Cognitive Ability and Enrollment in Medicare Part D

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Motivation

- Researchers increasingly question the desirability of lots of choice (Iyengar and Lepper, 2000; Reutskaja and Hogarth, 2009; Botti and Iyengar, 2006)
- Concerns regarding the desirability of choice particularly relevant for the development of public policy
    - → Trend towards choice in public policy more generally
        - Eg. Medicare Part D
- A key concern in the policy context is that the negative impacts of choice-based policies may be more pronounced for certain types of people

Research Questions

- Does cognitive ability hinder seniors' enrollment into drug plans?
- Does extensive choice hinder enrollment particularly for seniors of lower cognitive ability?

Medicare Part D Prescription Drug Coverage

- Seniors have the option to choose an insurance plan for drugs from many competing firms
  - The number of offers can range from 47 to 63 (in 2008) depending on the state in which the person lives
- Plans are partially subsidized by the government and are regulated to make sure they meet certain conditions
  - One standard type policy but plans have some ability to deviate from what they offer
- This policy has had very mixed reviews, based on the "promise" and "perils" of choice

Medicare Part D Prescription Drug Coverage

- Early evidence of enrollment
  - Medicare met its target of 90% coverage of eligible people in its 1st year
  - Sizable groups remain uncovered: 2 million that take at least one prescription drug regularly do not have health insurance from Medicare or elsewhere
  - Heiss, McFadden, and Winter (2006) argue that enrollment is clearly optimal for individuals that take at least one prescription drug regularly

Screenshot of enrollment website – Medicare

Hide Information

51 Prescription Drug Plans in LOS ANGELES, California

Top of Page

These results are sorted by the **Monthly Drug Premium**. Click on column titles to sort. Click on plan names to view more information about each plan.

Print this Chart

Sort Table By: Monthly Drug Premium Sort

Plan Name and ID Numbers	Company Name	Coverage in the Gap [1] [What is this?]	Monthly Premium ▲ [What is this?]	$0 Premium with Full Low Income Subsidy [2]	Annual Deductible [What is this?]	Summary Rating of Prescription Drug Plan Quality [What is this?]	Customer Service Phone Number
First Health Part D-Secure (S5768-114) *Available nationwide*‡	First Health Part D	No Gap Coverage	$18.30	No	$175	3 out of 5 stars	Non-Members 1-800-588-3322 TTY Users should call: 1-888-788-4010 Members
Advantage Star Plan by RxAmerica (S5644-084) *Available nationwide*‡	RxAmerica	No Gap Coverage	$19.80	Yes	$295	2.5 out of 5 stars	Non-Members 1-800-429-6686 TTY Users should call: 1-877-279-0371 Members
First Health Part D-Premier (S5768-082) *Available nationwide*‡	First Health Part D	No Gap Coverage	$21.10	Yes	$0	3 out of 5 stars	Non-Members 1-800-588-3322 TTY Users should call: 1-888-788-4010 Members
Health Net Orange Option 1 (S5678-002)	Health Net	No Gap Coverage	$24.00	Yes	$295	3.5 out of 5 stars	Non-Members 1-800-606-3604 TTY Users should call:

Conceptual Framework

- Choice: choice deferral can arise out of as few as two choices (Tversky and Shafir, 1992) but can increase with more choices (Schwartz, 2004)

- Cognitive Ability: generally accepted that higher cognitive ability is correlated with better decision making, Cokely and Kelley, 2009; Frederick, 2005; Peters & Levin, 2008; Peters, Vastfjall, Slovic, Mertz, Mazzocco, & Dickert, 2006; Stanovich & West, 2000, 2008

Background Literature – Medicare Part D

- Costs and benefits to having more plans in the choice set (Bundorf and Szrek, under review)
- Heiss, McFadden, and Winter (2006): although enrollment is optimal for those that take at least one drug regularly, many seniors respond to expansive choice by forgoing a decision
- Heiss, McFadden, and Winter (2007) suggest that only 2.5% of the individuals in their sample would be rational not to enroll
- Enrollees are making poor decisions, could save $500 on average by switching (Kling et. al, 2007)

- Our Assumption: Seniors that take at least one drug regularly should enroll in Medicare Part D.

Hypotheses

- Hypothesis 1: Seniors with higher cognitive abilities will be more likely to enroll in a drug plan than seniors of lower cognitive abilities.
- Hypothesis 2: Lower ability seniors with large choice sets will be less likely to enroll than lower ability seniors with smaller choice sets and than higher ability seniors with large choice sets.

Study Design I

- Web-based experiment for a random sample of Americans over 65 years of age with internet access
- Respondents found by Knowledge Networks and paid for their participation
- Experiment = Questionnaire that mimicked enrollment into Medicare Part D

Study Design II

- Step 1: Randomly assign respondents to a choice set size (2, 5, 10, 16).
- Step 2: Respondent can read information about product attributes.
- Step 3: Respondent makes choice among offered set of plans and answers questions about the decision.
- Step 4: Respondent is asked various cognition questions and questions about actual enrollment in Medicare Part D.

Study Design III

Item 2 out of 8:

Assume that the plans shown below are the choices available to you.

Which plan would you choose?

Plans available

		Monthly premium	Deductible	Number of top 100 Medicare drugs on formulary	Number of drugs requiring prior authorization	Number of drugs with a $20 or less copay	Availability of coverage in the gap
○	Plan I	39.2	0	85	15	40	No
○	Plan C	27.8	100	80	10	40	No
○	Plan G	42.8	0	90	10	60	No
○	Plan B	28.2	100	80	15	60	No
○	Plan O	50.3	0	85	10	50	Yes, Generic Drugs
○	Plan K	50.8	0	85	10	60	Yes, Generic Drugs
○	Plan H	40.4	100	85	5	40	Yes, Generic Drugs
○	Plan F	38.9	100	80	5	50	Yes, Generic Drugs
○	Plan J	49.7	0	85	15	50	Yes, Generic Drugs
○	Plan D	38.3	0	80	10	50	No

Click here to go on.

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Measures

- Main dependent variable (Expected Enrollment):
  If presented with the choice of the above plans, how likely would you be to enroll in ANY plan (where the alternative is going without a plan)?

Measures

A.Numeracy
(adapted from Lipkus, Samsa, Rimer 2001 General numeracy scale items)
1. Imagine that we rolled a fair, six-sided die 1,000 times. Out of 1,000 rolls, how many times do you think the die would come up even (2, 4, or 6)?
2. In the BIG BUCKS LOTTERY, the chances of winning a $10.00 prize is 1%. What is your best guess about how many people would win a $10.00 prize if 1,000 people each buy a single ticket to BIG BUCKS?
3. In the ACME PUBLISHING SWEEPSTAKES, the chance of winning a car is 1 in 1,000. What percent of tickets to ACME PUBLISHING SWEEPSTAKES win a car?

Measures

B. Cognitive reflection questions
(adapted from Frederick, 2005)

(1) A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost?

(2) If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?

(3) In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?

Measures

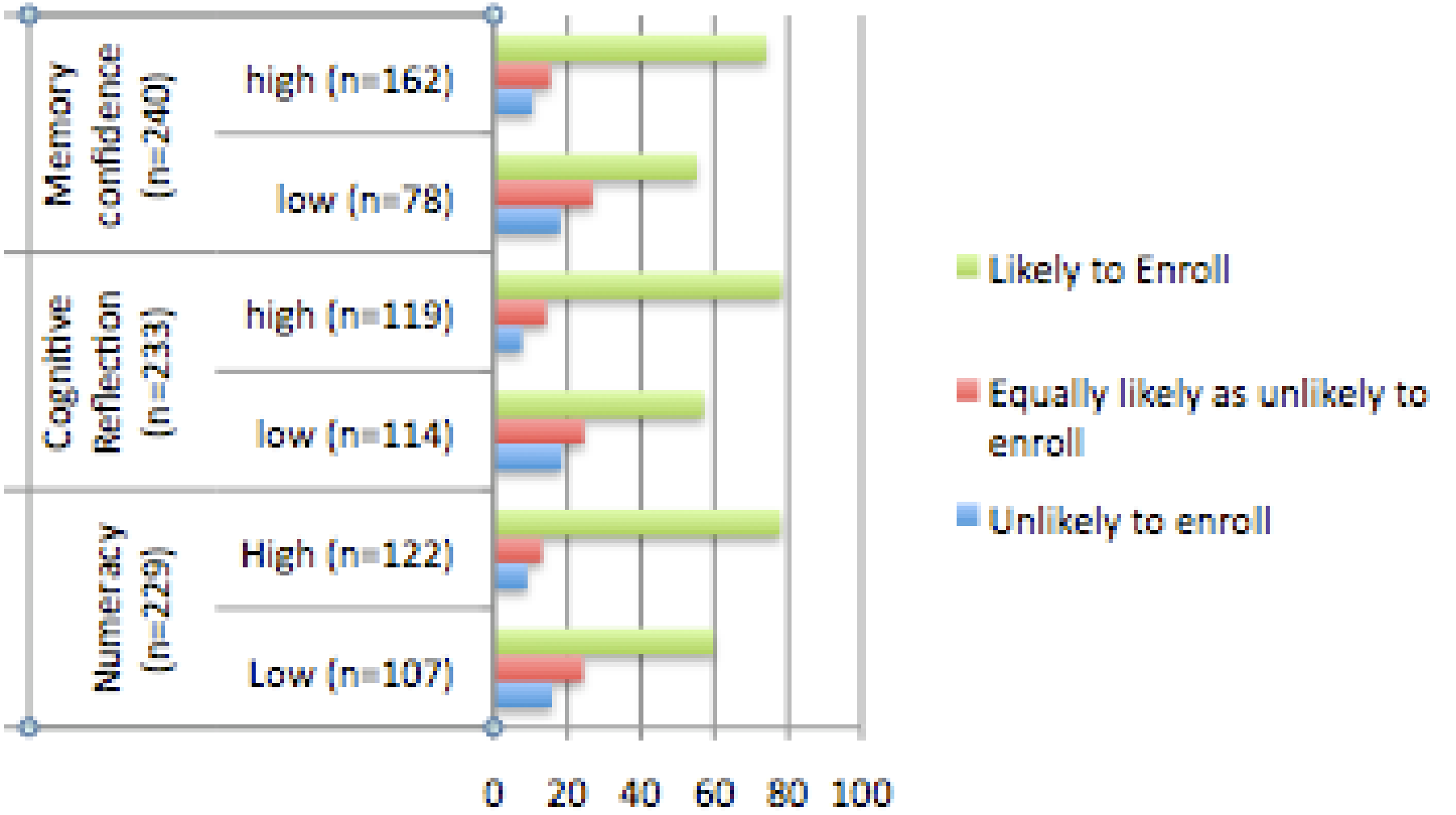
C. Memory

- Can you remember which of the following is the plan that you chose the second time you made a choice?
- How confident are you that you chose the correct plan?

Cognition Questions - Percent Correct

	Numeracy	Cognitive Reflection	Memory
0	22	49	33
1	25	30	68
2	28	14	
3	26	7	
	n=229	n=233	n=240

Enrollment Likelihood by Cognitive Ability



Note: Differences between groups are significant for each independent variable, doing a chi-squared test $p<0.01$.

Testing Hypothesis 1

- H1:Seniors with higher cognitive abilities will be more likely to choose a drug plan than seniors of lower cognitive abilities.
- Ordered probit regressions estimating expected enrollment to isolate the effect of cognitive ability, run separately for numeracy, cognitive reflection, and memory
- Independent variables: number of plans, condition, drugs take regularly, age, education, race, gender, income, household size, employment status, marital status, dummies for cognition variables (3 dummies for numeracy and cognitive reflection)

		How Likely Would you be to Enroll?	
		Pr(Not Likely to Enroll)	Pr(Likely to Enroll)
Model 1:	Numeracy		
	One cognitive question correct	-0.041	0.092
	Two cognitive questions correct	-0.075*	0.173*
	Three cognitive questions correct	-0.107**	0.254**
Model 2:	Cognitive Reflection		
	One cognitive reflection question correct	-0.061*	0.141*
	Two cognitive reflection questions correct	-0.096**	0.259**
	Three cognitive reflection questions correct	-0.091**	0.265**
Model 3: Memory confidence and correct		-0.082*	0.154*

Testing Hypothesis 2

- H2: Lower ability seniors with large choice sets will be less likely to enroll than lower ability seniors with smaller choice sets and than higher ability seniors with large choice sets.
- Ordered probit regressions estimating expected enrollment to isolate the effect of choice and cognition interactions (number of plans is interacted with Low and High for each cognition measure)
- Separate models for each cognition measure
- Same independent measures as before

Marginal effect of probability of likely to enroll relative to 2 plans

	Low Numeracy	High Numeracy
5	0.102	0.185*
10	-0.048	0.183*
16	0.061	-0.027

	Low Reflection	High Reflection
5	0.131	0.204*
10	0.139	-0.014
16	0.015	0.103

	Low Memory	High Memory
5	0.053	0.175*
10	-0.007	0.108
16	-0.1	0.172*

Conclusions

- Cognitive ability is a strong and highly significant predictor of expected enrollment
  - Individuals with higher cognitive ability as measured by numeracy, cognitive reflection, and memory are 14-27% more likely to enroll than those with lower cognitive ability
- Our results are suggestive of an interaction between cognitive ability and choice set size
  - It seems that individuals with higher abilities are sensitive to choice set size, but that individuals with lower abilities do not have the "mindware" necessary (Stanovich and West, 2008) for the decisions, and hence they are not sensitive to choice set size.

Innovation of this study

- To use an individuals differences approach that compares the decision quality of those with higher and lower cognitive ability to assess the success of a government policy

Policy Implications

- Our results caution that Medicare Part D policy could adversely affect a disadvantaged group
- The problem may not be because of extensive choice (as many critics argue) but because seniors are forced to make a decision in the first place

- CAUTION: results in the real world may be mitigated for 2 reasons
  - 1: individuals get help from others
  - 2: motivation is higher for a real task as compared to a hypothetical task