Behavioral economics: (Wikipedia, 2014-01-22)

Behavioral economics and the related field, **behavioral finance**, study the effects of social, cognitive, and emotional factors on the economic decisions of individuals and institutions and the consequences for market prices, returns, and the resource allocation.[1] The fields are primarily concerned with the bounds of rationality of economic agents. Behavioral models typically integrate insights from psychology with microeconomic theory; in so doing, these behavioral models cover a range of concepts, methods, and fields.[2]

The study of behavioral economics includes how market decisions are made and the mechanisms that drive public choice.

There are three prevalent themes in behavioral finances:[3]

Heuristics: People often make decisions based on approximate rules of thumb and not strict logic.

Framing: The collection of anecdotes and stereotypes that make up the mental emotional filters individuals rely on to understand and respond to events.

Market inefficiencies: These include *mis-pricings* and *non-rational decision making*.

Behavioral economics: (Wikipedia, 2014-01-22)

Studies of the effects of social, cognitive, and emotional factors on the economic decisions of individuals and institutions.

Bounded rationality of economic agents.

Three prevalent themes

Heuristics: decisions based on approximate rules of thumb and not strict logic.

Framing: The collection of anecdotes and stereotypes that make up the mental emotional filters individuals rely on to understand and respond to events.

Market inefficiencies: These include mispricings and non-rational decision making.

Especially important in health economics, since many emotional factors enter in, and experts play a huge role in framing how to think about health problems.

Behavioral economics

Studies of the effects of social, cognitive, and emotional factors on the economic decisions of individuals and institutions.

Themes:

Bounded rationality *or irrationality* of economic agents: consumers do not always optimize

Heuristics: decisions use approximate rules of thumb and not strict logic.

Framing: The information and emotional filters individuals rely on to understand and respond to events.

Market inefficiencies: These include mispricings and non-rational decision making.

Especially important in **health economics.** (Think about why.)

Results of a mini behavioral economics survey.

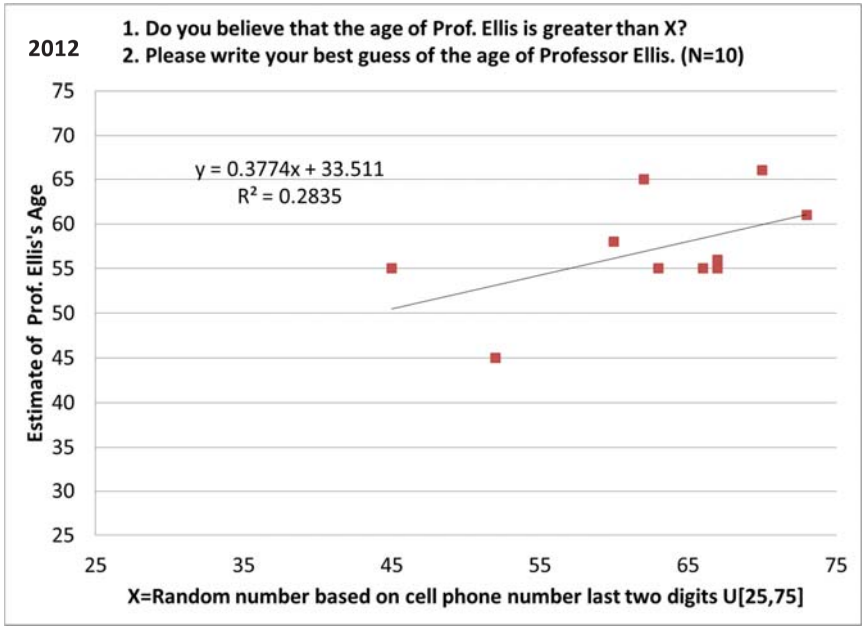
A. X=Random number based on cell phone number last two digits (=N) if(N<25, N+25,if(N>75,N-25,N)), so that X is U[25,75]

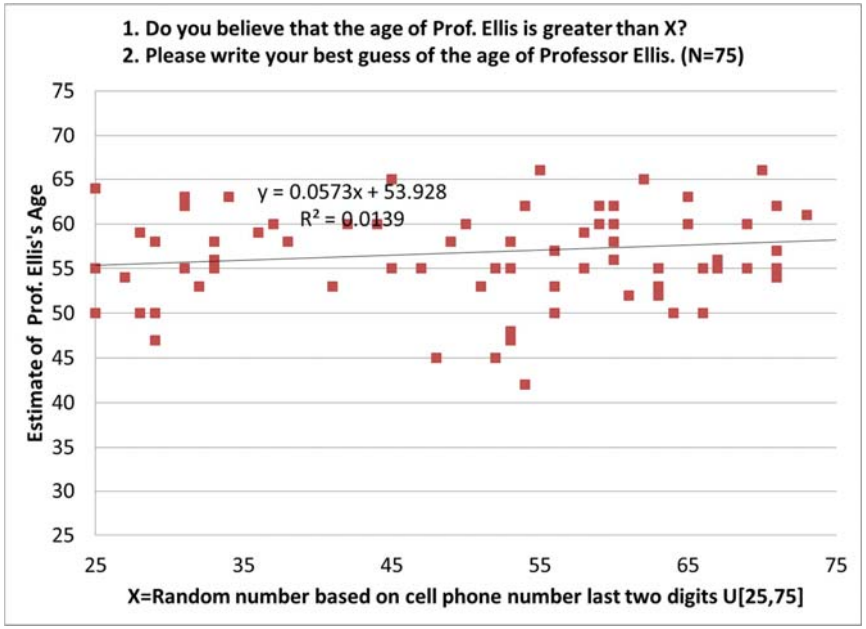
1. Do you believe that the age of Prof. Ellis is greater than X?
2. Please write your best guess of the age of Professor Ellis.

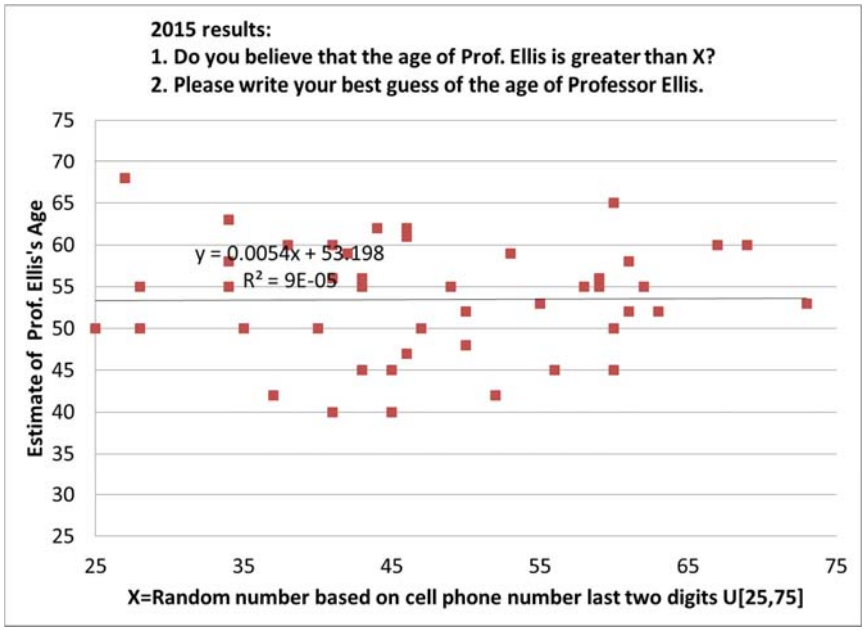
B. X = random number based on last two digits of BU ID.
if(N>50, N-50,N)), so that X is U[0,50]

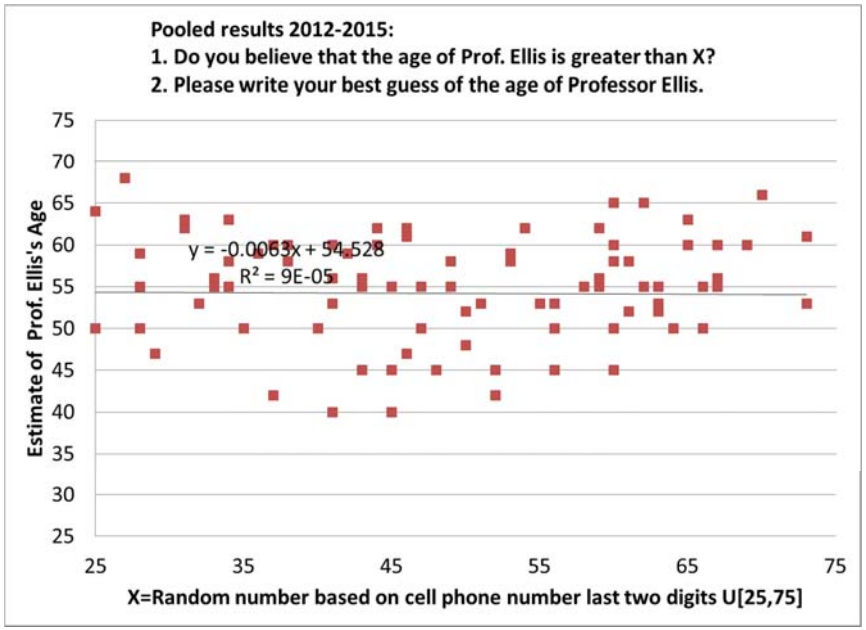
3. Do you think the total number of students at BU (including part-time, undergraduate and graduate students) is greater than X?
4. Please write your best guess of the total number of students at BU.

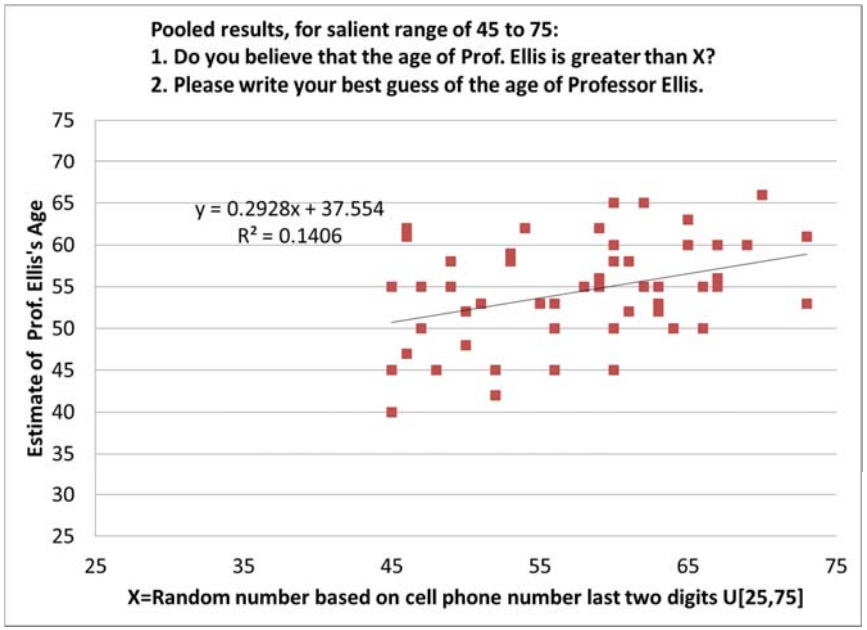
B. X Two different versions of survey, half with X=100, half with X=200
5. Do you think BU is more than X years old?
6. Write down your best guess of the age of BU.


2012
1. Do you believe that the age of Prof. Ellis is greater than X?
2. Please write your best guess of the age of Professor Ellis. (N=10)
y = 0.3774x + 33.511
R² = 0.2835
Estimate of Prof. Ellis's Age
X=Random number based on cell phone number last two digits U[25,75]

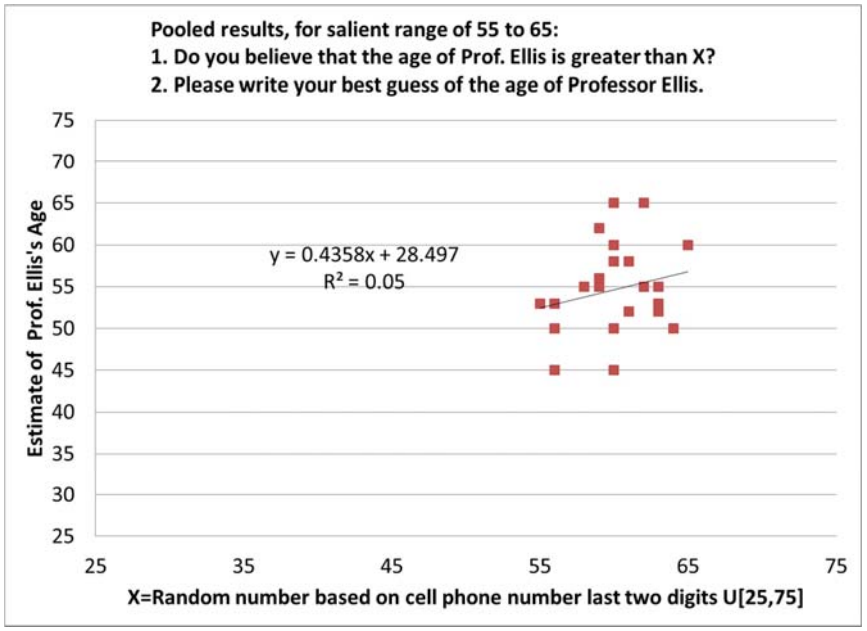

1. Do you believe that the age of Prof. Ellis is greater than X?
2. Please write your best guess of the age of Professor Ellis. (N=75)
y = 0.0573x + 53.928
R² = 0.0139
Estimate of Prof. Ellis's Age
X=Random number based on cell phone number last two digits U[25,75]

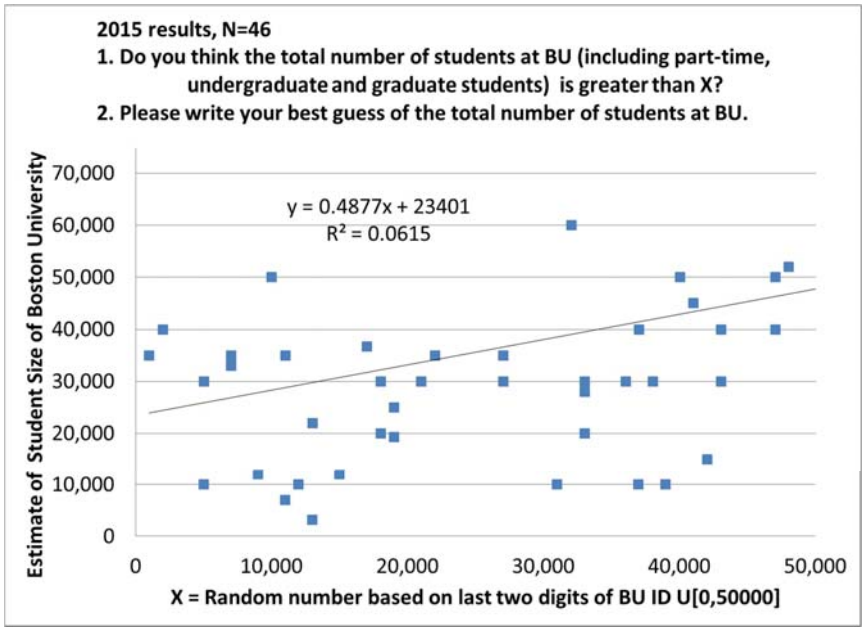

2015 results:
1. Do you believe that the age of Prof. Ellis is greater than X?
2. Please write your best guess of the age of Professor Ellis.
y = 0.0054x + 53.198
R² = 9E-05
Estimate of Prof. Ellis's Age
X=Random number based on cell phone number last two digits U[25,75]

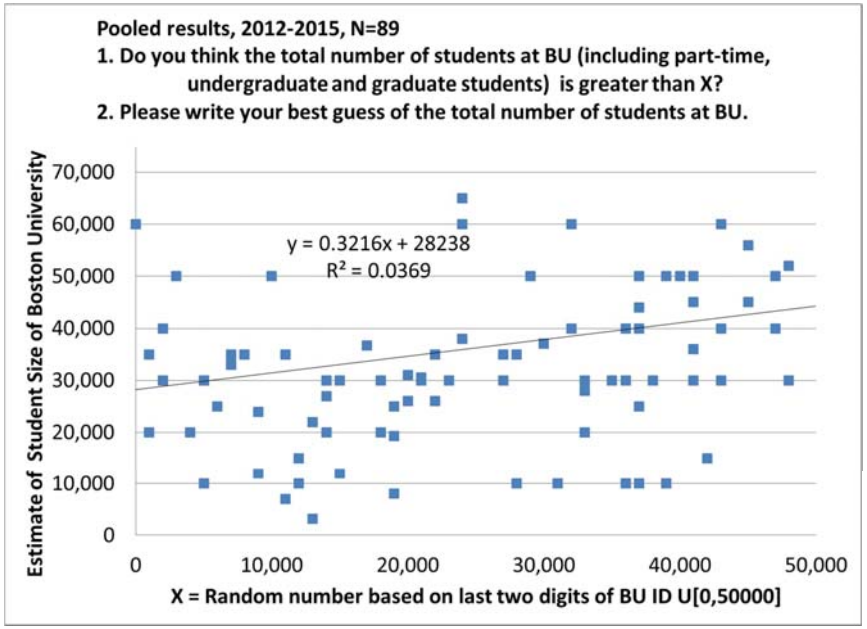

Pooled results 2012-2015:
1. Do you believe that the age of Prof. Ellis is greater than X?
2. Please write your best guess of the age of Professor Ellis.
y = -0.0063x + 54.528
R² = 9E-05
Estimate of Prof. Ellis's Age
X=Random number based on cell phone number last two digits U[25,75]

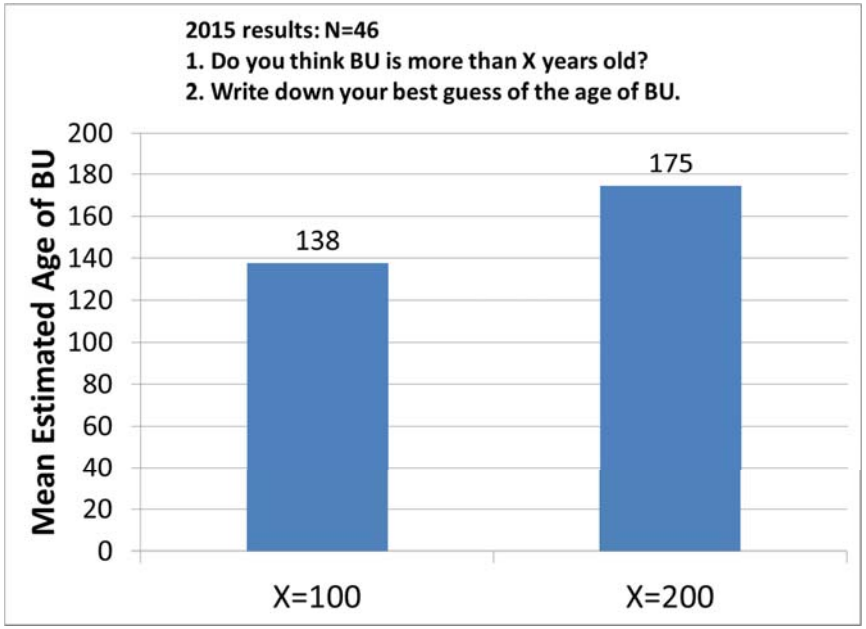

Pooled results, for salient range of 45 to 75:
1. Do you believe that the age of Prof. Ellis is greater than X?
2. Please write your best guess of the age of Professor Ellis.
y = 0.2928x + 37.554
R² = 0.1406
Estimate of Prof. Ellis's Age
X=Random number based on cell phone number last two digits U[25,75]

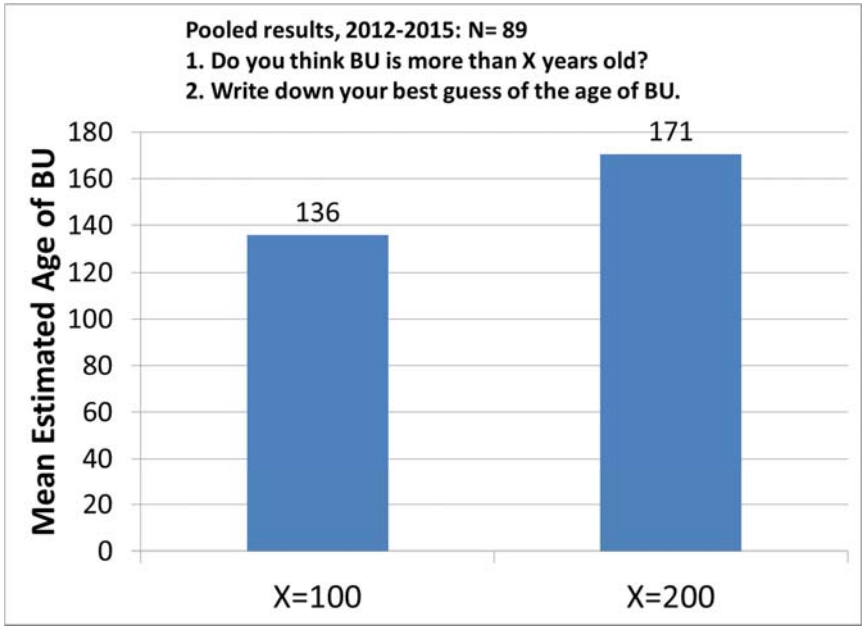

Pooled results, for salient range of 50 to 70:
1. Do you believe that the age of Prof. Ellis is greater than X?
2. Please write your best guess of the age of Professor Ellis.
y = 0.4308x + 29.135
R² = 0.1623
Estimate of Prof. Ellis's Age
X=Random number based on cell phone number last two digits U[25,75]

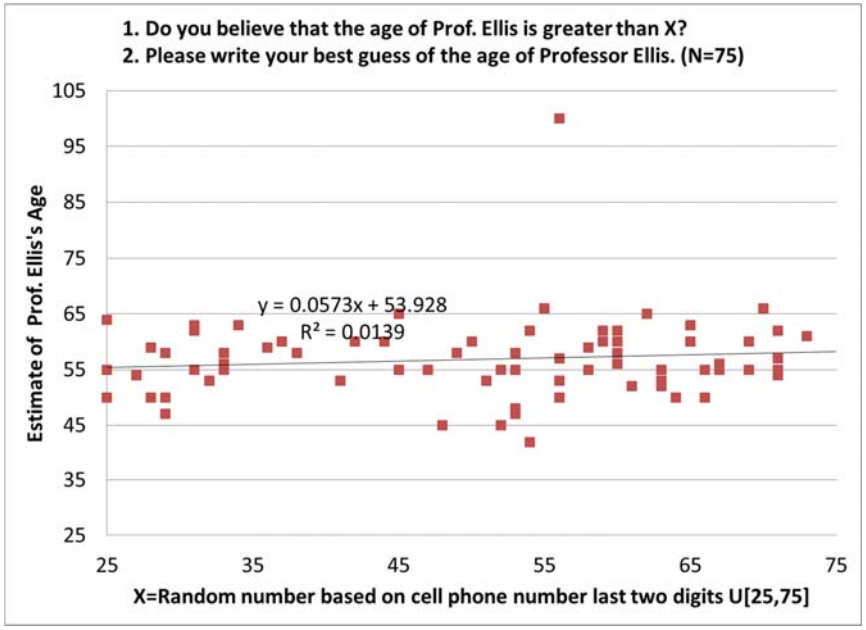

Pooled results, for salient range of 55 to 65:
1. Do you believe that the age of Prof. Ellis is greater than X?
2. Please write your best guess of the age of Professor Ellis.
y = 0.4358x + 28.497
R² = 0.05
Estimate of Prof. Ellis's Age
X=Random number based on cell phone number last two digits U[25,75]

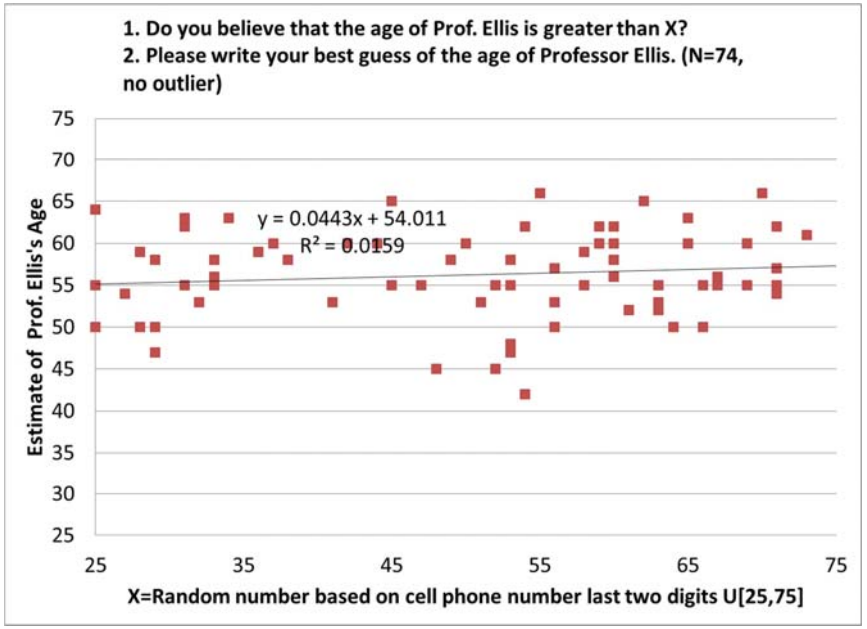

2015 results, N=46
1. Do you think the total number of students at BU (including part-time, undergraduate and graduate students) is greater than X?
2. Please write your best guess of the total number of students at BU.
y = 0.4877x + 23401
R² = 0.0615
Estimate of Student Size of Boston University
X = Random number based on last two digits of BU ID U[0,50000]

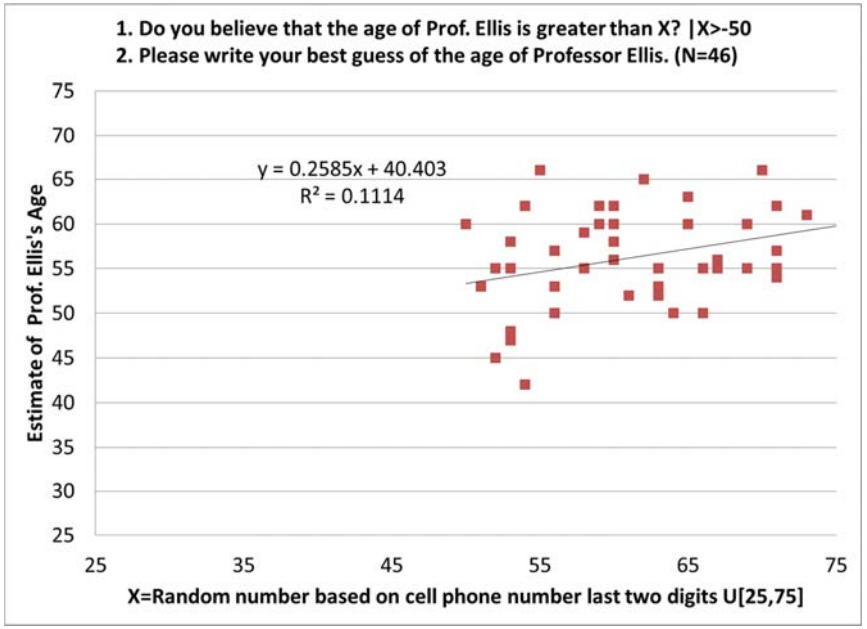

Pooled results, 2012-2015, N=89
1. Do you think the total number of students at BU (including part-time, undergraduate and graduate students) is greater than X?
2. Please write your best guess of the total number of students at BU.
Estimate of Student Size of Boston University
y = 0.3216x + 28238
R² = 0.0369
X = Random number based on last two digits of BU ID U[0,50000]

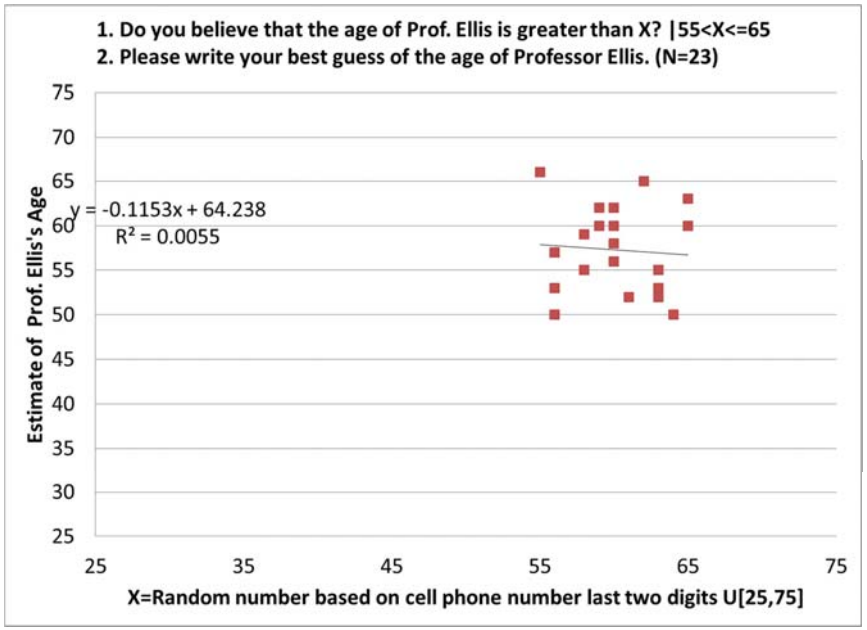

2015 results: N=46
1. Do you think BU is more than X years old?
2. Write down your best guess of the age of BU.
Mean Estimated Age of BU
138
175
X=100
X=200

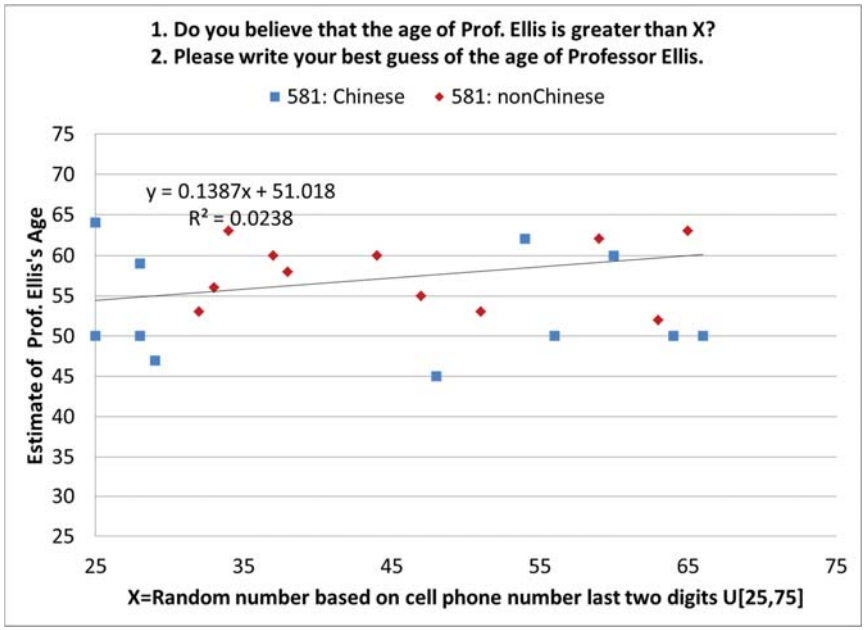

Pooled results, 2012-2015: N= 89
1. Do you think BU is more than X years old?
2. Write down your best guess of the age of BU.
Mean Estimated Age of BU
136
171
X=100
X=200

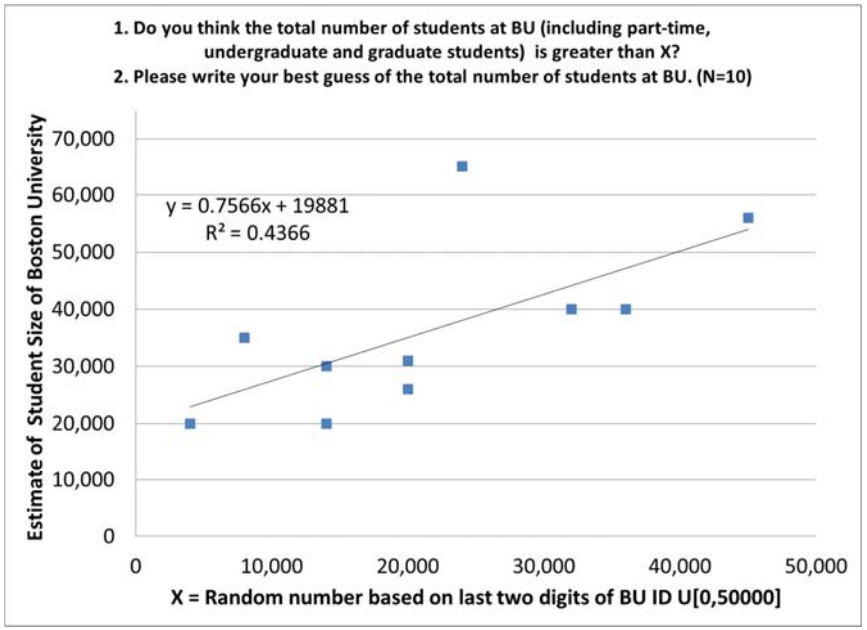

1. Do you believe that the age of Prof. Ellis is greater than X?
2. Please write your best guess of the age of Professor Ellis. (N=75)
Estimate of Prof. Ellis's Age
y = 0.0573x + 53.928
R² = 0.0139
X=Random number based on cell phone number last two digits U[25,75]

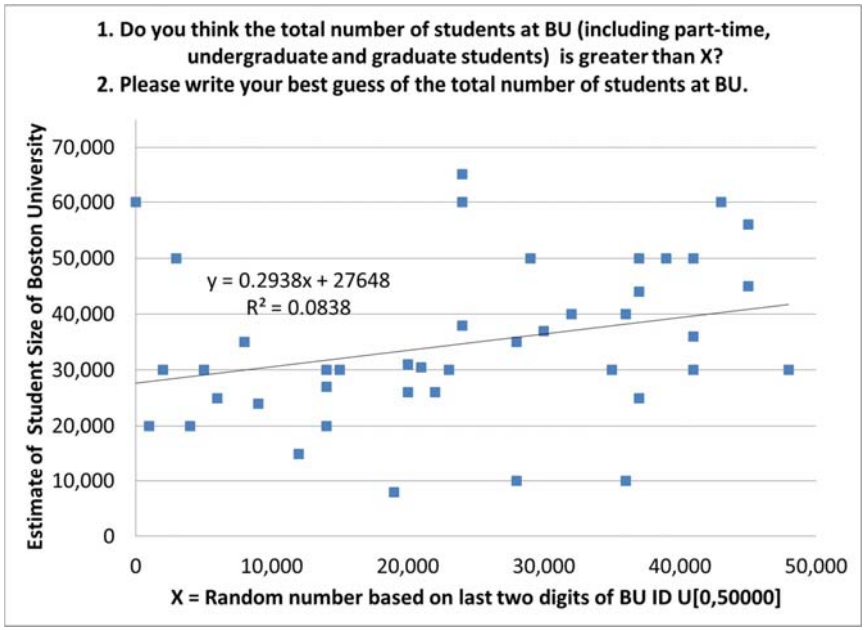

1. Do you believe that the age of Prof. Ellis is greater than X?
2. Please write your best guess of the age of Professor Ellis. (N=74, no outlier)
y = 0.0443x + 54.011
R² = 0.0159
Estimate of Prof. Ellis's Age
X=Random number based on cell phone number last two digits U[25,75]

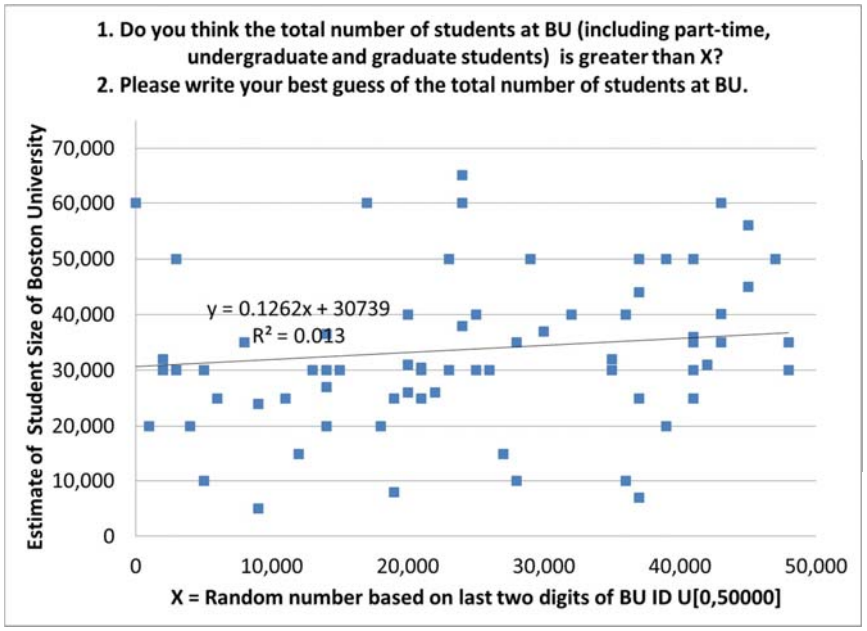

1. Do you believe that the age of Prof. Ellis is greater than X? |X>-50
2. Please write your best guess of the age of Professor Ellis. (N=46)
y = 0.2585x + 40.403
R² = 0.1114
Estimate of Prof. Ellis's Age
X=Random number based on cell phone number last two digits U[25,75]

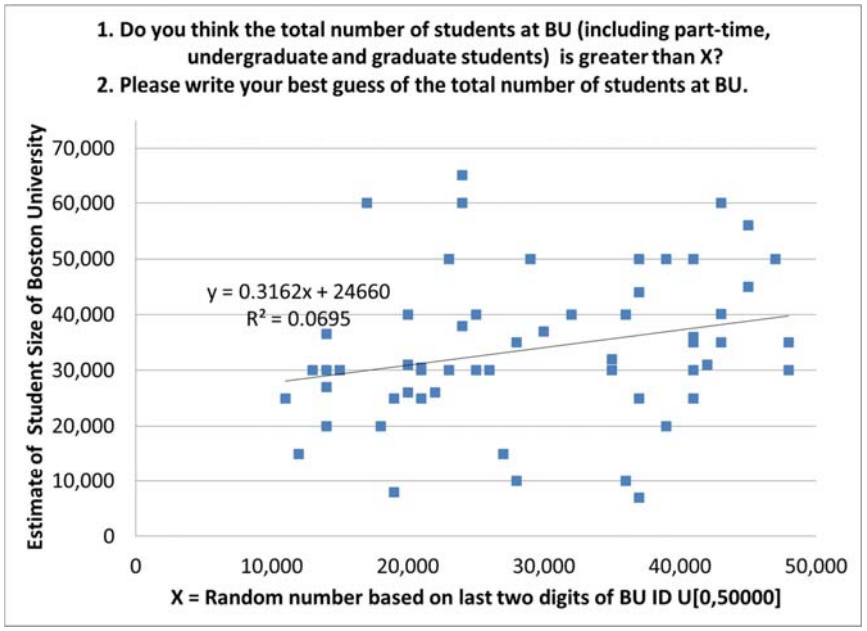

1. Do you believe that the age of Prof. Ellis is greater than X? |55<X<=65
2. Please write your best guess of the age of Professor Ellis. (N=23)
y = -0.1153x + 64.238
R² = 0.0055
Estimate of Prof. Ellis's Age
X=Random number based on cell phone number last two digits U[25,75]

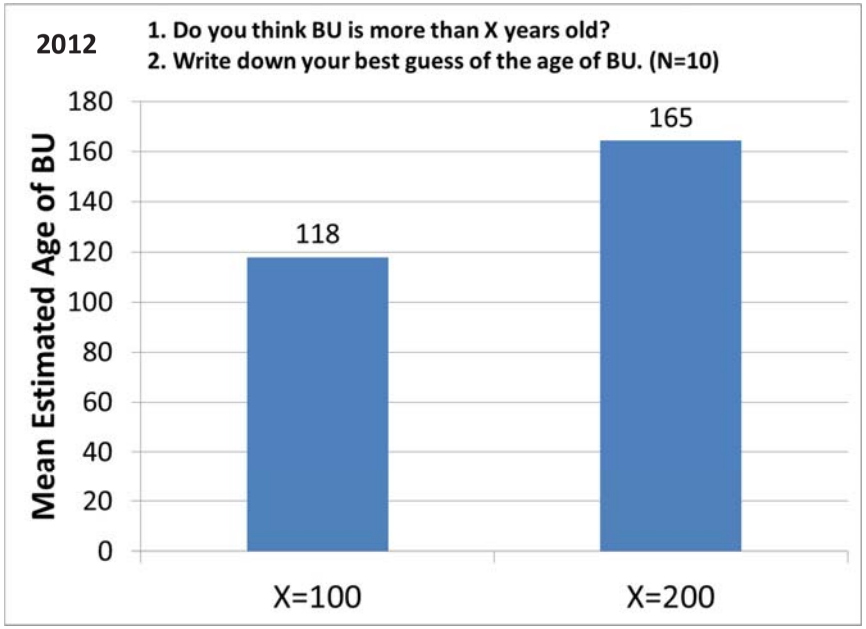

1. Do you believe that the age of Prof. Ellis is greater than X?
2. Please write your best guess of the age of Professor Ellis.
581: Chinese
581: nonChinese
y = 0.1387x + 51.018
R² = 0.0238
Estimate of Prof. Ellis's Age
X=Random number based on cell phone number last two digits U[25,75]

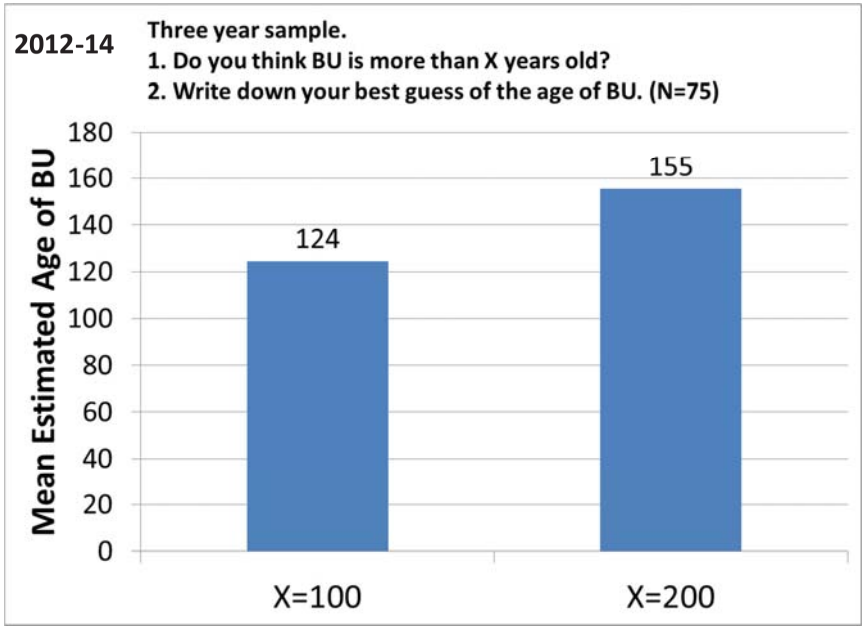

1. Do you think the total number of students at BU (including part-time, undergraduate and graduate students) is greater than X?
2. Please write your best guess of the total number of students at BU. (N=10)
y = 0.7566x + 19881
R² = 0.4366
Estimate of Student Size of Boston University
X = Random number based on last two digits of BU ID U[0,50000]
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000

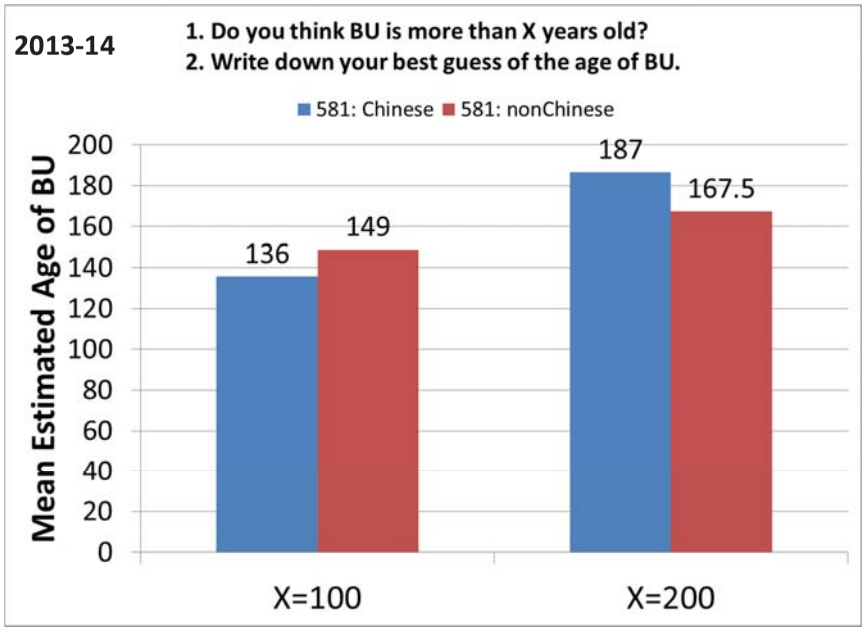

1. Do you think the total number of students at BU (including part-time, undergraduate and graduate students) is greater than X?
2. Please write your best guess of the total number of students at BU.
y = 0.2938x + 27648
R² = 0.0838
Estimate of Student Size of Boston University
X = Random number based on last two digits of BU ID U[0,50000]
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000

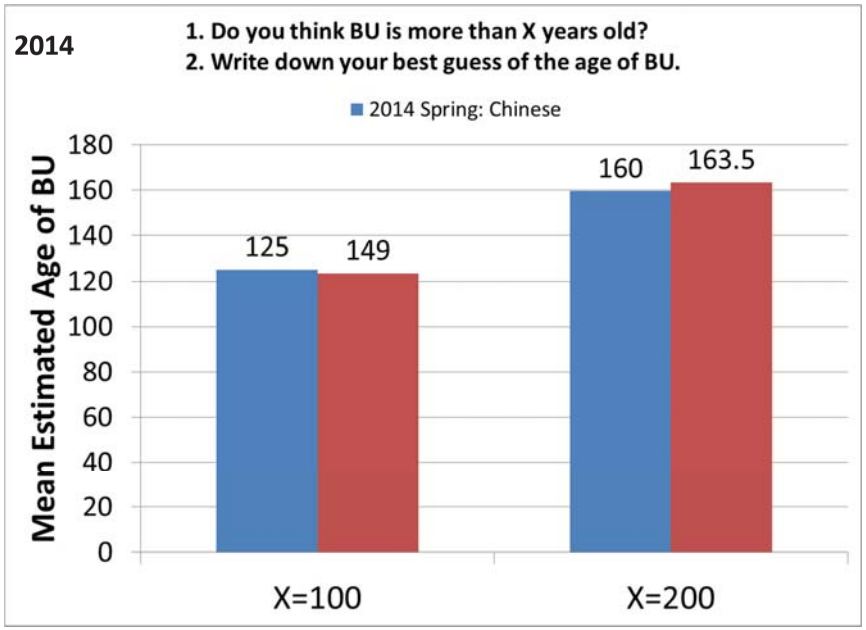

1. Do you think the total number of students at BU (including part-time, undergraduate and graduate students) is greater than X?
2. Please write your best guess of the total number of students at BU.
y = 0.1262x + 30739
R² = 0.013
Estimate of Student Size of Boston University
X = Random number based on last two digits of BU ID U[0,50000]
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000


1. Do you think the total number of students at BU (including part-time, undergraduate and graduate students) is greater than X?
2. Please write your best guess of the total number of students at BU.
y = 0.3162x + 24660
R² = 0.0695
Estimate of Student Size of Boston University
X = Random number based on last two digits of BU ID U[0,50000]
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000


2012
1. Do you think BU is more than X years old?
2. Write down your best guess of the age of BU. (N=10)
Mean Estimated Age of BU
180
160
140
120
100
80
60
40
20
0
118
165
X=100
X=200


2012-14
Three year sample.
1. Do you think BU is more than X years old?
2. Write down your best guess of the age of BU. (N=75)
Mean Estimated Age of BU
180
160
140
120
100
80
60
40
20
0
124
155
X=100
X=200


2013-14
1. Do you think BU is more than X years old?
2. Write down your best guess of the age of BU.
581: Chinese
581: nonChinese
Mean Estimated Age of BU
200
180
160
140
120
100
80
60
40
20
0
136
149
187
167.5
X=100
X=200


2014
1. Do you think BU is more than X years old?
2. Write down your best guess of the age of BU.
2014 Spring: Chinese
Mean Estimated Age of BU
180
160
140
120
100
80
60
40
20
0
125
149
160
163.5
X=100
X=200

Remarkable array of "irrational" behavior documented by Kahneman

i) Priming
ii) Framing
iii) Base rate neglect
iv) Cognitive ease
v) Anchors
vi) Availability bias
vii) Intuitive prediction
viii) Optimism bias
ix) Prospect theory
x) The endowment effect
xi) The possibility effect
xii) The certainty effect
xiii) Overestimation/over-weighting rare events
xiv) Avoiding regret
xv) WYSIATI

Behavioral economics

Studies of the effects of social, cognitive, and emotional factors on the economic decisions of individuals and institutions.

Themes:

Bounded rationality *or irrationality* of economic agents: consumers do not always optimize

Heuristics: decisions use approximate rules of thumb and not strict logic.

Framing: The information and emotional filters individuals rely on to understand and respond to events.

Market inefficiencies: These include mispricings and non-rational decision making.

Especially important in **health economics.** (why?)

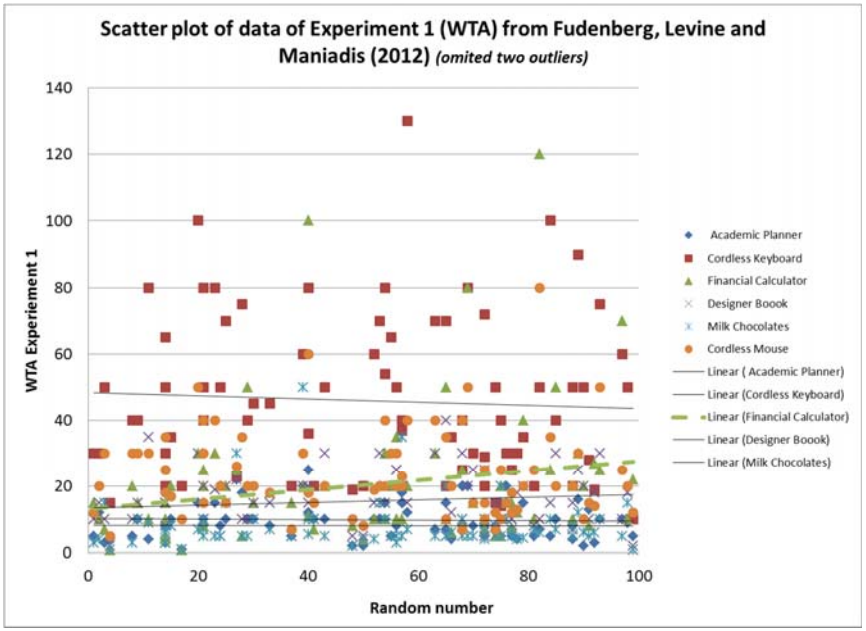
Another example where salience might be the key.

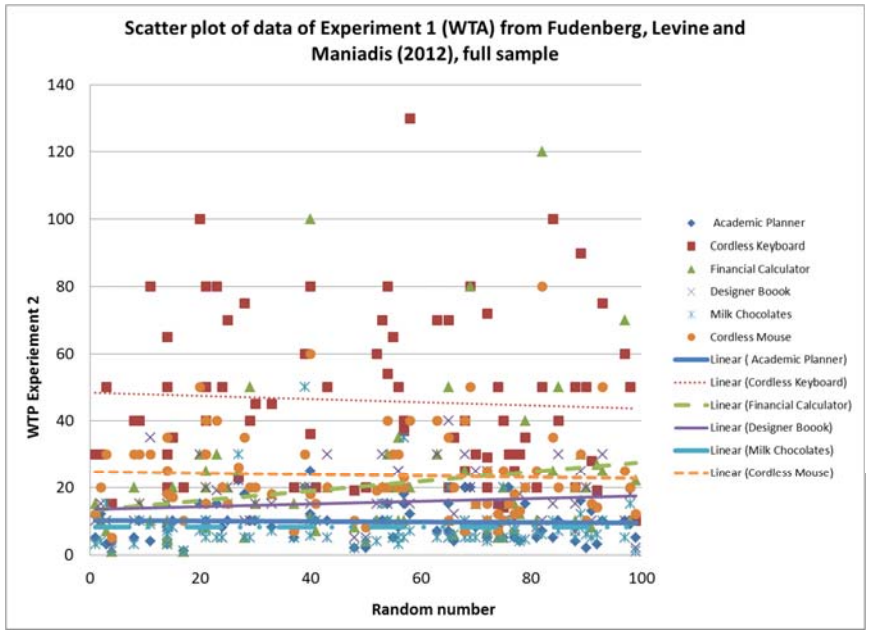
- Fudenberg, Drew, David K. Levine, and Zacharias Maniadis. 2012. "On the Robustness of Anchoring Effects in WTP and WTA Experiments." *American Economic Journal: Microeconomics*, 4(2): 131-45.

  http://www.aeaweb.org/articles.php?doi=10.1257/mic.4.2.131

  "We reexamine the effects of the anchoring manipulation of Ariely, Loewenstein, and Prelec (2003) on the evaluation of common market goods and find very weak anchoring effects. We perform the same manipulation on the evaluation of binary lotteries, and find no anchoring effects at all. This suggests limits on the robustness of anchoring effects. (JEL C91, D12, D44)"

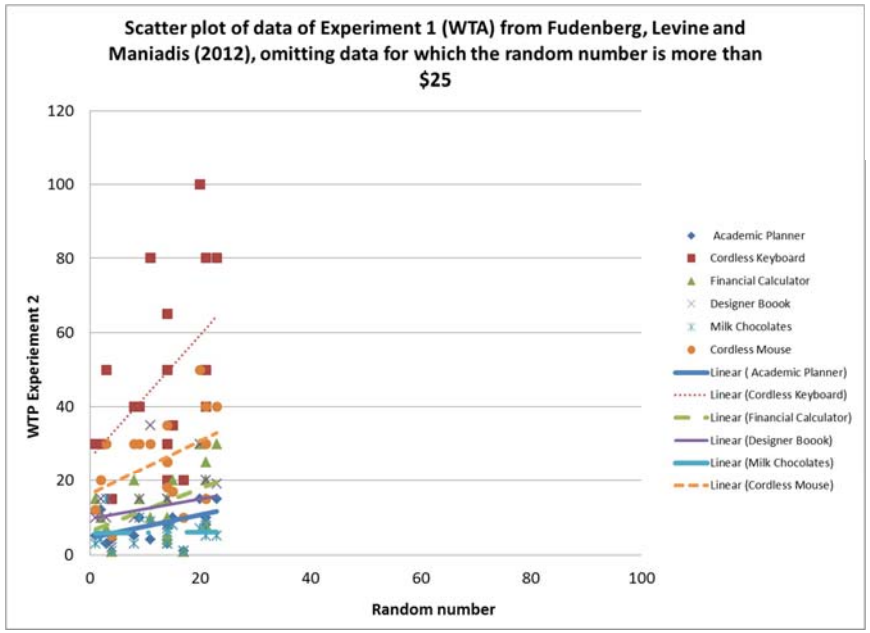
- Asked about both willingness to pay (WTP) and willingness to accept (WTA) five goods possibly valued by students.

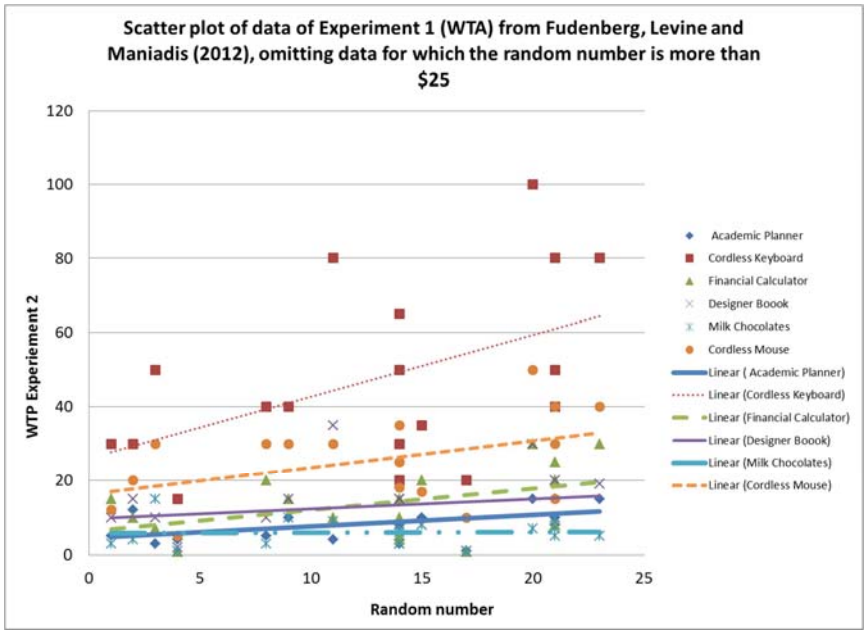


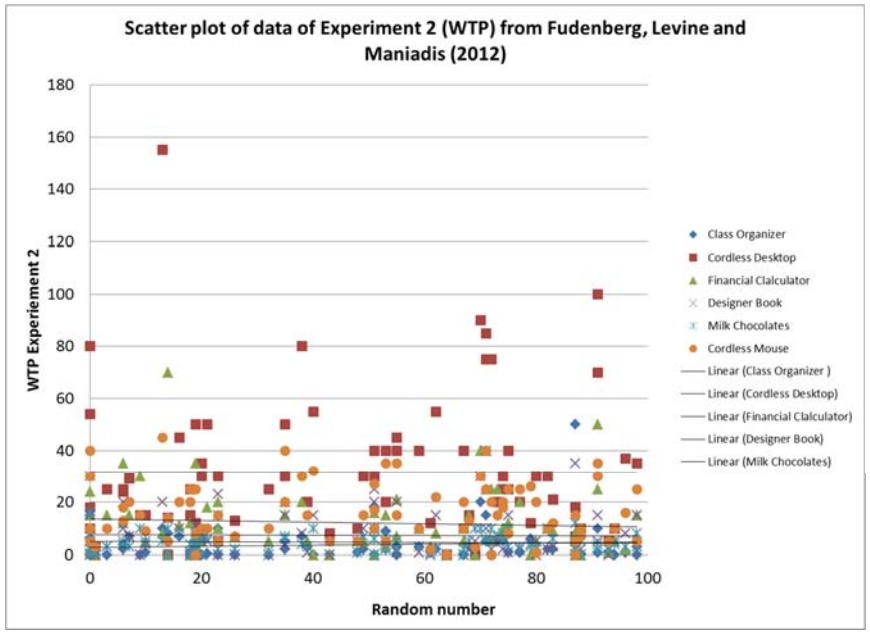


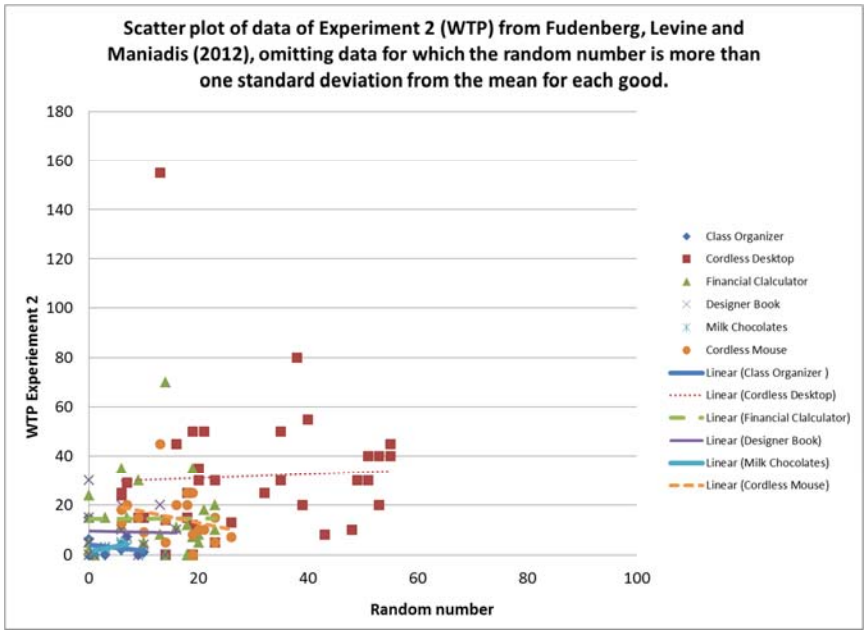
Three flaws to FLM (2012) study

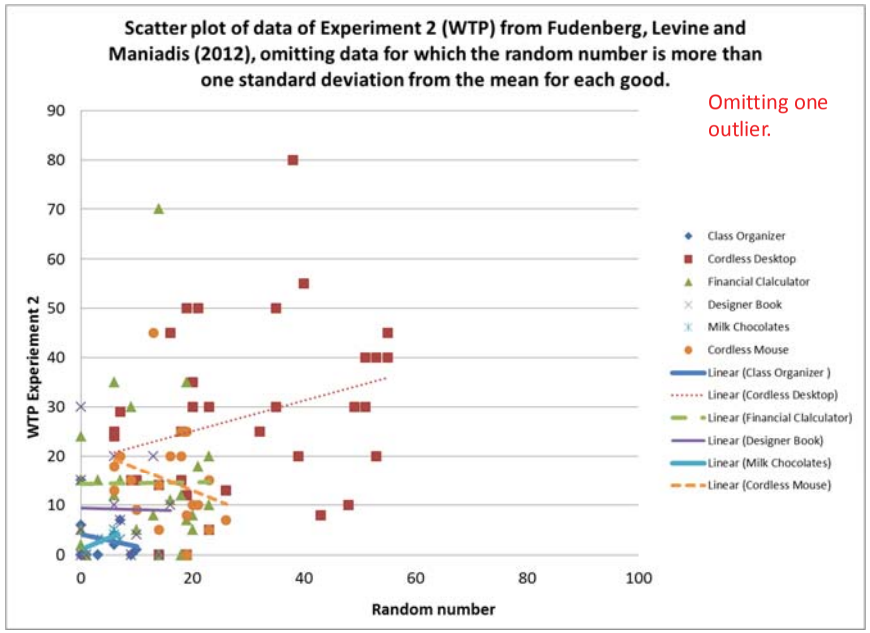
- Goods not valuable to students (average WTP =$13, WTA=$19, versus average retail value of goods = $51.70.) Silly experiment.
- Range of random values U(0,99) much greater than range of actual values (poor salience)
- Participants were told in advance exactly what they were going to be asked to do: receive a random number and compare, and then do their own "bids" on WTP and WTA. Not true in real world cases.) No deception.

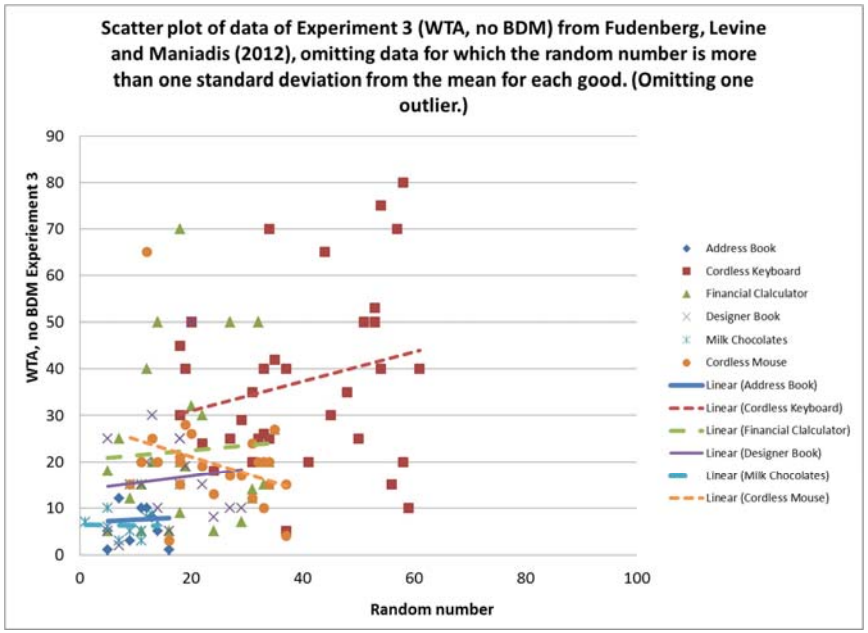





Scatter plot of data of Experiment 2 (WTP) from Fudenberg, Levine and Maniadis (2012)
WTP Experiement 2
Random number
Class Organizer
Cordless Desktop
Financial Clalculator
Designer Book
Milk Chocolates
Cordless Mouse
Linear (Class Organizer)
Linear (Cordless Desktop)
Linear (Financial Clalculator)
Linear (Designer Book)
Linear (Milk Chocolates)


Scatter plot of data of Experiment 2 (WTP) from Fudenberg, Levine and Maniadis (2012), omitting data for which the random number is more than one standard deviation from the mean for each good.
WTP Experiement 2
Random number
Class Organizer
Cordless Desktop
Financial Clalculator
Designer Book
Milk Chocolates
Cordless Mouse
Linear (Class Organizer)
Linear (Cordless Desktop)
Linear (Financial Clalculator)
Linear (Designer Book)
Linear (Milk Chocolates)
Linear (Cordless Mouse)


Scatter plot of data of Experiment 2 (WTP) from Fudenberg, Levine and Maniadis (2012), omitting data for which the random number is more than one standard deviation from the mean for each good.
Omitting one outlier.
WTP Experiement 2
Random number
Class Organizer
Cordless Desktop
Financial Clalculator
Designer Book
Milk Chocolates
Cordless Mouse
Linear (Class Organizer)
Linear (Cordless Desktop)
Linear (Financial Clalculator)
Linear (Designer Book)
Linear (Milk Chocolates)
Linear (Cordless Mouse)


Scatter plot of data of Experiment 3 (WTA, no BDM) from Fudenberg, Levine and Maniadis (2012), omitting data for which the random number is more than one standard deviation from the mean for each good. (Omitting one outlier.)
WTA, no BDM Experiement 3
Random number
Address Book
Cordless Keyboard
Financial Clalculator
Designer Book
Milk Chocolates
Cordless Mouse
Linear (Address Book)
Linear (Cordless Keyboard)
Linear (Financial Clalculator)
Linear (Designer Book)
Linear (Milk Chocolates)
Linear (Cordless Mouse)

The Salience of Salience

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581 Term Paper

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Table 1 Summary of WTA data From Fudenberg et al.

	Obs	Mean	Std. Dev.	Min	Max
Random Number	76	52.41	28.64	1	99
Academic planner	76	9.67	5.30	1	25
Cordless keyboard	76	46.22	24.37	10	130
Financial calculator	76	20.61	20.62	1	120
Designer book	76	15.45	8.87	1	40
Milk chocolates	76	7.86	6.99	1	50
Cordless mouse	76	23.62	13.31	5	80

Table 2 Basic MLS Regression Results

	0.5 stddev		1.0 stddev		1.5 stddev		2.0 stddev		2.5 stddev		3.0 stddev	
	Dummy &rand_nb		Dummy &rand_nb		Dummy &rand_nb		Dummy &rand_nb		Dummy &rand_nb		Dummy &rand_nb	
Nb of Obs		58		113		161		202		230		253
P-value		0.5384		0.5143		0.1971		0.9465		0.8687		0.7325
	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|
Academic planner	-0.71	0.94	0.48	0.86	0.04	0.97	0.23	0.78	0.26	0.68	0.25	0.65
	(8.78)		(2.74)		(1.05)		(0.82)		(0.64)		(0.55)	
Cordless keyboard	1.14	0.08 **	-0.14	0.51	-0.27	0.01 ***	-0.05	0.53	-0.06	0.42	-0.06	0.43
	(0.62)		(0.21)		(0.10)		(0.08)		(0.07)		(0.07)	
Financial calculator	0.99	0.23	0.6	0.03 ***	0.31	0.18	0.15	0.31	0.14	0.2	0.15	0.11 *
	(0.80)		(0.28)		(0.23)		(0.15)		(0.11)		(0.09)	
Designer book	-3.05	0.67	-0.11	0.91	0.18	0.76	0.1	0.8	0.02	0.95	0.08	0.78
	(7.00)		(0.94)		(0.60)		(0.40)		(0.36)		(0.28)	
Milk chocolates	1.64	0.85	-0.03	0.98	-0.08	0.93	0.03	0.96	0.09	0.86	0.07	0.9
	(8.78)		(1.07)		(0.92)		(0.65)		(0.53)		(0.51)	
Cordless mouse	-0.33	0.82	-0.15	0.82	0.04	0.91	-0.07	0.76	-0.01	0.98	0.05	0.74
	(1.46)		(0.66)		(0.31)		(0.23)		(0.16)		(0.15)	

Table 3 SUR regression results

	[0, 100)		[0, 70)		[0, 50)	
Nb Obs		76		49		31
Joint p-value		0.0509		0.0399		0.0169
	Coef.	P>|z|	Coef.	P>|z|	Coef.	P>|z|
Academic planner	-0.002	0.932	0.073	0.046 ***	0.137	0.058 **
	(0.021)		(0.037)		(0.072)	
Cordless keyboard	-0.058	0.553	0.14	0.393	0.101	0.74
	(0.097)		(0.165)		(0.303)	
Financial calculator	0.147	0.069 **	0.224	0.06 **	0.426	0.069 **
	(0.081)		(0.119)		(0.235)	
Designer book	0.043	0.221	0.154	0.011 ***	0.087	0.425
	(0.035)		(0.06)		(0.109)	
Milk chocolates	0.008	0.771	0.057	0.3	0.154	0.172
	(0.028)		(0.055)		(0.113)	
Cordless mouse	-0.019	0.726	0.058	0.487	0.003	0.984
	(0.053)		(0.083)		(0.168)	

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(BU MA students in EC581)

- Reanalysis of Fudenberg et al results

Part I WTA experiment (Fudenberg et al.)

	1 std dev			2 std dev			3 std dev			4 std dev			Full		
	Obs	Coef.	P-value	Obs	Coef.	P-value	Obs	Coef.	P-value	Obs	Coef.	P-value	Obs	Coef.	P-value
Academic planner	7	0.4762	0.5908	14	0.2282	0.3373	20	0.2515	0.0753	23	0.2536	0.0264	76	-0.0018	0.9335
Cordless keybord	33	-0.1431	0.6443	73	-0.0476	0.6513	76	-0.0578	0.56	76	-0.0578	0.5601	76	-0.0578	0.5601
Financial caculator	29	0.6023	0.0372	42	0.1540	0.2694	64	0.1451	0.171	76	0.1469	0.077	76	0.1469	0.0771
Designer book	15	-0.1051	0.8422	24	0.1044	0.5751	29	0.0779	0.525	32	0.0388	0.7186	76	0.0430	0.2314
Mild chocolates	11	-0.0286	0.9156	17	0.0321	0.8215	21	0.0667	0.552	24	0.0668	0.439	76	0.0081	0.7749
Cordless mouse	18	-0.1526	0.7173	32	-0.0695	0.6742	43	0.0495	0.6123	58	-0.0506	0.4586	76	-0.0187	0.7303

Appendix

A.1 Example questions in questionnaire (With translation)

- 请填写您手机号的最后两位，并请您记住这个数字（以下简称“我的号码”）

  Please enter the last two digits of your phone number, and remember them as “My Number”
- 请判断: 与下图中人物年龄相比 : “我的号码”更大 / “我的号码”更小

  Comparing to his/her age : “My Number” is larger / “My Number” is smaller
- 请估计图片中人物的实际年龄

  What is the his/her age
- 请选择你的性别

  Please select your gender : Female / Male
- 请选择您的年龄段

  Please select your age category : (every five years)

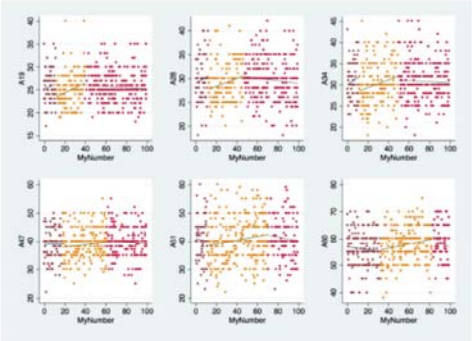
Photo we used and their real age





Part II Guessing age experiment

	1 std dev			2 std dev			3 std dev			4 std dev			5 std dev			6 std dev			Full		
	Obs	Coef.	P-value	Obs	Coef.	P-value	Obs	Coef.	P-value	Obs	Coef.	P-value	Obs	Coef.	P-value	Obs	Coef.	P-value	Obs	Coef.	P-value
A19	20	0.1591	0.791	70	0.0239	0.808	100	0.0868	0.1254	138	0.1078	0.0029	162	0.0536	0.0699	194	0.0263	0.2305	504	0.0053	0.2996
A28	39	0.7583	0.0026	68	0.1769	0.0852	118	0.1017	0.036	158	0.0842	0.0093	197	0.0526	0.025	243	0.0296	0.0869	504	0.0036	0.5708
A34	49	-0.5154	0.0091	82	-0.0370	0.6942	126	0.1295	0.0172	175	0.0921	0.0061	230	0.0390	0.0894	283	0.0192	0.2583	504	0.0071	0.3228
A47	43	-0.0406	0.8793	96	0.1378	0.1887	142	0.0401	0.3729	213	0.0424	0.1259	280	0.0459	0.018	407	0.0203	0.0571	504	0.0138	0.0054
A51	60	0.2302	0.2145	135	0.1378	0.0374	218	0.0732	0.0523	304	0.0692	0.0038	375	0.0483	0.007	424	0.0292	0.0477	504	0.0194	0.0853
A60	76	0.5038	0.0019	145	0.1610	0.0099	185	0.1394	0.0011	246	0.0826	0.0034	359	0.0400	0.0004	355	0.0625	0	504	0.0384	0



3-segment graph truncated at mean add/minus 4 standard deviation.
All slope are significantly different to zero at 1% level except the one of "A47".



Key resources for experiments

- Mturk (Mechanical Turk)