Example: Logistic Regression Predicting Ever Marrying

- **An interaction between a categorical and continuous predictor (DeMaris 2004, p 143):**

  $E(Y) = \beta_0 + \delta_1 Black + \beta_1 Parity + \Upsilon_1 Black*Parity$

  - The subpop consists of only White and Black women
  - Black is a dummy variable
  - Parity indicates number of live births, range 0-15
  - Analyses is weighted

- **Stata Output for Full Model**:

```
. svy, subpop(blkwht): logistic evermar black PARITY PARITYblk, coef
(running logistic on estimation sample)

Survey: Logistic regression

Number of strata   =        56                  Number of obs      =     12279
Number of PSUs     =       152                  Population size    =  61754741
                                                Subpop. no. of obs =      8568
                                                Subpop. size       =  45835139
                                                Design df          =        96
                                                F(   3,     94)    =    186.25
                                                Prob > F           =    0.0000
------------------------------------------------------------------------------
             |             Linearized
     evermar |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       black |  -.4698438   .1172022    -4.01   0.000    -.7024885   -.2371992
      PARITY |   1.458909   .0707637    20.62   0.000     1.318444    1.599374
   PARITYblk |  -.9253343   .0978554    -9.46   0.000    -1.119576   -.7310928
       _cons |  -.8652098   .0616793   -14.03   0.000    -.9876423   -.7427772
------------------------------------------------------------------------------
```

- **Table of Results**:

Logistic Regression Predicting Ever Marrying

	Model 1 (Zero-Order)		Model 2		Model 3 (Full)	
	Coef.	SE	Coef.	SE	Coef.	SE
Black	-0.854	0.325***	-1.589	0.1***	-0.470	0.117***
Parity	1.040	0.054***	1.150	0.1***	1.459	0.071***
Black X Parity					-0.925	0.098***
Constant			-0.679	0.1***	-0.865	0.062***

How do I—Chart Interaction Effects?

- **Equation for Black Women**

  $E(Y) = \beta_0 + \delta_1 + \beta_1 Parity + \Upsilon_1 * Parity$

- **Equation for White Women**

  $E(Y) = \beta_0 + \beta_1 Parity$

- **Now, Plug and Play in Excel!**
  - After doing the computations, highlight the values you want displayed in your chart—AKA your **data series**.

							Predicted Probabilities of Ever Marrying	
Constant	E of Black	E of Parity	Parity	E of Int.	Parity		Black Women	White Women
-0.865	-0.470	1.459	0	-0.925	0		-1.335	-0.865
-0.865	-0.470	1.459	1	-0.925	1		-0.801	0.594
-0.865	-0.470	1.459	2	-0.925	2		-0.268	2.053
-0.865	-0.470	1.459	3	-0.925	3		0.266	3.512
-0.865	-0.470	1.459	4	-0.925	4		0.799	4.970
-0.865	-0.470	1.459	5	-0.925	5		1.333	6.429
-0.865	-0.470	1.459	6	-0.925	6		1.866	7.888
-0.865	-0.470	1.459	7	-0.925	7		2.400	9.347
-0.865	-0.470	1.459	8	-0.925	8		2.934	10.806
-0.865	-0.470	1.459	9	-0.925	9		3.467	12.265
-0.865	-0.470	1.459	10	-0.925	10		4.001	13.724
-0.865	-0.470	1.459	11	-0.925	11		4.534	15.183
-0.865	-0.470	1.459	12	-0.925	12		5.068	16.642
-0.865	-0.470	1.459	13	-0.925	13		5.601	18.101
-0.865	-0.470	1.459	14	-0.925	14		6.135	19.560
-0.865	-0.470	1.459	15	-0.925	15		6.669	21.018

- **Generate your figure using a line chart**