

# Developing an Online Mode for the Consumer Expenditure Diary Survey

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# I. Objectives and Current Diary Design



# Test and Design Objectives

- Improve on each past diary design and refine options as part of the Gemini Redesign Initiative
- Present respondents with options for contemporaneous data entry
- Improve unit and item response rates through increased options and a reduction in proxy reporting
- Lower costs compared to a paper-only option due to reduced or eliminated printing, scanning, and data entry expenses
- Reduce measurement error due to proxy reporting through ease of access afforded by both individual and online diaries



# Consumer Expenditure Diary Overview

- The Consumer Expenditure Diary (CED) currently uses a singular paper diary to collect household expenditures for a week (x2)
- Interviewers “double place” the diary in-person and conduct one more visit
- The CED gathers more detailed expenditures than the Consumer Expenditure Interview Survey
- The Diary is divided into four sections:
  - ▶ Food and Drink Away From Home
  - ▶ Food and Drink for Home Consumption
  - ▶ Clothing, Shoes, Jewelry and Accessories
  - ▶ All Other Products, Services and Expenses



# Consumer Expenditure Diary Overview

Day 1					SUN	MON	TUE	WED	THU	FRI	SAT
<b>1. Food and Drinks Away from Home</b>											
<b>Examples:</b>		breakfast buffet carry-out lunch dinner & cocktails at restaurant	pizza delivery Chinese takeout child's school lunch	beer at happy hour pretzels at ballgame wine at tavern	croissant from café ice cream from truck wedding reception caterer	soda from vending machine hot dog from convenience store popcorn & soda at movies	← Please unfold the LEFT FLAP to see Additional Examples				
Mark (X) one that best describes the type of meal	Description <i>(see examples above and on the flap)</i>	Mark (X) one that best describes where you made this purchase				Total Cost with tax & tip	If alcoholic beverages included, mark (X) all that apply			Enter the total cost of the alcohol	
		Fast Food Take-out Delivery Concession	Full Service Places	Vending Machines or Mobile Vendors	Employer or School Cafeteria		wine	beer	other		
101.	1 2 3 4		1 2 3 4				1 2 3				
102.	1 2 3 4		1 2 3 4				1 2 3				
103.	1 2 3 4		1 2 3 4				1 2 3				
104.	1 2 3 4		1 2 3 4				1 2 3				
105.	1 2 3 4		1 2 3 4				1 2 3				
106.	1 2 3 4		1 2 3 4				1 2 3				
107.	1 2 3 4		1 2 3 4				1 2 3				
108.	1 2 3 4		1 2 3 4				1 2 3				
109.	1 2 3 4		1 2 3 4				1 2 3				



## II. Past Design and Testing Efforts



# Previous CE Diary Tests and Projects

- Web Diary Feasibility Test
- Individual Diaries Feasibility Test
- Proof of Concept Test – Diary Portion
- Electronic Diary Desktop Design Improvements Project



# Web Diary Feasibility Test Overview

- Designed to simulate entry methods used by respondents in CED paper diary
- Formatted for desktops and laptops
- Household-level diary
- New materials -
  - ▶ Interviewer Talking Points
  - ▶ User Guide
- 600 starting sample collected January-March of 2013





# Web Diary Feasibility Test Diary

Food and Drink Away from Home | Food and Drink for Home Consumption | Clothing, Shoes, Jewelry, and Acc. | All Other Products/Services

Meal Type	Description	Where Purchased	Total Cost with tax and tip	Alcohol Included? (Check all that apply)			Total Alcohol Cost	Date Purchased	Clear
				Wine	Beer	Other			
Breakfast	bagel, juice	Employer or School Ce	\$2.79	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		03-14-2011	-
Lunch	pizza	Fast Food, Take-out C	\$5.57	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		03-14-2011	-
Snack/Other	coffee	Fast Food, Take-out C	\$1.35	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		03-14-2011	-
Lunch	sandwich, soda	Employer or School Ce	\$5.15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		03-14-2011	-
Dinner	chips	Vending Machines or M	\$.70	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		03-15-2011	-
Lunch	elem. school lunch - mo	Employer or School Ce	\$45.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		03-15-2011	-
Snack/Other	soda	Vending Machines or M	\$.65	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		03-21-2011	-
Dinner	buffet	Full Service Places	\$62.23	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$12.00	03-23-2011	-
Snack/Other	drinks from cash bar	Full Service Places	\$15.00	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	\$15.00	03-23-2011	-
Dinner	caterer-Family Reunion	Fast Food, Take-out C	\$350.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$95.00	03-24-2011	-

Add Rows | Save



# Individual Diaries Feasibility Test Overview

- Two instruments formatted for mobile devices and desktops/laptops
- Individual-level diary design
- Targeted sampling on area mobile usage, internet penetration, multi-person households, and English speaking households
- Assignment Protocol
  - ▶ If a household screens in as eligible, household members are offered modes sequentially
  - ▶ Mobile mode first and, if they do not have a Smartphone, then
  - ▶ Desktop mode, including tablet
- 1,200 starting sample collected August-December of 2014

# Individual Diaries Feasibility Test Diaries

Enter Date

respond.census.gov/cec

Logout **CE Diary**

July 15, 2014

Enter Description

\$0.00

Recorded for another household member

Food and Drink Away from Home

Breakfast Lunch  
Dinner Snack/Other

Select Type of Vendor

Alcohol Included?  
Wine Beer Other

Cost of Alcohol:  
\$0.00

Cancel

United States Census Bureau

CONSUMER EXPENDITURE DIARY SURVEY

About the Survey Help User Guide Change Password

Submit  
Logout

Food and Drink Away from Home | Food and Drink for Home Consumption | Clothing, Shoes, Jewelry, and Acc. | All Other Products/Services

Meal Type	Description	Where Purchased	Total Cost with tax and tip	Alcohol Included? (Check all that apply) Wine Beer Other	Total Alcohol Cost	Date Purchased	Recorded for another household member	Clear
Breakfast	sandwich & coffee	Employer or School C	\$5.98	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		07-15-2014	<input type="checkbox"/>	X
Snack/Other	soda	Vending Machines or	\$1.25	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		07-15-2014	<input type="checkbox"/>	X
Lunch	sandwich & chips	Fast Food, Take-out, (	\$7.95	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		07-15-2014	<input type="checkbox"/>	X
Dinner	Steak dinner	Full Service Places	\$55.00	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	\$15.00	07-15-2014	<input type="checkbox"/>	X
Select One		Select One		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		Select One	<input type="checkbox"/>	X
Select One		Select One		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		Select One	<input type="checkbox"/>	X
Select One		Select One		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		Select One	<input type="checkbox"/>	X
Select One		Select One		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		Select One	<input type="checkbox"/>	X
Select One		Select One		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		Select One	<input type="checkbox"/>	X
Select One		Select One		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		Select One	<input type="checkbox"/>	X

Add Rows Save

Burden Statement Accessibility Privacy Security



# Proof of Concept Test Overview

- Respondents who were eligible for and selected an electronic diary were given a single account username and password, and were not restricted to a single electronic mode (mobile or PC), but instead encouraged to move between the electronic versions depending on their situation or reporting needs.
- During the diary-keeping week, paradata was collected on the logins and entries for the electronic diaries. This information was available to the team during the test to identify and address potential issues.
- Individual-level diary design
- Incentives offered
- 1,200 starting sample collected July to October of 2015



# Proof of Concept Test Diaries

AT&T LTE 10:54 AM 98% respond.census.gov

February 24, 2015

Dinner at Restaurant

\$87.60

Food and Drink Away from Home

Breakfast Lunch

**Dinner** Snack/Other

Alcohol Included? (Select all that apply)

**Wine** Beer Other

None

Cost of Alcohol: \$9.00

Cancel Save

United States Census Bureau

## CONSUMER EXPENDITURE DIARY SURVEY

Information User Guide User Settings Logout

**Enter Your Expense Below**

Date	Description	Cost	Category
February 24, 2015	Coffee	\$3.00	Food and Drink Away from Home

Meal Type: Select One

Alcohol Included? (Select all that apply) Cost of Alcohol: \$0.00

None  Wine  Beer  Other

Clear Save

### Summary of Expenses

You haven't entered any expenses this week.



# Electronic Diary Desktop Design Improvements

## Project Overview

- Designed web diaries focused on the desktop/laptop platforms.
- Developed two prototypes incorporating design elements that utilize the increase screen space of desktops/laptops (relative to mobile devices).
  - ▶ Expanded list of categories to improve recall (more expense type cues).
- Prototype 1 focused on presenting all respondent actions and feedback (e.g., entries) on one screen.
- Prototype 2 presented expense entry tasks on progressive screens. This version included many more visual cues for each expense category type.
- Each prototype was laboratory tested with 30 respondents using a within-subjects design. Respondents completed a series of vignettes with mock receipts.

# Electronic Diary Desktop Design Improvements

## Project Diary Prototypes

Prototype 1:

The screenshot shows a web form for the 'Consumer Expenditure Diary Survey'. On the left, there is a form titled 'Enter your expense below' with the following fields: 'Date of expense/purchase' (03/01/2016), 'Category' (Food and Drinks Away from Home), 'Describe the meal' (Enter Description), 'Total cost (include tax and tips)' (\$ 0.00), and radio buttons for 'What meal was this?' (Breakfast, Lunch, Dinner, Snack/Other) and 'What alcoholic beverages were included?' (None, Beer, Wine, Other). 'Cancel' and 'Save' buttons are at the bottom. On the right, a 'Summary of your expenses (0)' box is visible.

Prototype 2:

The top screenshot shows a selection screen for 'April 10, 2016'. It features a progress bar with 'Expense Type' selected. Below, it says 'Select the type of expense you want to enter for April 10, 2016' and lists nine categories with icons: Food and Drinks Away From Home, Food and Drinks For Home Consumption, Clothing, Shoes, Jewelry, and Accessories, Transportation Expenses, Entertainment and Recreation, Home Furnishings and Decorative Items, Medical Expenses and Supplies, Education Expenses and Supplies, and All Other Products, Services, and Expenses.

The bottom screenshot shows a detail screen for 'March, 5 2016'. It features a progress bar with 'Expense Detail' selected. It says 'Provide detail for this specific expense or purchase on March, 5 2016' and 'Add expense details for Food and Drinks Away From Home'. The form includes: 'Describe the meal' (Enter brief description), 'Cost' (\$ 0.00, include tax & tip), 'What Meal Was This?' (Select one), and 'Select Any Alcohol Included' (None, Beer, Wine, Other). 'Cancel', '+ Add another', and 'Save' buttons are at the bottom.



# III. Current Design and Testing Efforts





# Online Diaries Improvement Project Overview

- Two instruments optimized to the respondent's device (mobile or desktop/laptop) and accessed through a single portal
- Individual-level diary design
- Developed based on previous CE online diaries
- Robust paradata output
- Modular design that allows for technological enhancements



# Online Diaries Improvement Project Instrument Design

- Desktop design with focus on minimizing burden and providing feedback:
  - ▶ Default to expense date and category last selected. .
  - ▶ Entered expenses are added to top of summary list and highlighted to provide entry feedback.

# Online Diaries Improvement Project Instrument Design

- Mobile design – same focus as desktop:
  - ▶ Same look and feel as desktop, but optimized for mobile.
  - ▶ Instrument appropriately renders for varied device screen sizes.
  - ▶ Uniform look and feel to promote usage of multiple devices.
- Developed using secure open-source software for scalability and accommodating future technologies.



# Online Diaries Improvement Project Diaries - Home Screen




 **Consumer Expenditure Diary** [Log out](#) [Contact us](#) [Help](#)

### Add Expenses

Select date of expense:

- 1 Friday, March 17
- 2 Saturday, March 18
- 3 Sunday, March 19
- 4 Monday, March 20
- 5 Tuesday, March 21
- 6 Wednesday, March 22
- Thursday, March 23

### My Expenses

 [View Members](#)   

Friday, March 17 (0)	▼
Saturday, March 18 (0)	▼
Sunday, March 19 (0)	▼
Monday, March 20 (0)	▼
Tuesday, March 21 (0)	▼
Wednesday, March 22 (1)	▼
Thursday, March 23 (0)	▼

 **CE Diary** [Log out](#) [Contact us](#)

### My Expenses

[Help](#)

Friday, Mar 17 (0)	▼
Saturday, Mar 18 (0)	▼
Sunday, Mar 19 (0)	▼
Monday, Mar 20 (0)	▼
Tuesday, Mar 21 (0)	▼
Wednesday, Mar 22 (1)	▼
Thursday, Mar 23 (0)	▼

 [Members](#)  [Filter](#)  [Search](#)  [Add](#)



# Online Diaries Improvement Project Diaries – Entry Screen

**Add Expenses**

Date: Saturday, March 18

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

Clear Save

**My Expenses** [View Members](#)

Friday, March 17 (0)	▼
Saturday, March 18 (0)	▲
No expenses reported.	
Sunday, March 19 (0)	▼
Monday, March 20 (0)	▼
Tuesday, March 21 (0)	▼
Wednesday, March 22 (1)	▲
Transportation Expenses Gas - 20Gal	\$43.98
Thursday, March 23 (0)	▼

**BLS CE Diary** [Log out](#) [Contact us](#)

**Add Expenses**

Date: Saturday, Mar 18

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



# Online Diaries Improvement Project Usability Test

- Three Component Usability Test –
  - ▶ A home component for testing instrument placement and instructions on diary keeping
  - ▶ A home component for testing participants' ability to log in and interact with the instrument, such as enter expenditures over the course of a week
  - ▶ A component where the interviewer returns to the home to test pickup of the diary and collect debriefing information

# Online Diaries Improvement Project Usability Test

- Goal of 60 component interviews (placement/reporting/pick-up). As of March 30<sup>th</sup>:
  - ▶ 18 placement interviews completed; 4 pick-up interviews completed.
    - 18 households represent 48 persons (~2.7 persons 15+ per household).
    - 1 nonresponse for pick-up interview (never used web diary).
    - 15 of 18 households have accessed the diary; 24 of 48 persons have accessed the diary.
    - 14 of 17 households have entered at least 1 expense; all persons accessing the diary have entered at least one expense.

# Online Diaries Improvement Project Usability Test

- Of those where user device detected: 41% used a mobile device.
- As expected most expenses are for food...

Expense Type	Count	Percentage
Meals, Snacks, and Drinks Away From Home	71	25.9
Food and Drink for Home Consumption	128	46.7
Clothing, Shoes, Jewelry, and Accessories	9	3.3
Entertainment and Recreation	9	3.3
Home Furnishings and Decorative Items	1	0.4
Education Expenses and Supplies	2	0.7
Transportation Expenses	21	7.7
Medical Expenses and Supplies	8	2.9
Personal Care, or Hygiene Items	10	3.6
All Other Products, Services, and Expenses	15	5.5



# Moving Forward...

## ■ Online Diary Results and Future Plans

- ▶ Percent of entries where expense and entry occurred on same day
  - For those not same day - what was the average difference between entry date and expense date?
- ▶ Edits and deletes – how well do descriptions match category?
- ▶ Expanded categories – were often missed expenses captured?
- ▶ Online versus paper – comparable data quality?

# Contact Information

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