Internet Appendix

to

Personal Financial Information Presentation and Consumer Spending

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A. Detailed Analysis

TABLE A1

Monthly Logins by Treatment Group (7 Groups)

The dependent variable in all columns is the count of monthly logins. $I(t = x)$ are event month indicator variables. Event month $t = -5$ is the baseline level in all columns. Each column presents the regression results for a given treatment group. The treatment groups in columns (6) and (7) are described in Appendix B. Reported t-statistics in parentheses are heteroskedasticity-robust and clustered at the consumer level. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment:	Control	FSI-Plot	FSI-Plot-inf	FSI-NoPlot	LAI-Plot	FSI-NoPlot-retire	LAI-NoPlot-retire
I(t=-4)	-1.893***	-2.867***	-1.998***	-2.505***	-1.958***	-1.906***	-3.304***
	(-3.65)	(-4.11)	(-2.80)	(-3.67)	(-3.12)	(-3.07)	(-5.36)
I(t=-3)	1.371**	-0.047	-0.473	1.334	-0.059	1.294*	-0.036
	(2.05)	(-0.06)	(-0.59)	(1.55)	(-0.07)	(1.71)	(-0.04)
I(t=-2)	-1.633**	-3.365***	-3.664***	-1.869**	-2.437***	-2.046***	-3.246***
	(-2.40)	(-3.92)	(-4.07)	(-2.37)	(-2.86)	(-2.60)	(-4.21)
I(t=-1)	-1.144*	-2.391***	-2.231**	-0.724	-1.070	-1.078	-2.261***
	(-1.71)	(-2.72)	(-2.31)	(-0.88)	(-1.22)	(-1.34)	(-2.72)
I(t=0)	-2.679***	-1.161	-1.807**	-0.887	-0.535	-0.809	-1.834**
	(-3.95)	(-1.28)	(-1.97)	(-1.04)	(-0.59)	(-0.95)	(-2.30)
I(t=1)	-3.869***	-2.258**	-3.271***	-2.323***	-2.927***	-1.753**	-3.837***
	(-5.94)	(-2.21)	(-3.51)	(-2.71)	(-3.20)	(-2.21)	(-5.08)
I(t=2)	-1.845***	-1.789*	-1.344	-1.500*	-1.934**	-1.226	-2.537***
	(-2.83)	(-1.80)	(-1.44)	(-1.69)	(-2.08)	(-1.52)	(-2.82)
I(t=3)	-2.039***	-2.085**	-1.436	-0.710	-1.683*	-1.136	-2.788***
	(-2.99)	(-2.04)	(-1.47)	(-0.81)	(-1.80)	(-1.36)	(-3.06)
I(t=4)	-3.906***	-4.773***	-3.938***	-3.454***	-3.223***	-3.646***	-2.911***
	(-5.68)	(-4.65)	(-4.03)	(-4.10)	(-3.55)	(-4.55)	(-3.18)
I(t=5)	-3.443***	-3.557***	-3.133***	-1.601*	-1.988**	-2.174**	-2.028**
	(-5.08)	(-3.36)	(-3.14)	(-1.86)	(-2.14)	(-2.51)	(-2.24)
I(t=6)	-4.493***	-3.974***	-3.900***	-3.523***	-4.192***	-3.178***	-3.537***
	(-6.15)	(-3.51)	(-3.52)	(-3.67)	(-4.62)	(-3.87)	(-3.92)
I(t=7)	-1.517**	-1.457	-2.769**	-0.191	-1.033	-0.350	-2.272**
	(-2.05)	(-1.28)	(-2.55)	(-0.20)	(-1.05)	(-0.38)	(-2.38)
I(t=8)	-3.199***	-3.180***	-3.133***	-2.288***	-2.237**	-2.166**	-3.628***
	(-4.42)	(-2.84)	(-2.87)	(-2.59)	(-2.15)	(-2.46)	(-3.58)
I(t=9)	-3.009***	-2.908***	-2.573**	-1.350	-1.446	-1.413	-2.985***
	(-4.03)	(-2.74)	(-2.44)	(-1.40)	(-1.38)	(-1.51)	(-3.01)
I(t=10)	-1.144	-0.872	0.038	0.329	-0.230	0.589	-1.720*
	(-1.50)	(-0.80)	(0.03)	(0.32)	(-0.22)	(0.59)	(-1.76)
I(t=11)	-2.201***	-1.813*	-1.438	-1.793*	-1.448	-0.509	-2.637***
	(-2.85)	(-1.67)	(-1.29)	(-1.76)	(-1.44)	(-0.52)	(-2.63)
I(t=12)	-0.299	-0.704	0.009	0.214	-0.444	0.713	-0.367
	(-0.37)	(-0.63)	(0.01)	(0.19)	(-0.42)	(0.70)	(-0.31)
I(t=13)	-1.459*	-0.995	-1.473	-1.293	-0.587	-0.379	-2.263**
	(-1.82)	(-0.89)	(-1.34)	(-1.18)	(-0.52)	(-0.38)	(-2.07)
I(t=14)	-0.592	-1.583	-1.271	-0.606	-1.026	-0.312	-1.845*
	(-0.75)	(-1.45)	(-1.17)	(-0.58)	(-0.93)	(-0.34)	(-1.77)
I(t=15)	-0.428	-1.607	-1.682	-0.906	-1.995*	-0.656	-2.546**
	(-0.57)	(-1.44)	(-1.48)	(-0.86)	(-1.79)	(-0.72)	(-2.39)
I(t=16)	-1.797**	-3.443***	-2.756**	-2.108**	-3.005***	-2.080**	-3.178***
	(-2.27)	(-3.04)	(-2.39)	(-2.01)	(-2.89)	(-2.34)	(-3.20)
I(t=17)	-1.797**	-2.758**	-3.829***	-1.903*	-2.223**	-1.591	-1.414
	(-2.11)	(-2.34)	(-3.33)	(-1.68)	(-2.02)	(-1.60)	(-1.36)
I(t=18)	-3.469***	-3.652***	-4.438***	-3.249***	-3.399***	-3.042***	-2.752***
	(-4.19)	(-3.23)	(-4.10)	(-3.01)	(-3.16)	(-3.23)	(-2.63)
I(t=19)	-2.199***	-2.675**	-2.811**	-1.484	-2.221**	-1.413	-1.643
	(-2.68)	(-2.48)	(-2.47)	(-1.32)	(-2.00)	(-1.48)	(-1.56)
consumer FE	Y	Y	Y	Y	Y	Y	Y
N	11,450	10,550	11,250	10,850	10,650	11,925	11,775
adj. R2	0.77	0.75	0.73	0.74	0.72	0.76	0.74

TABLE A2

Monthly Discretionary Spending by Treatment Group (7 Groups)

The dependent variable in all columns is the log of monthly discretionary spending. $I(t = x)$ are event month indicator variables. Event month $t = -5$ is the baseline level in all columns. Each column presents the regression results for a given treatment group. The treatment groups in columns (6) and (7) are described in Appendix B. Reported t-statistics in parentheses are heteroskedasticity-robust and clustered at the consumer level. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment:	Control	FSI-Plot	FSI-Plot-inf	FSI-NoPlot	LAI-Plot	FSI-NoPlot-retire	LAI-NoPlot-retire
I(t=-4)	0.189***	0.141***	0.073	0.143**	0.194***	0.089**	0.144**
	(3.15)	(2.96)	(1.21)	(2.29)	(3.34)	(2.57)	(2.46)
I(t=-3)	0.226***	0.122*	0.143*	0.161**	0.289***	0.061	0.099
	(3.26)	(1.94)	(1.83)	(2.53)	(4.03)	(1.61)	(1.53)
I(t=-2)	-0.128*	-0.101	-0.089	-0.051	0.051	-0.118***	-0.132*
	(-1.77)	(-1.38)	(-1.10)	(-0.65)	(0.66)	(-2.68)	(-1.71)
I(t=-1)	-0.132*	-0.065	-0.037	-0.045	-0.093	-0.140***	-0.151*
	(-1.82)	(-0.88)	(-0.47)	(-0.55)	(-1.12)	(-3.19)	(-1.96)
I(t=0)	-0.010	-0.143*	-0.119	0.130*	0.127*	-0.058	0.104
	(-0.14)	(-1.73)	(-1.32)	(1.70)	(1.69)	(-1.28)	(1.29)
I(t=1)	-0.040	-0.185**	-0.226**	-0.007	0.068	-0.138***	0.018
	(-0.52)	(-2.06)	(-2.52)	(-0.08)	(0.85)	(-2.88)	(0.21)
I(t=2)	0.042	-0.151*	-0.133*	-0.065	0.029	-0.125**	0.018
	(0.56)	(-1.84)	(-1.71)	(-0.70)	(0.36)	(-2.46)	(0.22)
I(t=3)	-0.054	-0.188**	-0.149*	-0.092	-0.030	-0.143***	-0.089
	(-0.68)	(-2.06)	(-1.74)	(-1.04)	(-0.35)	(-2.72)	(-1.00)
I(t=4)	0.030	-0.172**	-0.162**	0.011	0.036	-0.074	-0.095
	(0.37)	(-1.98)	(-2.00)	(0.12)	(0.40)	(-1.52)	(-1.00)
I(t=5)	-0.040	-0.183**	-0.169**	0.024	0.071	-0.065	-0.099
	(-0.46)	(-2.06)	(-1.98)	(0.27)	(0.81)	(-1.34)	(-1.13)
I(t=6)	-0.022	-0.181**	-0.244***	-0.101	0.082	-0.118**	-0.132
	(-0.26)	(-2.02)	(-2.66)	(-1.05)	(0.93)	(-2.44)	(-1.41)
I(t=7)	-0.010	-0.238***	-0.181*	-0.012	0.040	-0.089*	-0.087
	(-0.11)	(-2.63)	(-1.91)	(-0.14)	(0.44)	(-1.75)	(-0.91)
I(t=8)	0.083	-0.137	-0.160	0.035	0.129	-0.014	-0.024
	(0.90)	(-1.47)	(-1.62)	(0.39)	(1.45)	(-0.27)	(-0.27)
I(t=9)	0.049	-0.148	-0.138	-0.007	0.028	-0.095*	-0.035
	(0.51)	(-1.46)	(-1.40)	(-0.07)	(0.29)	(-1.80)	(-0.39)
I(t=10)	-0.026	-0.235**	-0.219**	-0.067	-0.133	-0.175***	-0.157*
	(-0.29)	(-2.41)	(-2.33)	(-0.70)	(-1.30)	(-3.33)	(-1.76)
I(t=11)	-0.114	-0.147	-0.171*	-0.124	-0.035	-0.203***	-0.127
	(-1.32)	(-1.63)	(-1.66)	(-1.28)	(-0.39)	(-3.72)	(-1.48)
I(t=12)	0.049	-0.127	-0.087	0.055	0.081	-0.069	0.043
	(0.55)	(-1.20)	(-0.87)	(0.54)	(0.77)	(-1.25)	(0.45)
I(t=13)	0.060	-0.124	-0.199*	0.048	0.083	-0.061	-0.009
	(0.60)	(-1.16)	(-1.91)	(0.48)	(0.81)	(-1.08)	(-0.10)
I(t=14)	0.086	-0.037	-0.035	0.014	0.146	-0.068	0.007
	(0.90)	(-0.34)	(-0.35)	(0.13)	(1.48)	(-1.18)	(0.07)
I(t=15)	-0.047	-0.172	-0.127	-0.040	0.017	-0.020	-0.032
	(-0.49)	(-1.53)	(-1.21)	(-0.37)	(0.17)	(-0.35)	(-0.32)
I(t=16)	0.049	-0.057	0.013	0.000	-0.054	-0.044	-0.093
	(0.47)	(-0.53)	(0.12)	(0.00)	(-0.49)	(-0.74)	(-0.86)
I(t=17)	-0.097	-0.033	0.080	-0.085	-0.037	0.010	-0.130
	(-0.96)	(-0.30)	(0.78)	(-0.76)	(-0.33)	(0.15)	(-1.18)
I(t=18)	-0.098	-0.012	0.060	-0.002	-0.033	-0.192***	-0.201*
	(-0.94)	(-0.10)	(0.54)	(-0.02)	(-0.29)	(-3.03)	(-1.77)
I(t=19)	-0.008	-0.026	-0.063	0.018	0.055	-0.024	-0.136
	(-0.08)	(-0.23)	(-0.56)	(0.15)	(0.47)	(-0.40)	(-1.18)
consumer FE	Y	Y	Y	Y	Y	Y	Y
N	11,450	10,550	11,250	10,850	10,650	11,925	11,775
adj. R2	0.64	0.68	0.61	0.61	0.65	0.64	0.67

B. Additional Treatment Groups

A third variation in information design (in addition to framing and salience of context) was a current- versus future-self framing. An individual can be viewed as two conflicted agents: a current self and a future self (Strotz (1955), Thaler and Shefrin (1981)). Previous studies confirm that individuals tend to make decisions that favor their current selves and often treat their future selves as they would treat a stranger.[1] In this study, we examine the effect of presenting the intertemporal choice dilemma in either a current-self frame or a future-self frame.

In the current-self framing, users received the annuitized value of their net worth represented by a cash flow stream that starts immediately (using immediate annuities quote). In this frame, users are primed to reflect on questions that place the current self in the center, such as "Can I retire today?" or "How far away am I from sustainably retiring, based on my current net worth?" In the future-self framing, users received the annuitized values of their net worth as a cash flow stream starting at retirement (calculated using the deferred annuities quote). Under this frame, users are primed to reflect on questions that place their future self in the center such as "Will I have enough money to spend when I retire?" To the extent that people identify with their current selves more than their future selves, we can expect that users receiving current-self framing would alter their saving behavior more than users receiving the future-self framing.

Unlike the other variations in treatments, the current-self/future-self variation is not a pure information design test, as the users are exposed to somewhat different information content. Nevertheless, it is important to test because most financial planners, retirement account providers, and the Social Security Administration offer some projection of wealth or income at a future date. Yet it is difficult to argue that the exposure to the new information content might

[1]Examples include Pronin and Ross (2006), Pronin, Olivola, and Kennedy (2008), and Wakslak, Nussbaum, Liberman, and Trope (2008). Researchers have been exploring tools to mitigate this conflict by creating commitments to the future self (e.g., Choi, Laibson, Madrian, Metrick et al. (2005), Thaler and Benartzi (2004)) or by improving the vividness or connectedness with the future self (Hershfield, Goldstein, Sharpe, Fox, Yeykelis, Carstensen, and Bailenson (2011)).

drive a differential response between the treatments, as immediate and deferred annuity quotes are equally available to the public.[2]

In addition to the five experiment groups described in the main text, two additional experiment groups were included to test the current-/future-self framing effect. The groups are described below and in Table B1.

FSI-NoPlot-retire Group (Figure C6): Users in this treatment group received a personalized index named FSI, which represents a potential cash flow that will start at retirement and no context plot. By comparing the behavior of this group to that of the FSI-NoPlot group, we can identify the effect of the current-self or future-self framing under the consumption frame, but without the salience of the spending context.

LAI-NoPlot-retire Group (Figure C7): Users in this treatment group received a personalized index named LAI, which represents a potential cash flow that will start at retirement, and no context plot. By comparing the consumption behavior of this group with that of the LAI-Plot group, we can identify the effect of the current-self or future-self framing combined with the context effect.

As noted in the main text, framing effects are sensitive to the salience of the context in which they are presented. In this study, it was not possible to design a treatment group with high salience of context and future-self framing. Presentation of current spending levels with future potential monthly income in the same plot was likely to confuse users and therefore was not included in the experiment.

Table B2 presents the effect of all the treatments on login behavior. Both the FSI-NoPlot-retire and the LAI-NoPlot-retire groups show a similar increase in login activity as the other treatment groups. This confirms the previous conclusion that the increase in login activity can be attributed to an interest in the new features of the app. Also, as the increase in login activity is similar across all treated groups, we reconfirm that none of the experiment features were

[2]Numerous websites provide free quotes for both immediate and deferred annuities. Inflation-protected life annuities used in this study are relatively difficult to obtain for both immediate and deferred annuities.

more engaging than the rest (e.g., differed annuity quotes did not draw more attention than the immediate annuity quotes).

The remaining tables and figures in this appendix present the full set of tests for all seven treatment groups in the experiment. Neither the FSI-NoPlot-retire nor the LAI-NoPlot-retire treatments had an impact on user spending behavior relative to the control, FSI-NoPlot, or LAI-Plot groups. The lack of impact of retirement treatments reconfirms the previous conclusion that framing effects are sensitive to the presence of a salient context. Current or future framing had no differential impact on financial behavior in the absence of a salient context. The lack of response to future-self framing is concerning and merits additional research, as it is a common method of presenting retirement income used by retirement account providers.

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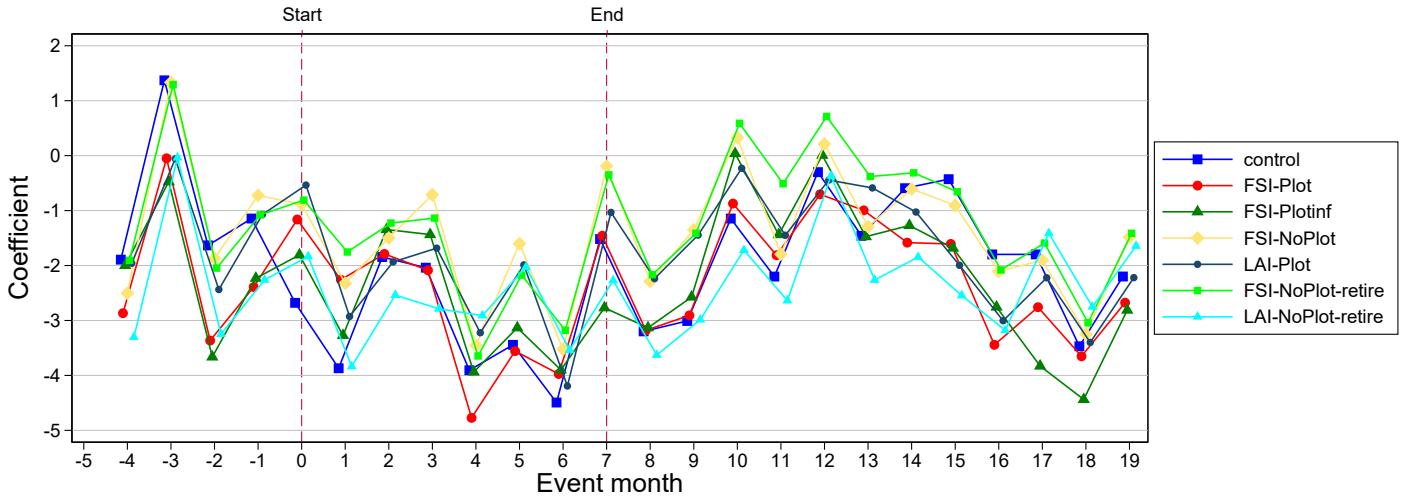
FIGURE B1

Monthly Logins by Treatment Group (7 Groups)

Panel (a) shows the estimated coefficients in a regression of monthly login count on event month indicator variables with consumer fixed effects for each treatment group. Panel (b) shows the average predicted values for that regression. Detailed regression results are in Table A1.

(a) Coefficients



(b) Predicted Values

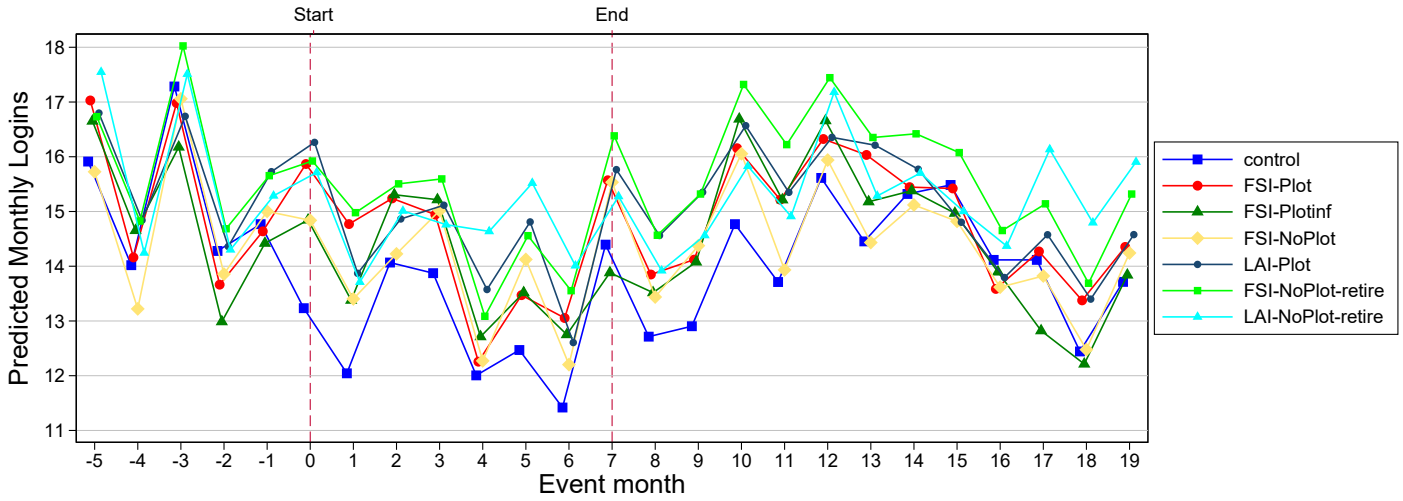


TABLE B1

Treatment Groups (7 Groups)

#	group name	index name	index and spending plot	comments
1	control	-	-	
2	FSI-Plot	Financial Sustainability Index	yes	
3	FSI-Plot-inf	Financial Sustainability Index	yes	index inflated by 20%
4	FSI-NoPlot	Financial Sustainability Index	no	
5	LAI-Plot	Life Annuity Index	yes	
6	FSI-NoPlot-retire	Financial Sustainability Index	no	cash flow starts at retirement
7	LAI-NoPlot-retire	Life Annuity Index	no	cash flow starts at retirement

TABLE B2

Treatment Effects on Login Behavior (7 Groups)

The dependent variable in all columns is the count of monthly logins. *Control*, *FSI-Plot*, *FSI-Plot-inf*, *FSI-NoPlot*, *FSI-NoPlot-retire*, *LAI-Plot*, and *LAI-NoPlot-retire* are treatment group indicator variables (see Table B1 for details). The baseline period in all regressions is the five months before the experiment launch (t=-5 to t=-1). *Intra* is an indicator variable for the eight months during which experiment materials were presented in the app (t=0 to t=7), and *Post* is an indicator for the following twelve months (t=8 to t=19). Reported t-statistics in parentheses are heteroskedasticity-robust and clustered at the consumer level. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	(1)	(2)	(3)
*Control * Intra*		-1.417**	-1.288**
		(-2.03)	(-2.11)
*FSI-Plot * Intra*	1.417**		0.129
	(2.03)		(0.17)
*FSI-Plot-inf * Intra*	1.288**	-0.129	
	(2.11)	(-0.17)	
*FSI-NoPlot * Intra*	1.293**	-0.123	0.005
	(2.05)	(-0.16)	(0.01)
*LAI-Plot * Intra*	1.229**	-0.187	-0.058
	(2.05)	(-0.25)	(-0.09)
*FSI-NoPlot-retire * Intra*	1.277**	-0.139	-0.011
	(2.13)	(-0.18)	(-0.02)
*LAI-NoPlot-retire * Intra*	1.366**	-0.051	0.078
	(2.12)	(-0.06)	(0.11)
*Control * Post*		-0.691	-0.700
		(-0.75)	(-0.80)
*FSI-Plot * Post*	0.691		-0.009
	(0.75)		(-0.01)
*FSI-Plot-inf * Post*	0.700	0.009	
	(0.80)	(0.01)	
*FSI-NoPlot * Post*	0.522	-0.169	-0.177
	(0.57)	(-0.16)	(-0.17)
*LAI-Plot * Post*	0.556	-0.135	-0.144
	(0.61)	(-0.13)	(-0.14)
*FSI-NoPlot-retire * Post*	0.865	0.174	0.165
	(0.95)	(0.16)	(0.16)
*LAI-NoPlot-retire * Post*	0.661	-0.030	-0.039
	(0.76)	(-0.03)	(-0.04)
reference group	Control	FSI-Plot	FSI-Plot-inf
consumer FE	Y	Y	Y
event month FE	Y	Y	Y
N	78,450	78,450	78,450
adj. R2	0.74	0.74	0.74

TABLE B3

Treatment Effects on Discretionary Spending (7 Groups)

The dependent variable in all columns is the log of monthly discretionary spending. *Control*, *FSI-Plot*, *FSI-Plot-inf*, *FSI-NoPlot*, *FSI-NoPlot-retire*, *LAI-Plot*, and *LAI-NoPlot-retire* are treatment group indicator variables (see Table B1 for details). The baseline period in all regressions is the five months before the experiment launch (t=-5 to t=-1). *Intra* is an indicator variable for the eight months during which experiment materials were presented in the app (t=0 to t=7), and *Post* is an indicator for the following twelve months (t=8 to t=19). Reported t-statistics in parentheses are heteroskedasticity-robust and clustered at the consumer level. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	(1)	(2)	(3)
*Control * Intra*		0.156**	0.147**
		(2.22)	(2.25)
*FSI-Plot * Intra*	-0.156**		-0.009
	(-2.22)		(-0.13)
*FSI-Plot-inf * Intra*	-0.147**	0.009	
	(-2.25)	(0.13)	
*FSI-NoPlot * Intra*	-0.012	0.144**	0.135**
	(-0.18)	(2.00)	(2.01)
*LAI-Plot * Intra*	0.009	0.165**	0.156**
	(0.13)	(2.24)	(2.26)
*FSI-NoPlot-retire * Intra*	-0.036	0.120**	0.111**
	(-0.66)	(1.99)	(2.04)
*LAI-NoPlot-retire * Intra*	0.006	0.162**	0.154**
	(0.09)	(2.11)	(2.12)
*Control * Post*		0.092	0.073
		(0.98)	(0.77)
*FSI-Plot * Post*	-0.092		-0.019
	(-0.98)		(-0.19)
*FSI-Plot-inf * Post*	-0.073	0.019	
	(-0.77)	(0.19)	
*FSI-NoPlot * Post*	-0.022	0.070	0.050
	(-0.25)	(0.73)	(0.52)
*LAI-Plot * Post*	-0.035	0.057	0.038
	(-0.37)	(0.57)	(0.37)
*FSI-NoPlot-retire * Post*	-0.026	0.066	0.047
	(-0.34)	(0.82)	(0.58)
*LAI-NoPlot-retire * Post*	-0.034	0.057	0.038
	(-0.38)	(0.59)	(0.39)
reference group	Control	FSI-Plot	FSI-Plot-inf
consumer FE	Y	Y	Y
event month FE	Y	Y	Y
N	78,450	78,450	78,450
adj. R2	0.65	0.65	0.65

FIGURE B2

Monthly Discretionary Spending by Treatment Group (7 Groups)

The figure shows the estimated coefficients in a regression of log monthly discretionary spending on event month indicator variables with consumer fixed effects for each treatment group. Detailed regression results are in Table A2.

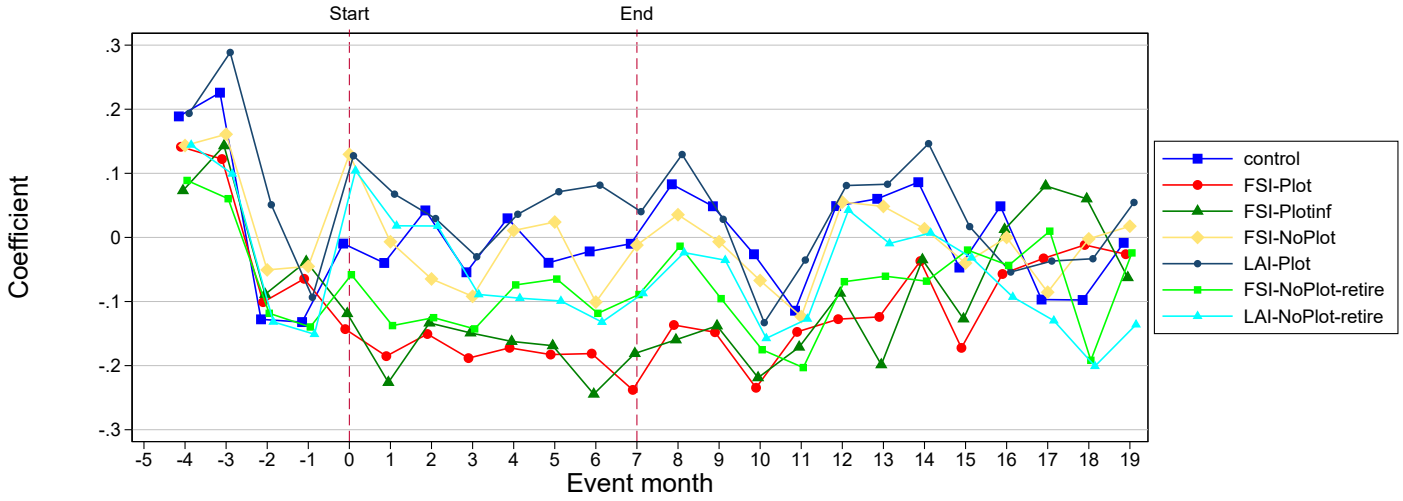


TABLE B4

Treatment Effects on Discretionary Spending Over Four Months Intervals (7 Groups)

The dependent variable in all columns is the log of monthly discretionary spending. *FSI-Plot*, *FSI-Plot-inf*, *FSI-NoPlot*, *FSI-NoPlot-retire*, *LAI-Plot*, and *LAI-NoPlot-retire* are treatment group indicator variables (see Table B1 for details). The baseline period in all regressions is the five months before the experiment launch (t=-5 to t=-1) and the reference group is the *Control* group. Treatment group indicators are interacted with a time period indicator for the four months listed at the top of each column. Experiment materials were presented on the app from $t = 0$ to $t = 7$. Reported t-statistics in parentheses are heteroskedasticity-robust and clustered at the consumer level. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	(1)	(2)	(3)	(4)	(5)
Interaction:	$I(0 \leq t \leq 3)$	$I(4 \leq t \leq 7)$	$I(8 \leq t \leq 11)$	$I(12 \leq t \leq 15)$	$I(16 \leq t \leq 19)$
FSI-Plot * $I(a \leq t \leq b)$	-0.140**	-0.172**	-0.153*	-0.141	0.018
	(-2.02)	(-1.97)	(-1.69)	(-1.31)	(0.16)
FSI-Plot-inf * $I(a \leq t \leq b)$	-0.128**	-0.166**	-0.157*	-0.136	0.074
	(-2.03)	(-2.00)	(-1.70)	(-1.28)	(0.63)
FSI-NoPlot * $I(a \leq t \leq b)$	-0.004	-0.020	-0.049	-0.028	0.010
	(-0.06)	(-0.23)	(-0.55)	(-0.28)	(0.09)
LAI-Plot * $I(a \leq t \leq b)$	0.007	0.011	-0.057	-0.012	-0.036
	(0.10)	(0.13)	(-0.63)	(-0.12)	(-0.30)
FSI-NoPlot-retire * $I(a \leq t \leq b)$	-0.048	-0.024	-0.067	-0.039	0.029
	(-0.88)	(-0.35)	(-0.91)	(-0.47)	(0.31)
LAI-NoPlot-retire * $I(a \leq t \leq b)$	0.067	-0.054	-0.045	0.004	-0.063
	(0.98)	(-0.61)	(-0.52)	(0.04)	(-0.53)
consumer FE	Y	Y	Y	Y	Y
event month FE	Y	Y	Y	Y	Y
N	28,242	28,242	28,242	28,242	28,242
adj. R2	0.73	0.70	0.68	0.64	0.60

TABLE B5

Treatment Effects on Spending Categories (7 Groups)

The dependent variables in columns (1)-(4) are the log of monthly spending in the corresponding category, and the log of monthly cash withdrawal is in column (5). The dependent variable in column (6) is the log sum of the five largest spending transactions for a given consumer-month. *FSI-Plot*, *FSI-Plot-inf*, *FSI-NoPlot*, *FSI-NoPlot-retire*, *LAI-Plot*, and *LAI-NoPlot-retire* are treatment group indicator variables (see Table B1 for details). The baseline period in all regressions is the five months before the experiment launch (t=-5 to t=-1) and the reference group is the *Control* group. *Intra* is an indicator variable for the eight months during which experiment materials were presented in the app (t=0 to t=7), and *Post* is an indicator for the following twelve months (t=8 to t=19). Reported t-statistics in parentheses are heteroskedasticity-robust and clustered at the consumer level. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Dependent:	Restaurants	Clothing	Entertainment	Travel	Cash Withdrawal	5 Largest Transactions
*FSI-Plot * Intra*	-0.140**	-0.219**	-0.155**	-0.222**	-0.265**	-0.127***
	(-1.96)	(-2.37)	(-2.23)	(-2.12)	(-2.23)	(-2.94)
*FSI-Plot-inf * Intra*	-0.137**	-0.184**	-0.132**	-0.257**	-0.237**	-0.141***
	(-1.99)	(-2.07)	(-2.03)	(-2.45)	(-2.19)	(-3.92)
*FSI-NoPlot * Intra*	0.052	0.010	0.014	0.015	-0.009	-0.037
	(0.75)	(0.10)	(0.21)	(0.14)	(-0.07)	(-0.98)
*LAI-Plot * Intra*	0.020	-0.004	0.002	0.082	0.007	-0.038
	(0.29)	(-0.05)	(0.03)	(0.74)	(0.06)	(-1.03)
*FSI-NoPlot-retire * Intra*	-0.005	-0.005	0.006	-0.005	-0.023	-0.002
	(-0.09)	(-0.08)	(0.09)	(-0.05)	(-0.20)	(-0.08)
*LAI-NoPlot-retire * Intra*	0.023	-0.041	-0.007	0.021	-0.025	-0.000
	(0.33)	(-0.47)	(-0.10)	(0.20)	(-0.27)	(-0.01)
*FSI-Plot * Post*	0.004	0.089	-0.018	0.035	0.006	-0.042
	(0.05)	(0.81)	(-0.20)	(0.27)	(0.04)	(-0.88)
*FSI-Plot-inf * Post*	0.008	0.030	0.023	-0.017	0.021	0.000
	(0.09)	(0.29)	(0.28)	(-0.13)	(0.15)	(0.00)
*FSI-NoPlot * Post*	-0.021	-0.010	0.016	0.027	-0.030	-0.011
	(-0.23)	(-0.09)	(0.18)	(0.21)	(-0.21)	(-0.25)
*LAI-Plot * Post*	-0.037	-0.041	-0.048	0.011	0.025	0.033
	(-0.40)	(-0.39)	(-0.56)	(0.08)	(0.17)	(0.71)
*FSI-NoPlot-retire * Post*	0.021	0.066	0.002	0.018	0.003	0.021
	(0.29)	(0.79)	(0.02)	(0.14)	(0.02)	(0.52)
*LAI-NoPlot-retire * Post*	-0.017	0.011	-0.009	-0.014	0.013	0.017
	(-0.19)	(0.11)	(-0.11)	(-0.11)	(0.11)	(0.40)
consumer FE	Y	Y	Y	Y	Y	Y
event month FE	Y	Y	Y	Y	Y	Y
N	78,450	78,450	78,450	78,450	78,450	78,450
adj. R2	0.71	0.50	0.57	0.48	0.49	0.49

TABLE B6

Treatment Effects on Additional Spending Categories (7 Groups)

The dependent variables are the log of monthly total spending in column (1) and log monthly spending in the corresponding category in columns (2)-(5). *FSI-Plot*, *FSI-Plot-inf*, *FSI-NoPlot*, and *LAI-Plot* are treatment group indicator variables (see Table B1 for details). The baseline period in all regressions is the five months before the experiment launch (t=-5 to t=-1) and the reference group is the *Control* group. *Intra* is an indicator variable for the eight months during which experiment materials were presented in the app (t=0 to t=7), and *Post* is an indicator for the following twelve months (t=8 to t=19). Reported t-statistics in parentheses are heteroskedasticity-robust and clustered at the consumer level. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	(1)	(2)	(3)	(4)	(5)
Dependent:	Spending	Gas	Groceries	Telephone	Utilities
*FSI-Plot * Intra*	-0.065*	0.026	0.010	-0.046	-0.086
	(-1.95)	(0.39)	(0.15)	(-0.65)	(-0.95)
*FSI-Plot-inf * Intra*	-0.053*	0.090	0.069	-0.001	-0.080
	(-1.74)	(1.24)	(1.00)	(-0.01)	(-0.91)
*FSI-NoPlot * Intra*	0.007	0.008	0.024	0.007	-0.107
	(0.22)	(0.14)	(0.35)	(0.09)	(-1.22)
*LAI-Plot * Intra*	0.006	0.093	0.025	-0.030	-0.021
	(0.19)	(1.43)	(0.37)	(-0.41)	(-0.22)
*FSI-NoPlot-retire * Intra*	-0.001	0.033	0.024	-0.047	0.002
	(-0.02)	(0.64)	(0.37)	(-0.65)	(0.03)
*LAI-NoPlot-retire * Intra*	0.001	0.100	0.076	-0.000	0.015
	(0.04)	(1.53)	(1.11)	(-0.00)	(0.17)
*FSI-Plot * Post*	-0.003	-0.024	-0.041	-0.012	-0.126
	(-0.06)	(-0.31)	(-0.42)	(-0.14)	(-1.06)
*FSI-Plot-inf * Post*	-0.012	0.010	0.063	0.051	-0.073
	(-0.30)	(0.11)	(0.65)	(0.58)	(-0.66)
*FSI-NoPlot * Post*	0.021	0.023	-0.005	0.071	-0.162
	(0.52)	(0.34)	(-0.06)	(0.82)	(-1.46)
*LAI-Plot * Post*	0.017	-0.098	0.013	-0.082	-0.167
	(0.40)	(-1.25)	(0.14)	(-0.95)	(-1.44)
*FSI-NoPlot-retire * Post*	-0.018	-0.001	0.057	0.024	0.042
	(-0.45)	(-0.02)	(0.63)	(0.31)	(0.36)
*LAI-NoPlot-retire * Post*	-0.005	-0.027	0.044	0.034	0.012
	(-0.12)	(-0.33)	(0.48)	(0.39)	(0.10)
consumer FE	Y	Y	Y	Y	Y
event month FE	Y	Y	Y	Y	Y
N	78,450	51,375	62,350	49,675	48,150
adj. R2	0.61	0.37	0.42	0.27	0.24

TABLE B7

Balance Tests

Variables are defined in Table 3.

Panel A.

Treatment		Age		Net Worth		Personalized Index		Logins	
	N	mean	sd	mean	sd	mean	sd	mean	sd
Control	458	44.48	7.78	1,146,247	1,583,688	3,274	5,562	15.25	17.52
FSI-Plot	422	44.4	7.93	1,184,688	1,645,099	3,310	4,854	15.29	22.21
FSI-Plot-inf	450	44.23	7.96	1,086,211	1,357,686	2,953	4,791	14.98	21.03
FSI-NoPlot	434	44.67	7.77	1,114,032	1,391,693	2,990	4,603	14.97	20.20
LAI-Plot	426	44.78	7.9	1,126,652	1,600,438	3,367	6,766	15.69	19.15
FSI-NoPlot-retire	477	44.48	7.91	1,097,916	1,302,980	3,037	4,713	15.98	21.60
LAI-NoPlot-retire	471	44.84	8.08	1,144,653	1,563,826	3,328	4,940	15.78	21.27

Panel B.

Treatment		Income		Spending		Discretionary Spending		Clothing	
	N	mean	sd	mean	sd	mean	sd	mean	sd
Control	458	16,863	12,683	12,323	9,826	3,610	3,290	371	492
FSI-Plot	422	16,721	13,405	12,748	10,396	3,694	3,547	406	577
FSI-Plot-inf	450	16,446	12,753	12,459	10,062	3,836	3,709	384	552
FSI-NoPlot	434	16,692	13,110	12,047	9,841	3,669	3,549	370	484
LAI-Plot	426	17,284	13,525	12,678	10,434	3,621	3,206	369	467
FSI-NoPlot-retire	477	16,972	13,370	12,022	8,656	3,690	3,168	362	396
LAI-NoPlot-retire	471	16,531	13,355	12,323	9,971	3,701	3,654	359	485

Panel C.

Treatment		Entertainment		Restaurants		Travel		Cash Withdrawal	
	N	mean	sd	mean	sd	mean	sd	mean	sd
Control	458	170	224	508	494	667	1,050	913	1,281
FSI-Plot	422	172	238	531	547	677	1,038	946	1,458
FSI-Plot-inf	450	177	213	495	450	742	1,123	969	1,292
FSI-NoPlot	434	163	201	499	434	686	1,014	934	1,331
LAI-Plot	426	168	225	509	460	749	1,156	942	1,320
FSI-NoPlot-retire	477	163	197	490	445	682	830	903	1,344
LAI-NoPlot-retire	471	161	224	499	525	656	1,018	871	1,264

C. Experiment Material

FIGURE C1

Full Dashboard Page for the Control Group

This dashboard page was presented to all treatment groups before the experiment launch $(t < 0)$ and after the removal of the experiment material from the app $(t > 7)$.

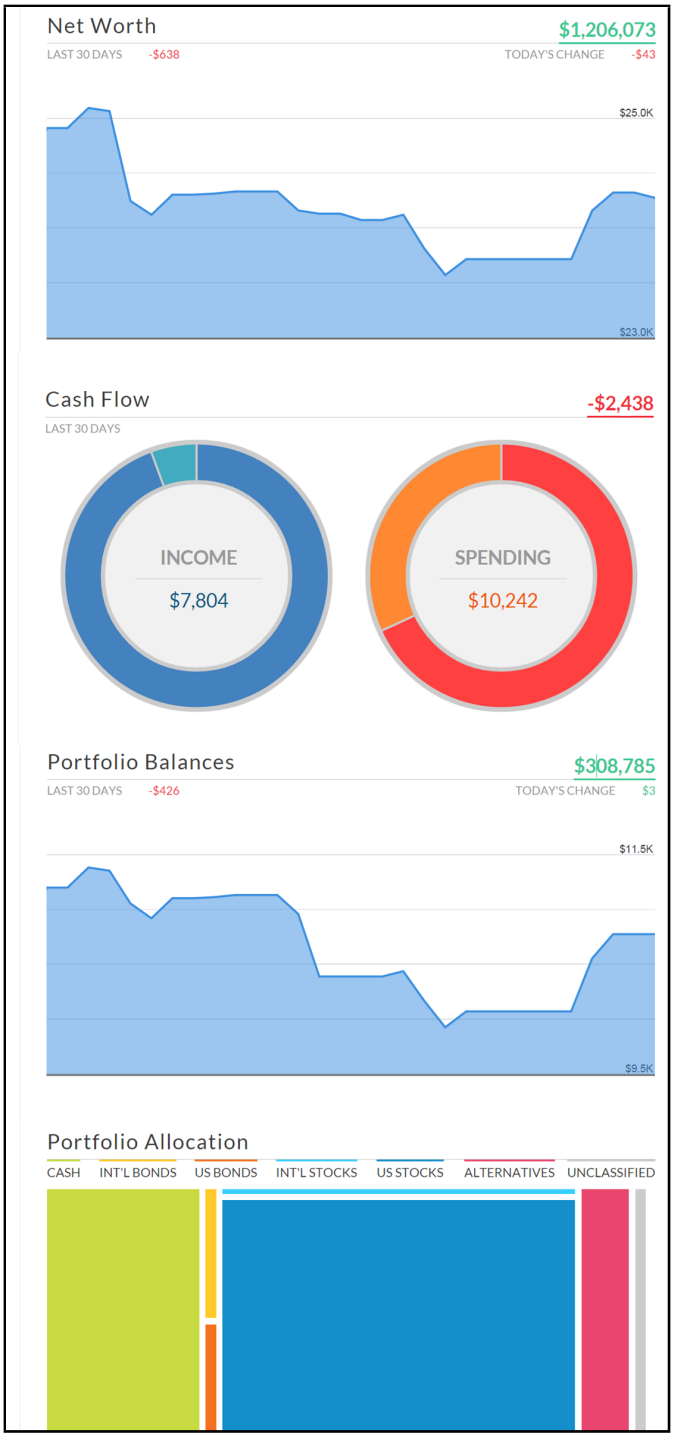


FIGURE C2

Full Dashboard Page for the FSI-Plot Treatment

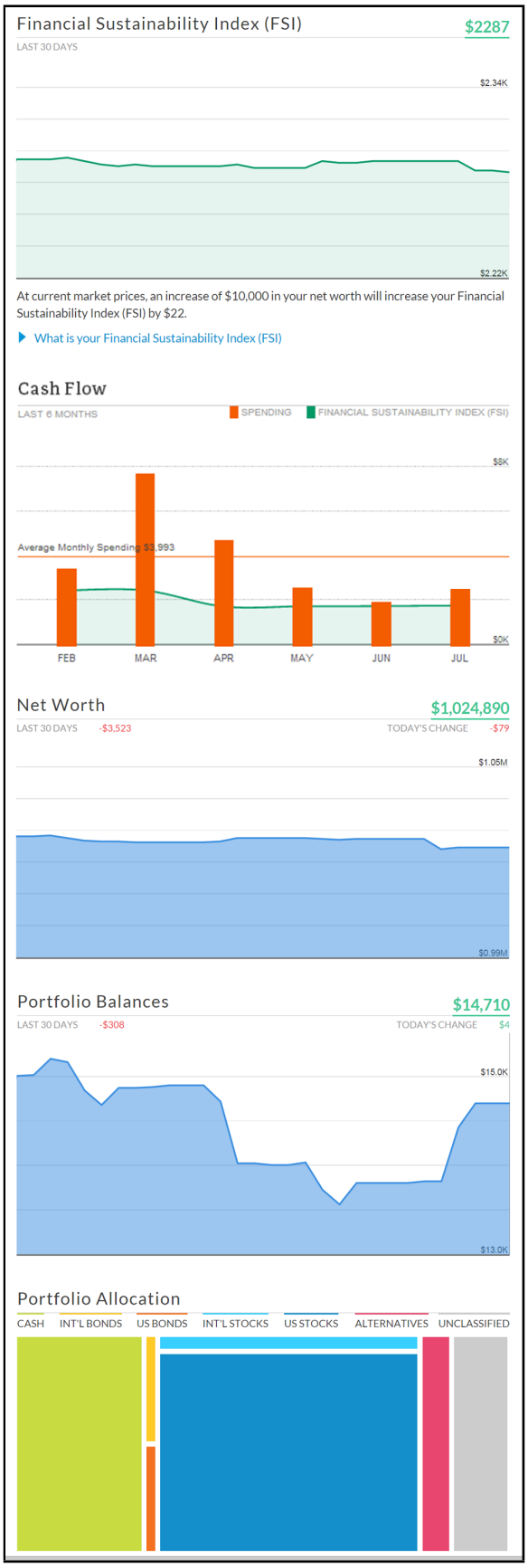


FIGURE C3

Top of the Dashboard Page for the FSI-Plot Treatment

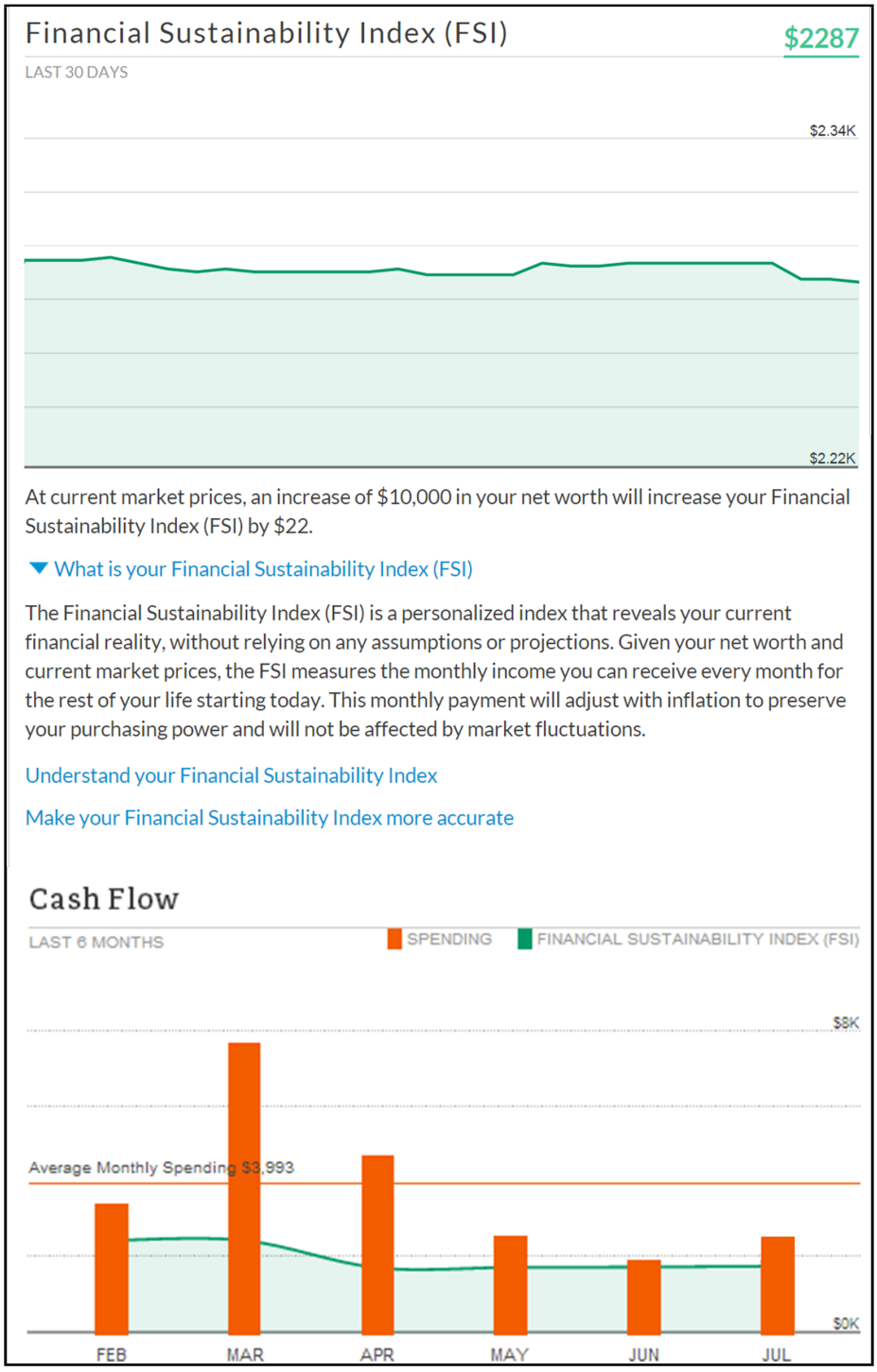


FIGURE C4

Top of the Dashboard Page for the FSI-NoPlot Treatment

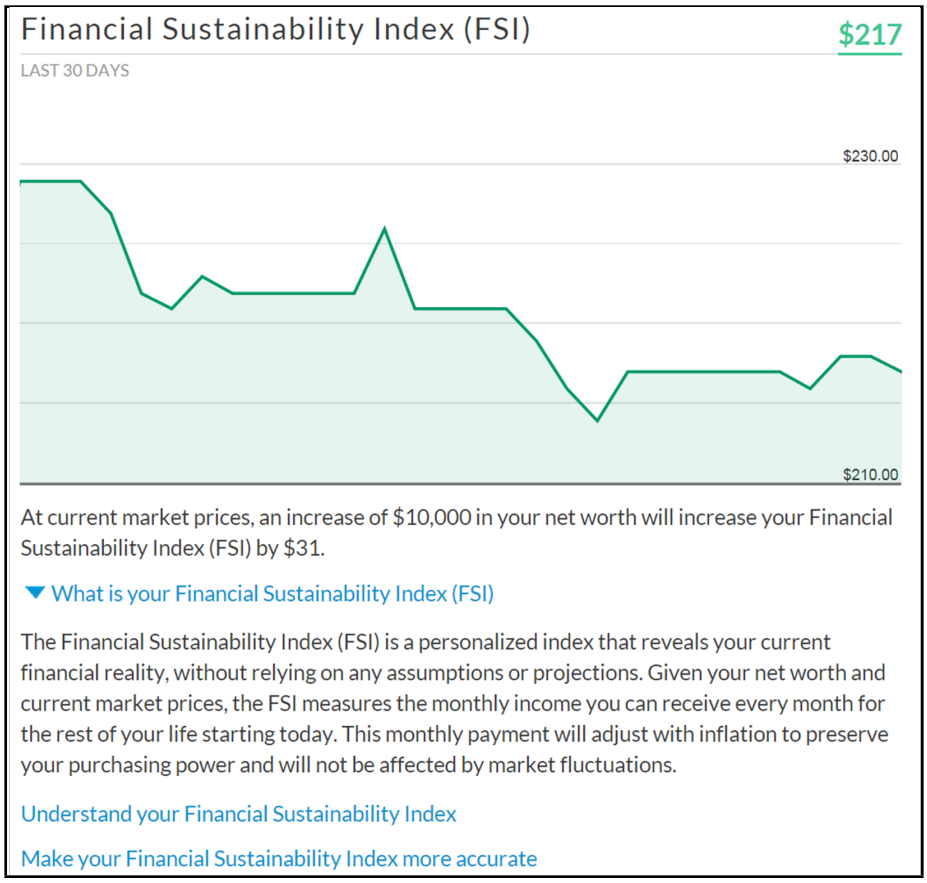


FIGURE C5

Top of the Dashboard Page for the LAI-Plot Treatment

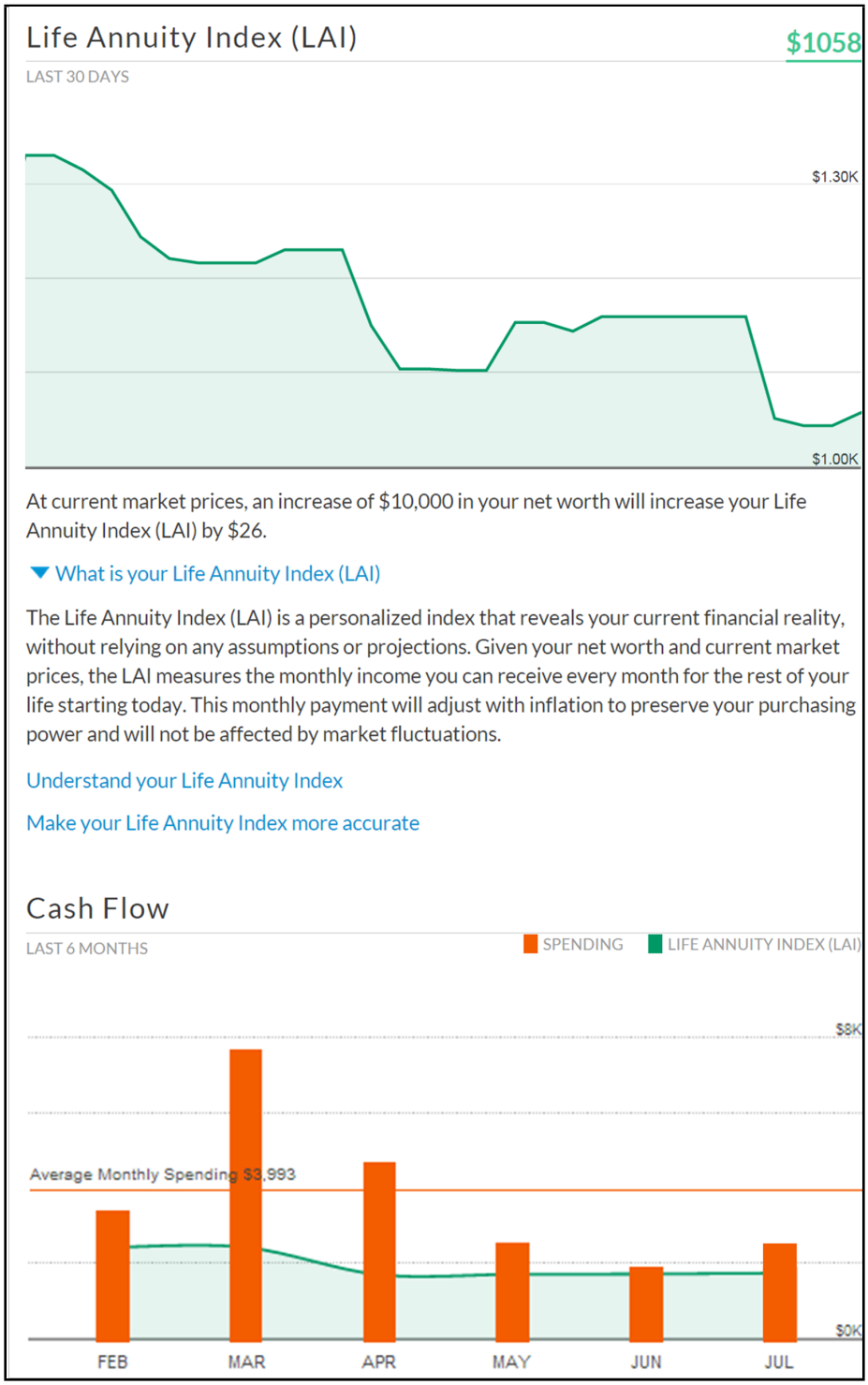


FIGURE C6

Top of the Dashboard Page for the FSI-NoPlot-retire Treatment

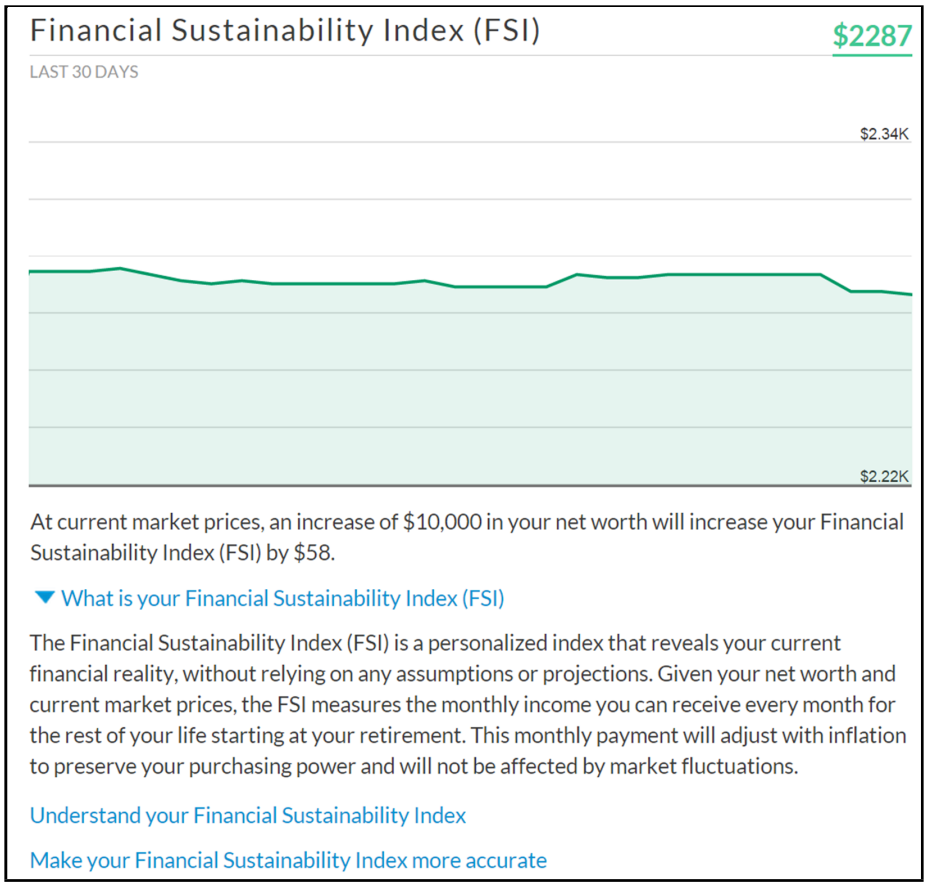


FIGURE C7

Top of the Dashboard Page for the LAI-NoPlot-retire Treatment

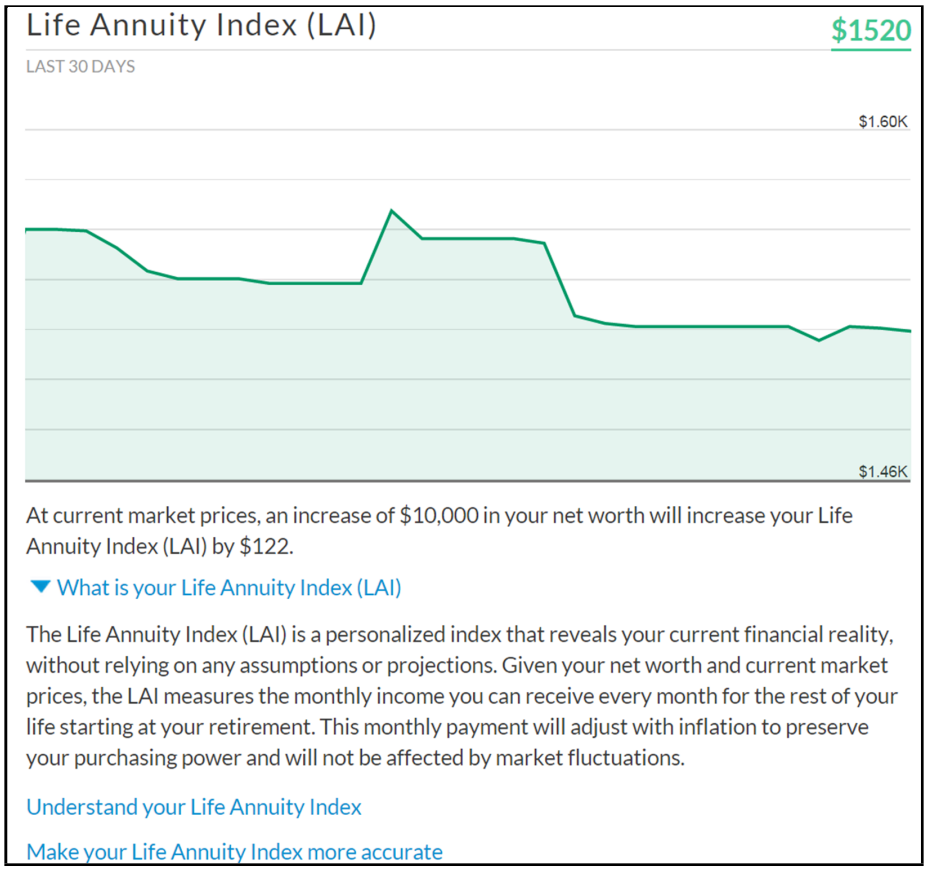


FIGURE C8

FAQ page for the FSI-Plot Treatment (part 1)

What is your Financial Sustainability Index?

The Financial Sustainability Index (FSI) is a personalized index that reveals your current financial reality, without relying on any assumptions or projections. Given your net wealth and current market prices, the FSI measures the monthly income you can receive every month for the rest of your life starting today. This monthly payment will adjust with inflation to preserve your purchasing power and will not be affected by market fluctuations.

What can I learn from the Financial Sustainability Index?

Having all of your financial information in a single location is a great first step. The next step is to understand what this information actually means. Do you have enough money? Should you be saving more? Can you afford to increase your spending? The goal of the FSI is to give you reliable answers to these hard questions.

What are the problems with current solutions?

Unfortunately, people often struggle to come up with the correct answers to personal finance questions. Instead of using reliable numbers, they tend to rely on short-cuts, such as whether or not the amount of money in an investment account *seems* like a lot, or if it's more than our peers have saved. However, these shortcuts often lead to the wrong conclusions when it comes to financial planning.

Another approach involves using financial calculators to come up with a multi-decade financial plan. While these plans can be useful, they are highly dependent on many assumptions about the distant future, such as years of remaining work, market returns, inflation rates and other variables. Alas, history demonstrates that these assumptions are often very inaccurate, which means that our detailed financial plans can be misleading. Life is full of unexpected events, especially over long time horizons.

How is the Financial Sustainability Index different?

The Financial Sustainability Index takes a new approach to financial planning. Instead of making assumptions about the distant future, it simply tells you what you can purchase in the financial markets at current market prices.

The monthly income stream eliminates all the major risk factors that are relevant to your financial future:

- *Market risk* - The FSI income stream will not be affected by any market fluctuation.
- *Inflation risk* – Over the last 20 years, cash lost 37% of its value. The FSI presents possible real monthly income that preserves your purchasing power.
- *Longevity risk* – The FSI represent the income you can receive for the rest of your life.

The FSI is simple, fast and intuitive. The Index is based upon extensive field studies in the areas of household finance, behavioral economics and psychology to help you make the best financial decisions. It does not require you to read through lengthy financial reports. It adjusts instantly to your financial information and market conditions. All information is described in terms of monthly income (rather than a lump sum) so that you can think more clearly about your financial future.

FIGURE C9

FAQ page for the FSI-Plot Treatment (part 2)

What should I do with this information?

The FSI does *not* tell you how much you should be spending, or how to divide your savings between bonds and stock. Rather, it is simply a useful piece of information that helps you understand where you stand.

Using this index you can measure how far are you from a sustainable level of spending. For example, if your average monthly spending is far above your FSI level, then your current spending levels are not sustainable. Perhaps you should cut back, or even postpone your retirement. On the other hand, if your FSI is above your spending levels, then you might consider increasing your spending and enjoying higher living standards.

From your dashboard, you can see how additional savings or spending affect your FSI. You might want to consult the dashboard or speak to one of our dedicated financial advisors about the potential impact of additional spending or saving.

This data are for informational purposes only and does not constitute a recommendation to buy or sell securities. You should not rely on this information as the primary basis of your investment, financial, or tax planning decisions. Third party data is obtained from sources believed to be reliable. However, we cannot guarantee that data's currency, accuracy, timeliness, completeness or fitness for any particular purpose.

How is the index calculated?

The index is calculated daily using your net worth, personal information and current market prices of many asset classes including government bonds, fixed income securities, inflation swaps and annuities. The index is sensitive to changes in your net worth, as well as to shifts in market conditions such as inflation and interest rates.