Leveraging Paradata to Assess Respondent Behavior and Data Quality in the CE Online Diary Survey

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Agenda

- What is Paradata?
- Background of CE Online Diary
- Use in measuring activity
- Analysis Results:
  - Diary Use and Logins
  - Devices and Operating systems
  - Time spent in the Diary
  - Relation to CE Data Quality
- Next Steps for CE Paradata use

What are Paradata?

- Data generated as a by-product of the survey's a collection process
- Analysis of paradata can lead to…
  - Improved data collection efficiency
  - Reduced survey fielding costs
  - Better understanding of measurement error

CE Online Diary Background

CE Online Diary Paradata

- Events and user actions recorded along with event details in tabular form.
  - Each event (action) is recorded as its own row in the data
  - Each event (action) is time-stamped
  - All rows have a value describing the event "type"
- Event Types:
  - Login
  - Hyperlink (click)
  - Failed Login
  - Next Action
  - Logout
  - Previous Action
  - Entry
  - Field Change
  - Exit
  - Error Trigger

CE Online Diary Paradata

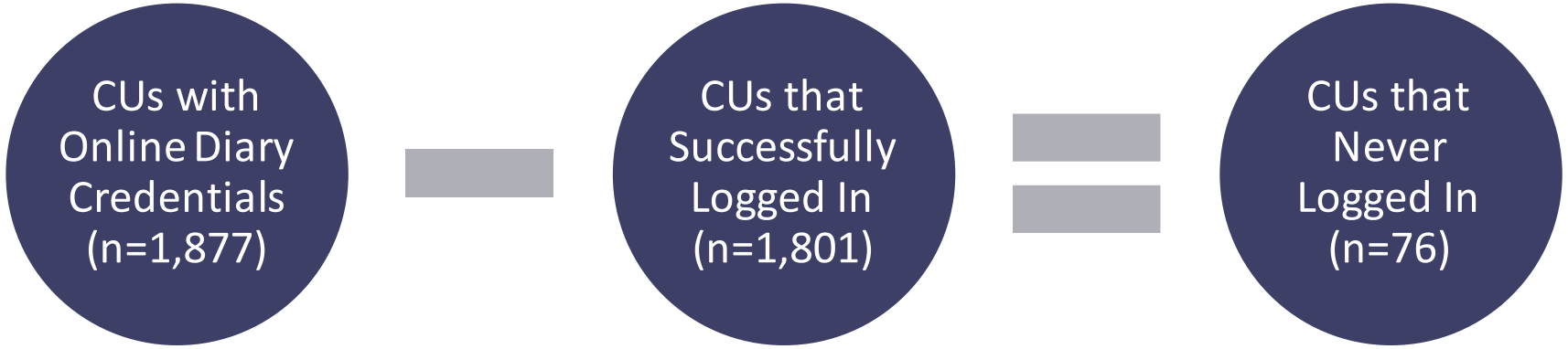
	respondent~l	event_ordi~l	event_time	type	event_id	event_page	environmen~l	environment_accept_language	environme~ht	environme~nt	environmen~h
1	1	1	2021-01-16 20:42:08	login			1	en-US,en;q=0.9	937	Mozilla/5.0…	1920
2	1	2	2021-01-16 20:42:11	entry	main	post_login	NA		NA		NA
3	1	3	2021-01-16 20:42:36	next_action	main	post_login	NA		NA		NA
4	1	4	2021-01-16 20:42:36	hyperlink	main	post_login	NA		NA		NA
5	1	5	2021-01-16 20:42:37	entry	main	diary	NA		NA		NA
6	1	6	2021-01-16 20:42:37	exit	main	post_login	NA		NA		NA
7	1	7	2021-01-16 20:42:42	hyperlink	main	diary	NA		NA		NA
8	1	8	2021-01-16 20:46:41	exit	main	diary	NA		NA		NA
9	1	9	2021-01-16 20:50:02	logout			NA		NA		NA
10	1	10	2021-01-18 05:53:49	login			2	en-US,en;q=0.9	937	Mozilla/5.0…	1920
11	1	11	2021-01-18 05:56:23	logout			NA		NA		NA
12	1	12	2021-01-20 02:15:25	login			3	en-US,en;q=0.9	937	Mozilla/5.0…	1920
13	1	13	2021-01-20 02:17:43	logout			NA		NA		NA
14	1	14	2021-01-22 06:04:57	login			4	en-US,en;q=0.9	937	Mozilla/5.0…	1920
15	1	15	2021-01-22 06:04:58	entry	main	diary	NA		NA		NA
16	1	16	2021-01-22 06:05:03	hyperlink	main	diary	NA		NA		NA
17	1	17	2021-01-22 06:05:05	field_change	main	diary	NA		NA		NA
18	1	18	2021-01-22 06:05:12	field_change	main	diary	NA		NA		NA
19	1	19	2021-01-22 06:05:19	field_change	main	diary	NA		NA		NA
20	1	20	2021-01-22 06:05:29	field_change	main	diary	NA		NA		NA
21	1	21	2021-01-22 06:05:35	field_change	main	diary	NA		NA		NA
22	1	22	2021-01-22 06:05:35	field_change	main	diary	NA		NA		NA

Paradata Analysis Results

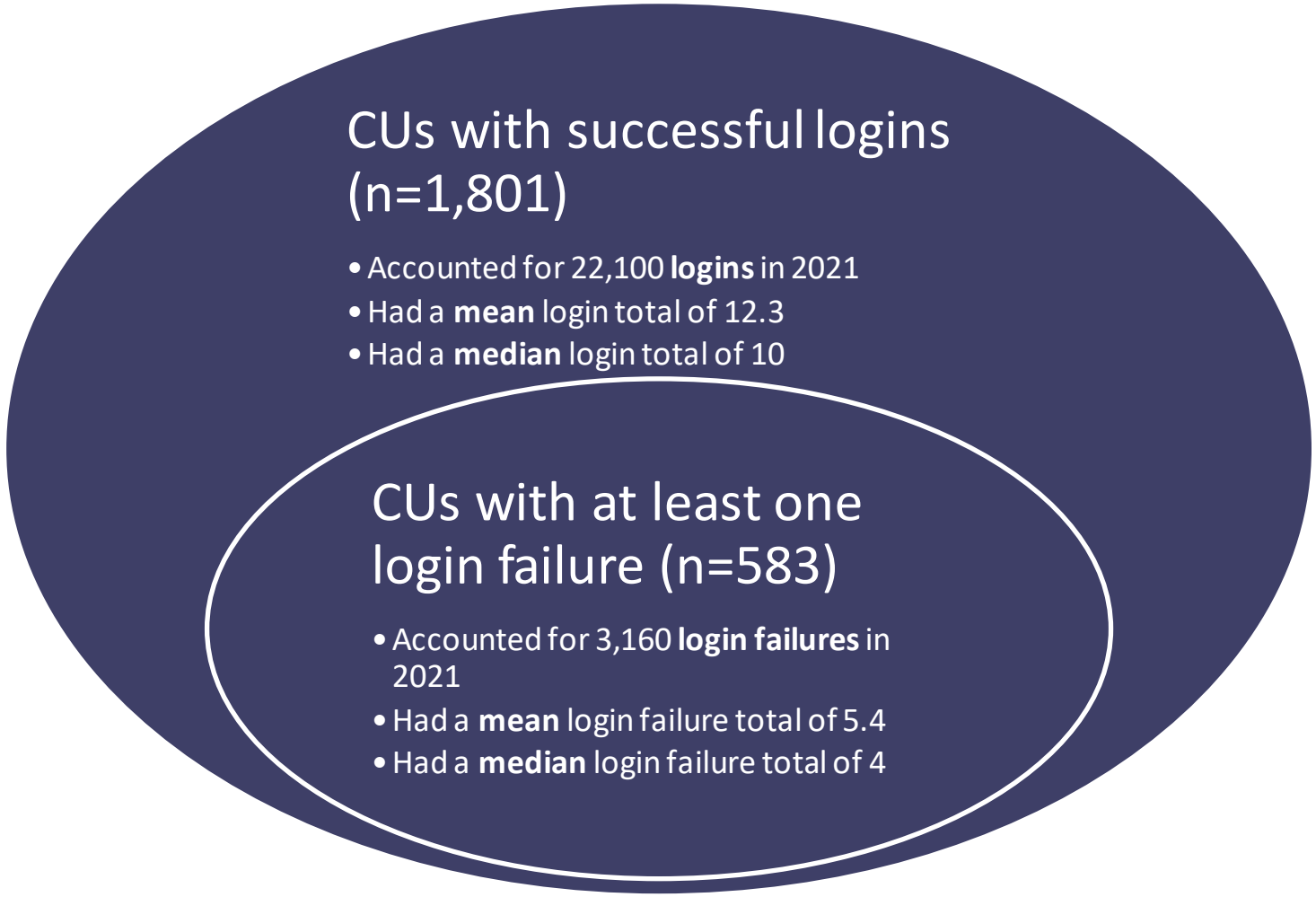
1. **Diary Use and Logins**
2. Devices and Operating systems
3. Time spent in the Diary
4. Relation to CE Data Quality

Online Diary Use

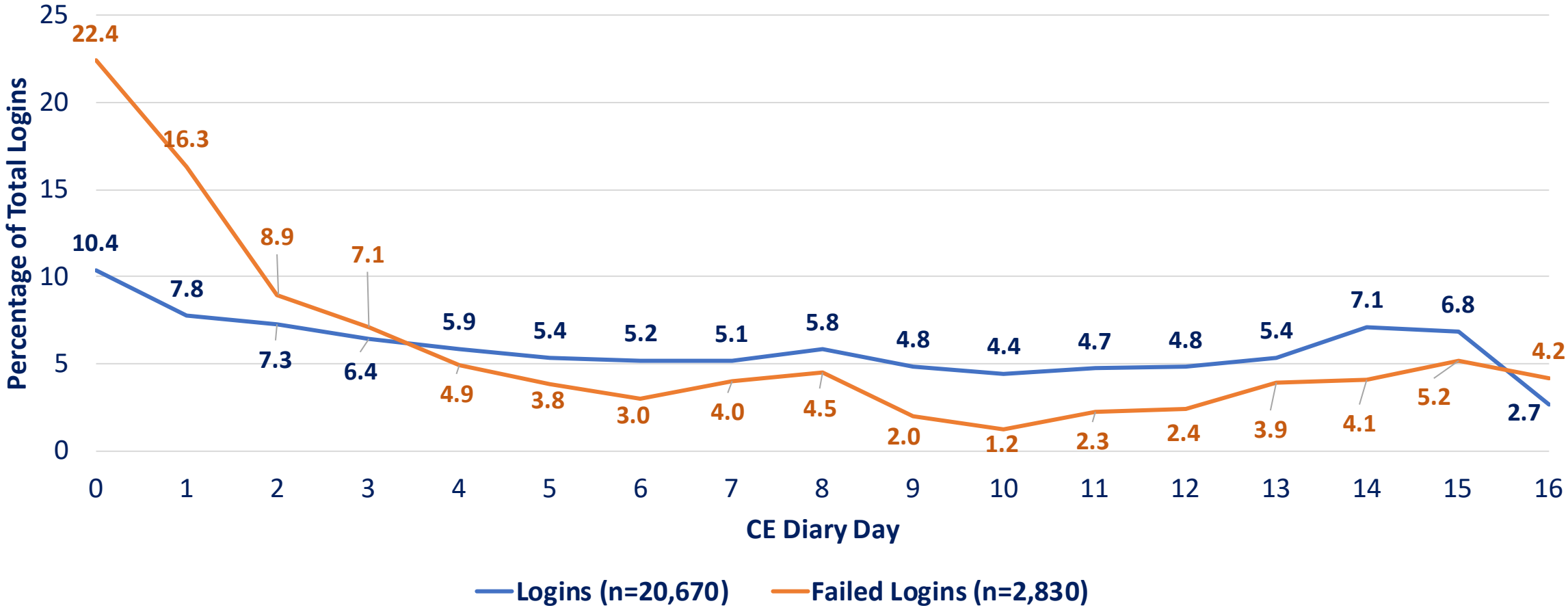
- 1,877 unique Consumer Units (CUs) with online diary credentials
  - **1,801 successfully logged in**
  - 76 never successfully logged in



Login Activity



Percentage of Logins by Diary Day in 2021



Paradata Analysis Results

1. Diary Use and Logins
2. **Devices and Operating systems**
3. Time spent in the Diary
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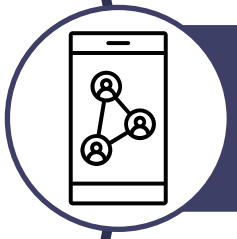
Paradata Analysis: Device Use in 2021

Desktop Only User

- All actions recorded in the paradata associated with a desktop
- Accounted for 1,162 or 64.5% of CUs



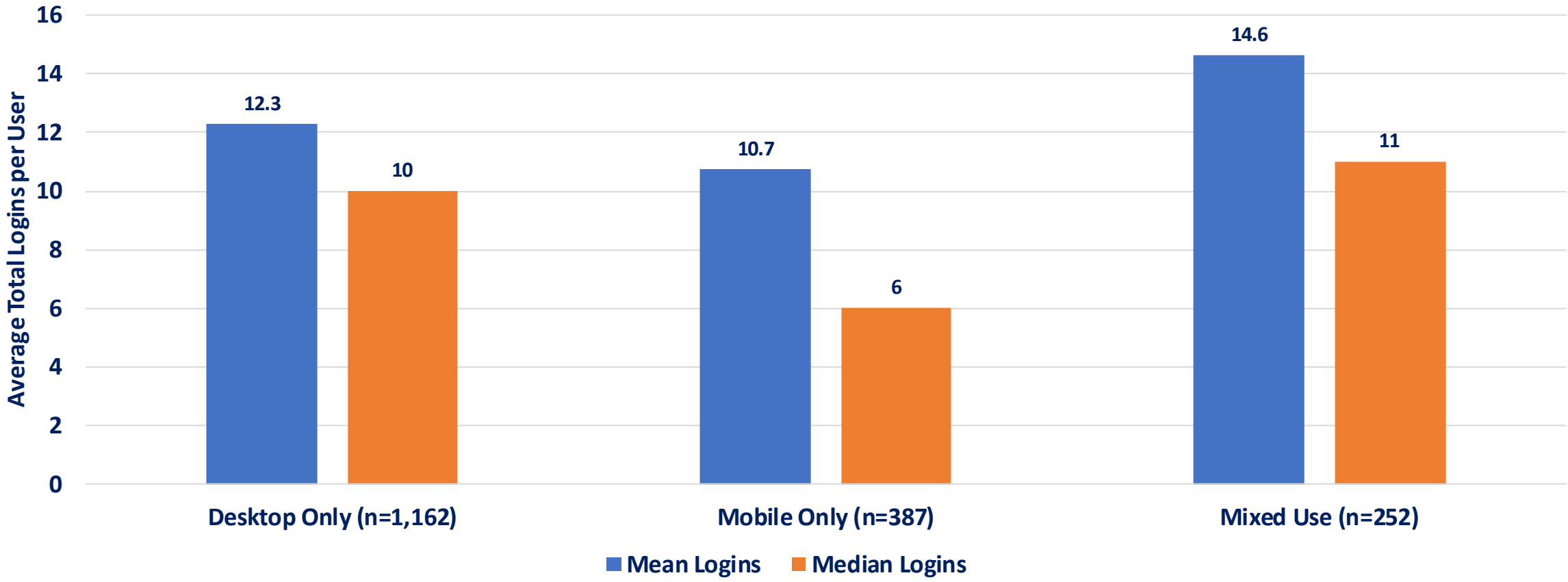
Mobile Only User

- All actions recorded in the paradata associated with a mobile device
- Accounted for 387 or 21.5% of CUs

Mixed Device User

- Actions recorded in the paradata split between desktop and mobile devices.
- Accounted for 252 or 14.0% of CUs

Login Activity Comparison by Device Use



Paradata Analysis Results

1. Diary Use and Logins
2. Devices and Operating systems
3. **Time spent in the Diary**
4. Relation to CE Data Quality

Paradata Analysis: Time Spent in the Diary

- Time Spent in the Diary Per User $= \frac{\sum_{t=1}^{n}(Event_t - Event_{t+1})}{60}$
- Action/Event Types:
  - Login
  - Hyperlink (click)
  - Failed Login
  - Next Action
  - Logout
  - Previous Action
  - Entry
  - Field Change
  - Exit
  - Error Trigger

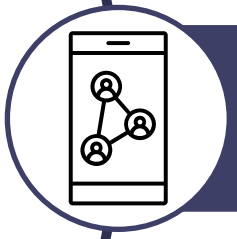
Paradata Analysis: Time Spent in the Diary

- 1,606 CUs had sufficient diary activity for the total time calculation in 2021.
  - Mean of 33.5 minutes
  - Median of 24.2 minutes

Time Spent in the Diary by Device Type

Desktop Only User

- Mean of **36.7 minutes**
- Median of **27.5 minutes**



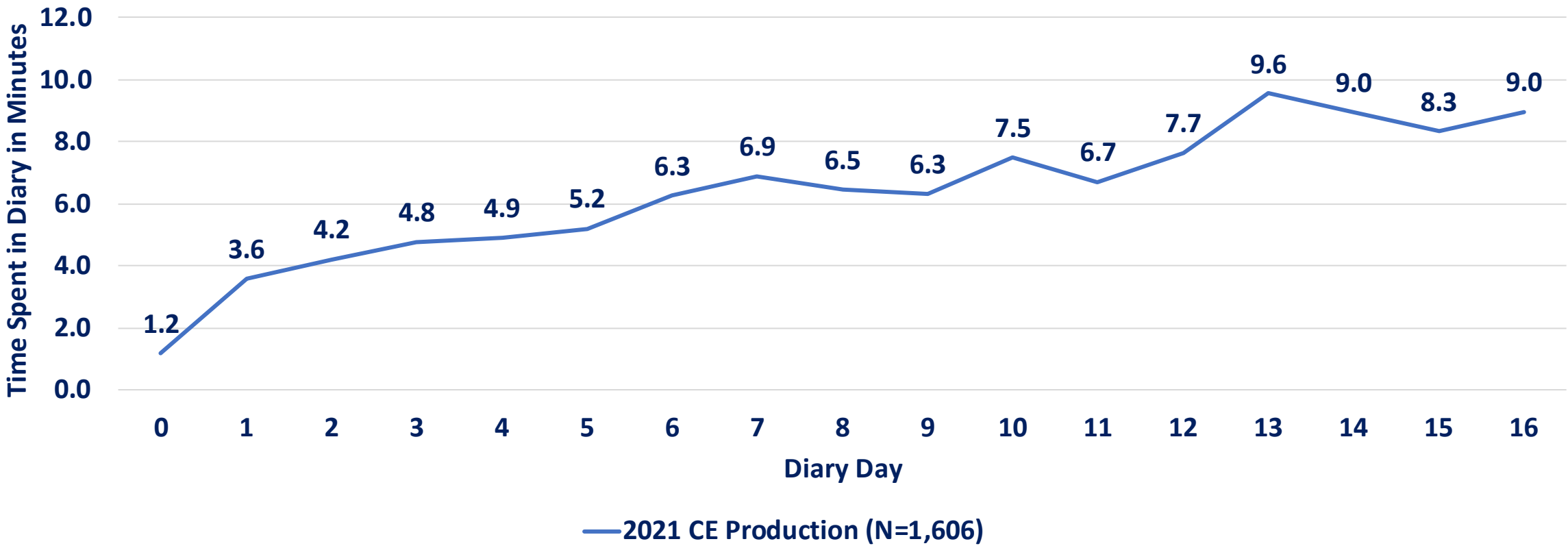
Mobile Only User

- Mean of **19.7 minutes**
- Median of **10.3 minutes**

Mixed Device User

- Mean of **35.7 minutes**
- Median of **26.5 minutes**

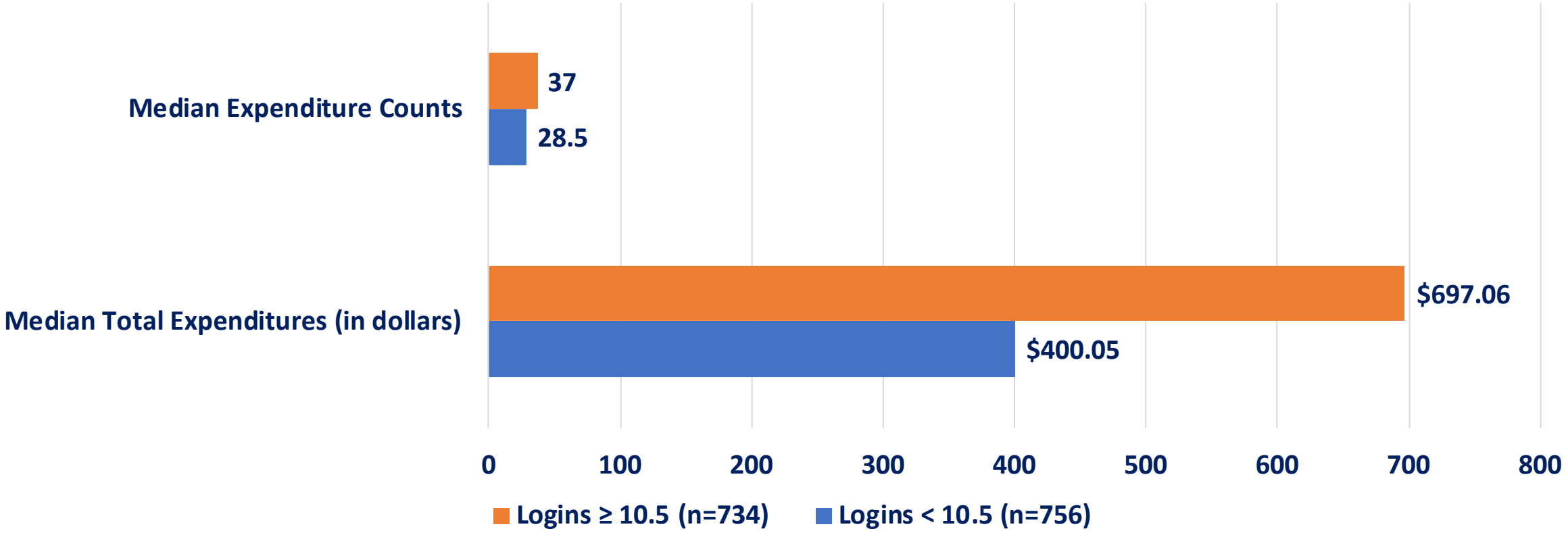
Median Time Spent in Diary per Diary Day



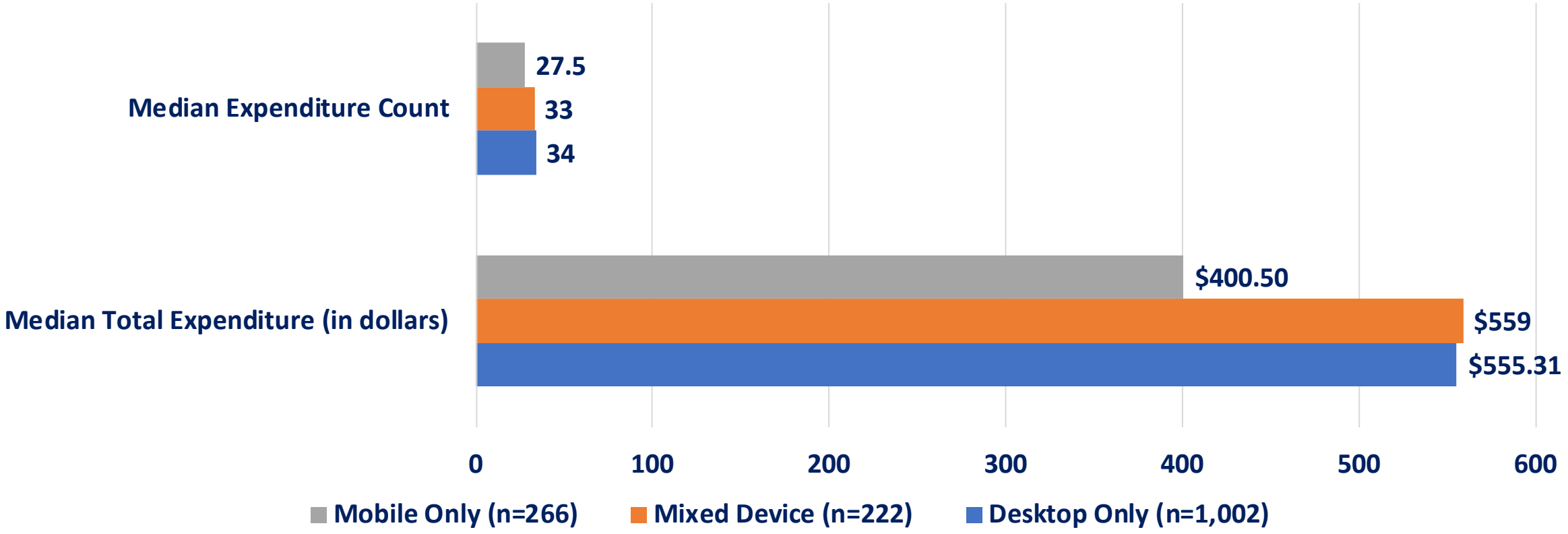
Paradata Analysis Results

1. Diary Use and Logins
2. Devices and Operating systems
3. Time spent in the Diary
4. **Relation to CE Data Quality**

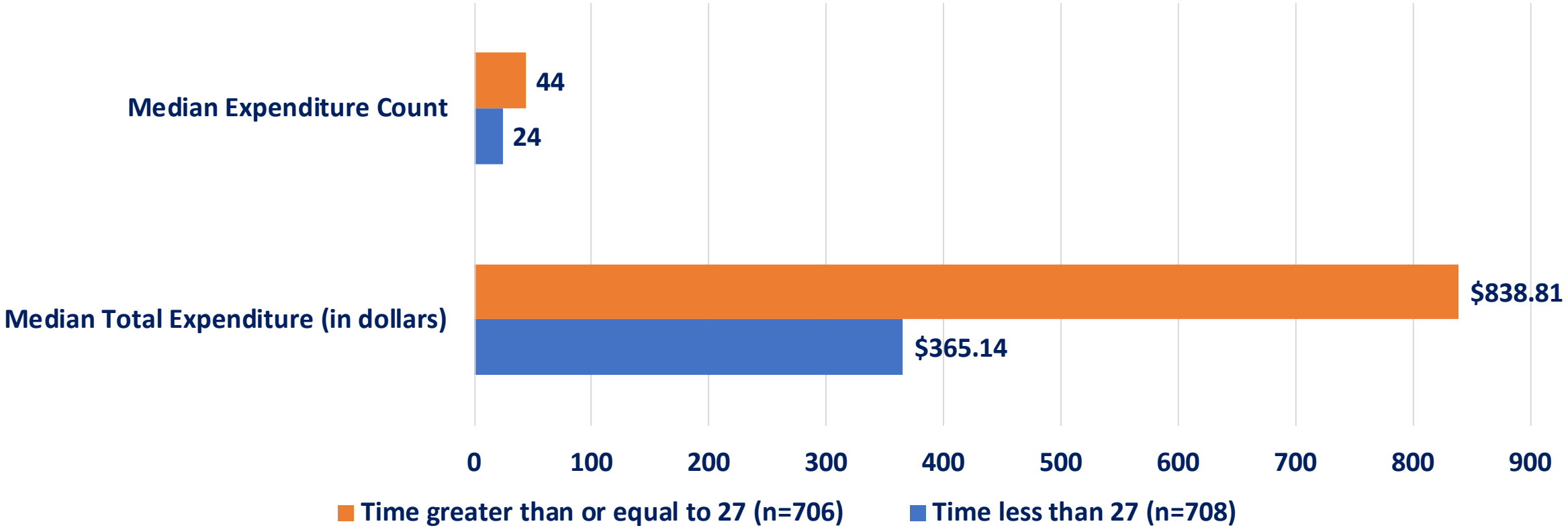
Login Activity Relation to CE Data Quality



Device Use Relation to CE Data Quality



Time Spent in Diary Relation to CE Data Quality



End of Paradata Analysis Results

Paradata Analysis Conclusions

- Granular detail of paradata allows researchers to look at diary keeping behavior from new perspective.
- Greater time spent in the diary and login activity were associated with higher quality data.
- Respondents using non-mobile devices outperformed those only using a mobile device.

Paradata Analysis Next Steps

- Incorporate average total logins and median total time spent in the diary into the CE Data Quality Profile as standard metrics.
- Continue to tweak the calculation of ‘time spent in diary’ for the most precise estimate.
- Revaluating values and naming convention for the variables in the paradata.
- Encouraging respondents to use non-mobile devices

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