Survey Reporting Experience, Survey Response, and Proxy Reporting in the FoodAPS-2 Field Test

Deji Suolang[1] , Brady T. West[1], Yajuan Si[1],

Elina T. Page[2], Lauren Miller[2], and Joseph Rodhouse[2]

(1) University of Michigan, Institute for Social Research, Survey Research Center

(2) U.S. Department of Agriculture, Economic Research Service

February 8, 2024

Disclaimer

The findings and conclusions in this presentation are those of the authors and should not be construed to represent any official U.S. Department of Agriculture or U.S. Government determination or policy. Mention of trade names or commercial products in this presentation is solely for research purposes only and does not imply recommendation or endorsement by the U.S. Department of Agriculture.

Introduction

Objectives:

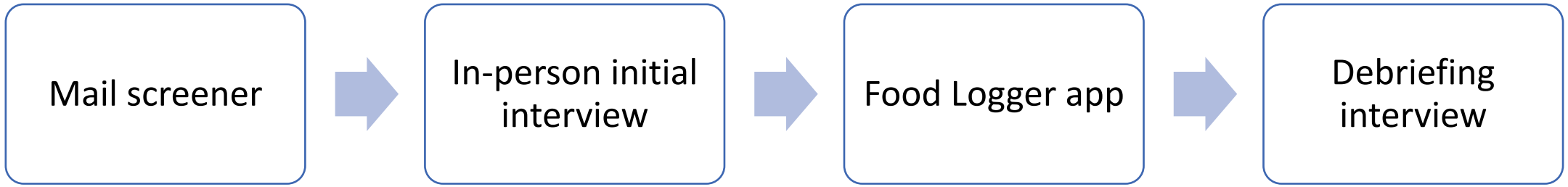
- Evaluate the new survey design features and finalize the main data collection protocols for the full FoodAPS-2[1] survey.
- Understand the response burden and data quality properties in the current target population and food acquisition landscape (Page et al., 2022).

This presentation focuses on:

- Survey reporting experience
- Response rates
- Food event occurrences and expenditures
- Proxy reporting
- Predictive factors influencing survey response propensity

[1.] The Second National Household Food Acquisition and Purchase Survey

Data



- The household's main food shopper/meal planner (primary respondent, PR) completed initial and post-survey debriefing interviews with a field interviewer.
- All household members were asked to report all food acquisitions over seven days through the food logger app, including food-at-home (FAH) and food-away-from-home (FAFH).
  - Also completed the questionnaires on shopping habits, demographic characteristics, and income.
- In total, there were 444 households and 1,233 individuals in the data.
- We accounted for sample design features, including household clusters and survey weights, to produce weighted estimates.

Survey Reporting Experience

The debriefing interview asked the PR in the household to provide feedback on their survey reporting experience, measured by three questions:

1. Is the burden estimate about right, or is it too high (spent less time than the estimate) or too low (spent more time than the estimate)?
2. How easy or difficult was it to keep track of and record the food you got?
3. How easy or difficult was it to use the app?

Survey Reporting Experience (Cont'd)

- Most PRs reported the survey burden estimate was about right (65%) or too high (26%), with only 9% stating it was too low.
- Most PRs found the survey was straightforward to complete. However, a noticeable group (25%) reported high difficulty tracking food and using the app.

Breaking down the survey reporting experience by PRs' demographic characteristics:

- Those identifying themselves as Hispanic or other[1] racial minorities showed a higher proportion of reporting the burden estimate was too low (they spent more time than the estimate).
- Those aged >=65 were more likely to have difficulty using the app.
- Those with less than a high school education were more likely to experience higher difficulty tracking food and using the app.

1. This category combined Asian, Pacific Islander, Alaska Native, American Indian, and other minorities that are not specifically listed.

Survey Reporting Experience (Cont’d)

Note that survey reporting experience questions were answered only by the household’s PR as a collective experience of all individuals within the same household.

In the remainder of the presentation, **we extended the household-level experience to each individual within the same household, considering it their individual-level experience.**

Overall Response Rate

Every day, a response status is documented for each individual:

1) Confirmed purchase, 2) Confirmed no purchase, and 3)Unknown/Unconfirmed.

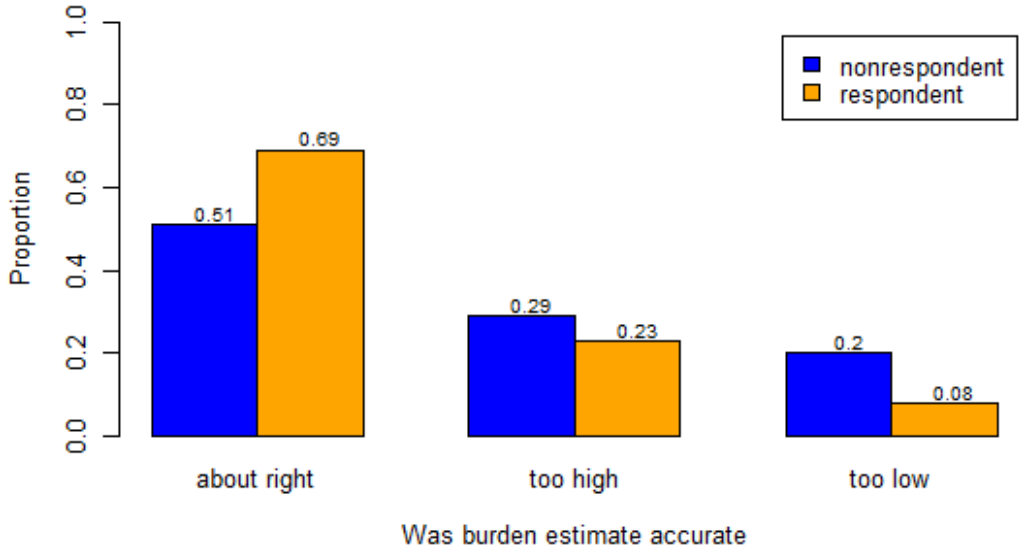
Response Nonresponse

The overall response rate was defined as the proportion of individuals who have responded to the survey at least once during the 7-day data collection.

Among 1,233 individuals, there were 844 respondents and 389 nonrespondents. The weighted response rate was 0.67.

Overall Response Rate (Cont'd)

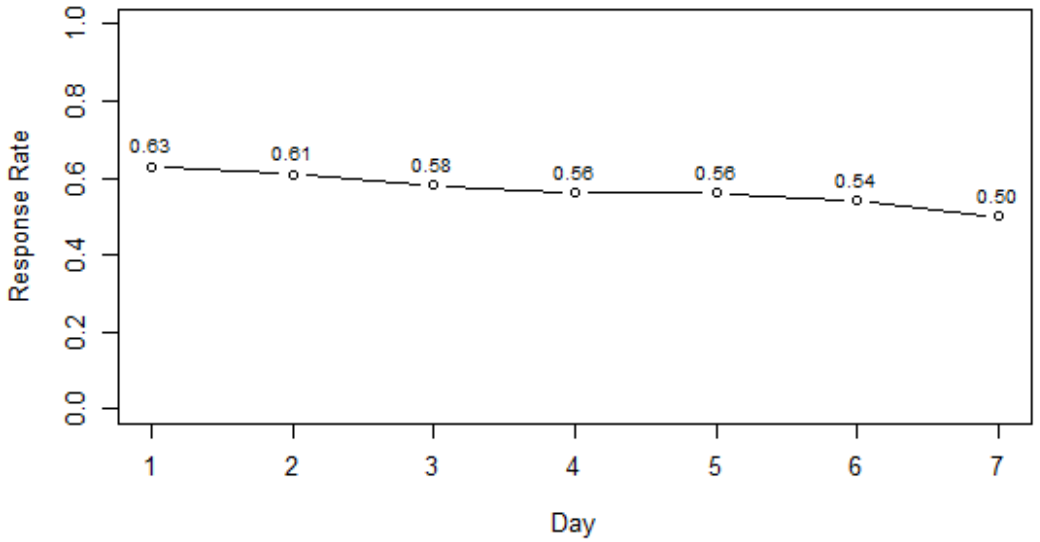
- A higher proportion (weighted) of respondents than nonrespondents reported the burden as "about right" (not statistically significant).
- Respondents reported a lower difficulty than nonrespondents in tracking food and using the app. Rao & Scott Chi-square test showed the differences were significant.



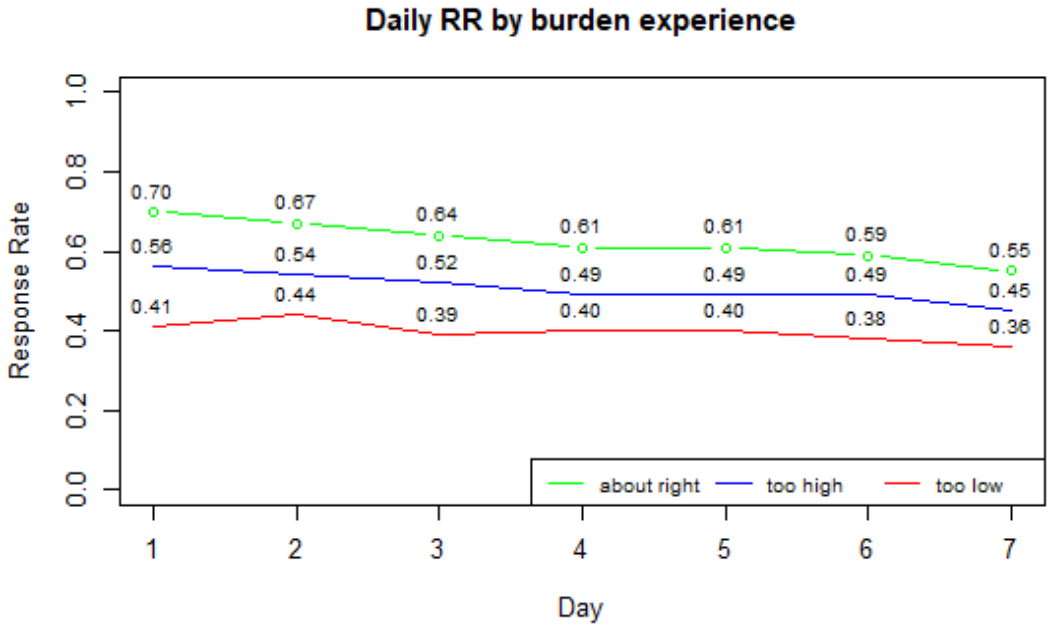
	Proportions of Difficulty level (weighted)				
	1 Very easy	2 Easy	3 Neutral	4 Difficult	5 Very difficult
Tracking food					
Nonrespondents	0.10	0.42	0.18	0.16	0.15
Respondents	0.28	0.51	0.11	0.08	0.03
Using app					
Nonrespondents	0.12	0.46	0.17	0.11	0.13
Respondents	0.33	0.46	0.11	0.08	0.02

Daily Response Rate

- Daily response rate was defined as the proportion of individuals who responded to the survey on a particular day.
- They ranged between 0.50 and 0.63. We observed a decreasing pattern, indicating drop-offs.



- If we stratify the daily response rates by the burden experience reported by their PRs:

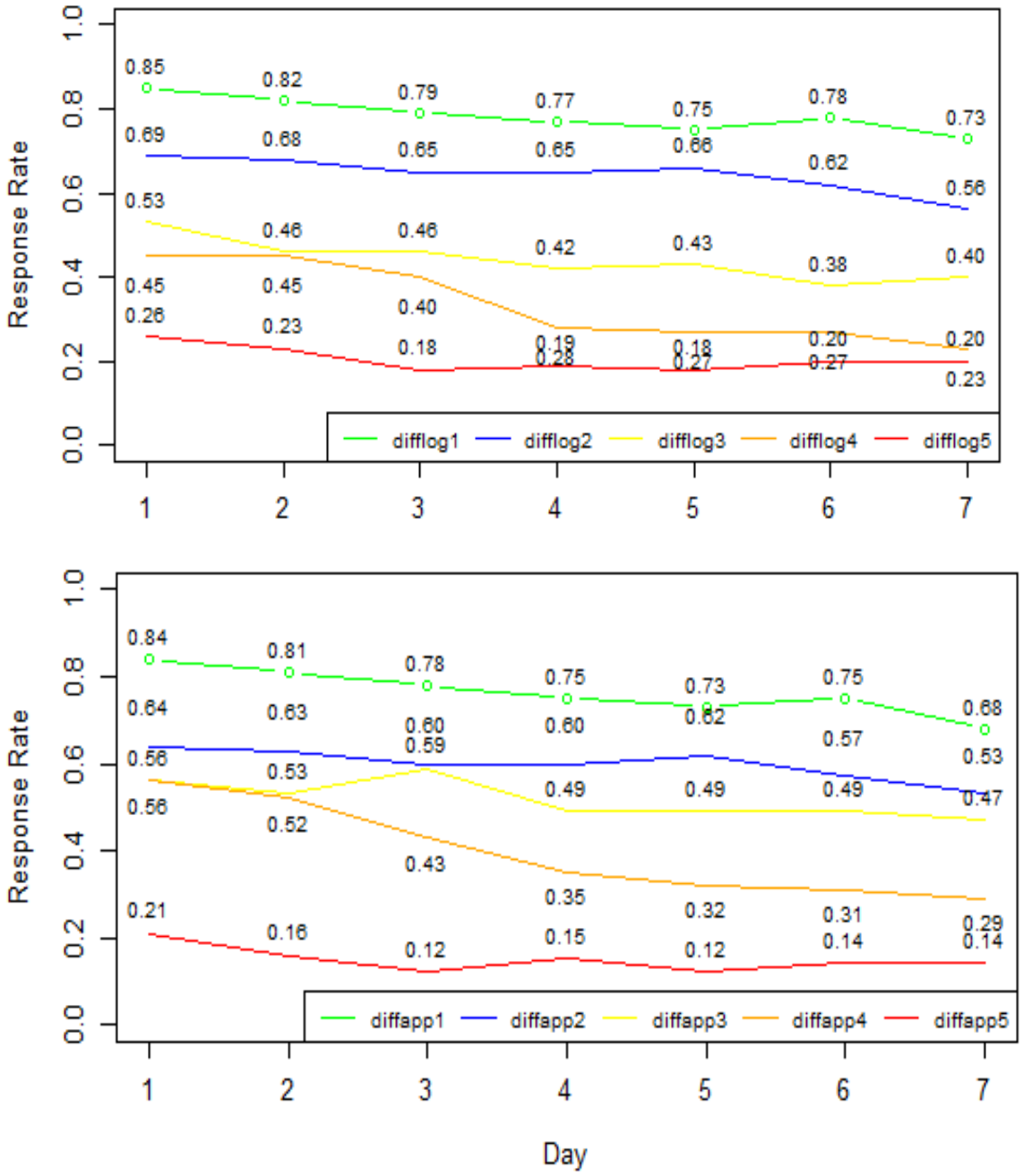


Daily Response Rate (Cont'd)

Daily response rates (weighted) by the survey difficulty level reported by their PRs:

- Tracking food
  "difflog", 1-5 very easy to very difficult

- Using the app
  "diffapp", 1-5 very easy to very difficult



Event Occurrence

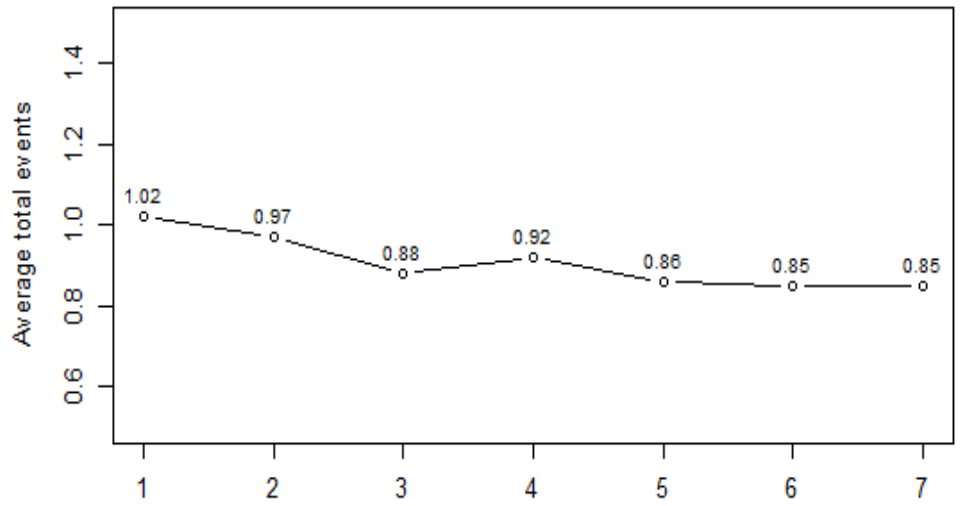
- Respondents reported an average of 5.40 events in total. Compared with FoodAPS-1 (weighted), the Field Test respondents reported slightly more events on average. (weighted)

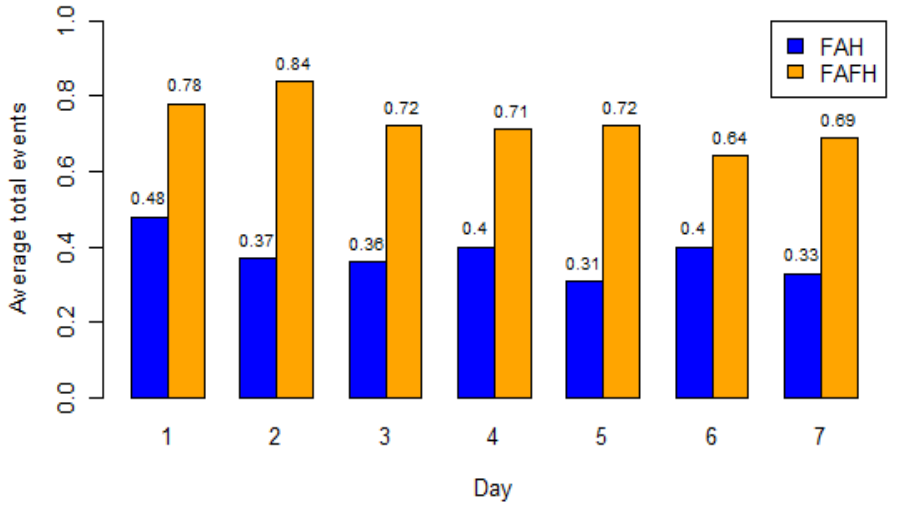
	FoodAPS2-Field Test	FoodAPS-1
	Mean (SE)	**Mean (SE)**
Total	5.40 (0.46)	4.53 (0.07)
FAH	1.48 (0.12)	1.32 (0.02)
FAFH	3.92 (0.41)	3.21 (0.06)

- No significant association was found with the survey reporting experience.

Daily Event Occurrence

- Respondents reported an average of 1.02 events on the first day, which then dropped over time.
- If we look at the FAH and FAFH events separately, fewer events were reported on the later days compared to the first day.

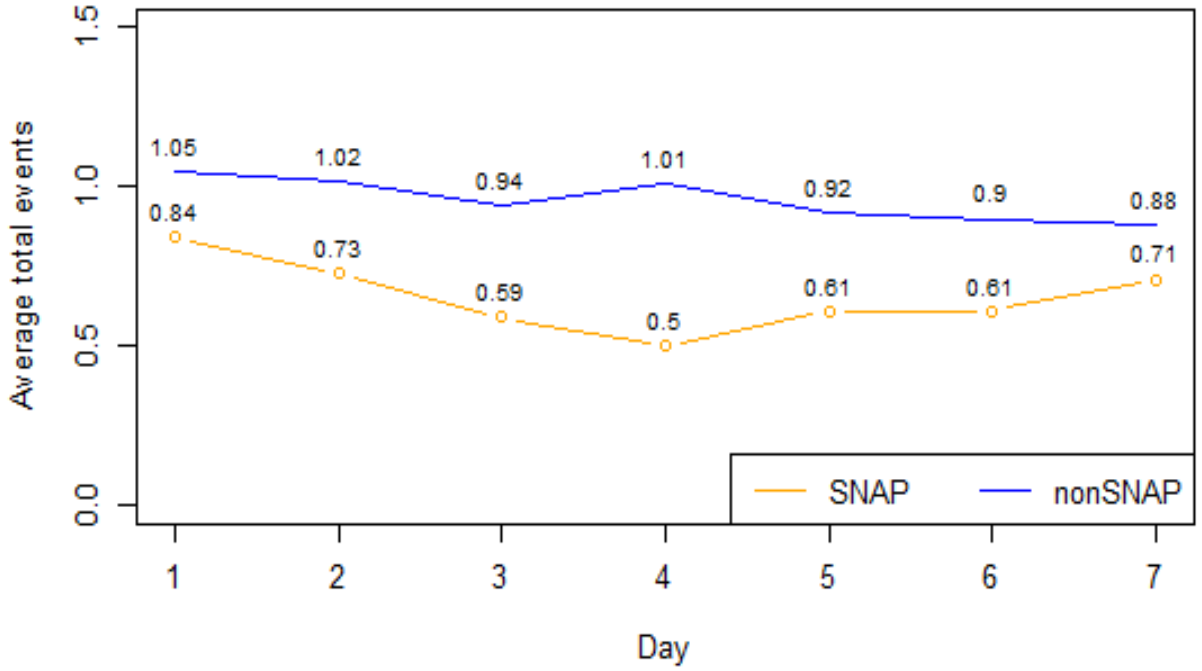




Daily Event Occurrence (Cont'd)

If we break it down by SNAP and non-SNAP respondents, their average daily events (weighted) showed different patterns.

- Average daily events reported by non-SNAP respondents decreased over time and hit their lowest point on day 7.
- SNAP respondents had the lowest number of events in the middle of the week.



Event Expenditure

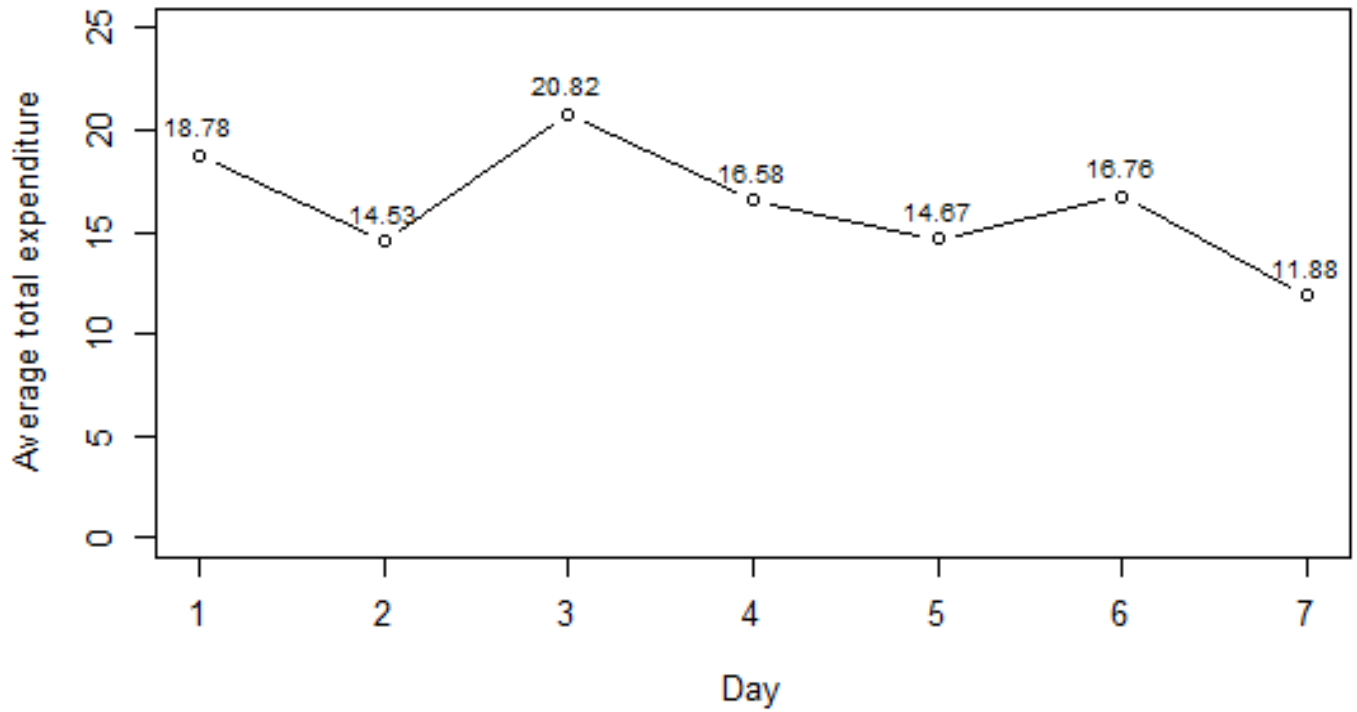
- Respondents reported an average of $97.15 in food expenditures over the seven days.
- The comparison with the FoodAPS-1 (without inflation adjustments, weighted) showed higher expenditures reported in the Field Test. The differences might result from the food price increase between the times the two studies collected their data.

	FoodAPS2-Field Test	FoodAPS-1
	Mean (SE)	**Mean (SE)**
Total	$97.15 (7.60)	$67.51 (1.27)
FAH	$59.74 (6.04)	$43.50 (0.93)
FAFH	$37.42 (3.56)	$24.01 (0.70)

- No significant association was found with the survey reporting experience.

Daily Expenditure

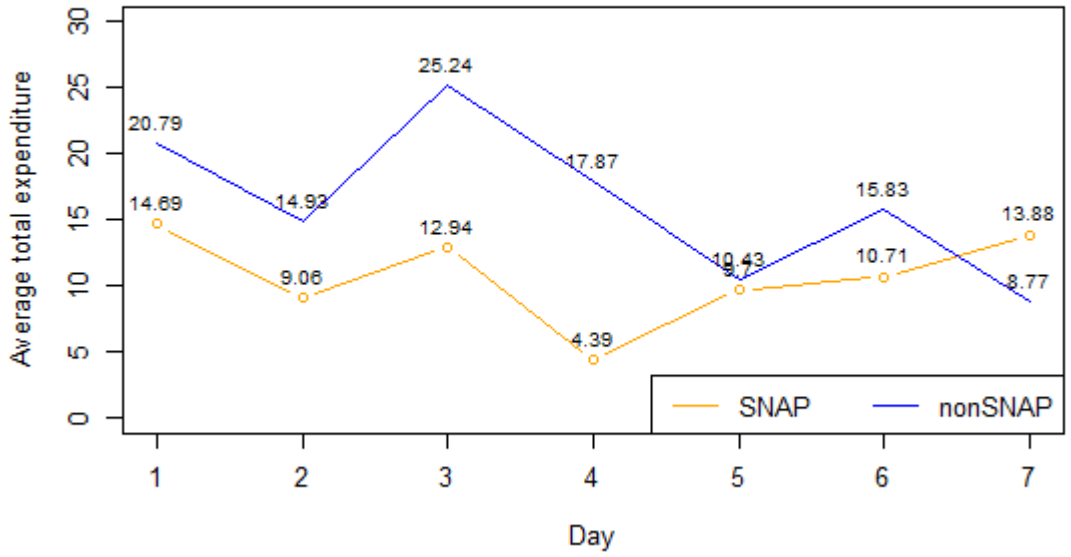
Average daily expenditures showed a decreasing trend in later days.



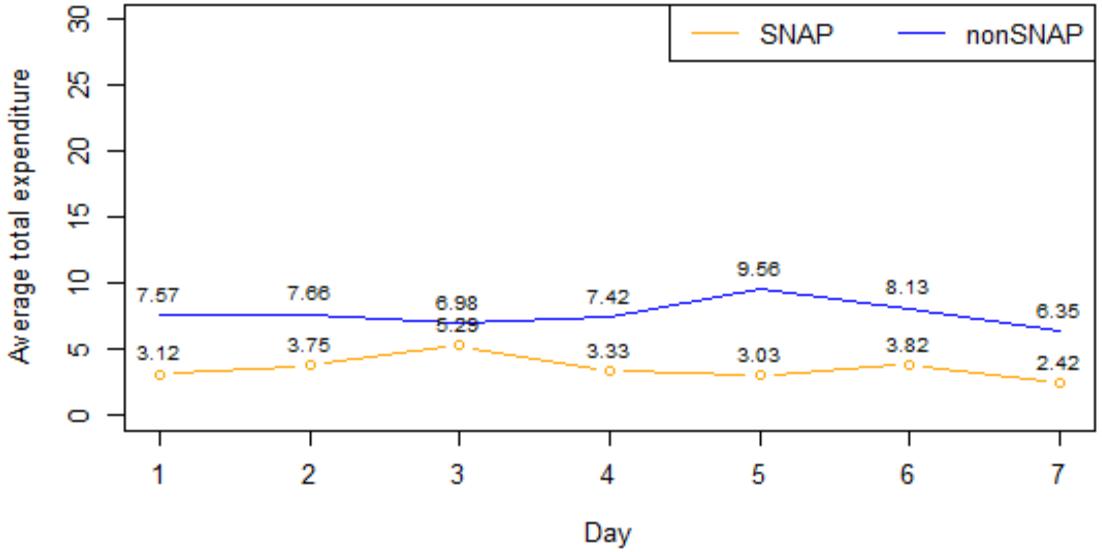
Daily Expenditure (Cont'd)

SNAP vs. non-SNAP respondents' daily average expenditures for FAH/FAFH events (weighted)

Interestingly, SNAP respondents' FAH daily expenditures increased in the last few days of the reporting period, which was different from the pattern we observed earlier.



FAH



FAFH

Proxy Reporting

The Field Test allowed the PR to report on behalf of household members who could not report for themselves to collect food acquisition data.

- PRs must report for children aged <11, and they might start proxy reporting from day 1
- PRs could proxy report for household members aged >=11 starting from day 4

How often was the proxy reporting option used in the Field Test (unweighted)?

- 122 out of 444 households had at least one household member use proxy reporting
- 9% of the events reported in the Field Test were through proxy reporters, 97% were for children under 11 years old, and the rest were for children/teens aged 11-18.
- There were more proxy events in the first two reporting days.

Response Propensity

- We used logistic regression models to predict the overall and daily survey response status (binary, 1-response, 0-nonresponse) of 1,233 individuals.
- The predictor variables were from demographic questionnaires, income questionnaires, and debriefing interviews on survey reporting experience.

  In addition, we incorporated the previous day's data when predicting the next day's response.

Model performance

Metric	Overall	Day1	Day2	Day3	Day4	Day5	Day6	Day7
AUC	0.90	0.86	0.89	0.90	0.91	0.89	0.88	0.86
Pseudo R-squared	0.57	0.54	0.62	0.62	0.68	0.66	0.64	0.62

Response Propensity (Cont'd)

General observations on variables showed significance in predicting the survey response, while all other variables were held at the baseline level.

- Individuals with higher education levels, younger age, and residing in larger households had a higher likelihood of responding.
- Those identifying as racial minorities[1], reporting difficulty using smartphones, facing difficulties tracking food or using the app as reported by the PR, and were less likely to respond to the survey.
- In the daily response propensity model, the prior day's event count and cumulative event count were predictive of the next day's response status. Individuals who have reported more events were more likely to respond the following day.

1. This category combined Asian, Pacific Islander, Alaska Native, American Indian, and other minorities that are not specifically listed.

Key Takeaways

- Most PRs indicated that the burden estimate was accurate, and the food logger survey was easy. Nevertheless, there was a noticeable subgroup of nonrespondents reporting high difficulty in tracking food and using the app.
  - Modifications such as improving app usability or adding alternative modes need to be considered in future collections to make the survey more accessible to a broader audience.
- Event Occurrence and expenditures decreased over the seven days, indicating drop-offs.
  - It is worth stratifying FAH/FAFH events and SNAP/non-SNAP individuals to compare patterns.
- A quarter of households used proxy reporting, mainly for children <11 years old.
- Age, race and ethnicity, education level, household size, and difficulty with the survey showed significant associations with survey response status.
- The previous day's data was predictive of the following day's response status.

Reference

Antoun, C., Conrad, F. G., Couper, M. P., & West, B. T. (2019). Simultaneous estimation of multiple sources of error in a smartphone-based survey. In *Journal of Survey Statistics and Methodology* (Vol. 7, Issue 1). https://doi.org/10.1093/jssam/smy002

Conrad, F. G., Schober, M. F., Antoun, C., Yan, H. Y., Hupp, A. L., Johnston, M., Ehlen, P., Vickers, L., & Zhang, C. (2017). Respondent mode choice in a smartphone survey. In *Public Opinion Quarterly* (Vol. 81). https://doi.org/10.1093/poq/nfw097

Couper, M. P., Antoun, C., & Mavletova, A. (2017). Mobile web surveys: A total survey error perspective. In *Total Survey Error in Practice*.

Crawford, S. D., Couper, M. P., & Lamias, M. J. (2001). Web surveys: Perceptions of burden. In *Social Science Computer Review* (Vol. 19, Issue 2). https://doi.org/10.1177/089443930101900202

Jäckle, A., Burton, J., Couper, M. P., & Lessof, C. (2019). Participation in a mobile app survey to collect expenditure data as part of a large-scale probability household panel: Coverage and participation rates and biases. *Survey Research Methods*, *13*(1). https://doi.org/10.18148/srm/2019.v13i1.7297

Mccarthy, J. S., Beckler, D. G., & Qualey, S. M. (2006). An Analysis of the Relationship Between Survey Burden and Nonresponse: If We Bother Them More, Are They Less Cooperative? *Journal of Official Statistics*, *22*(1).

Page, E.T., Kantor, L., Miller, L., Gonzalez, J.M. & Denbaly, M. (2022). An Overview of Survey Development Activities for the Second National Food Acquisition and Purchase Survey (FoodAPS-2). The International Food Acquisition and Research Methods Workshop

Yan, T., Fricker, S., & Tsai, S. (2019). Response burden: What Is it and what predicts it? In *Advances in Questionnaire Design, Development, Evaluation and Testing*. https://doi.org/10.1002/9781119263685.ch8

https://www.ers.usda.gov/data-products/foodaps-national-household-food-acquisition-and-purchase-survey/

Thank you!

Deji Suolang
dsuolang@umich.edu