# Human Capital Investments and Expectations about Career and Family

Sebastian Valet, Johannes Walter

July 7, 2020

## Summary I

#### Research questions and design

- What do students believe about the consequences of their education choices?
- How do students sort into majors?
- Novel: what role do family variables play in such choices?
- Survey with undergraduate students at NYU on perceptions about consequences of educational choices
- Specifically: choice of a major
- Follow-up survey after six years

# Summary II

- Students believe in importance of consequences for own earnings and family life
- Particularly women, major choice also corresponds to different rates and timing of marriage and fertility
- Belief about marriage market "return" to higher earning majors
- Ex-ante beliefs are systematically related to educational choices and ex-post realized outcomes

#### Model I

#### Human capital investment under uncertainty

• Expected utility for human capital choice at time  $\tau$ :

$$E_{i,\tau}(V_k) = \sum_{t=\tau+1}^T \beta^{t-\tau} \int u_t(X) \ dG_{i,\tau}(X|k,t)$$

- with discount rate beta and outcome X for all subsequent periods given a human capital investment k
- $G_{i,\tau}(X|k,t)$  is the belief distribution about the outcome given human capital investments k

### Model II

#### Belief distribution $G_{i,\tau}(X|k,t)$

- Survey design elicits beliefs  $G_{i,\tau}(X|k,t)$  about the choice of a major
- Belief distrubtions have four characteristics:
  - reflect individual uncertainty
  - are heterogenous
  - can be incorrect
  - can evolve over time due to learning
- Natural limitation: elicitation of degree of uncertainty ask Jogibär if put here; also how do they elicit?

#### Model III

#### Different effects of human capital choices

Ex-ante individual differences in beliefs

$$\Delta_{G,i}(k,k') = G_i(X|k,t) - G_i(X|k',t)$$

Ex-post individual differences in potential outcomes

$$\Delta_{F,i}(k,k') = F_i(X|k,t) - F_i(X|k',t)$$

Ex-post individual differences realized outcomes

$$\Delta_H(k,k') = H(X|k,t) - H(X|k',t)$$

with 
$$H(X|k,t) = \frac{1}{M_k} \sum_{t \in \Omega_k} F_i(k=k^*,t)$$

#### Data

- Survey among NYU undergraduate students in 2010
- Beliefs about earnings, earnings growth, earnings uncertainty, marriage, spousal earnings, fertility and labor supply
- Questions conditioned on ages 23, 30 and 45
- Sample consists of 493 individuals
- Follow-up survey 6 years later

### Current Population Characteristics I

- Earnings, employment, and marriage data for the US population using the 2009
- Not suited for causal inference; needs not reflect the student's beliefs
- Data from older cohort; includes not only high-ability participants
- But data is suited to document that career and family outcomes differ by educational choices in observational data

# Earnings Beliefs

Earnings Levels

- Male students believe to earn more than female students at each age
- All students believe to see rapid growth in earnings
- Students believe to see substantially smaller earning growth if they don't major in science/business
- Perceived gender gap is largest in science/business and at later stages

## **Earnings Beliefs**

Earnings Returns and Earnings Growth

• Should I make go more into details here?

# Beliefs about Marriage and Spousal Characteristics

- Recent theory predicts that investment in education generates returns in the marriage market
- Probabilities:
  - Women belief they are slightly more likely to be married at younger ages, but no difference at age 45
  - Students believe they are less likely to be married without a degree
- Potential Spouse's Earnings
  - Men expect lower, women expect higher earnings for their potential Spouse
  - Students believe graduating in science or business relative to humanities or no degree will result in a higher earning spouse
  - There is evidence for assortative mating by education



## Beliefs about Fertility

- Conditioned on ages 30 and 45
- Men and women believe that completing a science or business degree rather than a degree in the humanities would reduce their expected number of children at age 30
- In contrast, completing a degree relative to no degree doubles expected number of children
- Students believe major choice has a larger effect on the timing of fertility rather than on the level

### Beliefs about Future Labor Supply

- Students believe their human capital choice will substantially affect their future employment
- Beliefs about working full-time is higher for males and higher for science/business degree relative to a degree in humanities
- Students' beliefs about their age 30 labor supply conditional on future expected marital status:
- Male students beliefs about future labor supply vary little by marital status, female students believe to work less when married

- Do beliefs actually influence intended and actual decisions?
- Intended major and actual major are outcome variables in the analysis

#### **Females**

Table 14: (Intended and Actual) Major Choice and Expectations about Career and Family

There I is (Internated and Firstan) Find of entert and Entertained account entert and I aming						
		d Major				
0]	LS	LA	AD	Multinomial Logit		
(1)	(2)	(3)	(4)	(5)	(6)	
0.146***	0.099**	0.230***	0.183**	0.084***	0.037	
(0.047)	(0.048)	(0.065)	(0.078)	(0.019)	(0.026)	
0.029***	0.029***	0.035***	0.039***	0.021***	0.022***	
(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	
	-0.251		-0.171		1.444**	
	(0.706)		(0.713)		(0.690)	
	0.087***		0.083		0.110***	
	(0.028)		(0.059)		(0.036)	
	0.306*		0.603***		0.575***	
	(0.188)		(0.202)		(0.143)	
-1.473***	-1.266***	-1.445***	-0.878***			
(0.206)	(0.250)	(0.188)	(0.262)			
	0.0124		0.0088		0.000	
317	317	317	317	185	185	
634	634	634	634	555	555	
0.192	0.219	0.1323	0.1484	0.157	0.2399	
	OI (1) 0.146*** (0.047) 0.029*** (0.004) -1.473*** (0.206) 317 634	Intende   OLS   (1)	Intended Major   CJS	Intended   Major	OLS	

Cols (1)-(2) show OLS estimates. Cols (3)-(4) show Least Absolute Deviation estimates. The

dep. variable is the intended likelihood of choosing a major.

Cols (5)-(6) show estimates from a multinomial logit regression, where the dependent

variable is the actual major at graduation.

8 a variable is the actual major at graduation.

8 b value of a F-test that coefficients on prob of marriage, spousal earnings, and exp number of children are jointly zero.

Females

Table 14: (Intended and Actual) Major Choice and Expectations about Career and Family

Table 14. (Interface and Actual) Major Choice and Expectations about career and Fairing						
	Intended Major				Actual Major	
	0	LS	LA	AD	Multinomial Logit	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Females						
Age 30 Earnings (\$10,000s)	0.146***	0.099**	0.230***	0.183**	0.084***	0.037
8 (1 / /	(0.047)	(0.048)	(0.065)	(0.078)	(0.019)	(0.026)
Ability Rank	0.029***	0.029***	0.035***	0.039***	0.021***	0.022***
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)
Prob Marriage by Age 30	(3.3.3.1)	-0.251	()	-0.1/1	()	1.444**
		(0.706)		(0.713)		(0.690)
Spousal Earnings (\$10,000s)		0.087***		0.083		0.110***
Speasar Zarmigs (\$10,0000)		(0.028)		(0.059)		(0.036)
Exp num of children by 30		0.306*		0.603***		0.575***
Exp nam of emidren by 50		(0.188)		(0.202)		(0.143)
Constant	-1.473***	-1.266***	-1.445***	-0.878***		(0.145)
Constant	(0.206)	(0.250)	(0.188)	(0.262)		
	(0.200)	(0.250)	(0.100)	(0.202)		
Pvalue (Family variables) <sup>a</sup>		0.0124		0.0088		0.000
Number of Individuals	317	317	317	317	185	185
Observations	634	634	634	634	555	555
(Pseudo) R-squared	0.192	0.219	0.1323	0.1484	0.157	0.2399

Cols (1)-(2) show OLS estimates. Cols (3)-(4) show Least Absolute Deviation estimates. The

dep. variable is the intended likelihood of choosing a major.

Cols (5)-(6) show estimates from a multinomial logit regression, where the dependent variable is the actual major at graduation.

Robust standard errors in parentheses. \*\* p<0.01, \*\* p<0.05, \* p<0.1. \* p<0.1. \* p<0.05, \* p<0.1. of children are jointly zero.

Females

Table 14: (Intended and Actual) Major Choice and Expectations about Career and Family

Table 14: (Intelliged and 71et	Table 14. (Interface and Actual) Major Choice and Expectations about Career and Family							
			d Major		Actual Major			
	0	LS	L	AD .	Multinomial Logit			
	(1)	(2)	(3)	(4)	(5)	(6)		
Panel A: Females								
Age 30 Earnings (\$10,000s)	0.146***	0.099**	0.230***	0.183**	0.084***	0.037		
8 (1 / /	(0.047)	(0.048)	(0.065)	(0.078)	(0.019)	(0.026)		
Ability Rank	0.029***	0.029***	0.035***	0.039***	0.021***	0.022***		
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)		
Prob Marriage by Age 30	, ,	-0.251	` ′	-0.171	,	1.444**		
		(0.706)		(0.713)		(0.690)		
Spousal Earnings (\$10,000s)		0.087***		0.083		0.110***		
Speasar Zarmigs (\$10,0000)		(0.028)		(0.059)		(0.036)		
Exp num of children by 30		0.306*		0.603***		0.575***		
and the state of the		(0.188)		(0.202)		(0.143)		
Constant	-1.473***	-1.266***	-1.445***	-0.878***		(01110)		
	(0.206)	(0.250)	(0.188)	(0.262)				
	(0.200)	(0.200)	(0.100)	(0.202)				
Pvalue (Family variables) <sup>a</sup>		0.0124		0.0088		0.000		
Number of Individuals	317	317	317	317	185	185		
Observations	634	634	634	634	555	555		
(Pseudo) R-squared	0.192	0.219	0.1323	0.1484	0.157	0.2399		
(1 beauty) it squared	0.172	0.217	0.1020	511 101	5.157	0.20))		

Cols (1)-(2) show OLS estimates. Cols (3)-(4) show Least Absolute Deviation estimates. The

dep. variable is the intended likelihood of choosing a major.

Cols (5)-(6) show estimates from a multinomial logit regression, where the dependent variable is the actual major at graduation.

Robust standard errors in parentheses. \*\* p<0.01, \*\* p<0.05, \* p<0.1. \* p<0.1. \* p<0.05, \* p<0.1. of children are jointly zero.

#### **Females**

Table 14: (Intended and Actual) Major Choice and Expectations about Career and Family

Tuble 14: (Intelliged this rice	titil) Titigor		1	com currer		
			d Major		Actual Major	
	Ol	LS	LA	AD	Multinomial Logi	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Females						
Age 30 Earnings (\$10,000s)	0.146***	0.099**	0.230***	0.183**	0.084***	0.037
8 8 11 /	(0.047)	(0.048)	(0.065)	(0.078)	(0.019)	(0.026)
Ability Rank	0.029***	0.029***	0.035***	0.039***	0.021***	0.022***
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)
Prob Marriage by Age 30	()	-0.251	(/	-0.171	()	1.444**
		(0.706)		(0.713)		(0.690)
Spousal Earnings (\$10,000s)		0.087***		0.083		0.110***
		(0.028)		(0.059)		(0.036)
Exp num of children by 30		0.306*		0.603***		0.575***
		(0.188)		(0.202)	l	(0.143)
Constant	-1.473***	-1.266***	-1.445***	-0.878***		(313.13)
	(0.206)	(0.250)	(0.188)	(0.262)		
Pvalue (Family variables) <sup>a</sup>		0.0124		0.0088		0.000
Number of Individuals	317	317	317	317	185	185
Observations	634	634	634	634	555	555
(Pseudo) R-squared	0.192	0.219	0.1323	0.1484	0.157	0.2399

Cols (1)-(2) show OLS estimates. Cols (3)-(4) show Least Absolute Deviation estimates. The

dep. variable is the intended likelihood of choosing a major.

Cols (5)-(6) show estimates from a multinomial logit regression, where the dependent

variable is the actual major at graduation. Robust standard errors in parentheses. \*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

<sup>a</sup> P-value of a F-test that coefficients on prob of marriage, spousal earnings, and exp number of children are jointly zero.

Males

Table 14: (Intended and Actual) Major Choice and Expectations about Career and Family

-		Intende	d Major		Actual Major	
	O	LS	LAD		Multinomial Logit	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel B: Males						
Age 30 Earnings (\$10,000s)	0.095*** (0.026)	0.093*** (0.026)	0.105** (0.047)	0.102** (0.051)	0.407*** (0.074)	0.410*** (0.080)
Ability Rank	0.024*** (0.005)	0.025*** (0.005)	0.018*** (0.006)	0.018*** (0.006)	(0.002)	(0.002)
Prob Marriage by Age 30		0.704 (1.049)		1.513 (1.517)		0.569 (1.383)
Spousal Earnings (\$10,000s)		(0.029)		(0.018)		-0.010 (0.046)
Exp num of children by 30		0.202 (0.234)		0.242 (0.225)		(0.211)
Constant	-0.423* (0.235)	-0.243 (0.290)	-0.178 (0.138)	-0.018 (0.223)		(-12-1)
Pvalue (Family variables) <sup>a</sup>		0.5248		0.6978		0.8005
Number of Individuals Observations	176 352	176 352	176 352	176 352	88 264	88 264
(Pseudo) R-squared	0.159	0.167	0.0744	0.0803	0.39	0.3953

Cols (1)-(2) show OLS estimates. Cols (3)-(4) show Least Absolute Deviation estimates. The

dep. variable is the intended likelihood of choosing a major.

Cols (5)-(6) show estimates from a multinomial logit regression, where the dependent variable is the actual major at graduation.

Robust standard errors in parentheses. \*\* p<0.01, \*\* p<0.05, \* p<0.1. \* p<0.05, \* p<0.1. \* p<0.05, \* p<0.1. of children are jointly zero.

Males

Table 14: (Intended and A	Actual) Major Choice a	nd Expectations about	Career and Family

	Intende	d Major			
Ol	LS	LA	LAD		nial Logit
(1)	(2)	(3)	(4)	(5)	(6)
			$\overline{}$		
0.095***	0.093***	0.105**	0.102**	0.407***	0.410***
(0.026)	(0.026)	(0.047)	(0.051)	(0.074)	(0.080)
0.024***	0.025***	0.018***	0.018***	0.002	0.002
		(0.006)	(0.006)	(0.006)	(0.007)
(=====)		()		(/	0.569
					(1.383)
					-0.010
					(0.046)
					0.211
					(0.234)
-0.423*		-0.178			(0.254)
(0.233)	(0.290)	(0.156)	(0.223)		
	0.5248		0.6978		0.8005
176	176	176	176	88	88
352	352	352	352	264	264
					0.3953
	(1) 0.095*** (0.026) 0.024*** (0.005) -0.423* (0.235)	OLS (1) (2)  0.095*** 0.093*** (0.026) (0.026) (0.024*** (0.005) (0.005) (0.005) (1.049) (0.029) (0.202) (0.234) -0.423* -0.243 (0.235) (0.290)  0.5248 176 176 352 352	(1) (2) (3)  (0.095*** 0.093*** (0.026) (0.026) (0.026) (0.005) (0.005) (0.005) (0.005) (0.005) (0.005) (0.009) (0.029) (0.029) (0.029) (0.029) (0.029) (0.202 (0.234) -0.423* -0.243 -0.178 (0.235) (0.290) (0.138)  0.5248 176 176 176 352 352 352	OLS         LAD           (1)         (2)         (3)         (4)           (0.095***)         0.093***         0.105**         0.102**           (0.026)         (0.026)         (0.047)         (0.051)           (0.024***)         0.025***         0.018***         0.018***           (0.005)         (0.005)         (0.006)         (0.006)           (1.049)         (1.517)         0.029         0.018           (0.029)         (0.081)         0.202         0.242           (0.234)         (0.234)         (0.225)           -0.423*         -0.243         -0.178         -0.018           (0.235)         (0.290)         (0.138)         (0.223)           0.5248         0.6978           176         176         176         176           352         352         352         352	OLS         LAD         Multinon           (1)         (2)         (3)         (4)         (5)           (0.095**** (0.026)         (0.047)         (0.051)         (0.074)         (0.051)           (0.024*** (0.025*** (0.005)         (0.018*** (0.018*** (0.018*** (0.005)         (0.005)         (0.006)         (0.006)         (0.006)           (0.005)         (0.005)         (0.006)         (0.006)         (0.006)         (0.006)           (0.029)         (0.018)         (0.029)         (0.081)         (0.026)         (0.242)           (0.234)         (0.224)         (0.225)         (0.243)         (0.225)         (0.018)         (0.223)           (0.235)         (0.290)         (0.138)         (0.223)         (0.223)           0.5248         0.6978         176         176         186         88           352         352         352         352         264

Cols (1)-(2) show OLS estimates. Cols (3)-(4) show Least Absolute Deviation estimates. The

dep. variable is the intended likelihood of choosing a major. Cols (5)-(6) show estimates from a multinomial logit regression, where the dependent variable is the actual major at graduation.

Robust standard errors in parentheses. \*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

<sup>a</sup> P-value of a F-test that coefficients on prob of marriage, spousal earnings, and exp number of children are jointly zero.

Males

Table 14: (Intended and A	Actual) Major Choice a	nd Expectations about	Career and Family

		Intende	d Major		Actual	Major
	0	LS	LAD		Multinomial Logi	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel B: Males						
Age 30 Earnings (\$10,000s)	0.095***	0.093***	0.105**	0.102**	0.407***	0.410***
8,	(0.026)	(0.026)	(0.047)	(0.051)	(0.074)	(0.080)
Ability Rank	0.024***	0.025***	0.018***	0.018***	0.002	0.002
,	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)
Prob Marriage by Age 30	(/	0.704		1.513		0.569
		(1.049)		(1.517)		(1.383)
Spousal Earnings (\$10,000s)		0.029		0.018		-0.010
-1		(0.029)		(0.081)		(0.046)
Exp num of children by 30		0.202		0.242		0.211
		(0.234)		(0.225)		(0.234)
Constant	-0.423*	-0.243	-0.178	-0.018		
	(0.235)	(0.290)	(0.138)	(0.223)		
Pvalue (Family variables) <sup>a</sup>		0.5248		0.6978		0.8005
Number of Individuals	176	176	176	176	88	88
Observations	352	352	352	352	264	264
(Pseudo) R-squared	0.159	0.167	0.0744	0.0803	0.39	0.3953

Cols (1)-(2) show OLS estimates. Cols (3)-(4) show Least Absolute Deviation estimates. The

dep. variable is the intended likelihood of choosing a major. Cols (5)-(6) show estimates from a multinomial logit regression, where the dependent variable is the actual major at graduation.

Robust standard errors in parentheses. \*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

<sup>a</sup> P-value of a F-test that coefficients on prob of marriage, spousal earnings, and exp number of children are jointly zero.

Males

Table 14: (Intended and Actual	) Major Ch	noice and Exp	ectations about (	Career and F	₹amily
--------------------------------	------------	---------------	-------------------	--------------	--------

	Intended Major				Actual Major	
	Ol		LAD			nial Logit
	(1)	(2)	(3)	(4)	(5)	(6)
Panel B: Males						
Age 30 Earnings (\$10,000s)	0.095***	0.093***	0.105**	0.102**	0.407***	0.410***
	(0.026)	(0.026)	(0.047)	(0.051)	(0.074)	(0.080)
Ability Rank	0.024***	0.025***	0.018***	0.018***	0.002	0.002
ř	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)
Prob Marriage by Age 30		0.704		1.513		0.569
0,0		(1.049)		(1.517)		(1.383)
Spousal Earnings (\$10,000s)		0.029		0.018		-0.010
1		(0.029)		(0.081)		(0.046)
Exp num of children by 30		0.202		0.242		0.211
1		(0.234)		(0.225)	l	(0.234)
Constant	-0.423*	-0.243	-0.178	-0.018		
	(0.235)	(0.290)	(0.138)	(0.223)		
Pvalue (Family variables) <sup>a</sup>		0.5248		0.6978		0.8005
Number of Individuals	176	176	176	176	88	88
Observations	352	352	352	352	264	264
(Pseudo) R-squared	0.159	0.167	0.0744	0.0803	0.39	0.3953

Cols (1)-(2) show OLS estimates. Cols (3)-(4) show Least Absolute Deviation estimates. The

dep. variable is the intended likelihood of choosing a major. Cols (5)-(6) show estimates from a multinomial logit regression, where the dependent

variable is the actual major at graduation. Robust standard errors in parentheses. \*\* p < 0.01, \*\* p < 0.05, \* p < 0.1. \*\* p < 0.01. of children are jointly zero.

### Beliefs and Realized Outcomes I

Follow-up survey

- Follow-up survey six years after the initial survey
- 274 out of the initial 493 respondents participated
- Average age of respondent is 25
- Provides some evidence for the "quality" of the expectations data
- Respondents are not reminded of their initial answers

### Beliefs and Realized Outcomes II

Population descriptive statistics

- No statistically significant differences in expectations for earnings and working full-time
- 18% of females expected to work part-time, but only 9% in reality
- Large significant differences in expectations about marriage
- Significant difference in females expectations about partner's earnings: expectation 64.000 vs. realization 85.000

#### Beliefs and Realized Outcomes III

#### Individual-level relationship - career

Table 16: The Link between Expectations and Outcomes

Table 16. The Link between Expectations and Outcomes						
	All	Males	Females			
Panel A, dependent variable: Log (current earnings Log(Exp Earnings, Age Weighted)	0.386*** (0.131)	0.167 (0.207)	0.521*** (0.125)			
Observations $R^2$ Mean of Dependent Variable	201	64	137			
	0.092	0.018	0.153			
	10.99	11.18	10.90			
Panel B, dependent variable: Employed Full-time Expected Prob of full-time emp at 30	0.165	-0.189	0.358*			
	(0.148)	(0.220)	(0.187)			
Observations $R^2$ Mean of Dependent Variable	273	88	185			
	0.005	0.007	0.023			
	0.740	0.740	0.740			
Panel C, dependent variable: Employed Part-time Expected Prob of part-time Emp at 30	0.272*	0.0203	0.392**			
	(0.161)	(0.263)	(0.196)			
Observations $R^2$ Mean of Dependent Variable	273	88	185			
	0.015	0.000	0.032			
	0.0900	0.0900	0.0900			

### Beliefs and Realized Outcomes III

#### Individual-level relationship - career

Table 16: The Link between Expectations and Outcomes

Table 16. The Link between Expectations and Outcomes							
	All	Males	Females				
Panel A, dependent variable: Log (current earnings							
Log(Exp Earnings, Age Weighted)	0.386*** (0.131)	0.167 (0.207)	0.521*** (0.125)				
Observations	201	64	137				
$R^2$	0.092	0.018	0.153				
Mean of Dependent Variable	10.99	11.18	10.90				
Denot D. Janes Janton Schler Frenchen J Fell Con-							
Panel B, dependent variable: Employed Full-time Expected Prob of full-time emp at 30	0.165 (0.148)	-0.189 (0.220)	0.358* (0.187)				
Observations	273	88	185				
$R^2$	0.005	0.007	0.023				
Mean of Dependent Variable	0.740	0.740	0.740				
B 101 1 11 B 1 1B 1							
Panel C, dependent variable: Employed Part-time Expected Prob of part-time Emp at 30	0.272* (0.161)	0.0203 (0.263)	0.392** (0.196)				
Observations	273	88	185				
$R^2$	0.015	0.000	0.032				
Mean of Dependent Variable	0.0900	0.0900	0.0900				

### Beliefs and Realized Outcomes IV

Individual-level relationship - family variables

- Marriage variable is distorted due to young age of respondents
- Significant if approximated by actual outcome "in a relationship"
- Beliefs about spousal income are predictive for actual spousal income
- Overall beliefs compare favorably to actual outcomes
- Indication that students can anticipate career and family outcomes of educational choices to some degree

#### Future Research

- Run follow-up surveys when students realize outcomes at ages 30 and 45
- Choice of participants casts doubt on external validity: extend the Sample
- Study elicits student's beliefs, but does not uncover the reasons for these beliefs
- Stated beliefs are not consequential

### Current Population Characteristics II

Table 2: Des	criptive	Statistics	of 2009	ACS Data
--------------	----------	------------	---------	----------

14070	ole 2. Descriptive statustics of 2007 Nest Batta					15
	A, A	ge 23	A	.ge 30	A	ge 45
	Male	Female	Male	Female	Male	Female
E ( 610,000 )						
Earnings (in \$10,000s)						
Science/Business	3.33	3.22	6.74	5.48+++	11.61	7.46+++
	(2.15)	(2.19)	(4.81)	(3.15)	(9.79)	(6.49)
Humanities	2.51	2.57	5.40	4.47+++	9.07	5.93+++
	(1.33)	(1.88)	(4.20)	(2.71)	(8.48)	(5.67)
No Degree	2.54	2.15+++	4.21	3.08+++	5.70	3.88+++
C	(1.52)	(1.41)	(2.50)	(1.59)	(4.13)	(2.57)
p-value <sup>a</sup>	0	0	0	0	0	0
Spousal Earnings (in \$10.	(2000s)					
Science/Business	3.41	4.75+++	5.26	8.25+++	7.44	12.68+++
	(2.09)	(3.11)	(3.44)	(5.79)	(6.69)	(10.15)
Humanities	2.27	3.49+++	4.30	6,66+++	5.71	9.85+++
Tumumtes	(1.33)	(1.93)	(2.61)	(5.64)	(4.72)	(9.42)
No Degree	2.21	3,50+++	3.24	4.82+++	3.76	6.36+++
110 Degree	(1.13)	(1.93)	(1.86)	(2.92)	(2.59)	(4.81)
p-value	(1.13)	0.003	0	(2.52)	(2.55)	(4.01)
p-value	· ·	0.005	Ü	· ·	· ·	0
Full-time Employed (%)						
Science/Business	38.5	42.4+++	80.86	64.40+++	82.68	58.42+++
Humanities	30.9	36.2+++	72.96	57.92+++	75.86	52.07+++
No Degree	40.1	34.4+++	66.53	46.51+++	67.88	52.44+++
p-value	0.1	0	00.55	40.51777	07.88	0
p-value	U	U	U	U	U	U
Married (%)						
Science/Business	8.2	15.9+++	61.72	67.49+++	80.79	76.14+++
Humanities	11.5	15.3+++	55.7	64.94+++	76.58	74.51+
No Degree	15.2	26.4+++	54.86	59.29+++	69.3	69.65
p-value	0	0	0	0	09.3	09.05
p-value		610.000	U	V	U	V

Earnings and spousal earnings shown in \$10,000s.

Mean (standard deviation) shown for the continuous outcomes.
+++, ++, epender differences statistically significant at the 1, 5, and 10% levels, respectively. Symbols denoted on female column.

"p-value of a F-test of the joint equality of means across majors. p-value of zero

implies p-vlaue < 0.001.

### Earnings Beliefs: Earnings Levels

Tab	le	3:	Sel	f F	arn	ings
I ao	ıc	J.	OCI.		cui i i	யத

	Age	e 23	Ag	ge 30	Age 45		
	Male	Female	Male	Female	Male	Female	
Panel A: Levels (in 10,000s of dol	lars)						
Science/Business	5.93	5.39	13.74	10.86++	19.00	13.81+++	
	(7.32)	(4.66)	(16.61)	(9.31)	(22.38)	(14.12)	
Humanities	4.71	3.94	6.87	6.86	11.03	9.60	
	(7.38)	(3.51)	(5.51)	(7.4)	(13.53)	(11.75)	
No Degree	3.50	2.45++	5.07	3.27++	8.97	5.86+++	
<u> </u>	(7.54)	(1.16)	(11.0)	(4.56)	(15.95)	(10.22)	
Overall	5.60	4.68+	12.95	9.21+++	18.44	12.33+++	
	(7.36)	(3.81)	(16.35)	(8.45)	(22.52)	(13.90)	
Panel B: Individual Log Difference	es						
Sci/Business versus. Humanities	.267***	.304***	.523***	.425***++	.446***	.347***+	
	(.019)	(.017)	(.048)	(.025)	(.051)	(.026)	
Graduate versus. No Degree	.594***	.642***	1.022***	1.038***	.829***	.833***	
	(.033)	(.026)	(.055)	(.037)	(.054)	(.038)	

Panel A shows the mean and standard deviations of expected earnings (in \$10,000s). +++, ++, + denote gender differences are statistically different at the 1, 5, and 10% levels, respectively.

Panel B shows the avg. log differences and standard deviations in parentheses. \*\*\*, \*\*, \* denote the means are statistically different from zero at the 1, 5, and 10% levels, respectively. +++, ++, + (shown on the female column) denote gender differences are statistically different at the 1, 5, and 10% levels, respectively.

### Earnings Growth

Table 4: Earnings growth beliefs

Table 4: Earnings growth beliefs							
	Age 23-30 Age 30			30-45			
	Male	Female	Male	Female			
Panel A: Levels (in %)							
Science/Business	.67	.63	.25	.19			
	(.72)	(.65)	(.47)	(.54)			
Humanities	.41	.51÷	`.32	`.27			
	(.56)	(.53)	(.45)	(.52)			
No Degree	.23	.21	.47	.43			
	(.78)	(.55)	(.74)	(.58)			
Overall	.66	.6	.29	.23			
	(.73)	(.58)	(.48)	(.52)			
Panel B: Individual differences							
Sci/Business versus. Humanities	.26***	.12***+++	08*	08***			
Del Buomeso versuoi Tramamies	(.05)	(.03)	(.04)	(.03)			
Graduate versus. No Degree	.42***	.39***	19***	2***			
Gradatic versus 110 Degree	(.06)	(.03)	(.06)	(.03)			

Panel A shows the mean and standard dev of beliefs about earnings growth (in %). +++, ++, + denote gender differences are statistically different at the 1, 5, and 10% levels, respectively.

Panel B shows average log differences and standard deviations in parentheses.

\*\*\*, \*\* denote means are statistically different from zero at the 1, 5, and 10% levels, respectively. +++, +++, ++, known on the female column) denote gender differences are statistically different at the 1, 5, and 10% levels, respectively.

## **Earnings Uncertainty**

Table 5: Age 30 Earnings Uncertainty - Std deviations from fitting a Beta Distribution

9.17	9.49
(1.44)	(2.48)
	10.01
	(2.32)
	15.27
	(7.53) 9.68
	(2.01)

#### Panel B: Individual differences

Sci/Business versus. Humanities	11***	057***+++
	(.014)	(.012)
Graduate versus. No Degree	305***	335***
	(.052)	(.043)

Panel A shows the mean and std dev of age 30 earnings uncertainty beliefs (in \$10,000). Uncertainty is the standard deviation of the

behiefs (in \$10,000). Uncertainty is the standard overation of the individual-specific (beta-) fitted earnings distribution.
++++, +++ denote gender differences statistically different at the 1, 5, and 10% levels, respectively.
Panel B shows average log differences and standard deviations in parentheses. \*\*\*\* \*\*\* \*\* denote means are statistically diff from 0 at the 1, 5, and 10% levels, respectively, +++, ++, (shown on female statistically diff statistically diff from 0 at the 1, 5, and 10% levels, respectively, +++, ++, (shown on female statistically diff from 0 at the 1, 5, and 10% levels, respectively, +++, ++, (shown on female statistically diff from 0 at the 1, 5, and 10% levels, respectively, +++, ++, (shown on female statistically diff from 0 at the 1, 5, and 10% levels, respectively, +++, ++, ++ (shown on female statistically diff from 0 at the 1, 5, and 10% levels, respectively, +++, ++, ++ (shown on female statistically differences are statis column) denote gender differences are statistically different at the 1, 5, and 10% levels, respectively.

### Beliefs about Marriage

Table 6: Reliefs about Marriage

Table 6. Beliefs about Marriage									
Prob Marriage:	Age 23		A	ge 30	Age 45				
	Male	Female	Male	Female	Male	Female			
Panel A: Levels (0-1 scale)									
Science/Business	.148	.167	.593	.594	.804	.778			
Humanities	(.207)	(.214) .182	(.286) .601	(.271)	(.248) .797	(.253)			
Humanities	(.214)	(.229)	(.291)	(.268)	(.253)	.800 (.246)			
No Degree	.153	.221+++	.535	.605++	.727	.743			
-	(.219)	(.26)	(.329)	(.29)	(.302)	(.287)			
Overall	.149	.179	.589	.634+	.797	.793			
	(.213)	(.225)	(.288)	(.266)	(.25)	(.242)			
Panel B: Individual Log Differe	nces								
Sci/Business versus. Humanities	008	096*	024	147***++	.013	020			
Conductor warms No December	(.046)	(.053) 192**+	(.042)	(.039)	(.014)	(.024)			
Graduate versus. No Degree	(.099)	(.091)	(.11)	(.054)	(.09)	(.054)			
	(.0))	(.0)1)	()	(.054)	(.0)	(.007)			

Panel A shows the mean and standard deviations of marriage beliefs. +++, ++, + denote gender diffs are

significant at the 1, 5, and 10% levels, respectively.

respectively. +++, ++, + (shown on the female column) denote gender differences are statistically

# Beliefs about Potential Spousal Earnings

Table 7: Beliefs about Potential Spousal Earnings, Conditional on Own Major (and Own Age)

	Ag	e 23	Age	e 30	Ag	ge 45	
	Male	Female	Male	Female	Male	Female	
Panel A: Levels (in 10,000s of dollars)							
Science/Business	5.06	5.74+	9.00	10.76++	11.29	13.68+	
Science Business	(4.12)	(3.92)	(7.72)	(9.14)	(13.25)	(13.67)	
Humanities	4.52	4.75	7.05	7.86	8.02	11.07+++	
Humanities	(7.35)	(3.75)					
N. D.			(8.93)	(7.69)	(7.95)	(12.90)	
No Degree	4.58	3.46	4.57	5.54	6.25	7.76	
	(11.99)	(2.26)	(5.56)	(9.11)	(9.89)	(12.03)	
Overall	5.02	5.30	8.42	9.74+	10.77	12.73	
	(5.90)	(3.88)	(7.60)	(8.91)	(13.20)	(13.61)	
Panel B: Individual Log Difference	res						
Sci/Business versus. Humanities	.185***	.198***	.282***	.292***	.241***	.221***	
	(.019)	(.015)	(.044)	(.024)	(.04)	(.026)	
Graduate versus. No Degree	.432***	.481***	.687***	.741***	.587***	.632***	
Graduate versus. 110 Degree	(.048)	(.028)	(.05)	(.041)	(.054)	(.039)	
N 11 1 1 1 1 1 1 1	(.040)		(.05)	(.0+1)	(.054)		

Panel A shows the mean and standard dev of beliefs about spouse's expected earnings (in \$10,000s) conditional on own major.

+++, ++, + denote gender differences are statistically different at the 1, 5, and 10% levels, respectively. Panel B shows avg. log differences and standard deviations in parentheses. \*\*\*\* \*\* denote means are statistically different from zero at the 1, 5, and 10% levels, respectively. +++, ++, +(shown on the female column) denote gender differences are statistically different at the 1, 5, and 10% levels, respectively.

#### Beliefs and Realized Outcomes

#### Population statistics - career variables

Table 15: Descriptive Statistics - Expectations (Weighted by Major Probs) and Outcomes

15. Desc			ectations (we	iginiou by iv	iajoi Fiot	s) and Out	ICO1
	Expe	ctations in	2010	Real	izations in	2016	-
	All	Males	Females	A11	Males	Females	
Donal /	A: Earnings	Eull time	(age-weighte	d avpactatio	n)		_
Mean	7.35	9.90	6.16	7.49	10.18	6.24	
SD	(8.19)	(13.52)	(3.06)	(7.74)	(12.39)	(3.46)	
N	201	64	137	201	64	137	
Danal E	2. Likalihoo	d of full tin	ne employme	nt (202 30 a	v nactatio	2)	_
Paner	5. Likelilloo	u oi iuii-uii	ie employme	III (age 50 e	xpectation	74.05	
Mean	77.61	82.28	75.38	73.99	73.86	74.05	
SD	(19.15)	(19.51)	(18.61)	(43.95)	(44.19)	(43.95)	
N	273	88	185	273	88	185	
Danal (	. Likalihoo	d of part tir	na amployma	nt (aga 20 (	vnactatio	n)	_
Mann	16 02***	u oi part-ui	ne employme 18.08***	in (age 50 t	o oo	0.10	
SD	(13.1)	(12.02)	(13.12)	(28.9)	(28.91)	(28.97)	
N	273	88	185	273	88	185	

### Beliefs and Realized Outcomes

#### Population statistics - family variables

Table 15: Descriptive Statistics - Expectations (Weighted by Major Probs) and Outcomes

15. Desc			ctations (we	ignicu by iv	iajoi Fiou	s) and Out	COIII			
	Expe	ectations in :	2010	Reali	zations in	2016				
	All	Males	Females	A11	Males	Females				
Panel D: Likelihood of Marriage										
Using 6	expectation	for 1-vr afte	r graduation	(and marria	ge for out	tcomes)				
Mean	16.04***	13.62*	17.16***	5.56	8.14	4.35				
SD	(21.62)	(19.83)	(22.37)	(22.95)	(27.5)	(20.45)				
N	270	86	184	270	86	184				
Using a	age-weighte	d expectation	on (and marri 35.77***	age + cohat	o. for outc	omes)				
		31.35***	35.77***							
SD	(21.08)	(21.97)	(20.56)	(50.06)	(50.08)	(50.13)				
N	270	86	184	270	86	184				
Panel F	E: Likelihoo	d of partner	working full	-time (age 3	30 expecta	tion)				
Mean	73.91	62.28	78.89	76.15	69.23	79.12				
SD	(21.19)	(23.28)	(18.2)	(42.78)	(46.76)	(40.87)				
N	130	39	91	130	39	91				
11	130	39	91	150	39	91				
Danal I	- Dortnor's l	Farnings (a)	a waighted	vnactation)						
Maon	6.52*	Carinings (ag	ge-weighted 6	7 72	5.68	8.5				
SD	(2.84)	(3.24)	(2.69)	(6.14)	(3.53)	(6.73)				
N	99	27	72	99	27	72				

#### Beliefs and Realized Outcomes

#### Individual-level relationship - family variables

Tabl	e 16:	The	Link	between	Expectat	ions and	1	Outcomes
------	-------	-----	------	---------	----------	----------	---	----------

There for the Billi etc. this Billi	All	Males	Females			
Panel D, dependent variable: Married						
Age-Weighted Exp Probability of Being Married	0.217**	0.378*	0.147			
	(0.100)	(0.217)	(0.0936)			
Observations	270	86	184			
$R^2$	0.040	0.091	0.022			
Mean of Dependent Variable	0.0600	0.0800	0.0400			
Panel E, dependent variable: In Any relationship						
Age-Weighted Exp Probability of Being Married	0.503***	0.606***	0.441***			
rige weighted Exp Producinty of Being Married	(0.127)	(0.209)	(0.161)			
Observations	270	86	104			
Observations $R^2$	0.045	0.071	184 0.033			
Mean of Dependent Variable	0.480	0.450	0.033			
<del></del>		0.150	0.150			
Panel F, dependent variable: Spouse/Partner Working Full-time						
Expected Prob of Spouse full-time Emp at 30	0.415** (0.183)	0.458 (0.298)	0.339			
	(0.163)	(0.298)	(0.253)			
Observations	130	39	91			
$R^2$	0.042	0.052	0.023			
Mean of Dependent Variable	0.760	0.690	0.790			
Panel G, dependent variable: Log(Spouse/Partner Earnings)						
Log(Age-Weighted Expected Earnings of Spouse)	0.400**	0.598**	0.344*			
	(0.173)	(0.233)	(0.206)			
Observations	112	31	81			
$R^2$	0.054	0.119	0.042			
Mean of Dependent Variable	1.690	1.420	1.790			