

# Results from a Test of Online Modes for the Consumer Expenditure Diary Survey

Ian Elkin - Bureau of Labor Statistics

Douglas Williams & Hanyu Sun - Westat

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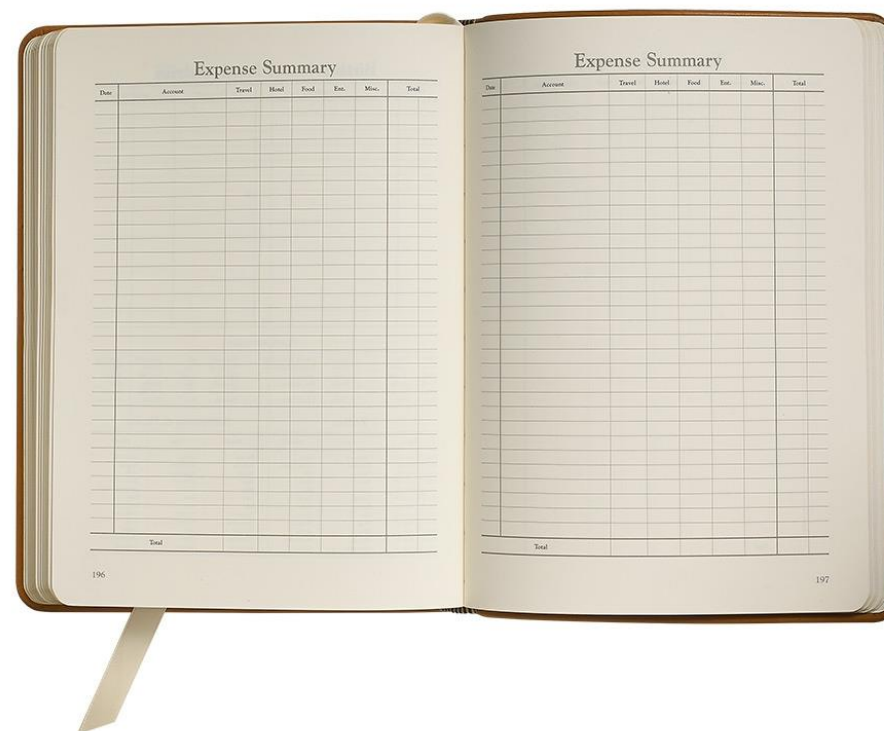
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# Outline

- I. Background
- II. Study Design
- III. Usability Test Results
- IV. Conclusions and Recommended Changes

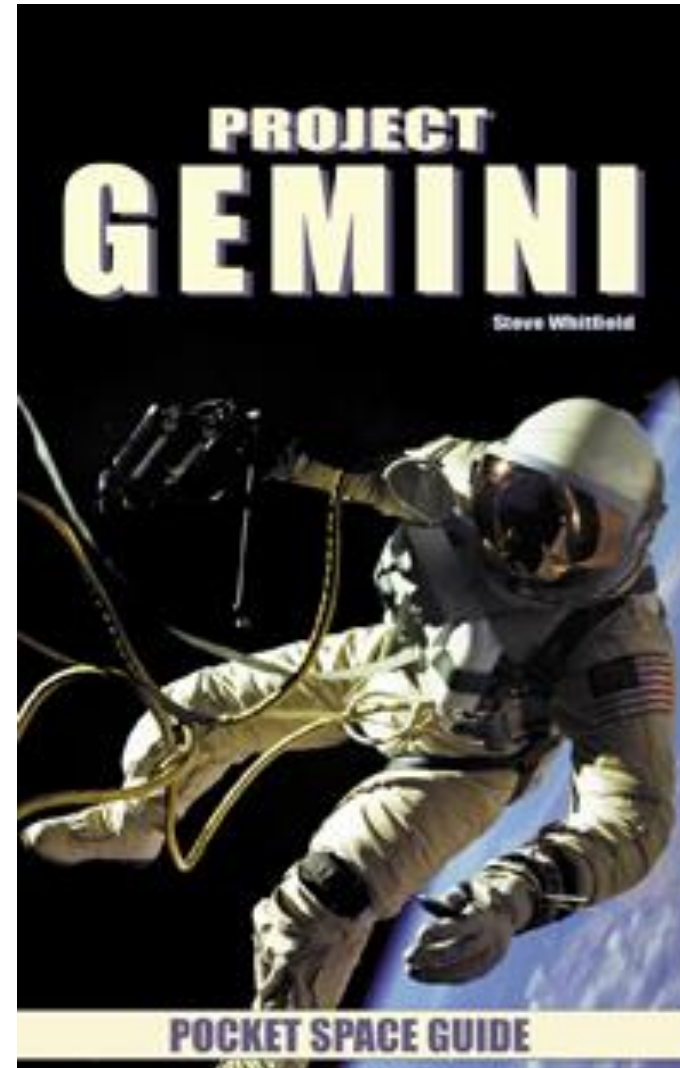


# I. Background



# Gemini Redesign Project

- “... is the multi-year redesign project for the purpose of researching, developing, and implementing an improved survey design to improve data quality through a verifiable reduction in measurement error.”



# Background

- CE Diary - one of two components of the CE Surveys used to capture smaller and more frequent expenditures.
- Current diary is a paper diary with a household-level respondent and covers two one-week reporting periods.
- Part of an iterative review and development of online platform for the CE Diary.
  - ▶ Web Diary Feasibility Test - 2013
  - ▶ Individual Diary Feasibility Test (IDFT) - 2014
  - ▶ Proof of Concept Test - 2015
  - ▶ Electronic Diary Desktop Design Improvements - 2016



## II. Study Design



# Online Diary Improvement Project - Overview

- Developed collaboratively with Westat building on prior research and diary data requirements.
  - ▶ Modernization – Flexible instrument that can add and adapt to new technologies
  - ▶ Access across multiple platforms specifically mobile optimization
  - ▶ Person-level diary assignment
- Instrument developed using open-source programming software.
  - ▶ Adaptive web design – optimized for mobile and desktop
  - ▶ Design elements were the same across device types

# Online Diary Improvement Project – Design & Methods

- Household recruitment for usability test.
  - ▶ Desktop/Laptop and Smartphone ownership
  - ▶ Multiple age eligible household members (71% of households)
- Procedure: placement interview; diary reporting; pick-up interview
  - ▶ In-person interviews conducted March 2017 – May 2017
  - ▶ Completed 62 placement interviews and 61 pick-up interviews
  - ▶ Incentive: \$40 for the main diarist and \$10 for the other household members



# Desktop Diary View

### Add Expenses

Date: Wednesday, July 5 ▼

Type: Meals, Snacks, and Drinks Away From Home ▼

Details:

Describe meal <sup>i</sup>

Total cost (include tax and/or tip) <sup>i</sup>

\$

What meal was this?

Breakfast       Lunch

Dinner             Snack/Other


Select any alcohol included:

None               Beer

Wine

Other

### My Expenses

 View Members

Wednesday, July 5 (0)	^
No expenses reported.	
Thursday, July 6 (0)	^
No expenses reported.	
Friday, July 7 (0)	▼
Saturday, July 8 (0)	▼
Sunday, July 9 (0)	▼
Monday, July 10 (0)	▼
Tuesday, July 11 (0)	▼



# Mobile Diary View

**BLS** CE Diary Log out Contact us

**My Expenses** Help

- Wednesday, Jul 5 (0) ▾
- Thursday, Jul 6 (0) ▾
- Friday, Jul 7 (0) ▾
- Saturday, Jul 8 (0) ▾
- Sunday, Jul 9 (0) ▾
- Monday, Jul 10 (0) ▾
- Tuesday, Jul 11 (0) ▾

Members Filter Search Add

**BLS** CE Diary Log out Contact us

**Add Expenses**

Date: Wednesday, Jul 5 ▾

Select type of expense:

- Meals, Snacks, and Drinks Away From Home **i**
- Food and Drinks for Home Consumption **i**
- Clothing, Shoes, Jewelry, and Accessories **i**
- Medical Expenses and Supplies **i**
- Entertainment and Recreation **i**
- Home Furnishings and Decorative Items **i**
- Education Expenses and Supplies **i**
- Transportation Expenses **i**
- Personal Care or Hygiene Items **i**
- All Other Products, Services, and Expenses **i**

Back Clear Save

**BLS** CE Diary Log out Contact us

**Add Expenses**

Date: Wednesday, Jul 5 ▾

Type: Meals, Snacks, and Drinks Away From Home ▾

Details:

Describe meal **i**

Enter description

Total cost (include tax and/or tip) **i**

\$ 0.00

What meal was this?

Breakfast  Lunch

Dinner  Snack/Other

Select any alcohol included:

None  Beer

Wine  Other

Back Clear Save



# III. Usability Test Results



# Research Questions

## ■ Compliance and Usage

- ▶ How well do different household members comply with diary task?

## ■ Device Usage

- ▶ What are the characteristics between diary usage by device?
- ▶ Are there differences in types of expenditures entered by device type?
- ▶ Are there any barriers to accessing the online diary?

## ■ Data Quality

- ▶ Do expenditures indicate problems or category mismatches?

# Compliance

- How well do different household members comply with the diary task?
  - ▶ Composition of recruited sample
    - 62 main diarist – responsible for encouraging other HHM participation
      - 48.% above the age of 40, predominantly female, education evenly distributed
    - 72 other household members
- Access Use
  - ▶ Access – log-on and create password
  - ▶ Use – enter an expense

# Compliance - Results

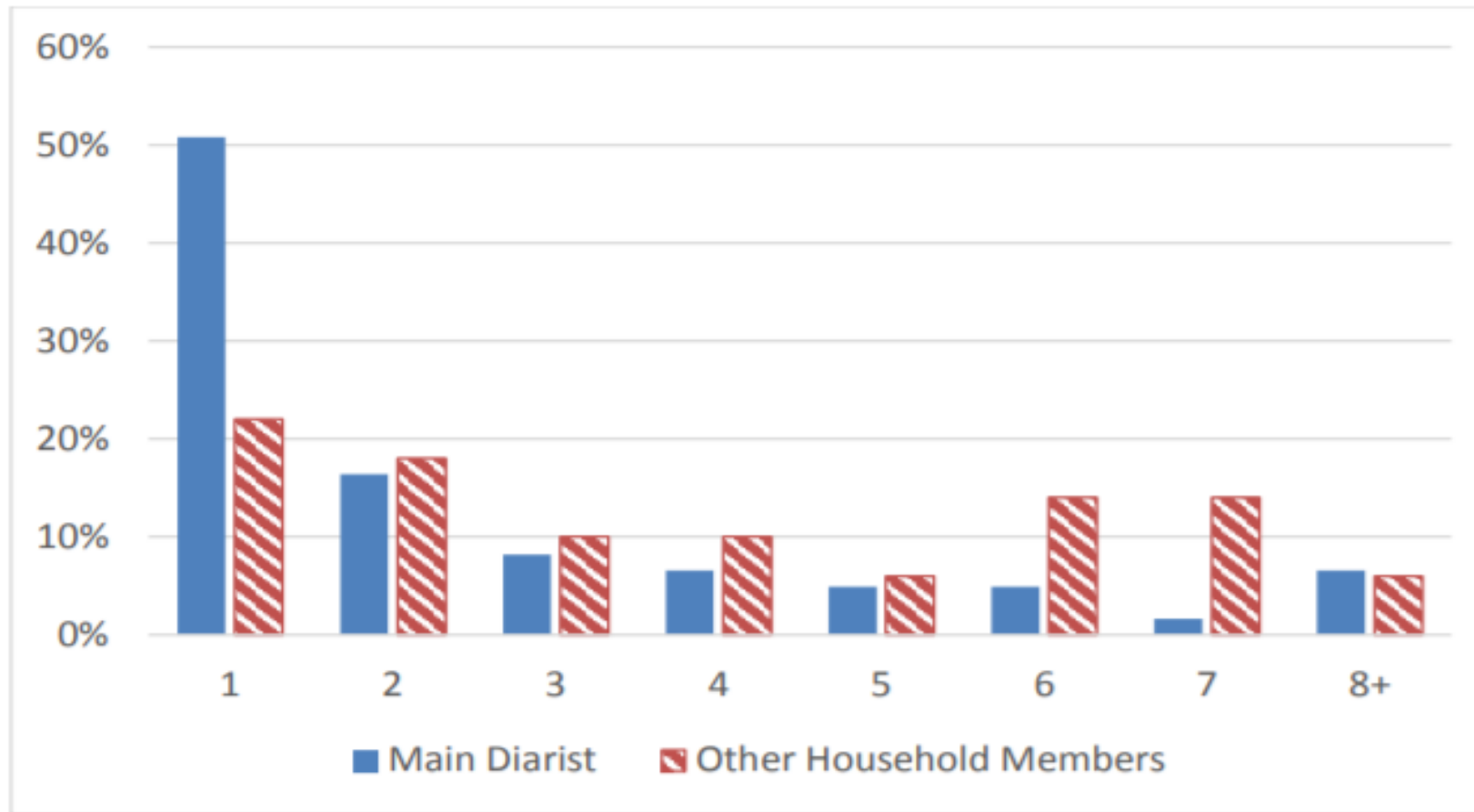
## ■ Access and Use

- ▶ 61 of 62 (98%) main diarist accessed the diary
- ▶ 50 of 72 (69%) other household members accessed the diary
- ▶ Similar results for use

## ■ Comply with directions to access and change password day of visit

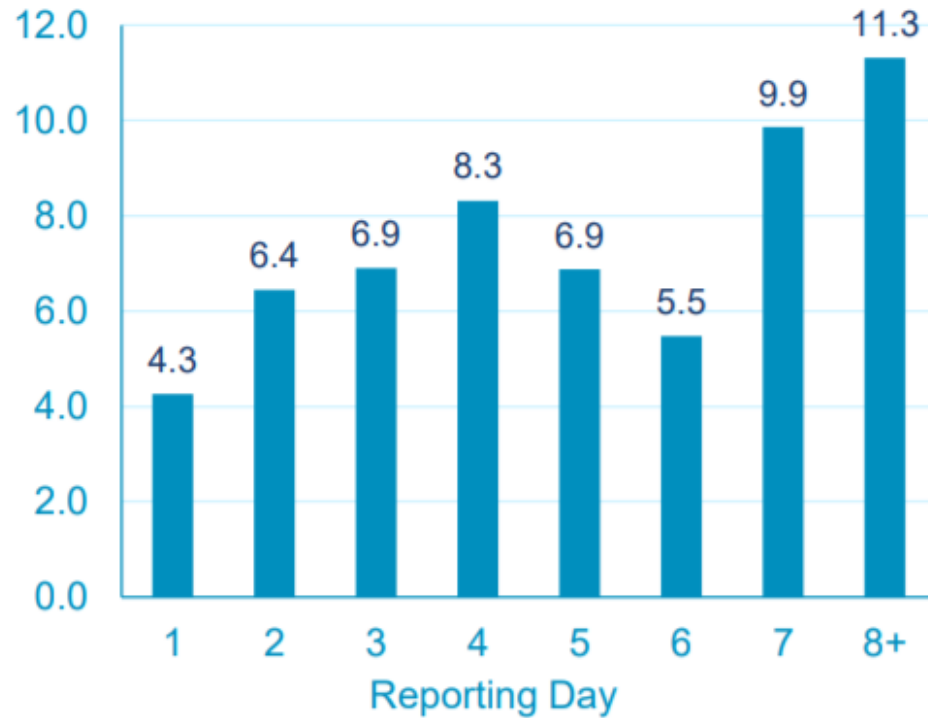
Days from visit	0	1	2	3	4	5	6	7+
Main Diarist	51%	16%	8%	7%	5%	5%	2%	7%
Other	22%	18%	10%	10%	6%	14%	14%	6%

# Distribution of Initial Diary Access

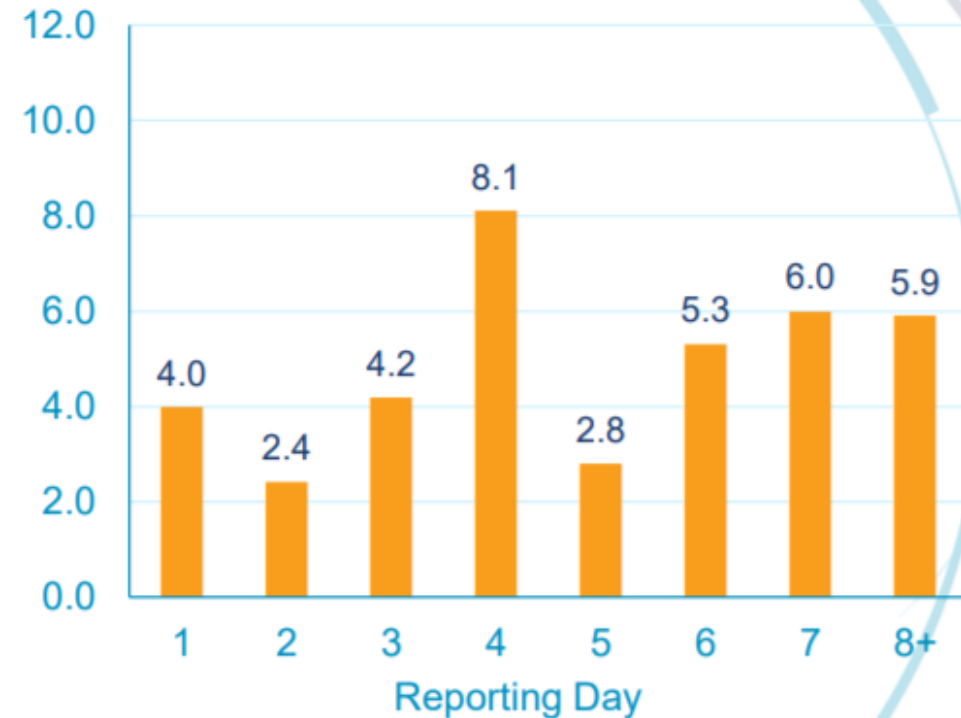


# Expense Reporting Behavior

## Main Diarist



## Other Household Members





# Expense Entry Timeliness

## ■ Timely entry of expenses

- ▶ Suggest attentiveness to the diary task
- ▶ Better data: less time for recall; less likely to forget expense
- ▶ Distributional difference between expense date and entry date

Difference	0	1	2	3	4	5	6+
Main Diarist	31.0	33.2	11.3	11.2	4.6	2.5	6.2
Other	15.1	36.4	9.0	9.2	9.0	6.7	14.6
All	27.0	34.0	10.7	10.7	5.7	3.6	8.3

# Device Usage - Characteristics

## ■ What are the characteristics of diary usage by device?

- ▶ Half of main diarists used mobile with one-third only using mobile

Device Type	Desk/Laptop	Mobile	Both
Main Diarist (n=61)	43	31	13
Other (n=49)	37	20	7

- ▶ Why not more mobile usage: smaller screen, lack of tactile keyboard
- ▶ Desk/Laptops used more (1,522;679), mobile more timely

Difference	0	1	2	3	4
Desk/Laptop	24%	31%	12%	12%	21%
Mobile	33%	41%	8%	8%	10%



# Device Usage – Expense Types

Expense Type	Desk/Laptop	Mobile	All
1 - Meals, Snacks, and Drinks Away From Home	15.0%	30.2%	19.7%
2 - Food and Drinks For Home Consumption	52.9	21.5	43.2
3 - Clothing, Shoes, Jewelry, and Accessories	6.0	6.8	6.2
4 - Medical Expenses and Supplies	1.9	2.4	2.0
5 - Entertainment and Recreation	2.1	5.7	3.2
6 - Home Furnishings and Decorative Items	0.3	2.5	1.0
7 - Education Expenses and Supplies	0.4	0.7	0.5
8 - Transportation Expenses	6.6	9.7	7.6
9 - Personal Care, or Hygiene Items	3.7	8.0	5.0
10 - All Other Products, Services, and Expenses	11.1	12.5	11.5

# Barriers to Access – Failed Login Attempts

- Are there any barriers to accessing the online diary?
  - ▶ Setting/remembering password most reported barrier
  - ▶ Password
    - Eight characters: number, upper & lower-case letter, special character (!@#\$%^&\*)

Total # of failed attempts	0	1	2	3	4	5	6	7+
Percent	46.9	12.6	8.1	3.6	3.6	3.6	4.5	17.1

- One-half of all failed attempts occurred before setting a new password

# Data Quality

- Do expenditure descriptions indicate problems or category mismatches?
  - ▶ Description field: open-ended text field for describing expense
    - Red polo shirt; 2 liter coke; Bananas; Gasoline; Etc...
  - ▶ Type of issues identified – independent coding and review
    - Including multiple items in one entry
    - Vague descriptions: item or expense is unclear (e.g., food, clothes, cleaning)
    - Establishment name: (e.g., Wegmans)
    - Incorrect category
    - Unidentifiable

# Data Quality – Expense Description

- Overall, poor quality descriptions were low (of n = 2,255 total expenses)
- Issues clustered within respondents, or affect specific category
  - ▶ 14 respondents account for over half (55%) of coded issues

Description Issue Type	Count	Percent/All Expenses
Multiple items	52	2.3%
Vague description	37	1.6%
Establishment name	59	2.6%
Incorrect category	41	1.8%
Unidentifiable	13	0.6%

# IV. Conclusions and Recommended Changes



# Conclusions

## ■ Personal Diaries

- ▶ Near uniform use of online diary by main diarist (household respondent)
  - Usage lower for other HHM, but encouraging
  - Not ideal to rely on the main diarist to encourage and motivate other HHM to participate
  - Indications that other HHM start later and abandon sooner



# Conclusions

## ■ Online Diaries

- ▶ Offers dimensions not available with paper: use of multiple devices, mobility
- ▶ Mobile devices were frequently used, but not as expected
  - Most respondents used at home – still convenient
  - Receipt complexity influencing device type used?
- ▶ Expenses entered via mobile device were more timely
- ▶ Password the biggest barrier to access – and mobility
- ▶ Data quality – low incidence of issues, but still problematic
  - E.g., 52 instances of multiple entries can equal 100-150 missed expenses

# Recommended Changes

## ■ Diary Placement

- ▶ Obtain main diarist commitment, collect other HHM contact information, and incentivize recruitment

## ■ Design, layout, and function of the online diary

### ▶ Simplify access

- Passwords & Usernames: simplify requirements, allow username changes, allow saving

### ▶ Provide summary statistics of spending for HH

### ▶ Active feedback

- E.g., Modal pop-up when entry saved

# Recommended Changes

## ■ Future Enhancements

- ▶ Features using the smartphone camera
  - Receipt scanning, barcode scanning, item detection/machine learning and pictures of products
- ▶ Features using the smartphone microphone
  - Speech-to-text functionality
- ▶ Features using smartphone GPS or geolocation
  - Geofencing

# Contact Information

**Ian J. Elkin**

Senior Economist

Division of the Consumer Expenditure Surveys

[www.bls.gov/cex](http://www.bls.gov/cex)

202-691-6865

[Elkin.Ian@bls.gov](mailto:Elkin.Ian@bls.gov)

