

Adapting Qualitative Pretesting Methods to Aid Development and Evaluation of Electronic Data Transfer Techniques to Augment Survey Collection

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Goal of the Data Collection Methodology and Research Branch (DCMRB)

Improving data quality while reducing nonresponse and respondent burden

- Using qualitative and quantitative research analyses to:
 - Identify, understand, evaluate, and reduce errors related to survey measurement (response) and nonresponse
 - Assist with designing experiments to evaluate the effectiveness of alternative contact strategies for data collection
 - Conduct studies of paradata and adaptive design strategies
- Talk with respondents (Rs) and represent the respondent and their perspectives on survey teams
- Ultimately, the outcome of our research is to help all of the survey programs
 - Improve and create understandable and less burdensome survey questions for respondents
 - Improve their data collection instruments - to make the questionnaires/web 'forms' easier and more intuitive for Rs to use

Overview

Contents:

- Commodity Flow Survey Background
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 - Application to CFS
 - Key Findings from Research
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 - Application to CFS
 - Key Findings from Research
- Respondent Debriefings
 - Application to CFS
 - Key Findings from Research
- Future Work

Commodity Flow Survey Background

Primary actions that respondents struggled with:

- Prior cognitive testing and direct feedback from respondents revealed the most difficult aspects of compiling the data for the Commodity Flow Survey:
 - Often **manual process of creating a sample of their shipments**
 - Process of **matching their company's commodity descriptions to the Census Bureau's commodity codes (had to look up codes in SCTG Code list)**
- Several respondents from larger companies reached out to the Census Bureau voluntarily to inquire about providing *a majority* of their shipment data as opposed to a sample, in a more easily accessible format.

If you prefer to complete the questionnaire online, please go to <https://econhelp.census.gov/lcfs>

Item F SHIPMENT CHARACTERISTICS

NOTE: Each line runs across pages 4 and 5. After entering column (I) data on page 4 for any line, continue with column (J) on page 5 for the same line.

Line No. (A)	Your Shipment ID Number (B)	Shipment Date (C)		Shipment value (excluding freight charges and excise taxes) in whole dollars. Estimates acceptable. (D)	Net Shipment Weight in pounds. Estimates acceptable. (E)	For shipments consisting of more than one commodity, report the code and description of the commodity that contributed the greatest weight of the shipment in columns (F) through (I)			Continue with column (J) on page 5	
		Month	Day			SCTG commodity code from accompanying booklet ¹ (F)	Commodity Description ¹ (G)	Is item in col. (G) Temperature ^{1,2} controlled? (Y/N) (H)		Is item in col (G) a hazardous material? Enter "UN" or "NA" ¹ number (I)
Ex.1	123-5	4	26	224,235	4,840	34520	Mechanical machinery	Y		➔
Ex.2	402H	4	26	1,375	50,125	20222	Sulfuric acid	N	1830	➔
1										➔
2										➔

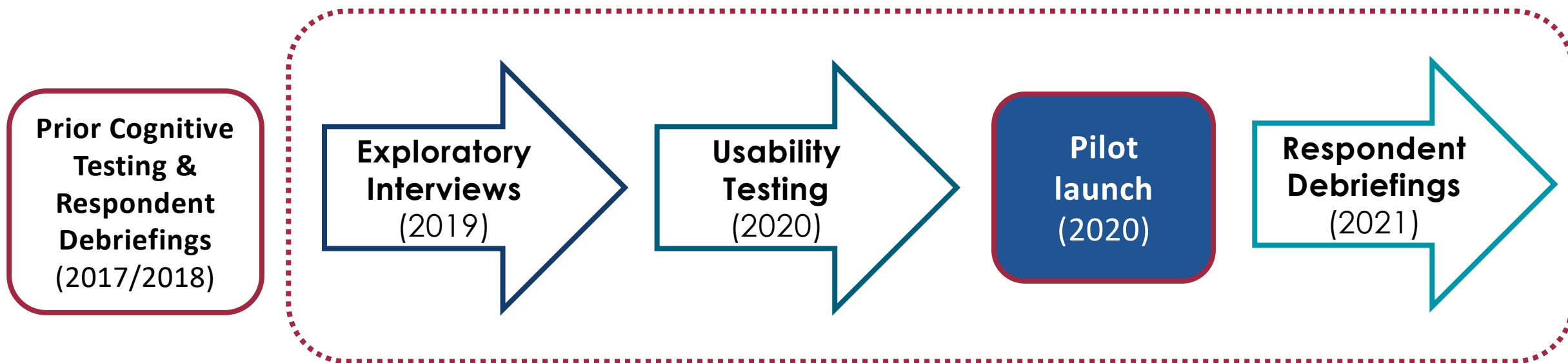
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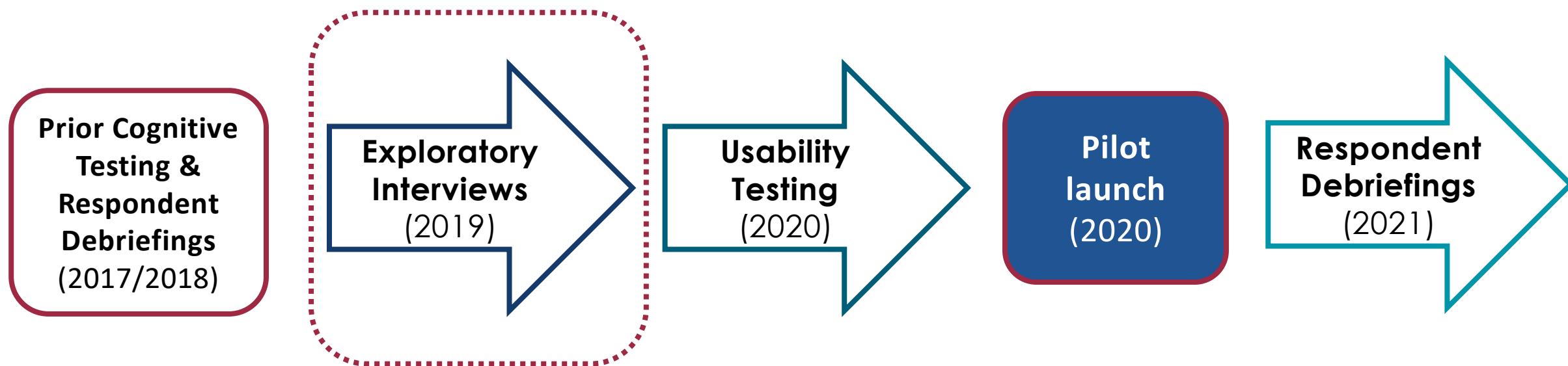
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1										→
2										→

Timeline



Timeline



Exploratory Interviews

Overview

- Exploratory interviews generally focus on:
 - Discussion of a survey concept in general
 - Respondents' **ability to collect and report** requested information
 - **Identifying** related **issues/topics** to take into consideration during question development
 - Early vetting of data collection processes (e.g., advanced letters, flyers, follow-up materials)
- Designed to help solidify a **CONCEPT** into a usable **QUESTION**; usually conducted **prior to question/questionnaire development**

Exploratory Interviews for the CFS Pilot

How was this research applied to the Commodity Flow Survey Pilot?

- For the pilot, this research represented a slight shift from the usual format because in this case we diverged from testing *questions* to exploring a completely different way of collecting raw data, as well as a more solidified plan for what to embed into the pilot test.
 - We also had to determine the best way to *communicate* this new process in a clear way to respondents
-
- From April through October 2019, 34 in-person exploratory interviews were conducted
 - In-person exploratory interviews were conducted to explore several research questions:
 - How feasible is it for companies to implement this new method of data collection?
 - Can requested pieces of data be provided en masse?
 - How would respondent burden be affected by this data collection change?
 - Do respondents have access to CFS data in their records?
 - How easily accessible are these records?

Key Findings from the Exploratory Interviews

Feasibility and willingness to provide larger amounts of shipment data:

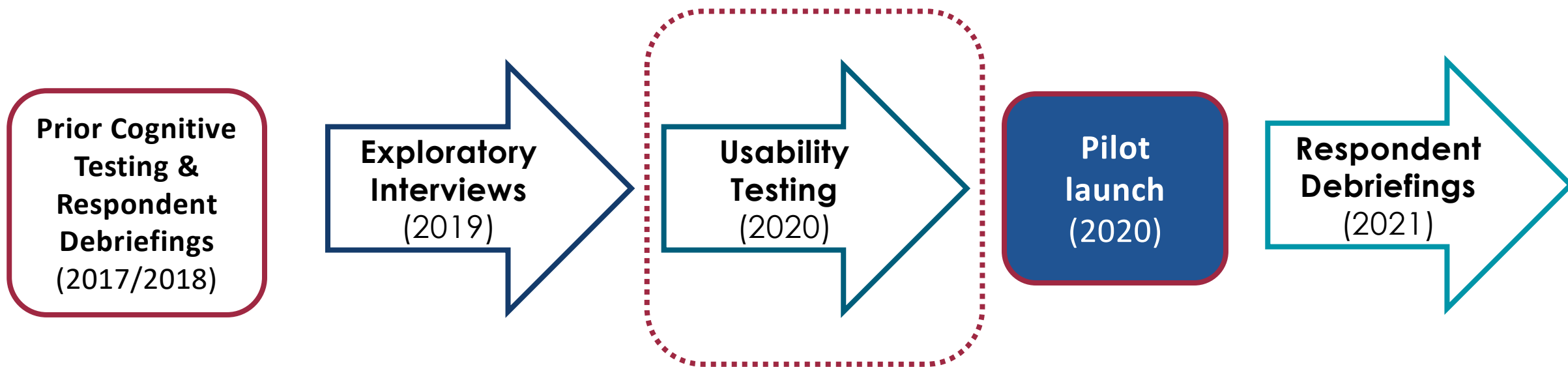
- Companies with fully electronic record systems generally expressed that providing a larger amount of their shipments as opposed to a sample of them *would reduce their reporting burden*. This was somewhat correlated with size of company.
 - Some participants were comfortable providing a full year's worth of data
 - Sometimes even if the files are electronic, they may be stored in separate databases that are not connected

Key Findings from the Exploratory Interviews

Commodity Descriptions

- Nearly all of the respondents retain descriptive data
- A majority of this data was easily understandable in laymen's terms
 - Some descriptive data not easily understood outside of the industry or company. May have to verify with respondent.
- Most respondents can provide item level descriptive data easily.
 - Some respondents have their product descriptions broken out into multiple columns
 - Respondents asked what piece would be best to report
 - Caveat: CFS requests shipment level data, whereas often descriptive data is item-level

Timeline



Usability Testing

Usability Testing Overview

- Similar in technique to cognitive testing but focuses on the usability of an electronic data collection instrument
 - Layout
 - Navigation
 - Functionality
- Respondents are given tasks designed to ensure they interact with key features (e.g., asked to enter erroneous information to trigger edit messaging)
- Three measures of evaluation:
 - Effectiveness: are users successfully able to complete specified tasks?
 - Efficiency: the number of steps it takes a respondent to complete a task
 - Satisfaction: self-rated measure or qualitative comment elicited during the testing that demonstrates the respondents' perceived ease of use and level of frustration with the product of interest.

Usability Testing for the CFS Pilot

How was this research conducted for the Commodity Flow Survey Pilot?

- Unexpectedly had to pivot to virtual visits. Four total participants screenshared with researchers
 - Originally slotted for May through August. Ended up occurring in September.
- Goal of testing was to:
 - Evaluate the instrument's performance in terms of efficiency, accuracy, and user satisfaction
 - Identify areas of the instrument that are problematic for users
 - Identify instructions/features that are difficult for users to understand
 - Provide recommendations for improvements to the design of the instrument that will enhance its usability

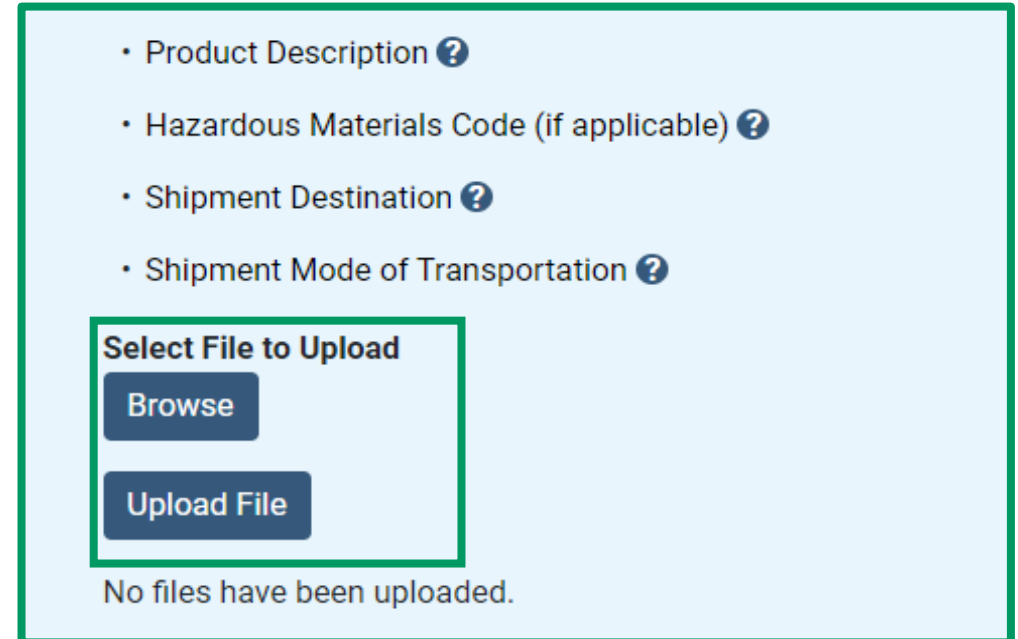
Usability Testing for the CFS Pilot

- Participants completed 8 total tasks designed to mimic the steps a respondent would take while completing the actual survey. Some examples included asking participants to:
 - Update a location listing to reflect a closed status.
 - Upload a pre-made dummy file of shipment data OR download the template before uploading the dummy data to the site
 - Errors were embedded in the dummy data, and respondents were asked to resolve them
 - Both single issue errors and multi-row errors
 - Interact with the commodity description (Machine learning) screens

Key Findings from Usability Testing

Key Findings:

- The Browse button needs to be front and center and not below the fold (depending on size of screen/browser)
- Some participants wanted to select Upload before browsing for the file. Grey out Upload button until Browse has been selected. Indicate the file has been selected/uploaded successfully.
- Access to a template was a very desired feature



The screenshot shows a light blue form interface. At the top, there is a list of four fields, each with a question mark icon: "Product Description", "Hazardous Materials Code (if applicable)", "Shipment Destination", and "Shipment Mode of Transportation". Below this list is a section titled "Select File to Upload" which contains two buttons: "Browse" and "Upload File". The "Upload File" button is greyed out. Below the buttons, the text "No files have been uploaded." is displayed.

Key Findings from Usability Testing

Key Findings:

- Respondents did seem to know how to take requested actions, but *confirmation* of those actions being accepted was consistently unclear
 - For example, when selecting Submit and Continue in the modal window, it wasn't clear to respondents that their selection had been accepted, if a new question from a different row of data then was asked

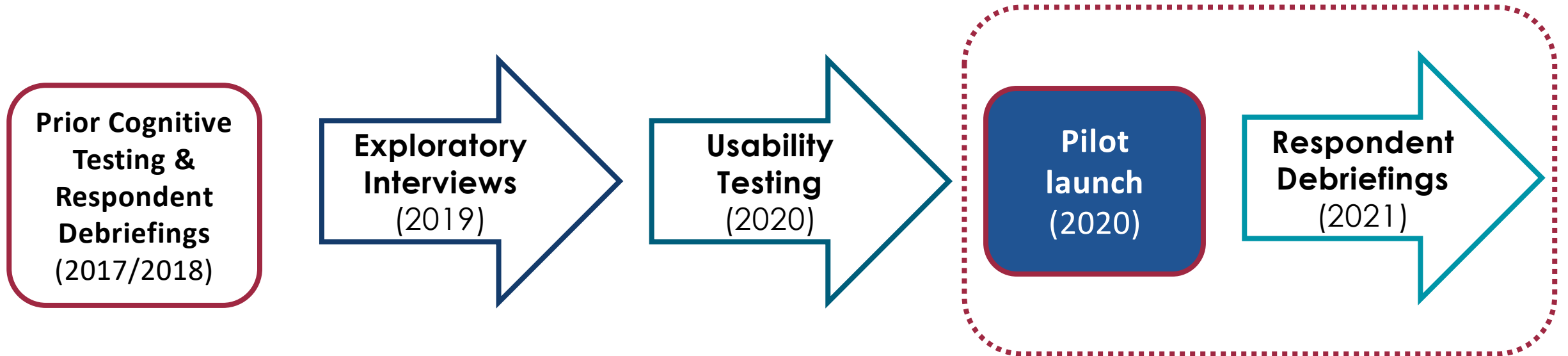
The screenshot shows a modal window titled "Fix Error". On the left is a table with the following data:

Row #	43
Facility ID	AB123
Date	9/1
Dest. City	Springfield
Dest. State	AZ
Dest. ZIP	12345
Value	99
Weight	42
Desc.	Honey

Below the table is a "1 of 1" indicator. To the right of the table is a survey question: "Which of these categories best describes this product?". The options are radio buttons for "Food", "Recycling", "Bees", and "None of these. Please describe.". Below the question is a text input field. At the bottom right are two buttons: "Submit and Continue" and "Skip".

**Note this is fictional data*

Timeline



Pilot Launch

November 2020

- Sent email request for participation to 500 previous CFS respondents
 - 400 mid to large companies
- Roughly 100 responded
 - About 30 provided a spreadsheet of their shipment data

Respondent Debriefings

Overview

- Conducted after data collection
 - Respondents take on the role of informant rather than respondent, which can result in a survey instrument that is better attuned to the respondents' needs
- Respondents are asked questions about the answers they provided in order to:
 - Understand the respondent's interpretation of the questions
 - Evaluate if respondent understood the question as intended
 - Identify problems or issues with the questions or the data collection instrument
 - Identify the source of the data (and any relevant inputs)

Respondent Debriefing Interviews for the CFS Pilot

How was this research conducted for the Commodity Flow Survey Pilot?

- In January and February 2021, researchers spoke with 12 participants using Skype for Business
- Researchers conducted semi-structured, protocol-guided conversation with respondents who previously interacted with the Commodity Flow Survey Pilot instrument
- Respondents were asked about their response strategies, data sources, reflections, and other interactions with the survey design to identify issues within the context of the survey response process.

Key Findings from Respondent Debriefings

Key Findings Upload Method:

- Participants responded positively to this upload method
- Some respondents wondered how “messy data” would be handled by our system. One person described how they regularly have to look at the data and manually remove messy data.
- Many respondents used the template feature. A few did not realize it was available but stated they would have used it.

Key Findings from Respondent Debriefings

Key Findings Commodity Descriptions:

- Respondents were consistently unsure what level of detail to provide
 - *“wasn't sure...we're selling tires and wheels, [are you] asking for generic tire or a detailed description of size? ...We have very specific descriptions...Give an example of description...More generic description of products, just tires or outdoor power equipment.”*
- Respondents wondered about company specific descriptions
 - *“Our product descriptions are unique to our company”*

Future Work

Conclusions:

- Our various qualitative pretesting methodologies allowed for respondent input across the various stages of survey/instrument design.
- The ability to adapt to business modern data storage practices, and collect data in a new way that's as natural as possible for the respondents, should allow the Commodity Flow Survey to collect more complete data with less respondent burden.

Next Steps:

- Usability Testing of the production instrument (2022), with the pilot findings integrated
- Continuing assistance with design of the instrument

Thank you!
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