

Who Feels the Nudge? Knowledge, Self-Awareness, and Retirement Savings Decisions

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 - ▶ Mandatory contributions to a retirement pension system with a strong default choice but many alternatives for those who wish to manage their own account
 - ▶ Initially citizens received a strong nudge in the form of large-scale advertising; later this was dropped
 - ▶ A market of tele-marketing advisors emerged and was later banned

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 - ▶ A market of tele-marketing advisors emerged and was later banned
- Three main questions of interest:
 - ▶ Who opts out? (What behavioral traits are associated with opting out?)
 - ▶ Who feels the nudge? (How do nudges and behavioral biases interact?)
 - ▶ Who uses tele-marketers? (How do sophistication and advice interact?)

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 - ▶ Who uses tele-marketers? (How do sophistication and advice interact?)
- Who in terms of knowledge and self-awareness
- As Mark Twain put it: It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so.

Research Design

- Survey a random sample of 12,000 Swedes aged 18-65
 - ▶ From a working age population of 5,985,147
 - ▶ 2,854 responses (Average response rate 23.8%)
 - ▶ 2,502 complete surveys remaining after matching to characteristics from Statistics Sweden and the PPA
 - ▶ Use sampling weights to adjust for survey response bias
- Measure financial literacy, self-perceptions and attitudes
- Extend financial literacy to pick up knowledge specific to mutual fund investing
- Match responses to socio-demographics and pension decisions
- Exploit the fact that one cohort was subjected to a big nudge, while later cohorts were not

Mutual fund question

Augment "Big 5" literacy test with question specifically relevant to knowledge about mutual fund selection

'When selecting a mutual fund, past returns are more important than fees'

Responses	Category	No. observations
Strongly Agree	MF Performance	257
Agree somewhat	Omitted Group	812
Disagree somewhat	Omitted Group	457
Strongly disagree	MF Fee	215
Don't know	MF DK	590
Prefer not to say	MF DK	63

Results:

- Mutual fund responses relate to actual and perceived “Big 5” scores and capture variation in choice
- Those who “don’t know they don’t know”:
 - ▶ Overestimate their financial knowledge
 - ▶ Opt out of default
 - ▶ Pay higher fees
 - ▶ Work with large tele-marketers
- This results in underperformance
- How do nudges work?
 - ▶ Nudges activate prior beliefs
 - ▶ They also pull the indecisive into the market

Retiring in Sweden

A Brief History

Early 1990s: Swedish Krona devalues, this sets off chain of economic reforms. Late 1990s: changed the pension system to one with a significant defined contribution component

- 2.5% of wage allocated freely among large number of registered mutual funds (456 in 2000 to 855 in 2016)
- Gov't initially promoted active choice through large-scale advertising campaign
- Those who made no choice were placed in a well diversified, low cost equity fund
 - ▶ 12 bps compared median alternative of 51bps
- Tele-marketers evolved, selling trading advice
 - ▶ Monthly fees
 - ▶ Coordinated trades in and out of funds across large numbers of investors
- This activity was banned in 2011, remaining advisors opened actively managed fund-of-funds

Pension choice sample

Panel B: Active and passive choice

Fund choice	As of 2000	New entrants	Opted out	As of 2015	One trade
Default fund	424	509	-109	824	567
Other	1,344	225	109	1,678	1,935
Total	1,768	734	0	2,502	2,502
Fraction (Default/Trade)	24%	69%		33%	23%

Panel C: Trades Coordinated through Advisors

Coordination Threshold	Respondents N=2,502	Trading Tot. trades = 18,566
At least 1,000 trades	353 (14.1%)	10,884 (58.6%)
Greater than 25 th percentile	330 (13.2%)	10,393 (56.0%)
Greater than Median	220 (8.8%)	6,345 (34.2%)

Our “Big 5”

- 1 **Compounding.** Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?
- a) **More than \$102** (92%)
 - b) Exactly \$102 (2%)
 - c) Less than \$102 (3%)
 - d) Don't know (2%)
- 2 **Inflation.** Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?
- a) More than today (6%)
 - b) **Less than today** (81%)
 - c) Exactly the same as today (3%)
 - d) Don't know (8%)
- 3 **Bond Pricing.** If interest rates fall, what should happen to bond prices?
- a) **They will rise** (23%)
 - b) They will fall (17%)
 - c) They will stay the same (45%)
 - d) Don't know (14%)
- 4 **72-rule.** Imagine you received a gift of 10,000 and want to save it. You want to double the amount by saving it for 10 years without touching it. What interest is needed to reach this goal?
- a) Around 15% (6%)
 - b) Around 10% (45%)
 - c) **Around 7%** (43%)
 - d) Don't know (5%)
- 5 **Diversification.** Buying a single company's stock usually provides a safer return than a stock mutual fund.
- a) True (4%)
 - b) **False** (76%)
 - c) Don't know (19%)

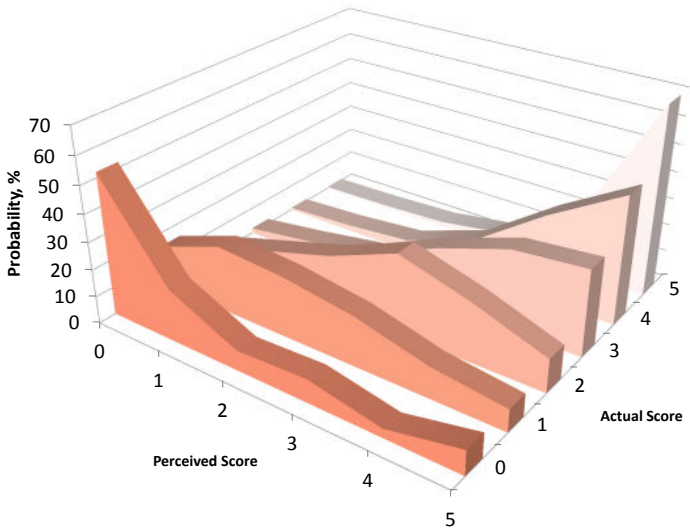
Soliciting beliefs

For the previous five multiple choice questions, you could have answered between zero and five correctly. We would like to know how many you think you got correct. Please assign a probability for each possible outcome below.

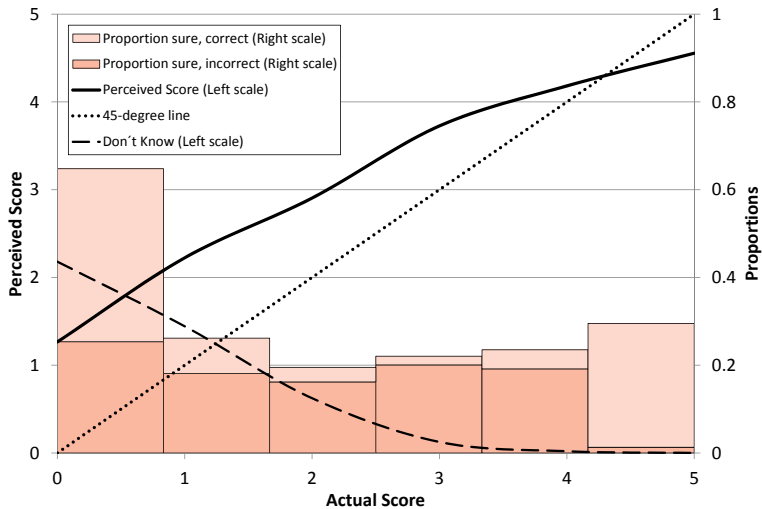
Enter whole numbers and total should add to 100.

	Total
Probability that I have all five correct	<input type="text" value="0"/> %
Probability that I have exactly four correct	<input type="text" value="0"/> %
Probability that I have exactly three correct	<input type="text" value="0"/> %
Probability that I have exactly two correct	<input type="text" value="0"/> %
Probability that I have exactly one correct	<input type="text" value="0"/> %
Probability that I have no correct answers	<input type="text" value="0"/> %
Don't know	<input type="checkbox"/>
Prefer not to answer	<input type="checkbox"/>
	Total: 0 %

Responses



Self-Awareness



Mutual fund choice and past performance

When selecting a mutual fund, **past returns** are more important than **fees**

	Past Returns More Important			Fees More Important			Don't Know		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Financial Literacy	0.018*** (0.005)	0.008 (0.006)		0.032*** (0.005)	0.020*** (0.006)		-0.140*** (0.008)	-0.108*** (0.009)	
Perceived Fin. Literacy		0.019*** (0.007)			0.025*** (0.007)			-0.058*** (0.009)	
Financial Mistakes			0.001 (0.007)			-0.022*** (0.006)			0.065*** (0.011)
DK			-0.039*** (0.008)			-0.046*** (0.009)			0.192*** (0.013)
2000 cohort	0.022 (0.020)	0.023 (0.020)	0.018 (0.020)	0.010 (0.018)	0.012 (0.017)	0.008 (0.018)	-0.141*** (0.034)	-0.144*** (0.033)	-0.124*** (0.035)
Married	0.029** (0.013)	0.028** (0.013)	0.028** (0.013)	-0.010 (0.012)	-0.012 (0.011)	-0.011 (0.011)	-0.073*** (0.019)	-0.068*** (0.019)	-0.070*** (0.020)
Female	-0.018 (0.013)	-0.013 (0.013)	-0.021* (0.013)	-0.016 (0.012)	-0.010 (0.012)	-0.017 (0.011)	0.132*** (0.019)	0.112*** (0.019)	0.150*** (0.019)
Age	0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.001 (0.001)	-0.000 (0.001)	-0.001 (0.001)	0.000 (0.001)	-0.000 (0.001)
Log Income	0.002 (0.007)	0.002 (0.006)	0.002 (0.006)	0.023** (0.010)	0.020** (0.009)	0.021** (0.009)	-0.031*** (0.009)	-0.030*** (0.008)	-0.030*** (0.008)
University	-0.029** (0.013)	-0.029** (0.013)	-0.026** (0.013)	0.011 (0.012)	0.011 (0.012)	0.012 (0.012)	0.015 (0.021)	0.014 (0.021)	0.005 (0.021)
Observations	2,502	2,502	2,502	2,502	2,502	2,502	2,502	2,502	2,502
Pseudo R ²	0.0189	0.0234	0.0288	0.0502	0.0612	0.0545	0.219	0.233	0.255

Robust standard errors in parentheses

*** p < 0.01, ** p < 0.05, * p < 0.1

Views of household finance

(1/2) "I find personal finance interesting," (3/4) "I have thought of how much to save for retirement," (5/6) "I'm willing to accept free financial advice," (7/8) "I'm the sole decision-maker"

VARIABLES	(1) Interesting	(2) Interesting	(3) Retire	(4) Retire	(5) Advice	(6) Advice	(7) Sole	(8) Sole
MF Return		0.036 (0.034)		-0.002 (0.033)		0.099*** (0.033)		0.071** (0.035)
MF Fee		0.093** (0.036)		0.035 (0.036)		-0.045 (0.034)		0.058 (0.037)
MF Don't know		-0.167*** (0.026)		-0.166*** (0.026)		-0.042* (0.025)		-0.028 (0.027)
Financial Literacy	0.100*** (0.009)	0.076*** (0.010)	0.057*** (0.009)	0.034*** (0.010)	0.002 (0.008)	-0.004 (0.009)	0.024*** (0.009)	0.018* (0.010)
Initial Cohort	-0.072** (0.035)	-0.097*** (0.035)	0.052 (0.035)	0.031 (0.035)	0.029 (0.032)	0.022 (0.032)	-0.005 (0.036)	-0.011 (0.036)
Married	-0.002 (0.022)	-0.013 (0.022)	0.048** (0.022)	0.039* (0.022)	-0.055*** (0.021)	-0.061*** (0.021)	-0.314*** (0.021)	-0.318*** (0.021)
Female	-0.041* (0.022)	-0.020 (0.022)	0.001 (0.022)	0.020 (0.022)	0.055*** (0.021)	0.061*** (0.021)	-0.102*** (0.022)	-0.097*** (0.022)
Age	0.001 (0.001)	0.001 (0.001)	0.003*** (0.001)	0.003** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)	0.001 (0.001)	0.001 (0.001)
Log Income	0.013 (0.010)	0.007 (0.010)	0.050*** (0.019)	0.045** (0.018)	0.021** (0.011)	0.020* (0.010)	0.018* (0.010)	0.016* (0.010)
University	-0.036 (0.023)	-0.034 (0.023)	0.053** (0.023)	0.055** (0.023)	0.033 (0.022)	0.038* (0.022)	0.060*** (0.023)	0.062*** (0.023)
Observations	2,502	2,502	2,502	2,502	2,502	2,502	2,502	2,502
MF Ret-MF Fee=0	-	0.21	-	0.67	-	0.01	-	0.08
Pseudo R ²	0.0474	0.0636	0.0486	0.0612	0.0184	0.0236	0.0785	0.0810

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Remained in Default Fund

	Remained in Default					Traded Exactly Once		Portfolio Turnover	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
MF Return		-0.055*	-0.050	-0.072***	0.032	-0.012	-0.011	0.617	0.610
		(0.032)	(0.038)	(0.027)	(0.059)	(0.104)	(0.104)	(0.937)	(0.928)
MF Fee		0.039	0.078*	0.087**	0.028	-0.047	-0.040	-1.173	-1.115
		(0.037)	(0.044)	(0.043)	(0.061)	(0.118)	(0.120)	(0.887)	(0.872)
MF D/K		0.131***	0.153***	0.053*	0.179***	-0.044	-0.016	-2.070***	-1.781***
		(0.027)	(0.031)	(0.030)	(0.041)	(0.084)	(0.084)	(0.658)	(0.650)
Fin. Lit.	-0.009	0.008	0.010	0.008	0.007	0.010	0.012	0.113	0.124
	(0.009)	(0.009)	(0.011)	(0.010)	(0.016)	(0.031)	(0.031)	(0.284)	(0.281)
Married	-0.060***	-0.050**	-0.041	-0.046**	-0.017	0.059	0.064	0.900	1.000
	(0.021)	(0.021)	(0.025)	(0.021)	(0.044)	(0.068)	(0.068)	(0.630)	(0.627)
Female	0.021	0.008	-0.005	0.010	-0.026	0.048	0.044	-0.475	-0.521
	(0.021)	(0.021)	(0.025)	(0.022)	(0.038)	(0.069)	(0.069)	(0.584)	(0.579)
Age	-0.014***	-0.014***	-0.017***	0.001	-0.010***	0.021***	0.009**	0.200***	0.056*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.004)	(0.020)	(0.032)
log(Inc)	-0.069***	-0.065***	-0.068***	-0.029**	-0.059*	0.041	0.026	0.537***	0.389**
	(0.019)	(0.018)	(0.019)	(0.011)	(0.032)	(0.034)	(0.032)	(0.162)	(0.154)
University	0.011	0.006	0.001	0.009	-0.032	0.014	0.029	-0.841	-0.696
	(0.023)	(0.023)	(0.027)	(0.023)	(0.043)	(0.073)	(0.074)	(0.543)	(0.536)
Initial Cohort							0.429***		4.868***
							(0.110)		(0.771)
Sample	Full	Full	Full	Initial	Later	Full	Full	Full	Full
Pop. weights	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald Ret=Fee	-	0.04	0.02	0.01	0.96	0.81	0.84	0.12	0.13

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Relied on Tele-marketers

Market share of tele-marketer based on number of coordinated trades occurring at the same time

	Any	25 th (3,000)	50 th (12,000 trades)			
	(1)	(2)	(3)	(4)	(5)	(6)
MF Return	0.027 (0.023)	0.034 (0.023)	0.055*** (0.021)	0.042** (0.021)	0.057* (0.030)	0.018 (0.019)
MF Fee	-0.029 (0.022)	-0.016 (0.022)	-0.031* (0.016)	-0.017 (0.019)	-0.047* (0.028)	0.012 (0.016)
MF Don't know	-0.028 (0.018)	-0.016 (0.017)	-0.008 (0.014)	-0.004 (0.015)	0.014 (0.025)	-0.008 (0.009)
Financial Literacy	-0.012* (0.006)	-0.014** (0.006)	-0.014*** (0.005)	-0.010** (0.005)	-0.016** (0.008)	-0.000 (0.002)
Married	0.010 (0.015)	0.007 (0.014)	-0.009 (0.012)	-0.006 (0.012)	-0.021 (0.018)	0.011 (0.011)
Female	-0.013 (0.015)	-0.009 (0.014)	0.001 (0.011)	-0.002 (0.011)	-0.009 (0.018)	0.007 (0.007)
Age	0.004*** (0.001)	0.003*** (0.001)	0.003*** (0.000)	0.003*** (0.000)	0.001 (0.001)	0.001* (0.000)
Log Income	0.017 (0.012)	0.036*** (0.011)	0.010** (0.005)	0.011** (0.005)	0.000 (0.006)	0.012** (0.006)
University	-0.023 (0.015)	-0.026* (0.014)	-0.014 (0.011)	-0.021** (0.011)	-0.031* (0.018)	-0.007 (0.006)
Sample	Full	Full	Full	Full	Initial	Later
Pop. weights	No	No	No	Yes	Yes	Yes
Wald Ret=Fee	0.07	0.10	0.01	0.04	0.02	0.77

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Fund fees

Dependent variable is weighted average portfolio fee

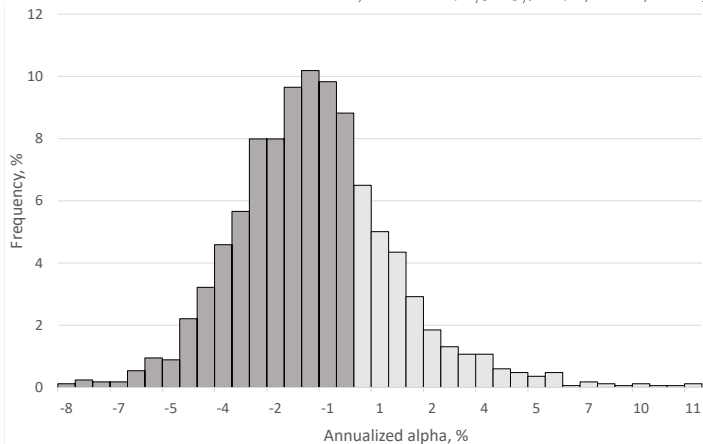
	Sample Restricted to Opt-out only				Full-Sample
	(1)	(2)	(3)	(4)	(5)
MMA 50	0.064*** (0.013)	0.061*** (0.009)		0.059*** (0.009)	0.076*** (0.011)
MF Return			0.028** (0.011)	0.025** (0.011)	0.023** (0.011)
MF Fee			-0.015 (0.014)	-0.013 (0.014)	-0.013 (0.011)
MF Don't know			-0.004 (0.009)	-0.005 (0.009)	-0.028*** (0.007)
Financial Literacy	0.005 (0.004)	0.002 (0.003)	0.000 (0.004)	0.001 (0.003)	0.002 (0.003)
2000 cohort	0.001 (0.017)	-0.014 (0.014)	-0.011 (0.014)	-0.014 (0.014)	0.074*** (0.010)
Demographics	Yes	Yes	Yes	Yes	Yes
Population weights	Yes	Yes	Yes	Yes	Yes
Strategy weights	No	Yes	Yes	Yes	Yes
Observations	1,678	1,678	1,678	1,678	2,502
R-squared	0.024	0.866	0.864	0.866	0.785
Wald Ret=Fee	-	-	0.01	0.03	0.02

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Performance (Active inv.)

Two market benchmark model, $R_{i,t} = \alpha_i + \beta_{i,S}R_{S,t} + \beta_{i,W}R_{W,t} + \epsilon_{i,t}$



Relative Performance

$$AP7_i = \frac{1}{T} \sum_1^T (R_{i,t} - R_{AP7,t})$$

	Full Sample			Post-2012 Returns			Choosers	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MMA 50		-1.196*** (0.157)	-1.433*** (0.197)		-0.190*** (0.021)	-0.206*** (0.024)	-0.613*** (0.156)	-0.067*** (0.022)
MF Return	-0.254 (0.169)	-0.183 (0.167)	-0.209 (0.189)	-0.010 (0.023)	0.001 (0.022)	-0.002 (0.024)	-0.182 (0.202)	0.029 (0.024)
MF Fee	0.019 (0.199)	-0.018 (0.199)	0.192 (0.219)	-0.009 (0.029)	-0.015 (0.029)	0.019 (0.030)	0.192 (0.260)	-0.003 (0.028)
MF Don't know	0.309** (0.135)	0.313** (0.134)	0.321** (0.147)	0.056*** (0.020)	0.057*** (0.020)	0.059*** (0.021)	-0.099 (0.160)	-0.011 (0.023)
Constant	-0.934 (0.664)	-0.810 (0.658)	-1.192* (0.652)	-0.202** (0.094)	-0.182** (0.092)	-0.155* (0.089)	-0.770 (1.005)	-0.382*** (0.145)
Observations	2,483	2,483	2,483	2,483	2,483	2,483	1,678	1,678
R-squared	0.186	0.199	0.221	0.257	0.271	0.314	0.113	0.038
Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pop. weights	No	No	Yes	No	No	Yes	Yes	Yes

Risk-adjusted Performance

$$R_{i,t} = \alpha_i + \beta_{i,S}R_{S,t} + \beta_{i,W}R_{W,t} + \beta_{i,SMB}R_{SMB,t} + \beta_{i,HML}R_{HML,t} + \beta_{i,MOM}R_{MOM,t} + \epsilon_{i,t}$$

	Full Sample		Post-2012 Returns				Choosers	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MMA 50		-0.364** (0.148)	-0.577*** (0.167)		-1.556*** (0.182)	-1.685*** (0.224)	0.185 (0.145)	-0.439** (0.186)
MF Return	-0.304* (0.164)	-0.282* (0.164)	-0.258 (0.187)	-0.116 (0.204)	-0.022 (0.223)	0.039 (0.244)	-0.227 (0.204)	0.297 (0.256)
MF Fee	-0.034 (0.188)	-0.046 (0.189)	0.151 (0.207)	-0.148 (0.265)	-0.197 (0.298)	0.246 (0.314)	0.169 (0.245)	0.074 (0.353)
MF Don't know	0.397*** (0.120)	0.400*** (0.120)	0.399*** (0.131)	0.972*** (0.199)	0.982*** (0.185)	1.046*** (0.202)	-0.034 (0.143)	0.353 (0.226)
Observations	2,483	2,483	2,483	2,483	2,483	2,483	1,678	1,678
R-squared	0.685	0.686	0.758	0.719	0.723	0.752	0.145	0.554
Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pop. weights	No	No	Yes	No	No	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Conclusion

- 1 Financial literacy question targeted at fees/returns allows us to split the sample into three groups based on meta-cognition
- 2 Those who know that they don't know are:
 - ▶ Less financially literate and less interested in personal finances
 - ▶ More likely to stay in the default fund
 - ▶ Less prone to use expensive advisors
- 3 Those who don't know that they don't know are:
 - ▶ Overly optimistic about their own financial literacy
 - ▶ More open to accepting free financial advice
 - ▶ Less likely to stay in default
 - ▶ Prone to use expensive advisors
 - ▶ Face higher fees
 - ▶ Experience lower performance as a result
- 4 Who got nudged?
 - ▶ Advertising pushed returns-chasers into opting out
 - ▶ It also pushed the indecisive into opting out when they likely wouldn't have