

FoodAPS: Alternative Data Collection Methods

Is "Proof of Purchase" Really Proof?



Adam M. Kaderabek

**University of Michigan
Institute for Social Research
Program in Survey & Data Science**

Prepared and Presented in Collaboration with:

Yajuan Si, Institute for Social Research

Brady T. West, Institute for Social Research

Jeffrey M. Gonzalez, USDA – Economic Research Service

Elina T. Page, USDA – Economic Research Service

John A. Kirlin, Kirlin Analytical Services



ECONOMIC RESEARCH SERVICE
United States Department of Agriculture



INSTITUTE FOR SOCIAL RESEARCH
UNIVERSITY OF MICHIGAN

*This presentation was supported in part by the U.S.
Department of Agriculture, Economic Research Service.*

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Background

- FoodAPS-1 was a nationally representative survey that collected data about household food purchases and acquisitions.
- The Alternative Data Collection Method (ADCM) study was conducted to test using a web-based app to collect data. The app included the ability to upload images of receipts.
- The ADCM aimed to investigate the likelihood respondents would provide receipts, and if the receipt data could be used to reduce the reporting burden and improve data quality.
- From the events where a receipt was available, a SRS of 100 *food away from home (FAFH)* and 100 *food at home (FAH)* events was taken and receipt data was compared to the respondent's report.
- Sampled events displayed variation in receipt quality, indicating several factors were influencing the reliability of the receipts for data validation.

Expectation of Receipt

Receipt Expected group (3,112 events):

Grocery stores, restaurants/bars, convenience stores, club stores, and superstores/big box stores.

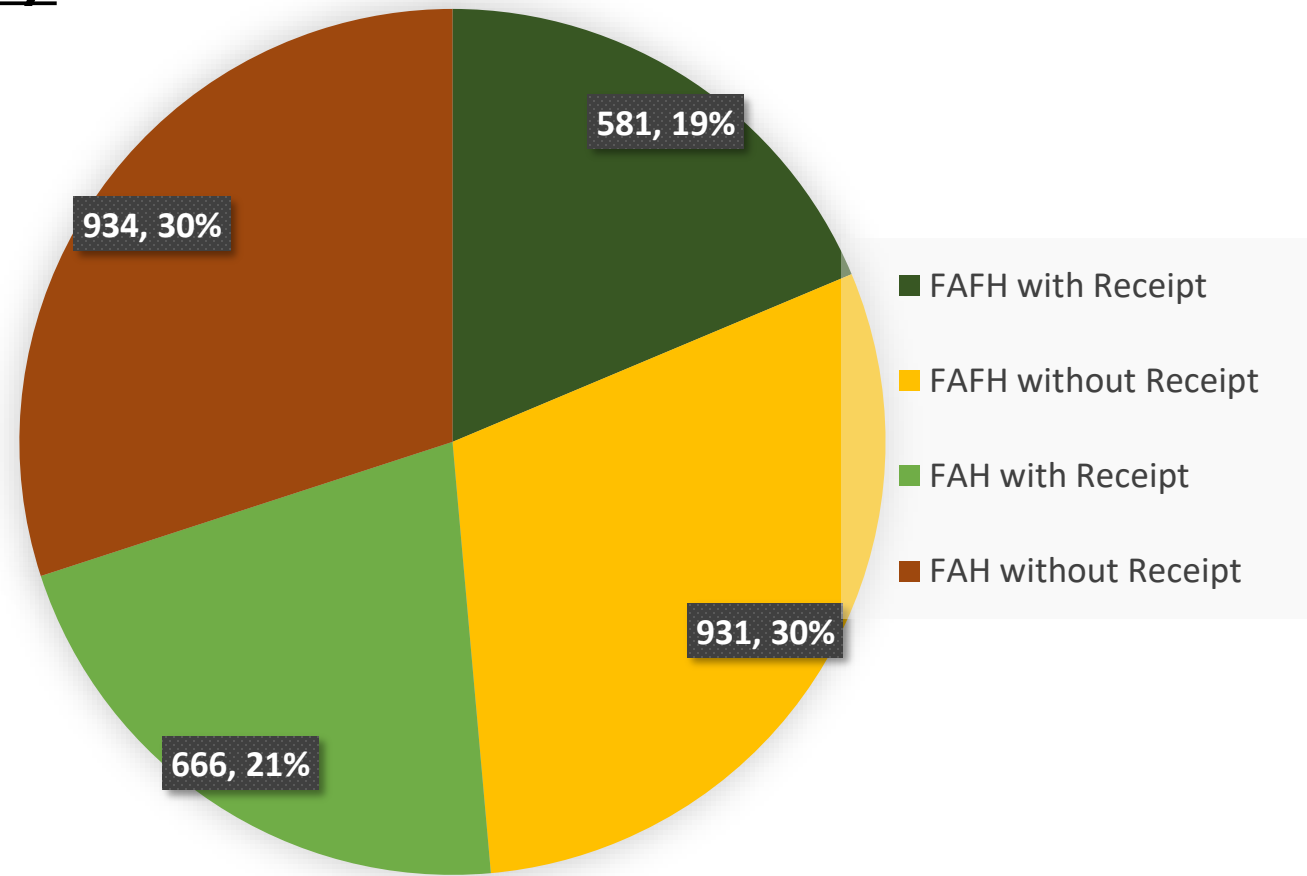
No Receipt Expected group (1,457 events):

School meals (including before and after school care), work, vending machines, and friend's or family's place.

Receipt Possible (336 events):

Farmers markets, food pantries, soup kitchens and locales defined as "other".

Receipt Expected Events (n=3,112)



Research Questions

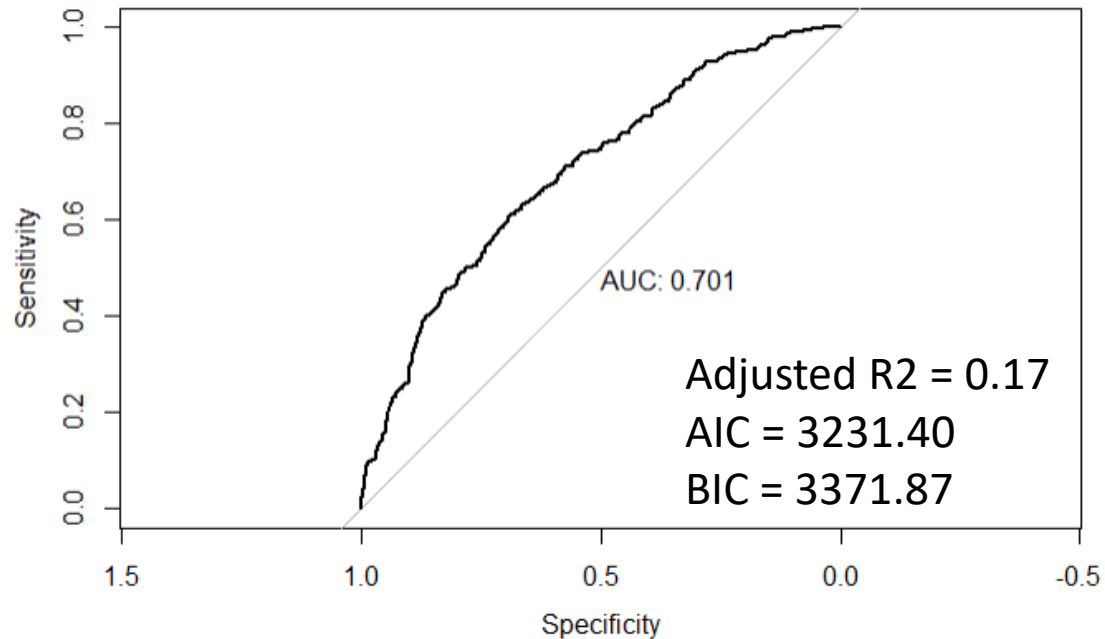
1. Are there relationships between the participants, their households, and food-events that can predict the probability a respondent will provide a receipt?
2. Can modeling these relationships identify opportunities for interventions that may influence respondent behavior and in turn improve data quality?

Receipt Predictors

Event Level	Respondent Level	Household Level
Report Mode/Application	Age	Household Size
<i>Smartphone or Computer</i>	<i>18-29; 30-39; 40-49; 50-59; 60+ years old</i>	<i>1, 2, 3, 4, or 5+ person(s)</i>
Event Type	Gender	Interview Length
<i>FAFH or FAH</i>	<i>Female or Male</i>	<i>11-20 min; 21-30 min; 31-40 min; 40+ min</i>
Item Count	Race	SNAP Status (received SNAP benefits in prior month)
<i>Few items or Many items</i>	<i>White, Black, Other (including Hispanic)</i>	<i>Yes or No</i>
Event Cost	Education	
<i>Low cost or High cost</i>	<i>High school or less or More than high school</i>	
Number of Participants	Employment	
<i>One or Multiple</i>	<i>In labor force or Not in labor force</i>	
	Primary Respondent for Household	
	<i>Yes or No</i>	

Model Specification

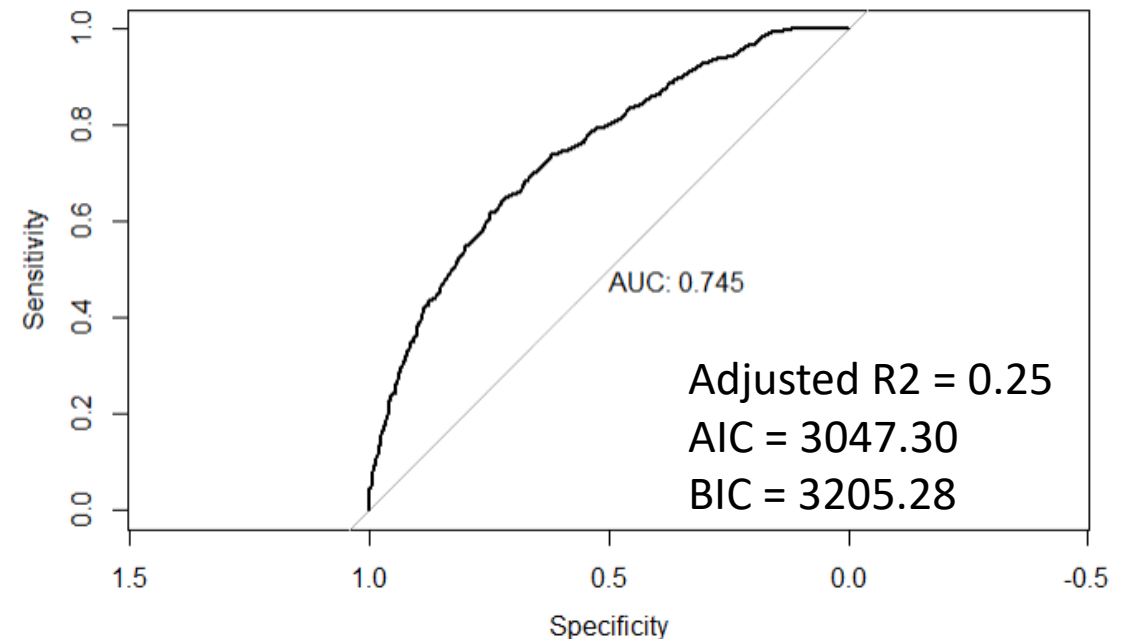
ROC Plot Reference Model



Initial Model with 14 covariates

Event Type, App, Item Count, Event Cost, Participants, Age, Gender, Race, Education, Employment, Primary R, Household Size, Int. Length, SNAP

ROC Plot Final Model



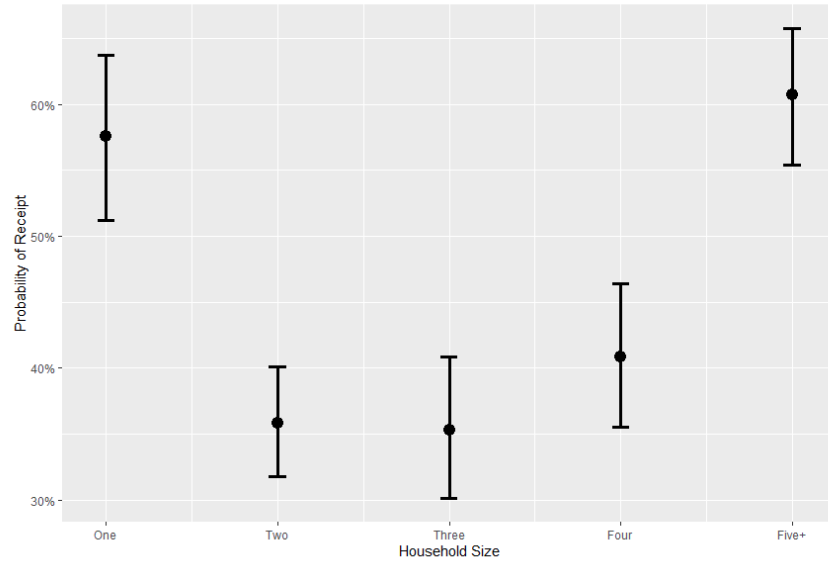
Stepwise BIC Model with 8 covariates (+7 interactions)

Event Type, App, Item Count, ~~Event Cost~~, ~~Participants~~, ~~Age~~, ~~Gender~~, Race, Education, Employment, ~~Primary R~~, Household Size, ~~Int. Length~~, SNAP

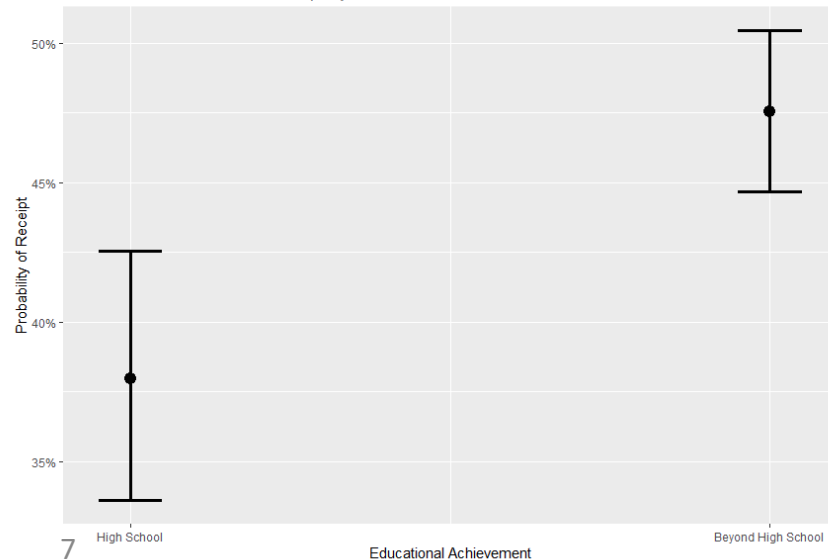
*Education*Household Size, App*Employment, Event Type*Item Count, App*Education, App*Household Size, Race*SNAP, App*SNAP*

Household Size & Education

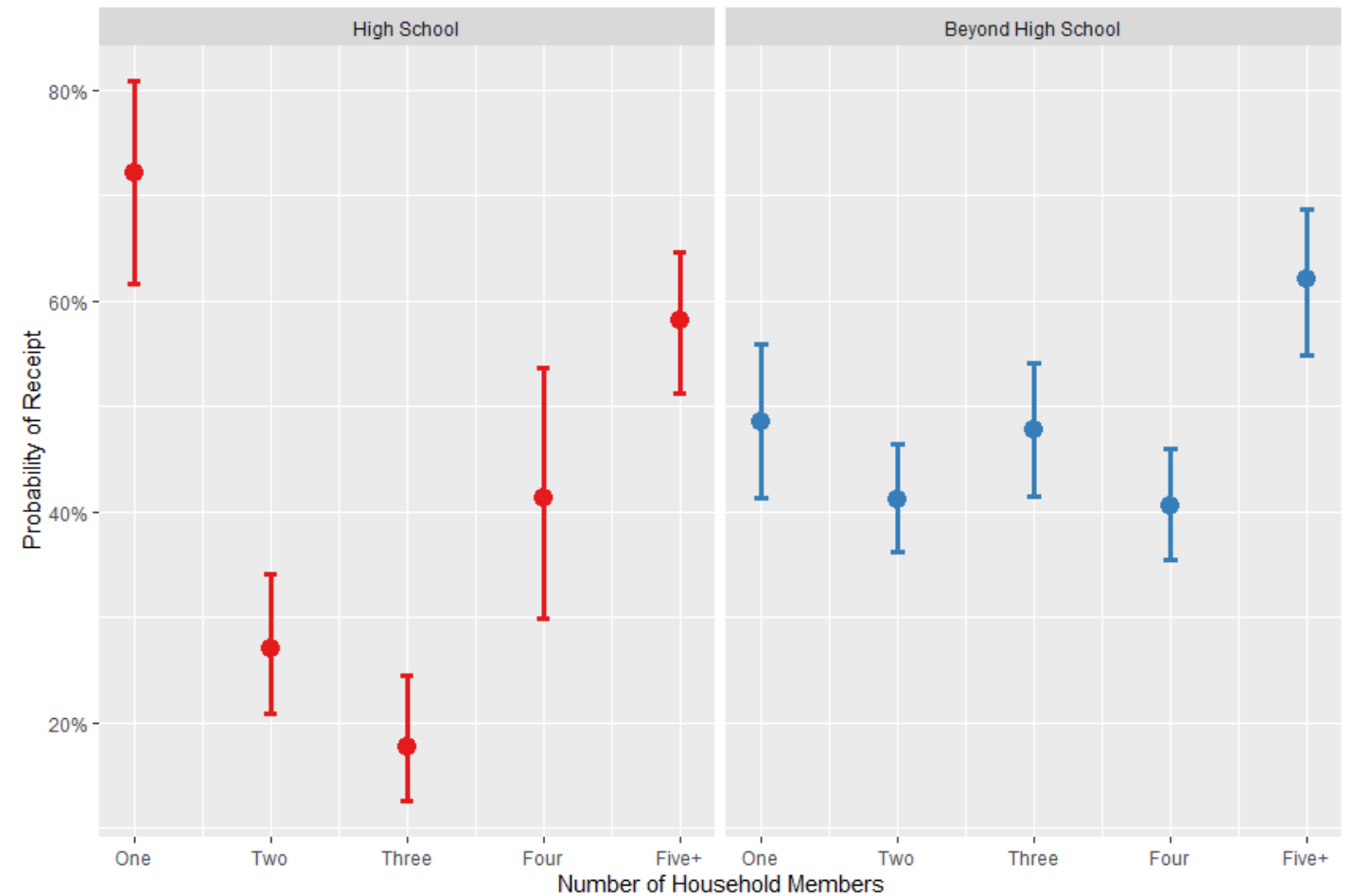
Predicted Probabilities of Receipt by Household Size



Predicted Probabilities of Receipt by Education

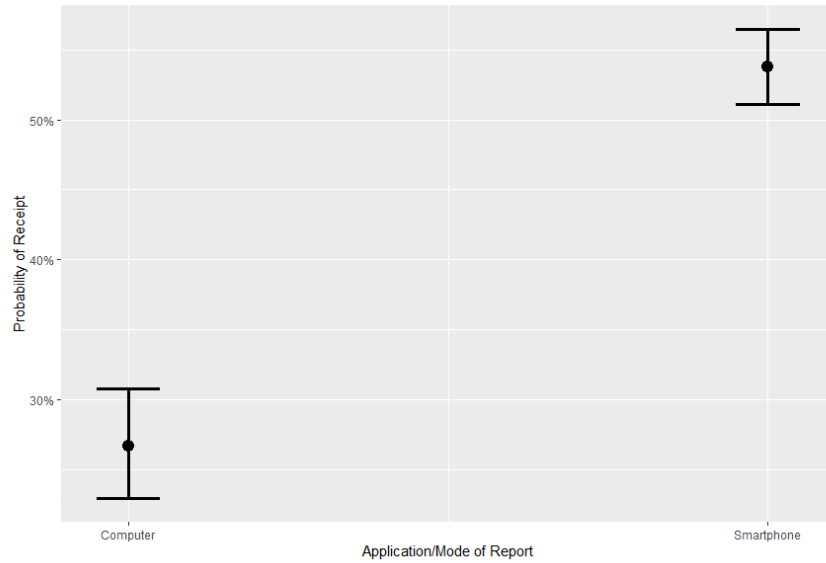


Predicted Probabilities of Receipt by Household Size & Level of Education

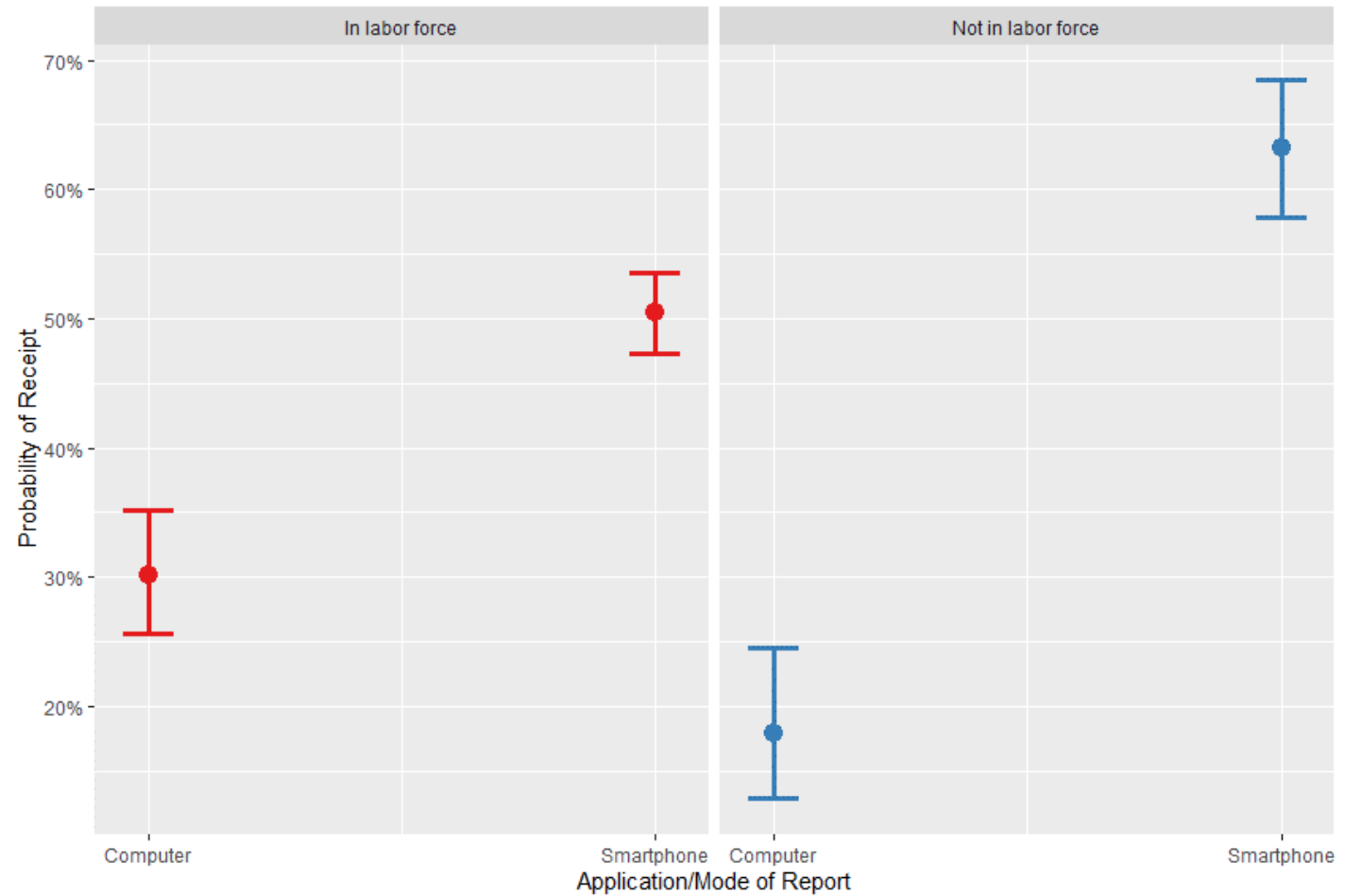


Application/Mode & Employment

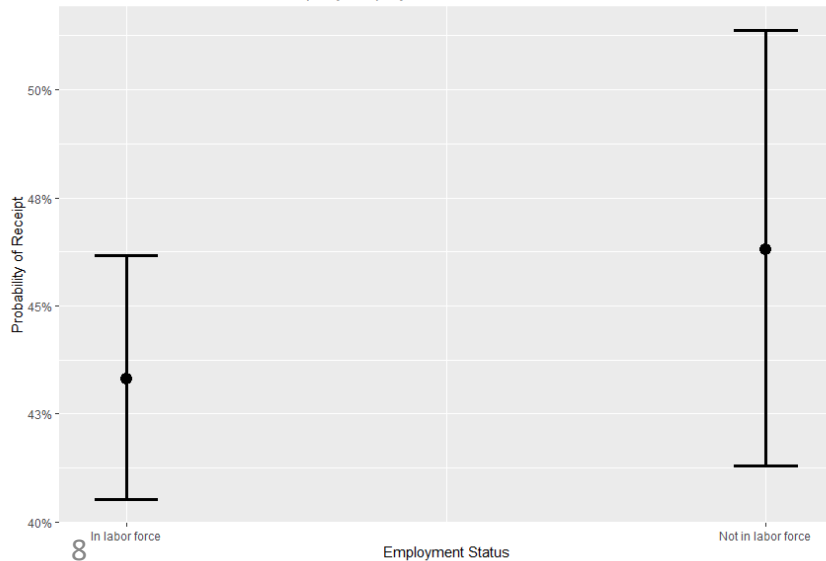
Predicted Probabilities of Receipt by Application/Mode of Report



Predicted Probabilities of Receipt by Employment Status & Application/Mode of Report

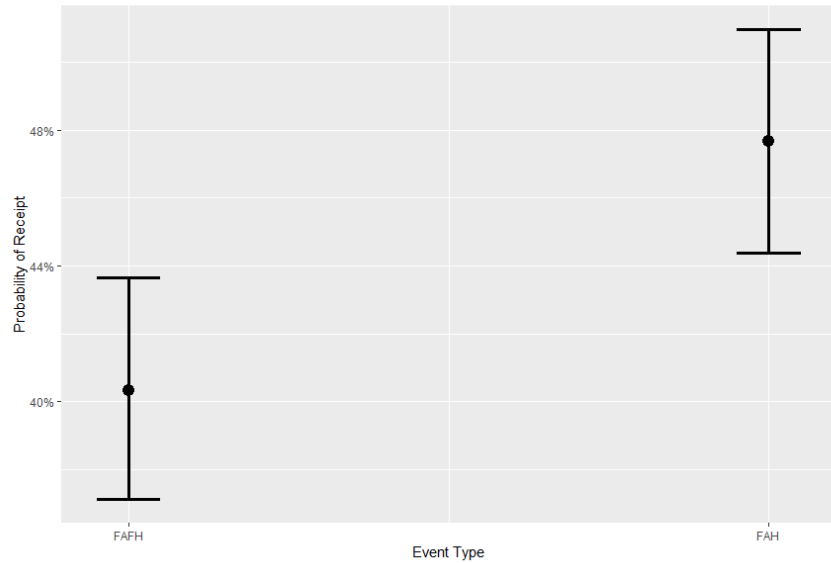


Predicted Probabilities of Receipt by Employment

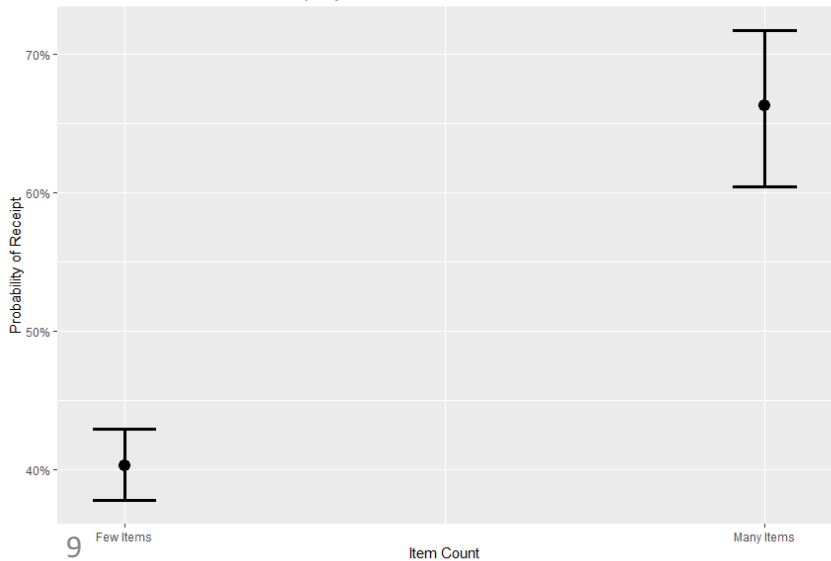


Event Type & Item Count

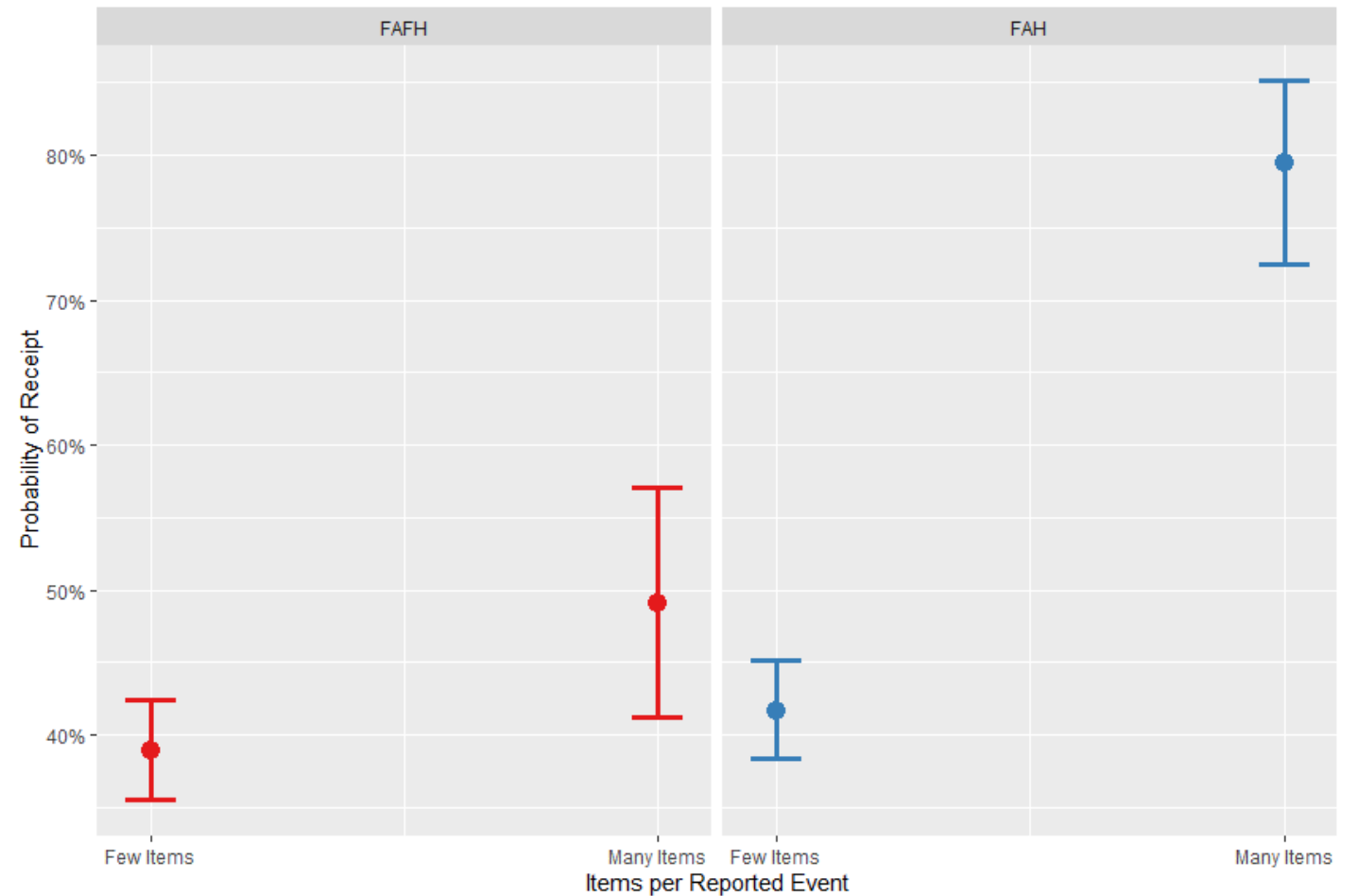
Predicted Probabilities of Receipt by Event type



Predicted Probabilities of Receipt by Item Count

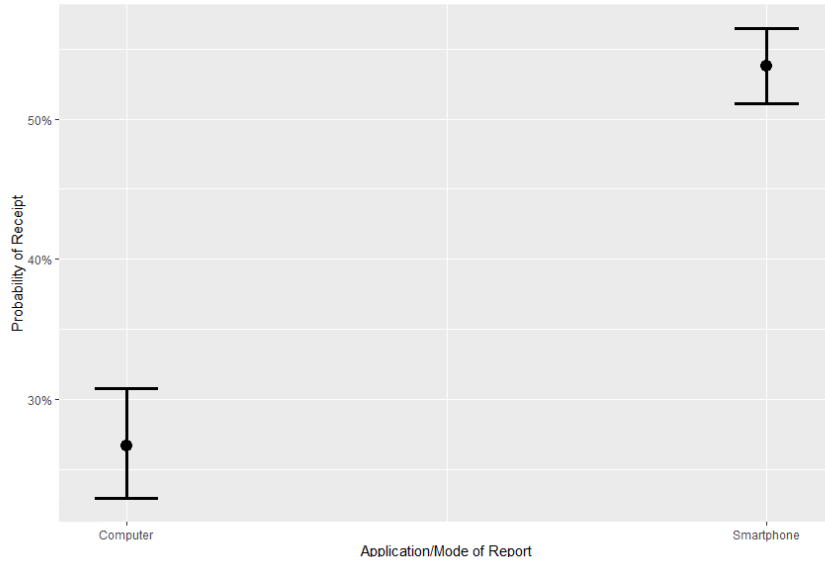


Predicted Probabilities of Receipt by Event Type & Items per Reported Event

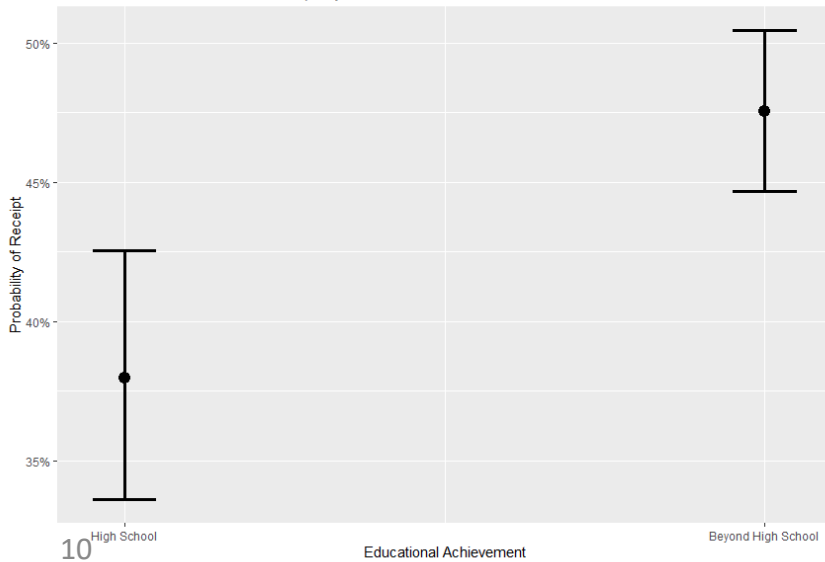


Application/Mode & Education

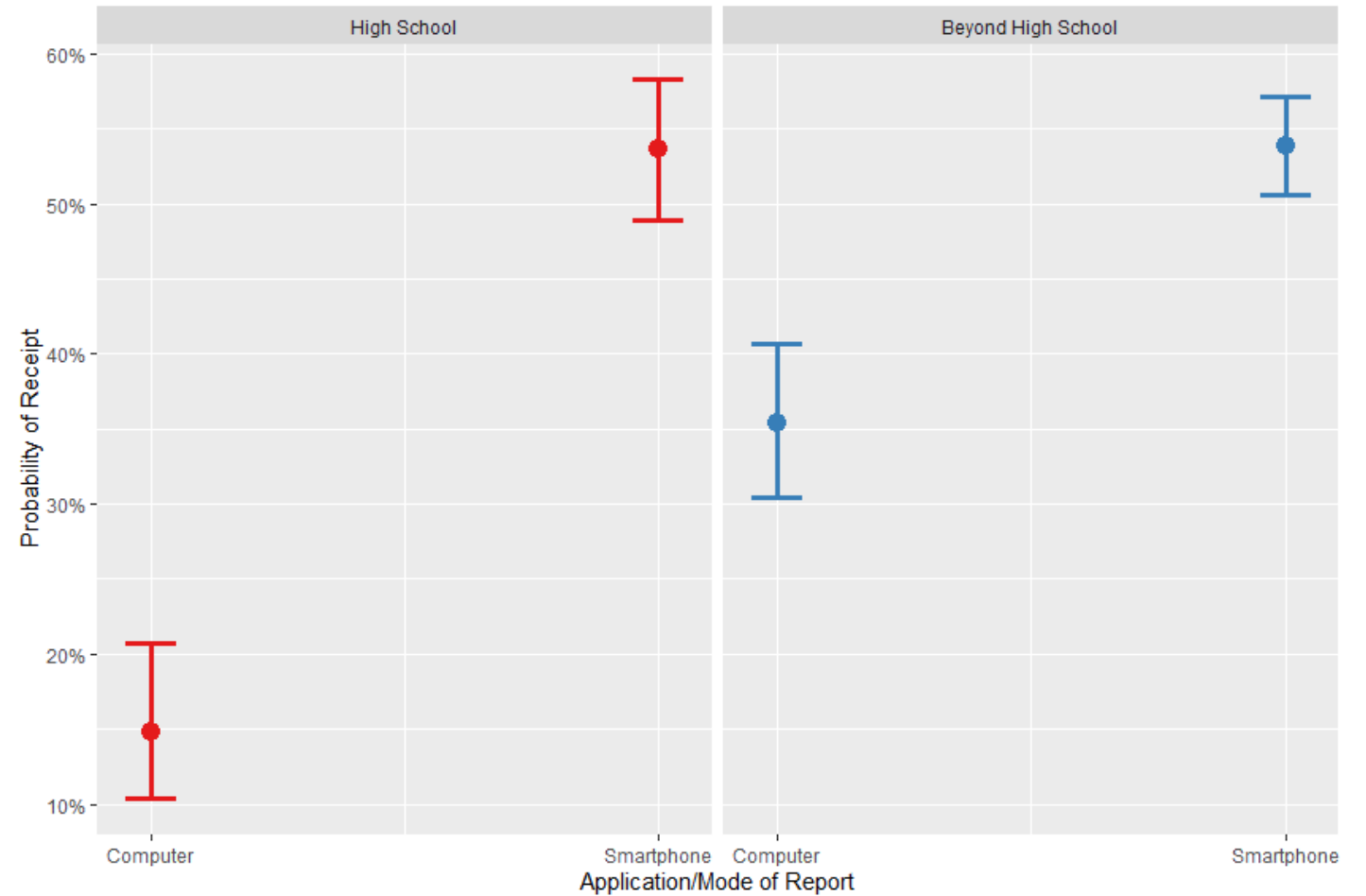
Predicted Probabilities of Receipt by Application/Mode of Report



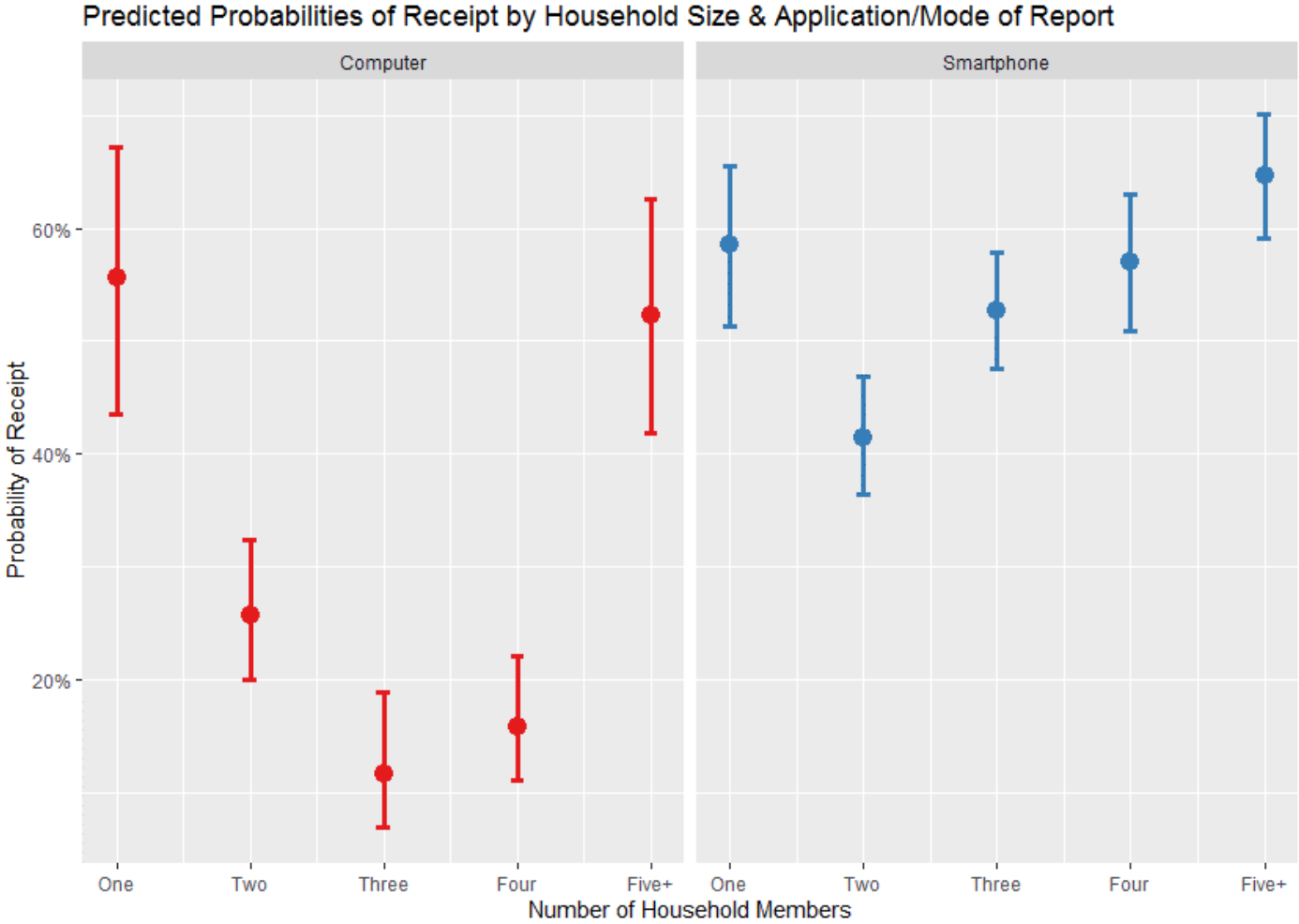
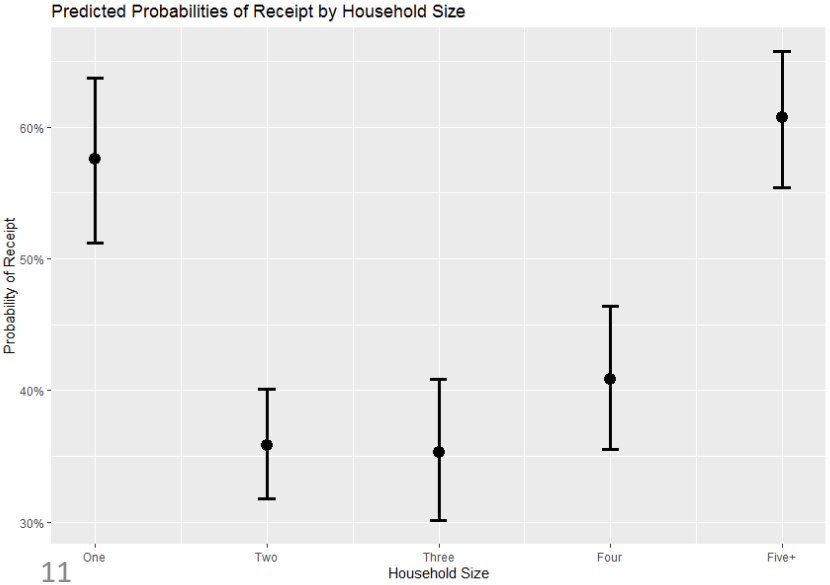
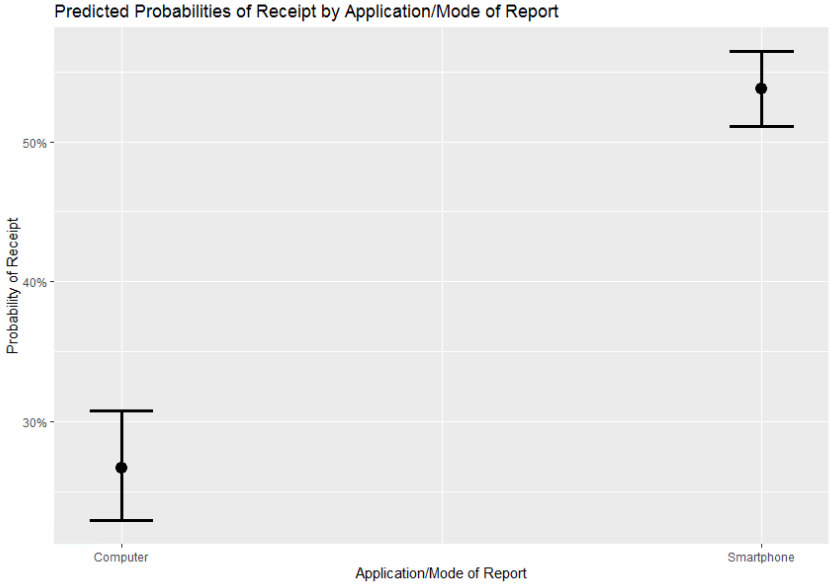
Predicted Probabilities of Receipt by Education



Predicted Probabilities of Receipt by Level of Education & Application/Mode of Report

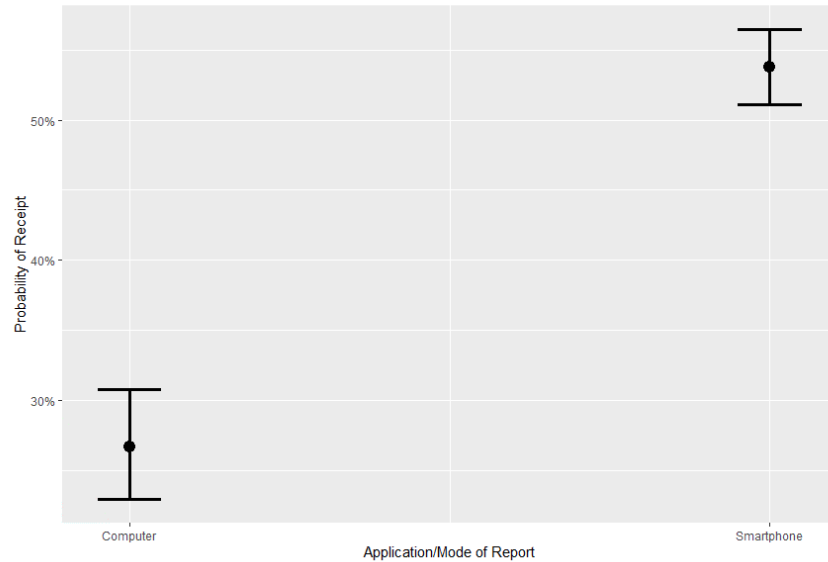


Application/Mode & Household Size

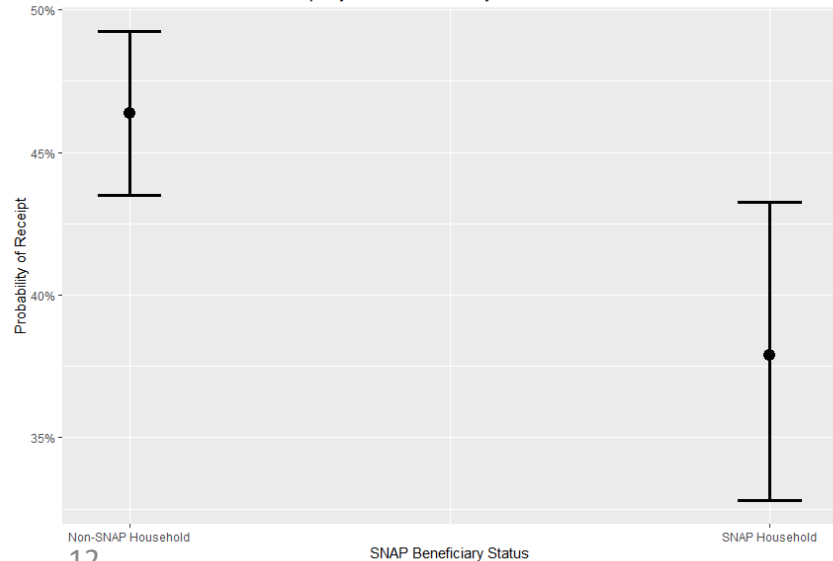


Application/Mode & SNAP Status

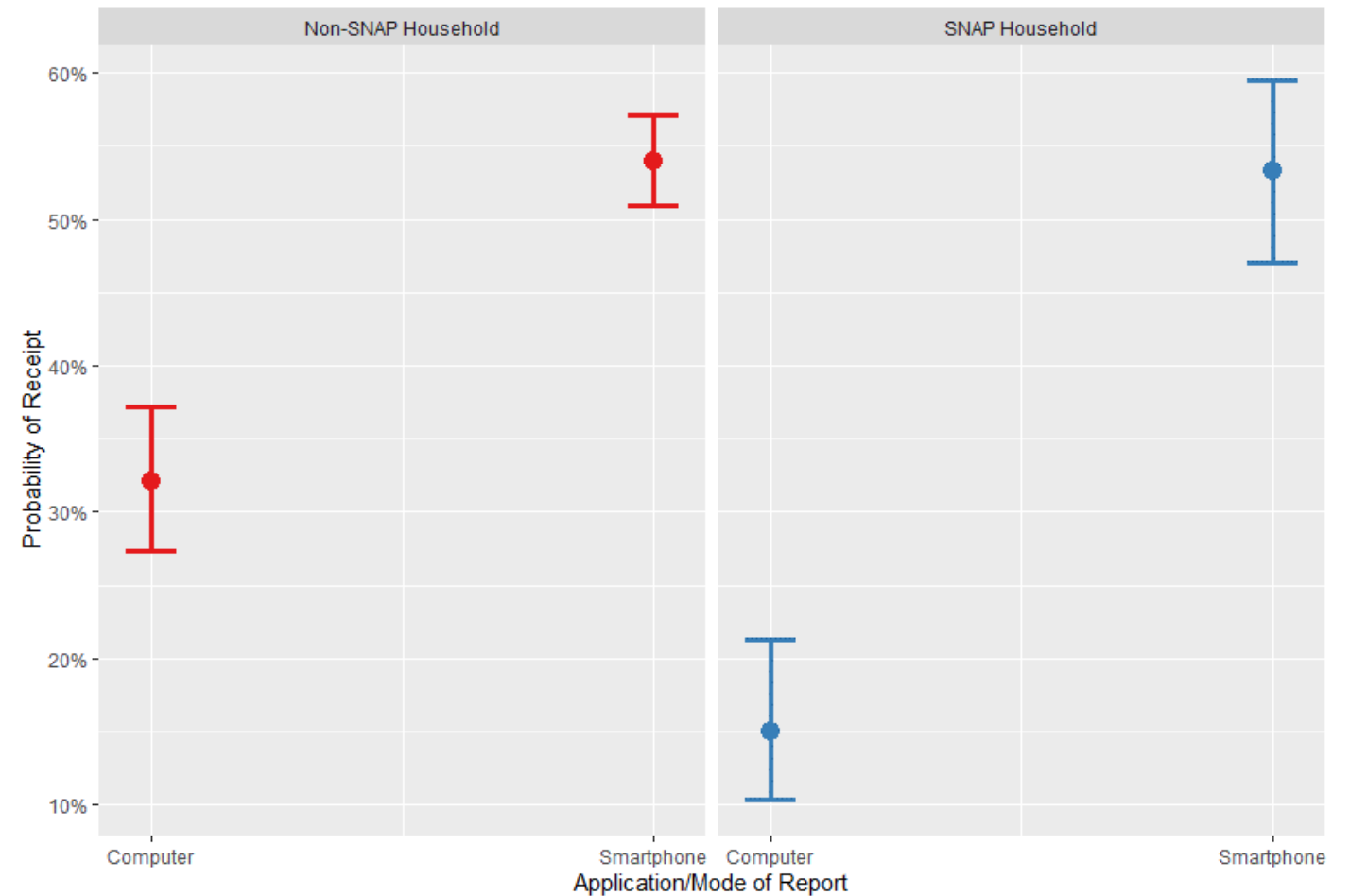
Predicted Probabilities of Receipt by Application/Mode of Report



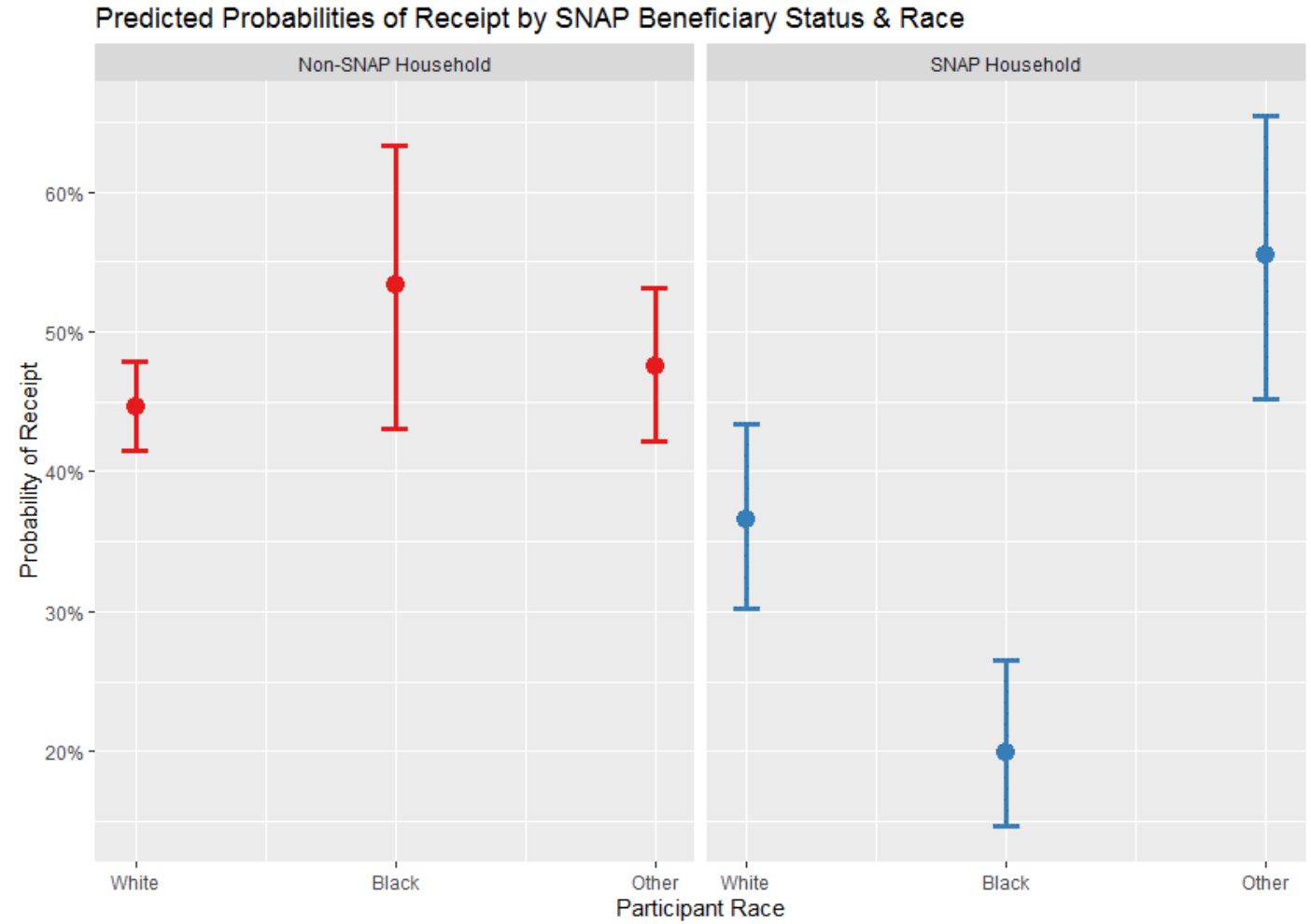
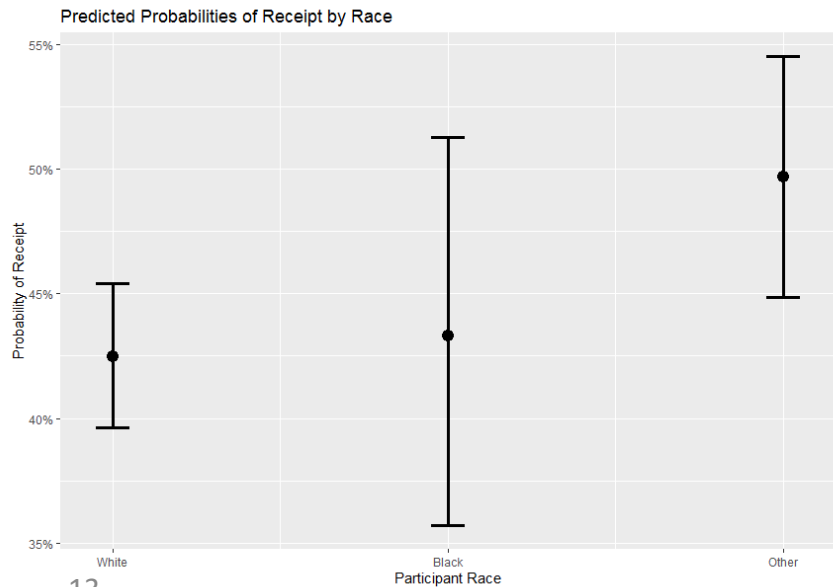
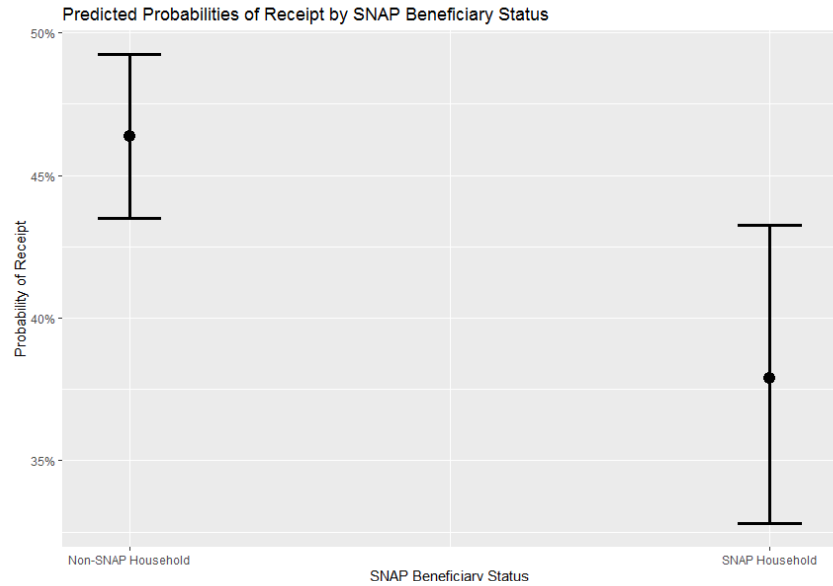
Predicted Probabilities of Receipt by SNAP Beneficiary Status



Predicted Probabilities of Receipt by SNAP Beneficiary Status & Application/Mode of Report



SNAP Status & Race



Key Takeaways

- Probability of a receipt among smartphone reports appear stable compared to computer reports. The use of a mobile format (i.e., smartphone) seems like a reliable method for encouraging respondent cooperation.
- Probability of a receipt is higher for FAH events and events with more items. It's possible the influence of item count is one that increases the saliency of the event.
- Dynamics of FAFH events may be substantively different than FAH events. Events could be less significant to respondents and more difficult to report promptly resulting in lower rates of receipt submission.
- Extra effort may be needed to engage SNAP beneficiaries, particularly among white and black households.

Next Steps?

- FoodAPS-2 Field Test
- FoodLogger Application
- Formalize Task Protocol
- Identify Compliance Issues

Thank you!

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amkad@umich.edu

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