



Understanding Society

THE UK HOUSEHOLD LONGITUDINAL STUDY

Participation in a Mobile App survey to collect expenditure data as part of a large-scale probability household panel: response rates and response biases

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Funding

- “Understanding household finance through better measurement”



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Study Aims



- **Collect detailed information about monthly spending**
 - In a probability household panel survey
- **Scan till receipts**
 - Reduce measurement error?
 - Lower burden?
- **Examine Total Survey Error**
 - Here: non-response rates and bias

Spending Study – Design



- Project partner: Kantar Worldpanel
- App
 - Scan receipts
 - Report purchases without receipts
 - Report day without purchase
- *Understanding Society* Innovation Panel sample
 - N=2,058 (wave 9 respondents)
- 5 weeks
 - Oct-Dec 2016

Spending Study – Design (2)



- Questionnaires: shopping, app use, burden
 - ✓ Registration survey (online)
 - ✓ End of week survey (5x online)
 - ✓ End of project survey (online, postal follow-up)
- Incentives
 - ✓ £2 vs. £6 conditional on downloading app
 - ✓ £0.50 per day used app
 - ✓ £10 conditional on using app for 5 weeks
 - ✓ £3 conditional on completing end of project survey
 - ✓ Max total: £30.50 / £34.50

Research Questions



1. What proportion of the sample participated in the Spending Study?
2. What is the effect of incentives on participation?
3. What are the patterns of participation over time?
4. How prevalent are potential barriers to participation?
5. Which barriers predict (non-)participation?
6. What is the nature of non-participation bias?

Results



(1) Participation in Spending Study?

Participation	N	%
Downloaded app	342	16.6
Used app at least once	267	13.0
Used app at least once in each of five weeks	214	10.4

N=2,057 IP9 respondents

Device used	N	%
Smartphone	220	82.4
Tablet	42	15.7
Smartphone and tablet	5	1.9

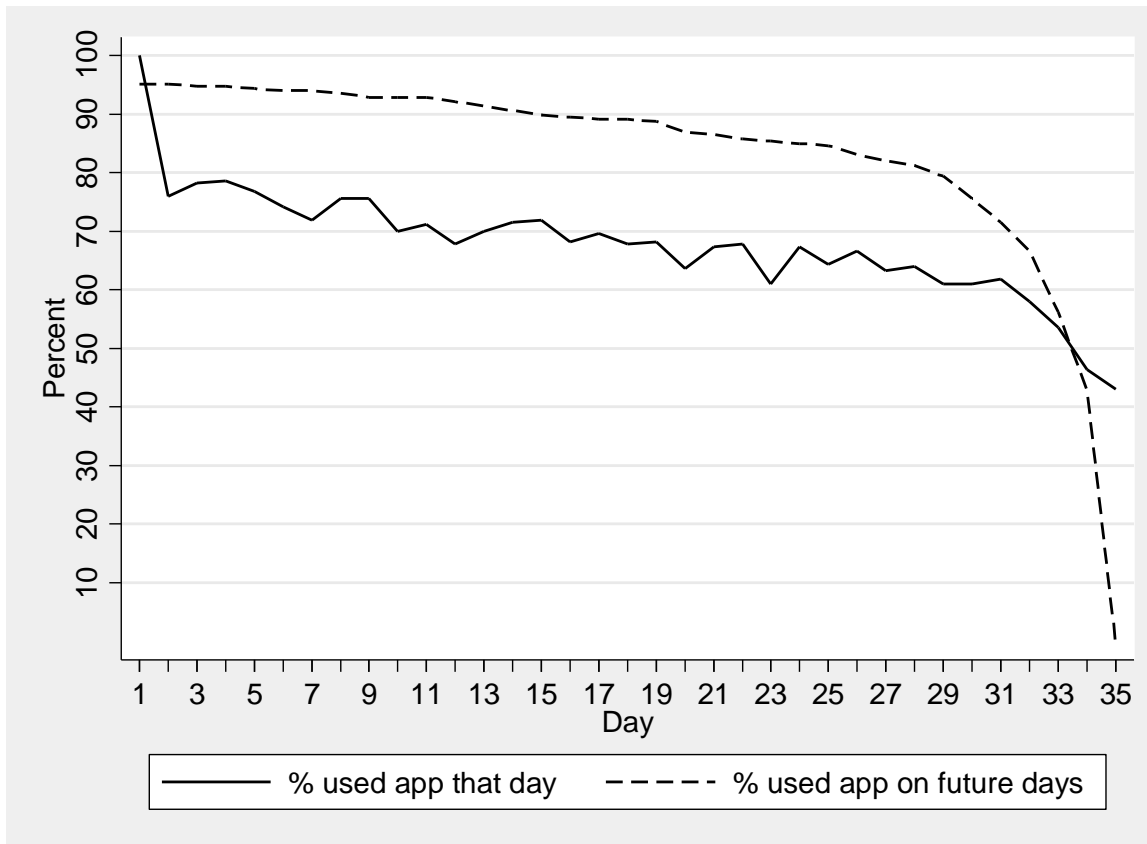
N=267

(2) Effect of incentive?

- £2 vs £6 conditional on downloading the app
- Random allocation to households
- No effect on:
 - Downloading app
 - Using app at least once
 - Using app at least once in each of 5 sequential weeks

(3) Participation over time?

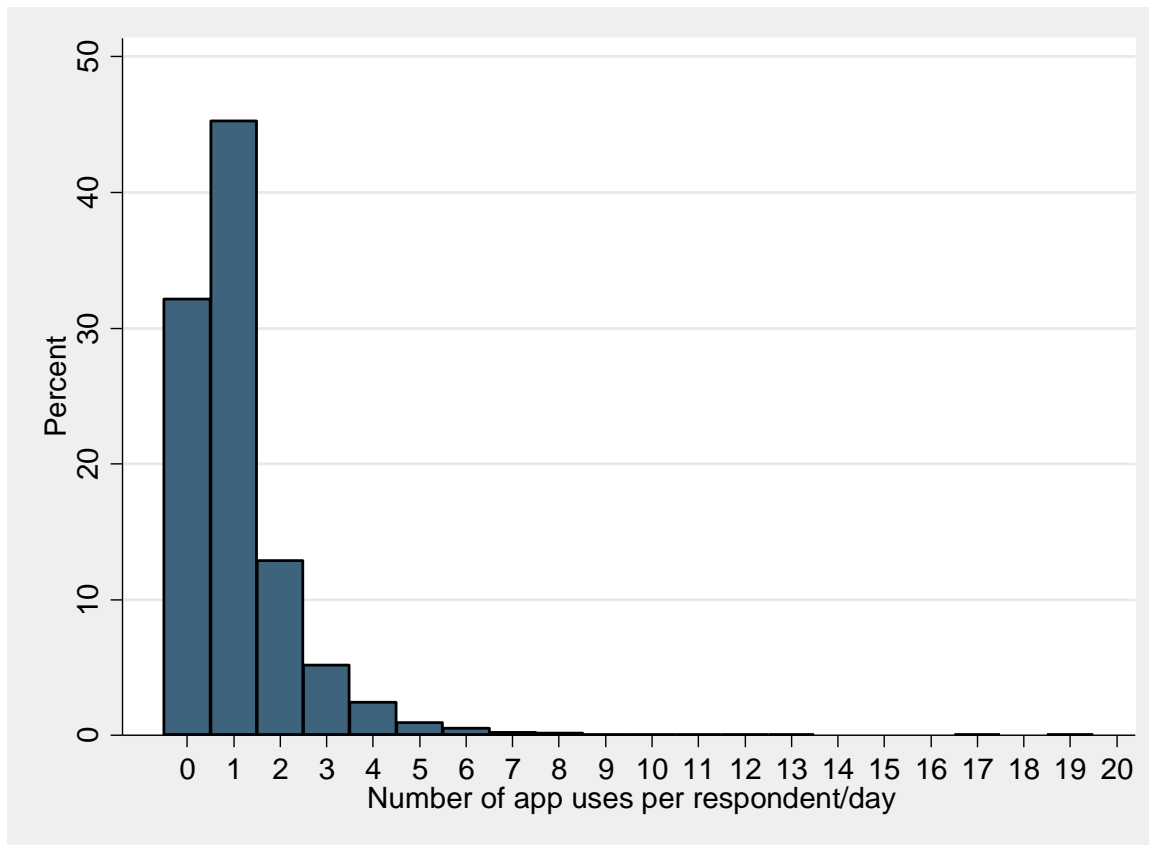
App users and drop-out per day:



- N=267
- Solid line: % of the 267 participants who used the app
- Dashed line: % of the 267 participants who used the app again on a future day

(3) Participation over time?

Frequency of app use per respondent/day:



- N=267 participants x 35 days
- Max = 19

(4) Barriers to participation?



- Characteristics of sample members from IP9 interview
- 61% of the sample:
 - No internet OR
 - No smartphone OR
 - Not willing to download app for a survey
- 14% of sample:
 - Have internet, smartphone and very willing to download app
- Each potential barrier:
 - Strong monotonic association with participation

(5) Barriers & participation? (4)

AME (Probability of participation)		Download	App used	5 weeks
Internet use	Every day	0.152***	0.113***	0.095***
	Several times a week	0.088***	0.060*	0.062**
	Several times a month	0.034	0.027	0.013
Has smartphone	Yes	0.068*	0.053*	0.055**
Has tablet	Yes	-0.019	0.027	0.000
Willingness download app (sp)	Very willing	0.091*	0.092**	0.059*
	Somewhat willing	0.047	0.045	0.031
	A little willing	0.029	0.017	0.014
Willingness download app (tb)	Very willing	0.094	0.067	0.093*
	Somewhat willing	0.019	0.015	0.037
	A little willing	0.000	-0.012	0.017
Willingness use camera (sp)	Very willing	-0.025	-0.009	0.004
	Somewhat willing	-0.028	-0.007	-0.001
	A little willing	-0.051	-0.055*	-0.043
Willingness use camera (tb)	Very willing	0.006	-0.026	-0.041
	Somewhat willing	0.033	-0.007	-0.012
	A little willing	0.074*	0.055	0.049

N=2,057, S.E.s adjusted for clustering and stratification

Omitted categories: No / not willing / not asked

(6) Non-participation bias? (1)

	IP9 respondents (Yf %)	Difference (Yp – Yf)	P-value
Female	55.2	5.5	0.021
Age 16-30	16.0	5.7	
31-40	13.1	9.4	
41-50	17.6	4.9	
51-60	20.8	-2.1	
61-70	17.6	-8.2	
70+	15.0	-9.7	0.000
Individual monthly income: p10	8.6	-0.4	
p20	8.6	-0.3	
p30	8.6	-2.2	
p40	8.5	-0.4	
p50	8.6	-1.4	
p60	8.6	1.2	
p70	8.6	1.9	
p80	8.6	1.1	
p90	8.5	1.2	
p100	8.6	1.2	
missing	14.3	-1.9	0.758

Yf:
full sample

Yp:
participant
sample

P-value:
Chi2 tests of
difference
between
participants
and non-
participants,
adjusted for
clustering and
stratification

(6) Non-participation bias? (2)

	IP9 respondents (Yf %)	Difference (Yp – Yf)	P-value
How keep budget (check all): on paper	25.9	1.9	0.480
on a computer document or spreadsheet	14.8	6.6	0.006
personal budget software on computer/laptop	1.0	2.0	0.002
online budget programme	0.2	0.1	0.651
personal budget app	1.3	1.0	0.184
do not keep a budget	59.2	-9.9	0.008
How often check balance: most days	17.6	4.1	
at least once a week	35.2	7.1	
a couple of times a month	17.8	-0.6	
at least once a month	18.2	-7.3	
less than once a month	5.3	-0.5	
never	5.8	-2.8	0.001

(6) Non-participation bias? (3)

	IP9 respondents (Yf %)	Difference (Yp – Yf)	P-value
How check balance (check all): cashpoint/ATM	31.9	-9.1	0.001
online	50.0	10.2	0.000
by telephone	3.7	-1.4	0.117
app on a mobile device	20.9	19.6	0.000
text messages/alerts from bank	3.8	2.8	0.009
paper statement	21.6	-11.5	0.000
other	1.6	-0.8	0.271
Tax return last year: no	83.0	1.6	
yes, online	12.2	1.4	
yes, paper form	4.8	-3.0	0.084
Accountant: yes	88.5	2.5	0.257
Help from family/friend: yes	88.4	3.0	0.109
Store loyalty cards: none	16.6	-6.8	0.005

Summary (1)

1. What proportion of the sample participated?
 - ✓ 13.0% of IP9 respondents used app
 - ✓ Most used smartphone (82.4%)
2. What is the effect of incentives on participation?
 - ✓ No effect
3. What are the patterns of participation over time?
 - ✓ Little drop-out: 81.3% of participants continued past 28 days
 - ✓ But most participants used app just once per day (45.3% of person days = 1 app use)

Summary (2)



4. How prevalent are potential barriers to participation?

- ✓ 61% of sample does not use internet, or has no smartphone, or not willing to download an app for survey
- ✓ 13.6% uses internet, has smartphone, very willing to download app

5. Which barriers predict non-participation?

- ✓ No internet, no smartphone
- ✓ Not willing to download app for a survey
- ✓ But: some people in potentially excluded groups do participate

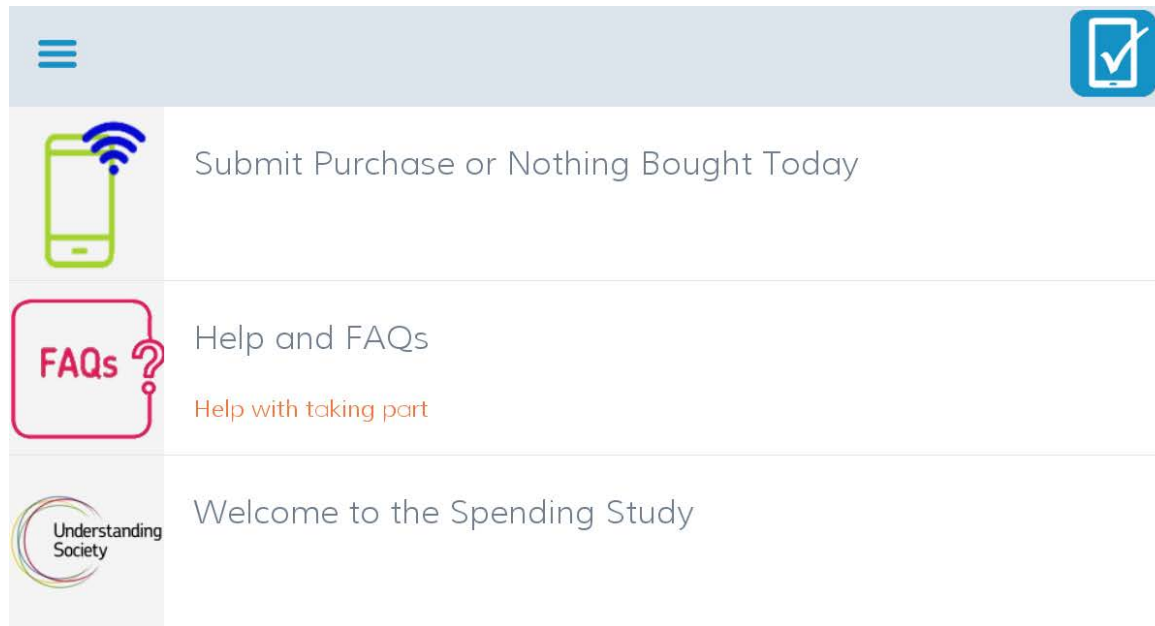
6. What is the nature of non-participation bias?

- ✓ + Women, ages 16-50
- ✓ + manage finances actively (online, apps, loyalty cards)
- ✓ n.s. personal income

Companion papers (lead authors)

- **Carli Lessof:**
Quality of scanned receipts data
- **Brendan Read:**
Respondent burden
- **Alexander Wenz:**
Willingness to use different smartphone features for a survey

Spending Study – App



Till Receipts Information

Several variables can be collected from Till receipts

Generally similar across all stores

- > Coupons
- > Savings
- > Click+Collect, Iceland Internet, other store differentiators
- > Full USI detail – store types, store size etc
- > Time of day, payment method,

Plus quality benefits:

- > Accurate loose/non-barcoded weights

Example of detail collected, but also identifier for C+C, coupons value etc

Sainsbury's
Try something new today

BEXLEYHEATH : 020 8298 0376

Sainsbury's Supermarkets Ltd
33 Holborn London EC1N 2HT
www.sainsburys.co.uk
Vat Number : 660 4548 36

* EVIAN WTR SQ	£0.80
DAILY EXPRESS	£0.40
GRAN SMITH APPLE	£1.85
RASPBERRIES 225G	£1.99
*GALAXY MILK	£0.49
CHEESE/ONION SLC	£1.00
LMDA MC SAUSGES 300G	
4 @ £0.94	£3.76
CANT BELLEVE NOT BTK	£2.00
PILCHARDS/BRINE	£0.36
PILCHARDS/BRINE	£0.36
LAUGHING COW LT	£1.78
LMDA MC SAUSGES 300G	£0.94
LMDA MC SAUSGES 300G	£0.94
BRINRA PALTRADE LSE	
1.095 kg @ £0.84/ kg	£0.92
BASICS YOGURT	£0.29
BASICS YOGURT	£0.29
BASICS YOGURT	£0.29
BASICS YOGURT	£0.29
CHERRY PUNNET 250G	£1.99

22 BALANCE DUE £20.74
Fruit2for3.00 -£0.98

TOTAL TO PAY £19.76
CASH £20.00

CHANGE £0.24

YOUR SAVINGS TODAY
TOTAL DISCOUNTS £0.98

NECTAR CARD STATEMENT
(S) 9828 3000 **** ****037
NECTAR QUALIFYING BAL £19.76

OPENING BALANCE 409
POINTS EARNED 38
CLOSING BALANCE 447

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Labels on the right:

- Retailer Chain
- Store Telephone No. (only if Store ID not present)
- Product line description & Prices
- Note: Price per unit NOT total price
- CAPTURE Kg bought AND price per Kg
- M/Buy savings by line, coupons value etc
- Total Spend
- Payment method
- Clubcard / Loyalty Scheme Used?
- Time of Shopping Trip
- Date of Shopping Trip
- Store ID

Next Steps



- **Data analysis:**

- Reasons for non-participation (end of project Qaires)

- Extend analysis of barriers: ability to use device, what device used for

- Extend analysis of NR bias?

Data

- Sample file: issued to Spending Study (N=2,432)
 - Incentive treatment
 - Response history in prior waves
- Innovation Panel w9: correlates of participation (N=2,058)
 - Socio-demographic characteristics
 - Mobile device ownership and use
 - Financial behaviours
- Registration survey – whether downloaded app
- App use paradata: participation outcomes (11,380 uses)
 - (including incomplete, paused)
 - Date and time of app use
 - Device used
- End of project Qaire: reasons for non-participation (N=@ @)

(4) Barriers to participation? (1)

		N	%
Frequency of internet use	Every day	1,481	72.0
	Several times a week	241	11.7
	Several times a month or less	120	5.8
	Never / no access	215	10.5
Has smartphone	Yes	1,315	63.9
	No / not asked	742	36.1
Has tablet	Yes	1,210	58.8
	No / not asked	847	41.2

(4) Barriers to participation? (2)

		N	%
Willingness to download app (smartphone)	Very willing	280	13.6
	Somewhat willing	288	14.0
	A little willing	234	11.4
	Not at all willing / not asked	1,255	61.0
Willingness to download app (tablet)	Very willing	321	15.6
	Somewhat willing	292	14.2
	A little willing	216	10.5
	Not at all willing / not asked	1,228	59.7
Willingness to use camera (smartphone)	Very willing	418	20.3
	Somewhat willing	406	19.7
	A little willing	223	10.8
	Not at all willing / not asked	1,010	49.1
Willingness to use camera (tablet)	Very willing	304	14.8
	Somewhat willing	315	15.3
	A little willing	237	11.5
	Not at all willing / not asked	1,201	58.4