missing values. In order to reduce the possibility of erroneously coding respondents as adulterous who were simply uncomfortable answering questions about sex, I also required that respondents identified in this way provided their number of sex partners in at least two other years. Because analysis required complete data on all variables, these respondents also answered all other questions used in the analyses including questions about other sensitive topics like income.[2]

In light of this error, I reviewed all files associated with this project and discovered five additional variables in which I mistakenly assigned real values to non-attritioned respondents with missing data: same married relationship (a component variable used to create infidelity), full-time student, hours worked, number of children, and child under 5. With the exception of hours worked, I recoded these cases as missing. Recoding hours worked in this way, however, resulted in a large amount of missing data; 1092 respondents (10.2%) had complete data for all variables except hours worked. Moreover, like number of sex partners, missing responses were not random. (For example, for men, 680 cases (15.3%) were missing; for women, 412 cases (6.6%) were missing.) Consequently, because hours worked was included because time spent at work may affect both relative income and exposure to opportunities for extramarital sex, I looked for an alternative measure of work time with little or no missing data. I located

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[1] I thank Professor Elizabeth McClintock for bringing this error this to my attention.

[2] I also created an additional infidelity variable in which all missing responses (including refusals) were coded as missing. Given space constraints, I do not describe these models. All coefficients of interest are directionally consistent, although not always statistically significant at $p < .05$.

the alternative measure, weeks worked, defined as the total number of weeks worked at any job since last interview date, and used this variable, instead of hours worked, in the models that follow.[3]

Estimation

As noted above, modeling decisions that may have been appropriate using the previous version of the data may not be appropriate using the corrected version. Accordingly, as advised by Weakliem (2016), I relied on a combination of likelihood ratio tests and exploration of the Akaike information criterion (AIC) as a means of model selection to decide among a set of candidate models advanced in the relative income literature.[4] In light of recent work by Betrand, Kamenica, and Pan (2015), I modeled the association between relative income and infidelity as a linear, curvilinear, and discontinuous relationship. In light of Gupta (2007), I examined the independent effects of absolute income and absolute spousal income. Otherwise, with the exception of hours worked, all models include the same controls. Again, I estimate effects separately by gender and present the models including relationship satisfaction and conflict, which were only assessed through 2008, independently.

Results

Respondents were unfaithful in 6.2 percent of the observations, compared with 10 percent previously reported. Men and women were unfaithful in 7.8 and 5.1 percent of the observations, respectively (compared to 12.0 and 9.0 percent). As before, men were more likely to cheat than women and there were evident gender differences in relative income, absolute income, and spousal income (See Table 1).

I began by estimating the effect of relative income on the likelihood of infidelity for men. I then compared this model to a model including both a linear and quadratic term for relative income to allow for the relationship to be nonlinear. Inclusion of the square improved model fit ($\chi^2 = 4.72$, $p = 0.030$). There was no support for an independent effect of absolute income or absolute spousal income on infidelity and comparisons revealed that the inclusion of these variables did not improve overall model fit. Model inference using AIC yielded the same conclusion. Thus, I present the results of the simpler model. This decision is further justified by inspection of the variance inflation factors which revealed multicollinearity (VIFs above 3) when estimating models including both relative and absolute income.

Table 2, Model 1 contains the estimates for the effect of relative income on the log odds of infidelity for men. The negative coefficient on the linear term ($\beta = -0.352$, $p = 0.034$) and the positive coefficient on the quadratic term ($\beta = 0.462$, $p = 0.029$) indicate that the relationship between economic dependency and infidelity is first negative and then positive. Model 2 controls for relationship satisfaction and conflict and reveals a similar pattern ($\beta = -0.497$, $p = 0.046$; $\beta = 0.709$, $p = 0.023$). Figures 1 and 2 depict the probability of infidelity as a function of relative income estimated from Models 1 and 2. Figure 1 has been rescaled to illustrate the overall pattern of variation across different levels of relative income, as well as the magnitude of effects for each group (Cleveland 1993; Morgan, Reichert, and Harrison 2002). For the sake of comparison, Figure 2 is drawn on the same scale as the original. According to the

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[3]To be sure, weeks worked differs from hours worked and is a less precise measure of time spent at work. Thus, I also I simulated missing values for hours worked out of a multivariate normal distribution using Markov Chain Monte Carlo separately for men and women. Twenty data sets were simulated. Again, given space constraints, I do not present these models; however, the results are virtually identical in terms of both significance and magnitude.

[4]Weakliem (1999, 2016) does not recommend the use of BIC for model selection.

figures, men who contribute equally have a predicted probability of 0.026 (Model 1); men who are completely dependent have a predicted probability of 0.057 (Model 1). When relative income equals 0.35, or 67.5 percent of the couple's total, the relationship changes direction. Between economic dependency scores of .35 and 1, the figure shows a weak upward trend in the predicted probability of cheating. These men have a predicted probability of 0.025, whereas complete breadwinners have a predicted probability of 0.029 (Model 1). Predicted probabilities derived from Model 2 reveal a similar pattern. As in the original paper, it is worth reiterating, the more prominent trend is the increase in the probability that men will engage in infidelity that occurs as they become more economically dependent.

I also modeled the relationship between relative income and infidelity as discontinuous with an indicator variable ("economic dependence") equal to 1 when respondents make less money than their spouse (Betrand, Kamenica, and Pan 2015). Results from these models also appear in Table 2 and reveal that men are more likely to engage in infidelity when they are economically dependent ($\beta = 0.418$, $p = 0.025$, Model 3; $\beta = 0.699$, $p = 0.015$, Model 4). Because the curvilinear and discontinuous models are not nested, a direct comparison of the two is difficult; however, the AIC allows me to assess the relative quality of both models. The lowest value of the AIC occurs for the discontinuous model (2178); however, the AIC for the curvilinear model is virtually identical (2179). Thus, I conclude both models are acceptable. More importantly, both models lead to the same substantive conclusion: for men, dependency is associated with increased infidelity.

Table 3 presents the estimates for women. Model selection followed the same procedure described above. Beginning with the effect of relative income, I found that the addition of the quadratic term did not substantially improve the overall fit of the model ($\chi^2 = 0.36$, $p = 0.546$). Inclusion of absolute income and its square, however, did improve model fit, as did the addition of absolute spousal earnings ($\chi^2 = 8.97$, $p = 0.030$). Model selection using AIC led to the same conclusion. All variance inflation factors are below 3.

Model 5 reveals a negative relationship between women's relative income and infidelity: as relative income increases, infidelity decreases ($\beta = -0.651$, $p = 0.010$). Model 6 controls for relationship satisfaction and conflict and reveals a similar pattern, although the coefficient is not statistically significant at the standard 5 percent level of significance ($\beta = -0.674$, $p = 0.060$). Predicted probabilities estimated from Models 5 and 6 are indistinguishable. Completely dependent women have a predicted probability of 0.033 (Model 5) or 0.031 (Model 6). Equal earners have a predicted probability of 0.018 (Model 5) or 0.016 (Model 6). Women who are complete breadwinners have a predicted probability of 0.009 (Model 5) or 0.008 (Model 6). As above, I also modeled the relationship between relative income and infidelity as discontinuous. (Models 7 and 8). The binary variable "economic dependence" is not a significant predictor of infidelity for women in either model. Thus, for women, what seems to matter is relative income as opposed to simply making more or less money than one's spouse.

Lastly, I retested the claim that the influence of dependency on infidelity is greater for men than for women. In redoing my analysis, however, a reviewer pointed out that coefficients in binary regression models are confounded with residual variation. Thus, it is inadvisable to make cross-group comparisons by comparing xtlogit coefficients (e.g., Allison 1999; Mood 2010; Long and Mustillo 2017; Williams 2009). Rather, methodologists advise examining group differences with probabilities (Landerman, Mustillo, and Land 2011; Long and Mustillo 2017; Mood 2010). Following the method outlined by Long and Mustillo (2017), I first asked if equally economically dependent men and women differ in their predicted probability of infidelity holding other variables constant at their subgroup mean. To answer this question, I estimated a joint model mathematically equivalent to models 1 and 5, computed the predicted probability of infidelity for economically dependent men and women at each value of relative income, and tested whether there were gender differences in the probability of infidelity at each value. For persons with relative income scores between 0 and -.6, there is a significant gender difference ($p < 0.05$). For persons with relative income scores above -.6, however, the gender difference is not significant. Following a similar procedure, I also estimated a joint model relying on the discontinuous relative income variable "economic dependency" (akin to models 3 and 7). Here, the difference in predicted probabilities between economically dependent men and women is significant ($p = 0.005$).

Just because the probability of infidelity for economically dependent men and women differs, at least at some values, does not mean that economic dependence has different effects on the probability of infidelity for both men and women. To answer this question, I computed the discrete change in the probability of infidelity as relative income decreased from 0 to -1 for each group and computed the group difference in the effect of economic dependency on infidelity as a second difference. Although the figure suggests that the probability of infidelity increases more rapidly for economically dependent men than economically dependent women, this difference is not significant ($p = 0.367$). Using the discontinuous specification, this change is also not significant ($p = 0.168$).

References

Allison, Paul. 1999. "Comparing Logit and Probit Coefficients Across Groups." *Sociological Methods & Research* 28(2): 186-208.

Allison, Paul. 2002. *Missing Data*. Thousand Oaks, CA: Sage.

Bertrand, Marianne, Emir Kamenica, and Jessica Pan. 2015. "Gender Identity and Relative Income within Households." *The Quarterly Journal of Economics* 130(2): 571-614.

Cleveland, William S. 1993. *Visualizing Data*. Summit, NJ: Hobart Press.

Gupta, Sanjiv. "Autonomy, dependence, or display? The relationship between married women's earnings and housework." *Journal of Marriage and Family* 69, no. 2 (2007): 399-417.

Landerman, Lawrence R., Sarah A. Mustillo, and Kenneth C. Land. 2011. "Modeling repeated measures of dichotomous data: testing whether the within-person trajectory of change varies across levels of between-person factors." *Social Science Research* 40(5): 1456-64.

Little, Roderick J. A., and Donald B. Rubin. 2014. *Statistical Analysis with Missing Data*. New York: Wiley.

Long, J. Scott and Sarah A. Mustillo. 2017. "Comparing Groups in Binary Regression Models Using Predictions." Unpublished Paper. Retrieved November 21, 2017. (http://www.indiana.edu/~jslsoc/stata/groupsbrm/long-mustillo-comparing-groups-brm-2017-06-06.pdf).

Mood, Carina. 2010. "Logistic regression: Why we cannot do what we think we can do, and what we can do about it." *European Sociological Review* 26(1): 67-82.

Morgan, Susan, Tom Reichert, and Tyler R. Harrison. 2002. *From Numbers to Words: Reporting Statistical Results for the Social Sciences.* Boston: Allyn & Bacon.

Munsch, Christin L. 2012. "The Science of Two-Timing: The State of Infidelity Research." *Sociology Compass* 6(1):46–59.

Porter, Jeremy R., and Elaine Howard Ecklund. 2012. "Missing Data in Sociological Research: An Overview of Recent Trends and an Illustration for Controversial Questions, Active Nonrespondents and Targeted Samples." *The American Sociologist* 43(4):448–68.

Weakliem, David L. 1999. "A Critique of the Bayesian Information Criterion for Model Selection." *Sociological Methods & Research* 27(3): 359-97.

Weakliem David L. 2016. *Hypothesis Testing and Model Selection in the Social Sciences*. New York: Guilford Press.

Whisman, Mark A., and Douglas K. Snyder. 2007. "Sexual Infidelity in a National Survey of American Women: Differences in Prevalence and Correlates as a Function of Method of Assessment." *Journal of Family Psychology* 21(2):147–54.

Table 1. Means and Standard Deviations for Variables Used in the Analyses by Gender

	Total Sample		Married Men		Married Women	
Variables	Mean	SD	Mean	SD	Mean	SD
Infidelity***	0.062		0.078		0.051	
Economic Dependence***	0.51		0.19		0.74	
Relative Income***	-0.03	0.65	0.40	0.52	-0.34	0.54
Income ($1,000s)***	26.62	23.84	37.55	25.33	18.76	19.19
Spouse Income ($1,000s)***	28.88	27.36	17.94	19.12	36.75	29.60
Black*	0.12		0.12		0.11	
Hispanic*	0.25		0.24		0.26	
Mixed, Non-Hispanic	0.01		0.01		0.01	
Age***	26.22	2.64	26.50	2.51	26.02	2.72
Four-Year Degree***	0.22		0.20		0.24	
Full-Time Student	0.07		0.07		0.07	
Week Worked***	38.27	20.08	42.71	17.58	35.08	21.13
Religious Attendance**	3.31	2.11	3.23	2.13	3.37	2.10
Number of Children with Spouse***	1.12	1.02	1.06	0.99	1.17	1.03
Child Under 5 Years Old*	0.59		0.58		0.60	
Relationship Satisfaction[a]	9.35	1.24	9.35	1.20	9.35	1.26
Conflict[a]	3.36	2.66	3.30	2.60	3.40	2.69
Number of Observations	10,614		4,438		6,176	
Number of Persons	2,713		1,217		1,496	

Source: National Longitudinal Survey of Youth 1997 (2002 to 2011).
Note: Standard deviations shown where appropriate. Stars indicate a statistically significant difference between men and women, *$p < .05$; **$p < .01$; ***$p < .001$ (two-tailed).
[a]Questions asked only through 2008, resulting in 5,441 observations and 1,868 individuals in the total sample, 2082 observations and 780 individuals for married men, and 3,359 observations and 1,088 individuals for married women.

Table 2. Random-Effects Logistic Regression Models for the Effects of Relative Income on the Log Odds of Infidelity for Married Men

	Model 1	Model 2	Model 3	Model 4
Income Variables				
Relative Income	-0.352*	-0.497*		
	(0.166)	(0.249)		
Relative Income Squared	0.462*	0.709*		
	(0.211)	(0.313)		
Economic Dependence			0.418*	0.699*
			(0.187)	(0.288)
Individual Characteristics				
Black	1.459***	1.193**	1.447***	1.208**
	(0.247)	(0.375)	(0.246)	(0.373)
Hispanic	0.819***	1.043***	0.833***	1.077***
	(0.210)	(0.285)	(0.209)	(0.285)
Mixed, Non-Hispanic	0.809	-0.354	0.804	-0.344
	(0.926)	(1.522)	(0.924)	(1.516)
Age	-0.0693*	-0.166**	-0.0729*	-0.181**
	(0.0301)	(0.0582)	(0.0302)	(0.0580)
Four-Year Degree	-0.864**	-0.456	-0.901**	-0.492
	(0.280)	(0.454)	(0.281)	(0.455)
Full-Time Student	-0.458	-0.205	-0.481	-0.279
	(0.319)	(0.414)	(0.320)	(0.416)
Weeks Worked	0.00651	0.00885	0.00496	0.00702
	(0.00438)	(0.00620)	(0.00428)	(0.00610)
Religious Attendance	-0.173***	-0.230***	-0.174***	-0.234***
	(0.0416)	(0.0612)	(0.0416)	(0.0613)
Relationship Characteristics				

Number of Children with Spouse	-0.0483	0.0803	-0.0123	0.136
	(0.111)	(0.179)	(0.109)	(0.177)
Child Under 5 Years Old	0.208	0.0791	0.192	0.0790
	(0.200)	(0.321)	(0.199)	(0.321)
Relationship Satisfaction		-0.368***		-0.374***
		(0.0747)		(0.0745)
Conflict		0.0658†		0.0674†
		(0.0396)		(0.0395)
Constant	-1.745*	3.510*	-1.622*	3.947*
	(0.820)	(1.643)	(0.810)	(1.615)
Log Likelihood	-1075.76	-519.72	-1076.27	-519.75
Observations	4,438	2,082	4,438	2,082
Number of Individuals	1,217	780	1,217	780

***p < 0.001, **p < 0.01, *p < 0.05, †p < 0.10, (two-tailed). Standard errors in parentheses.

Table 3. Random-Effects Logistic Regression Models for the Effects of Relative Income on the Log Odds of Infidelity for Married Women

	Model 5	Model 6	Model 7	Model 8
Income Variables				
Relative Income	-0.651*	-0.674†		
	(0.253)	(0.359)		
Income (in 1000s)	0.0299*	0.0463*	0.0104	0.0210
	(0.0132)	(0.0212)	(0.0100)	(0.0158)
Income Squared	-0.000180	-0.000338	-5.34e-05	-0.000146
	(0.000135)	(0.000245)	(0.000110)	(0.000207)
Spousal Income (in 1000s)	-0.00959*	-0.0129†	-0.00413	-0.00551
	(0.00414)	(0.00705)	(0.00334)	(0.00550)
Economic Dependence			0.137	0.0986
			(0.202)	(0.273)
Individual Characteristics				
Black	0.599*	0.620†	0.593*	0.615†
	(0.254)	(0.324)	(0.254)	(0.325)
Hispanic	0.353†	0.0775	0.348†	0.0786
	(0.193)	(0.249)	(0.192)	(0.249)
Mixed, Non-Hispanic	0.409	1.063	0.425	1.069
	(0.887)	(1.010)	(0.878)	(1.001)
Age	-0.0181	-0.0578	-0.0205	-0.0602
	(0.0294)	(0.0521)	(0.0292)	(0.0519)
Four-Year Degree	-0.731**	-0.474	-0.702**	-0.453
	(0.244)	(0.356)	(0.242)	(0.355)
Full-Time Student	-0.170	-0.719†	-0.177	-0.736†
	(0.272)	(0.397)	(0.271)	(0.397)
Weeks Worked	-0.00277	-0.00648	-0.00451	-0.00785

	(0.00409)	(0.00552)	(0.00401)	(0.00545)
Religious Attendance	-0.168***	-0.187***	-0.167***	-0.187***
	(0.0392)	(0.0518)	(0.0391)	(0.0519)
Relationship Characteristics				
Number of Children with Spouse	0.172†	0.245	0.172†	0.246
	(0.100)	(0.150)	(0.100)	(0.150)
Child Under 5 Years Old	-0.499**	-0.648*	-0.490**	-0.644*
	(0.185)	(0.275)	(0.184)	(0.274)
Relationship Satisfaction		-0.356***		-0.356***
		(0.0590)		(0.0590)
Conflict		0.0577		0.0584
		(0.0364)		(0.0364)
Constant	-2.911***	1.247	-2.584***	1.587
	(0.779)	(1.383)	(0.774)	(1.376)
Log Likelihood	-1151.11	-639.68	-1154.55	-641.57
Observations	6,176	3,359	6,176	3,359
Number of Individuals	1,496	1,088	1,496	1,088

***p < 0.001, **p < 0.01, *p < 0.05, †p < 0.10, (two-tailed). Standard errors in parentheses.

Figure 1. Predicted Probability of Engaging in Infidelity by Relative Income (Revised Scale)

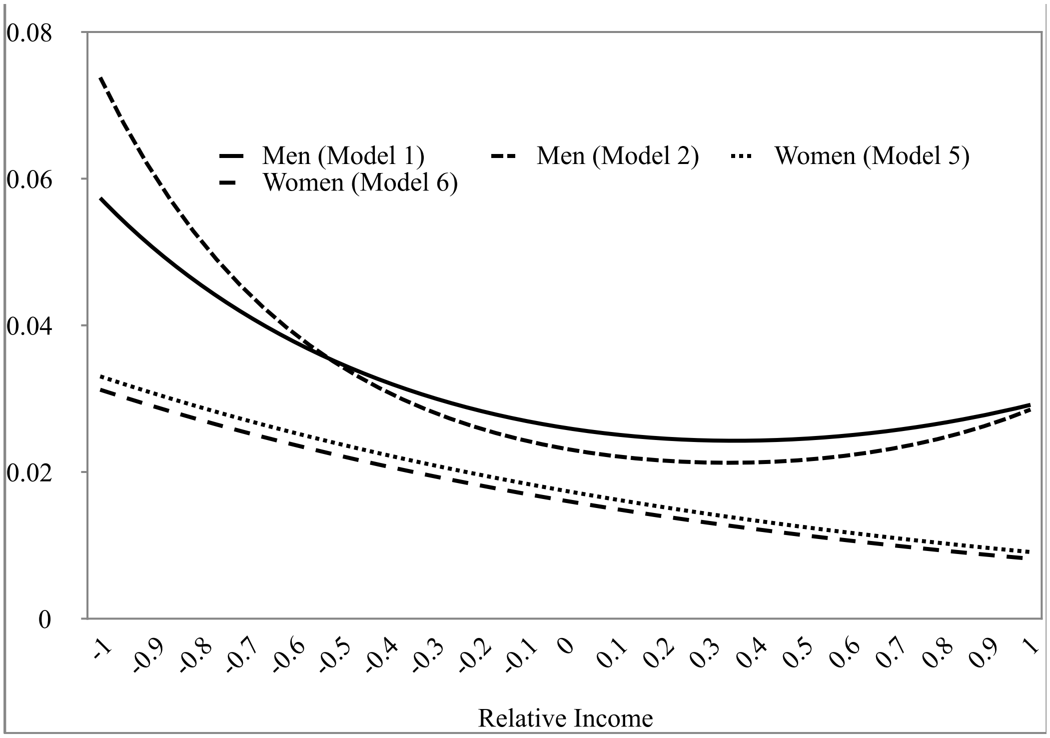

Figure 2. Predicted Probability of Engaging in Infidelity by Relative Income (Original Scale)