

<Supplemental Online Material>

APPENDIX A
Probit Coefficients for the Heckman Selection Models

<i>Variable</i>	Primary Respondents' Marital Quality (<i>n</i> = 1,523)		Secondary Respondents' Marital Quality (<i>n</i> = 1,527)	
	<i>B</i>	<i>SE(B)</i>	<i>B</i>	<i>SE(B)</i>
<i>Primary respondent</i>				
Self-rated health	-0.044	0.059	-0.050	0.059
Years married	-0.003	0.014	-0.003	0.014
Years married ²	-0.005	0.006	-0.005	0.006
Depression	0.009	0.008	0.008	0.008
Chronic illnesses	-0.031	0.065	-0.044	0.066
Self esteem	0.054*	0.025	0.057*	0.025
<i>Selection model</i>				
Years of school	0.056**	0.017	0.055**	0.017
Partner years of school	0.057***	0.015	0.057***	0.015
White race (non-white = reference)	0.422***	0.076	0.420***	0.075
Life satisfaction scale	0.011	0.017	0.011	0.017
Total family income (categories)	-0.021	0.016	-0.022	0.016
Number of children	-0.046	0.031	-0.044	0.031
Thought marriage in trouble	-0.324**	0.093	-0.329***	0.093
Year interviewed 2005	-0.267	0.141	-0.262	0.141
Year interviewed 2006	-0.347*	0.144	-0.342*	0.144
<i>Selection model constant</i>				
<i>Lambda</i>	-1.982***	0.559	-1.982***	0.559

Note: Years married² is centered and squared. Models correspond to those shown in Table 2 and Table 3.

p* < .05. *p* < .01. ****p* < .001.

APPENDIX B
Simulation Results when Primary Respondents' Marital Quality was Dependent Variable

<i>Independent Variables</i>	True Model	Complete Case Analysis		Inverse Probability Weight		Heckman Selection		Full-Info Maximum Likelihood		Multiple Imputation	
	<i>b</i> <i>SE(b)</i>	<i>Bias</i> <i>(SD)</i>	<i>RMSE</i> <i>(P)</i>	<i>Bias</i> <i>(SD)</i>	<i>RMSE</i> <i>(P)</i>	<i>Bias</i> <i>(SD)</i>	<i>RMSE</i> <i>(P)</i>	<i>Bias</i> <i>(SD)</i>	<i>RMSE</i> <i>(P)</i>	<i>Bias</i> <i>(SD)</i>	<i>RMSE</i> <i>(P)</i>
<i>Primary respondent</i>											
Self-rated health	0.359* (0.129)	-0.009 (0.128)	0.128 (0.458)	-0.010 (0.137)	0.137 (0.403)	-0.104 (0.172)	0.200 (0.211)	0.005 (0.026)	0.027 (1.000)	0.005 (0.026)	0.026 (1.000)
Years married	0.051 (0.030)	-0.002 (0.028)	0.027 (0.897)	-0.008 (0.028)	0.029 (0.883)	-0.003 (0.035)	0.035 (0.906)	0.005 (0.004)	0.006 (0.767)	0.005 (0.004)	0.006 (0.802)
Years married ²	0.047* (0.014)	0.001 (0.012)	0.012 (0.796)	-0.001 (0.012)	0.012 (0.797)	-0.002 (0.016)	0.016 (0.599)	0.002 (0.002)	0.003 (1.000)	0.002 (0.002)	0.003 (1.000)
Depression	-0.135* (0.018)	0.000 (0.017)	0.017 (1.000)	0.000 (0.019)	0.019 (1.000)	0.008 (0.025)	0.026 (0.976)	-0.003 (0.003)	0.005 (1.000)	-0.003 (0.003)	0.005 (1.000)
Chronic illnesses	-0.085 (0.144)	-0.102 (0.153)	0.184 (0.925)	-0.059 (0.167)	0.176 (0.965)	-0.181 (0.195)	0.267 (0.874)	-0.016 (0.024)	0.029 (1.000)	-0.017 (0.023)	0.029 (1.000)
Self-esteem	0.125* (0.055)	0.008 (0.048)	0.049 (0.357)	0.004 (0.052)	0.053 (0.341)	-0.070 (0.080)	0.107 (0.925)	-0.011 (0.008)	.014 (0.744)	-0.011 (0.008)	0.014 (0.711)
<i>Secondary respondent</i>											
Self-rated health	0.390* (0.115)	-0.009 (0.108)	0.108 (0.713)	-0.003 (0.116)	0.116 (0.723)	-0.043 (0.113)	0.121 (0.591)	-0.029 (0.109)	0.112 (0.689)	-0.042 (0.105)	0.113 (0.674)
Depression	-0.022 (0.021)	0.001 (0.021)	0.021 (0.996)	-0.001 (0.022)	0.022 (0.962)	-0.001 (0.021)	0.021 (0.963)	0.000 (0.021)	0.021 (0.952)	0.000 (0.020)	0.020 (0.961)
Self-esteem	-0.012 (0.026)	0.001 (0.053)	0.053 (0.996)	0.005 (0.057)	0.057 (0.994)	-0.019 (0.052)	0.056 (0.992)	-0.002 (0.052)	0.052 (0.994)	-0.011 (0.008)	0.050 (0.997)

Note: All results averaged across 1,000 simulations. Bias = difference from true b-coefficient. SD = standard deviation of bias. RMSE = root mean square error of bias. P = proportion of simulations where significance test was accurate at $p < .05$. Years married² is centered and squared.

* $p < .05$.

APPENDIX B (CONTINUED)
Simulation Results when Secondary Respondents' Marital Quality was Dependent Variable

<i>Independent Variables</i>	True Model	Complete Case Analysis		Inverse Probability Weight		Heckman Selection		Full-Info Maximum Likelihood		Multiple Imputation	
	<i>b</i> <i>SE(b)</i>	<i>Bias</i> <i>(SD)</i>	<i>RMSE</i> <i>(P)</i>	<i>Bias</i> <i>(SD)</i>	<i>RMSE</i> <i>(P)</i>	<i>Bias</i> <i>(SD)</i>	<i>RMSE</i> <i>(P)</i>	<i>Bias</i> <i>(SD)</i>	<i>RMSE</i> <i>(P)</i>	<i>Bias</i> <i>(SD)</i>	<i>RMSE</i> <i>(P)</i>
<i>Primary respondent</i>											
Self-rated health	0.010* (0.134)	-0.035 (0.119)	0.124 (0.001)	0.007 (0.125)	0.125 (0.005)	-0.069 (0.134)	0.150 (0.008)	-0.033 (0.116)	0.120 (0.005)	-0.033 (0.117)	0.122 (0.005)
Years married	-0.032* (0.012)	0.002 (0.001)	0.012 (0.361)	0.000 (0.012)	0.012 (0.499)	0.004 (0.012)	0.013 (0.286)	0.004 (0.010)	0.011 (0.368)	0.004 (0.010)	0.011 (0.340)
Depression	-0.053* (0.019)	-0.015 (0.018)	0.024 (0.824)	-0.008 (0.020)	0.021 (0.633)	-0.012 (0.019)	0.023 (0.748)	-0.014 (0.017)	0.022 (0.871)	-0.014 (0.017)	0.022 (0.854)
Chronic illnesses	-0.001 (0.150)	-0.005 (0.150)	0.150 (0.993)	-0.007 (0.163)	0.163 (0.986)	-0.038 (0.163)	0.167 (0.985)	0.003 (0.136)	0.136 (0.996)	0.006 (0.139)	0.139 (0.995)
Self-esteem	0.011 (0.057)	0.009 (0.053)	0.053 (0.995)	-0.001 (0.057)	0.057 (0.995)	-0.016 (0.064)	0.066 (0.990)	0.008 (0.049)	0.050 (0.995)	0.008 (0.050)	0.050 (0.994)
<i>Secondary respondent</i>											
Self-rated health	0.356* (0.129)	-0.080 (0.115)	0.140 (0.347)	-0.050 (0.122)	0.131 (0.380)	-0.090 (0.117)	0.148 (0.316)	-0.085 (0.116)	0.143 (0.341)	-0.085 (0.115)	0.143 (0.321)
Depression	-0.150* (0.021)	-0.008 (0.020)	0.022 (1.000)	-0.006 (0.022)	0.023 (1.000)	-0.009 (0.020)	0.022 (1.000)	-0.008 (0.020)	0.022 (1.000)	-0.007 (0.020)	0.021 (1.000)
Self-esteem	-0.010 (0.058)	-0.008 (0.052)	0.053 (0.997)	0.022 (0.058)	0.062 (0.995)	-0.015 (0.053)	0.055 (0.996)	-0.009 (0.052)	0.053 (0.995)	0.008 (0.050)	0.053 (0.994)

Note: All results averaged across 1,000 simulations. Bias = difference from true b-coefficient. SD = standard deviation of bias. RMSE = root mean square error of bias. P = proportion of simulations where significance test was accurate at $p < .05$.

* $p < .05$.

APPENDIX C

Examples of Stata Code for Five Methods of Handling Missing Secondary Respondent Data

All analyses for this paper were conducted using Stata version 12.1. In the example syntax shown here we note which models may only be available in version 12. We used Stata MI for the paper, but illustrate the use of the ICE program here for readers working with earlier versions of Stata. (The ICE program became part of Stata MI in version 12.)

Complete case analysis:

```
regress marqual health mardur mardur2 cesd chronic selfest phealth pcesd pselfest
```

Inverse probability weighting:

The variable “partner” indicates whether or not an interview with the partner was completed (0 = *nonresponse*; 1 = *completed*). The logistic regression shown below models partner nonresponse.

```
logit partner educ peduc race lifesat yr05 yr06 totfaminc biokid q70r
```

The command “predict” is a post-estimation command that gives the predicted probability of response (xb), which is used here to generate the inverse probability weight. Note: if a weight is already present in your dataset, it is possible to multiply it by the inverse probability selection weight.

```
predict xb
generate ipw = 1/xb
```

The regression model is then run with the weight as follows:

```
regress marqual health mardur mardur2 cesd chronic selfest phealth pcesd ///
pselfest [pweight=ipw2]
```

Heckman selection:

```
heckman marqual health mardur mardur2 cesd chronic selfest phealth pcesd pselfest, ///
select(partner = educ peduc race lifesat yr05 yr06 totfaminc biokid /// trouble) twostep
```

Maximum likelihood (Stata version 12):

```
#delimit ; /* Eliminates the need to use slashes in syntax (e.g., ///) */
```

```
sem (marqual <- health mardur mardur2 cesd chronic selfest phealth pcesd pselfest)
(educ <-health mardur mardur2 cesd chronic selfest phealth pcesd pselfest)
(peduc <-health mardur mardur2 cesd chronic selfest phealth pcesd pselfest)
(race <-health mardur mardur2 cesd chronic selfest phealth pcesd pselfest)
```

```
(lifesat <-health mardur mardur2 cesd chronic selfest phealth pcesd pselfest)
(yr05 <-health mardur mardur2 cesd chronic selfest phealth pcesd pselfest)
(yr06 <-health mardur mardur2 cesd chronic selfest phealth pcesd pselfest)
(income <-health mardur mardur2 cesd chronic selfest phealth pcesd pselfest)
(biokid <-health mardur mardur2 cesd chronic selfest phealth pcesd pselfest)
(trouble <-health mardur mardur2 cesd chronic selfest phealth pcesd pselfest)
(pmarqual <-health mardur mardur2 cesd chronic selfest phealth pcesd pselfest),
cov(e.marqual*e.educ) cov(e.marqual*e.peduc) cov(e.marqual*e.race)
cov(e.marqual*e.lifesat) cov(e.marqual*e.yr05) cov(e.marqual*e.yr06)
cov(e.marqual*e.income) cov(e.marqual*e.biokid) cov(e.marqual*e.trouble)
cov(e.marqual*e.pmarqual) cov(e.educ*e.peduc) cov(e.educ*e.race) cov(e.educ*e.lifesat)
cov(e.educ*e.yr05) cov(e.educ*e.yr06) cov(e.educ*e.income) cov(e.educ*e.biokid)
cov(e.educ*e.trouble) cov(e.educ*e.pmarqual) cov(e.peduc*e.race) cov(e.peduc*e.lifesat)
cov(e.peduc*e.yr05) cov(e.peduc*e.yr06) cov(e.peduc*e.income) cov(e.peduc*e.biokid)
cov(e.peduc*e.trouble) cov(e.peduc*e.pmarqual) cov(e.race*e.lifesat) cov(e.race*e.yr05)
cov(e.race*e.yr06)cov(e.race*e.income) cov(e.race*e.biokid) cov(e.race*e.trouble)
cov(e.race*e.pmarqual) cov(e.lifesat*e.yr05) cov(e.lifesat*e.yr06) cov(e.lifesat*e.income)
cov(e.lifesat*e.biokid) cov(e.lifesat*e.trouble) cov(e.lifesat*e.pmarqual) cov(e.yr05*e.yr06)
cov(e.yr05*e.income) cov(e.yr05*e.biokid) cov(e.yr05*e.trouble) cov(e.yr05*e.pmarqual)
cov(e.income*e.biokid) cov(e.income*e.trouble) cov(e.income*e.pmarqual)
cov(e.biokid*e.trouble) cov(e.biokid*e.pmarqual) cov(e.trouble*e.pmarqual) method(mlmv)
```

#delimiter cr /* Return delimiter to carriage return (Stata default; now use ///) */

Multiple imputation using Stata MI (version 12):

Set up the MI data:

```
mi set flong
```

Include all variables here, including those without missing values and auxiliary variables:

```
mi register imputed marqual health mardur mardur2 cesd chronic selfest pmarqual ///
phealth pcesd pselfest educ peduc race lifesat yr05 yr06 income biokid trouble
```

Impute the missing values using sequential chained regression (SQR):

```
mi impute chained (regress) marqual pmarqual mardur mardur2 cesd selfest pcesd ///
pselfest educ peduc lifes biokid income (ologit) health chronic phealth ///
(logit) race yr05 yr06 trouble, add(40) rseed(428)
```

Regression estimates are combined with the “mi estimate” prefix:

```
mi estimate: marqual health mardur mardur2 cesd chronic selfest phealth pcesd pselfest
```

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Multiple imputation using Stata ICE (use for versions prior to Stata 12):

Impute the missing values using sequential chained regression (SQR):

```
ice marqual health mardur mardur2 cesd chronic selfest phealth pcesd pselfest, ///  
  cmd(marqual mardur mardur2 cesd selfest pcesd pselfest biokid income: regress, ///  
  health chronic phealth: ologit, race yr05 yr05 trouble: logit) ///  
  saving(imputeddata) m(40) seed(428)
```

Regression estimates are combined with the “mim” prefix:

```
mim: regress marqual health mardur cesd chronic selfest phealth pcesd pselfest
```