

turning knowledge into practice

Challenges of Designing and Implementing Multimode Instruments

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RTI International is a trade name of Research Triangle Institute

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- First, thanks to co-authors and the many others at RTI who have worked on these studies

Why Multimode?

- NCES postsecondary studies – primarily CATI in the past, with some CAPI
- NCES required the addition of the web self-administered option to help offset the decline in survey response rates
- Characteristics of our postsecondary populations
 - Technologically savvy
 - Unconventional schedules
 - Cell phones replacing land lines
- Time and money

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- NCES began requiring multimode approach in 2002 for their PSE studies
 - To counteract declining response rates
- Ideally suited to postsec population
 - Technically savvy
 - Hard to reach
 - Flexibility of the web – scheduling convenience
 - Increasing use of cell phones in place of land lines
- Multimode approach believed to increase efficiency and reduce costs associated w/ telephone data collection

- This presentation will focus on the following issues:
 - How do we design it?
 - How do we encourage participation?
 - How do we evaluate data quality?

Data Collection Methodologies Used for the Postsecondary Studies

Study	Abbreviation	Year of data collection	Postsecondary population		Data collection methodology		
			Students	Faculty	Web	CATI	CAPI
1993/2003 Field Test of the Baccalaureate and Beyond Longitudinal Study	B&B FT	2002	✓		✓	✓	✓
1993/2003 Baccalaureate and Beyond Longitudinal Study	B&B FS	2003	✓		✓	✓	✓
2003 Field Test of the 2004 National Postsecondary Student Aid Study	NPSAS FT	2003	✓		✓	✓	
2004 National Postsecondary Student Aid Study*	NPSAS FS	2004	✓		✓	✓	
2003 Field Test of the 2004 National Study of Postsecondary Faculty	NSOPF FT	2003		✓	✓	✓	
2004 National Study of Postsecondary Faculty*	NSOPF FS	2004		✓	✓	✓	
2004 Field Test of the 2004/06 Beginning Postsecondary Students Longitudinal Study*	BPS FT	2005	✓		✓	✓	✓
2004/06 Beginning Postsecondary Students Longitudinal Study	BPS FS	2006	✓		✓	✓	✓

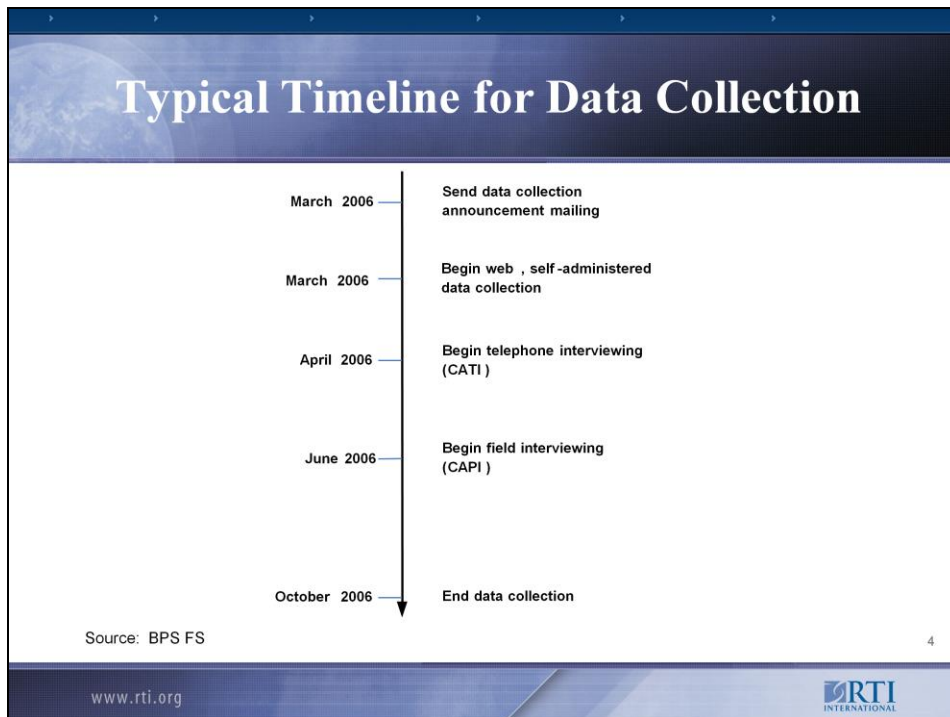
Source: National Center for Education Statistics, <http://www.nces.ed.gov/surveys/>. * = report under review

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- Results from 7 field test and full-scale data collections conducted for NCES since 2002
 - 5 are student-based surveys
 - 2 are surveys of postsecondary faculty
- These studies are related
 - NPSAS is a recurring cross-sectional survey of students enrolled in all types of PSE
 - BPS & B&B are two longitudinal follow-up interviews of cohorts identified in NPSAS
 - The alternate
 - B&B of graduating seniors
 - BPS of first-time beginners
 - NSOPF conducted w/ NPSAS in 04 as part of NSOFAS
- Data collection modes include CATI, web, and CAPI for the longitudinal follow-up interviews
- Those w/ * -- meth reports still under review
- BPS FS to begin data collection soon



- Quick overview of multimode data collection design and timeline
 - For a study that starts in March with a data collection period of about 7 months
- KEY POINTS:
 - EARLY RESPONSE PERIOD
 - SEQUENTIAL NATURE OF MODES
- Web self-administered begins
 - Early response period
 - Data collection announcement
 - 4 weeks to respond
 - Help Desk available
- CATI
 - Begins after 4 weeks
 - Web still an option
- CAPI (longitudinal only)

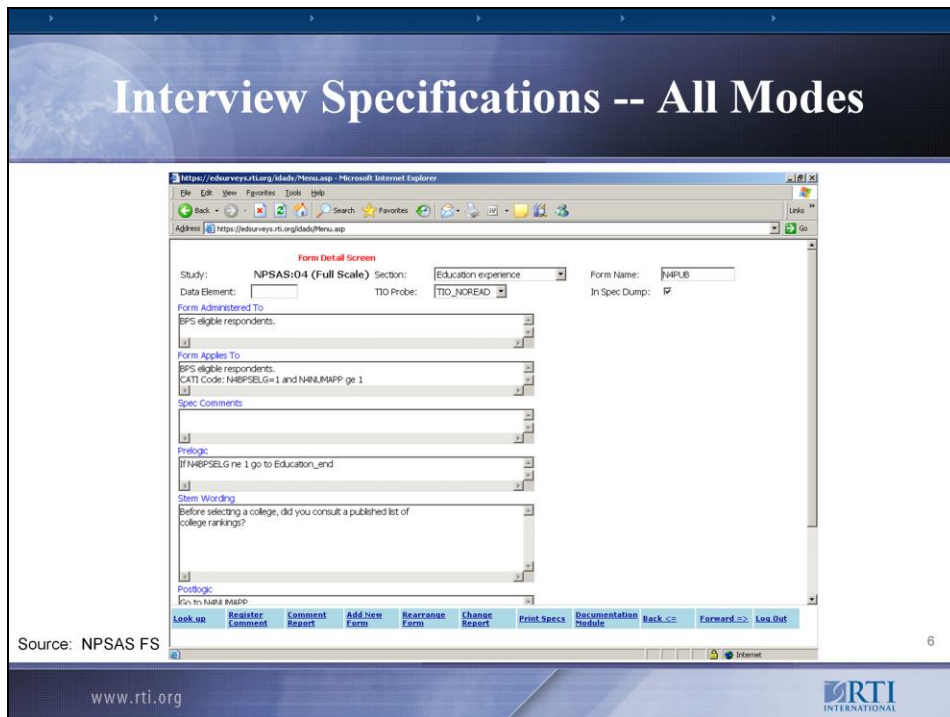
- For those hard to reach by CATI and in clustered locations

Multimode Design Challenges and Adaptations

Challenge	Adaptation
Similar interview experience despite administration mode	<ul style="list-style-type: none"> ▪ Design a single web-based instrument for use in all modes
Encouraging web participation	<ul style="list-style-type: none"> ▪ Early response incentives ▪ Prompting
Excessive burden on respondents	<ul style="list-style-type: none"> ▪ Streamlined code ▪ Pipeline ▪ Access speed
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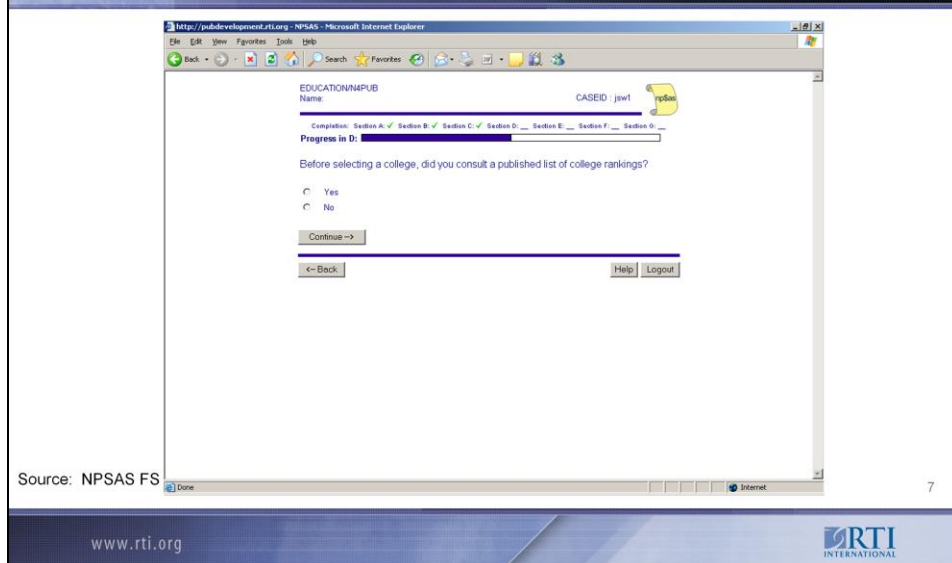
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- Now that we've decided to use the multimode approach, how do we implement it in a way that **achieves the goal of increasing response rates** while at the same time **collecting the highest quality data**?
- To minimize the potential error that can be introduced by using multiple data collection modes, **we need to make the interview experience as similar as possible -- despite mode --** to the extent that we can
- To respond to this challenge, we develop **ONE** instrument in a web-based system to be administered self/CATI/ and sometimes CAPI
- The next slides illustrate the steps taken during the design process to make sure all SMs respond to the same interview whether they do so via the web, phone, or in person



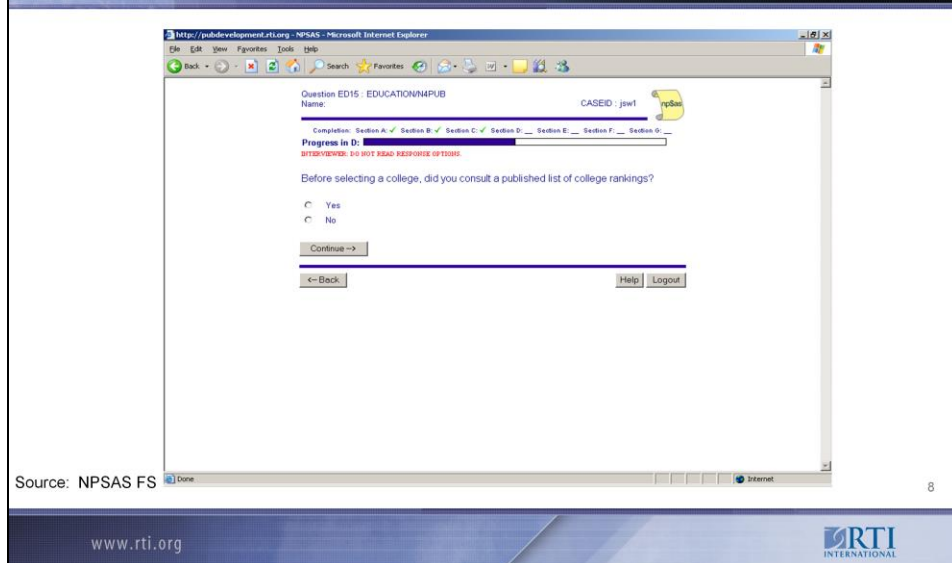
- Sample screen from IDADS – the system we use for instrument development
- Instrument designers can specify question wording w/ conditional logic, response options, and routing for each question
- Can also specify item documentation
 - Labels, format, type, etc
- Designers also specify interviewer instructions to be displayed on screen
 - Some items require that all response options are read aloud to be comparable to the web respondents who can read the list of options
 - Others are not read (e.g. yes, no)
 - Probe used to make sure enough detail is obtained (e.g. **XXYYZZ**)
- Thinking about this here ensures that we keep all modes in mind while developing question wording
- Have to be sure questions are optimally designed for both aural and visual administration

Selected Interview Screen – Web Mode



- Here is the same question we were just looking at in IDADS in the programmed instrument
- One question per screen (for the most part)
- Progress bar
 - Section and whole interview
- Help text on every screen
 - Item specific
 - General, # for help desk

Selected Interview Screen – CATI Mode



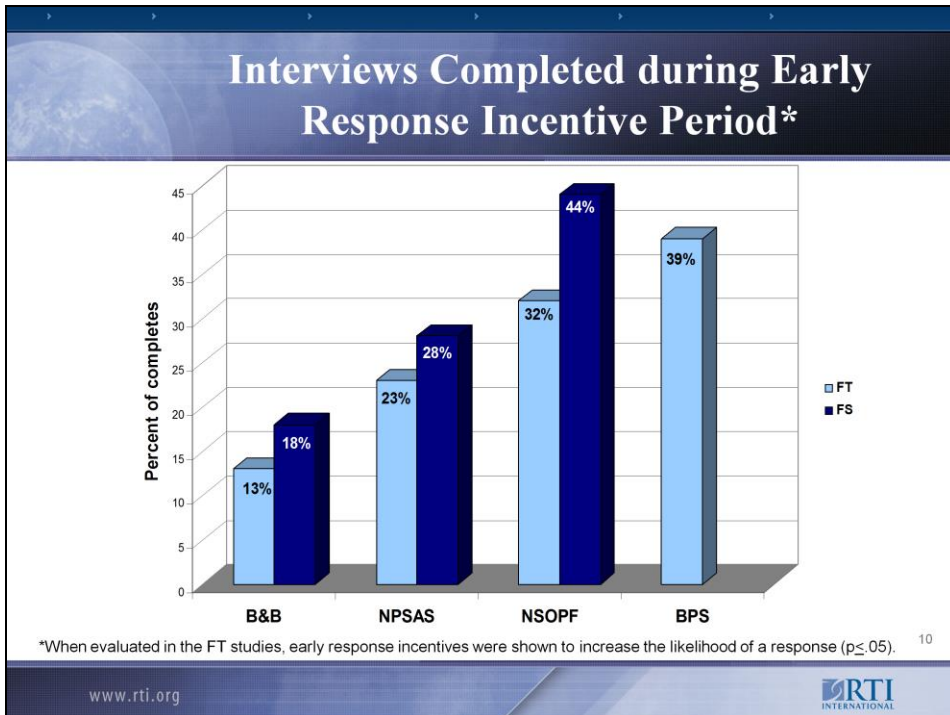
- Same question in the CATI version
- Only difference is the instruction

Multimode Design Challenges and Adaptations

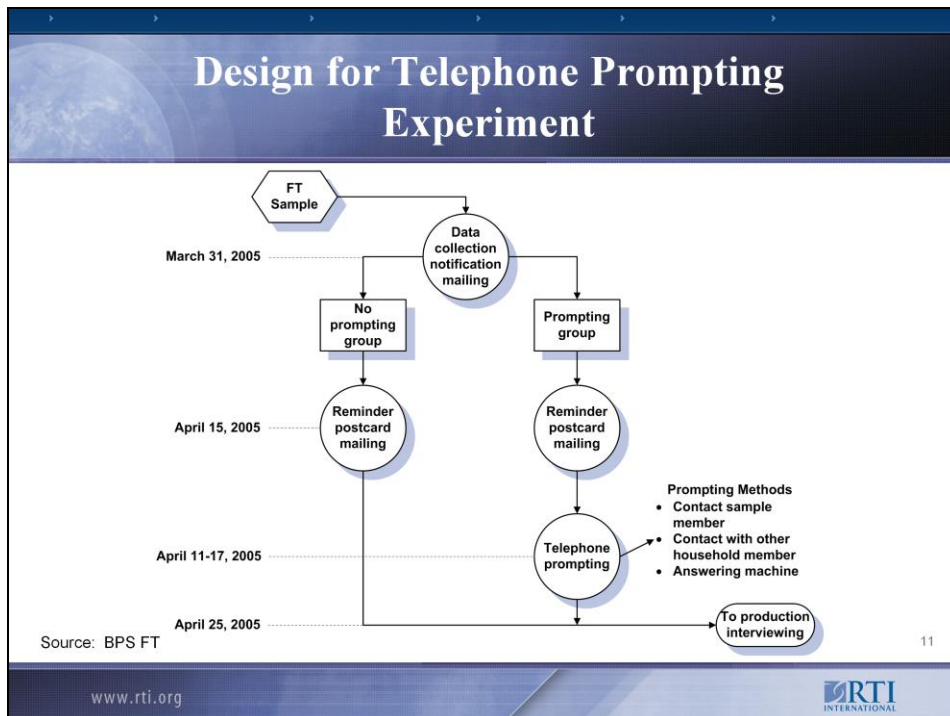
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•how to engage sample members and encourage web participation, especially in the absence of interviewers?



- Incentives offered during early response period
- This graph shows the % of total completed interviews that were completed during the early response period
- Highest early response obtained from PS Faculty but the general trend is clear.



•Another strategy to encourage early response – PROMPTING

•FT in 2005

•FT sample randomly assigned to 2 groups

•TI staff made outbound prompting calls half-way through early response period (after about 2 weeks)

•Prompting outcomes:

•Direct contact


•Left message on machine

•Left message w/ another HH member

•An efficient strategy from a data collection standpoint since calls are made by HD staff who are already trained and available to handle incoming help requests

Type of prompting	Response rates at end of early period
Prompted	21.6*
Not prompted	10.4

* $p \leq 0.1$
Source: BPS FT

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- Results of prompting experiment
- Those who were successfully prompted were more than twice as likely to participate during the early response period than those not prompted
- These are response rates at the end of the early response period – not the final rate at end of data collection

Prompting and Base Year Response Status

	Response rates at end of early period
Base year respondents	
Prompted	25.0
Base year nonrespondents	
Prompted	20.8*
Not prompted	15.1*

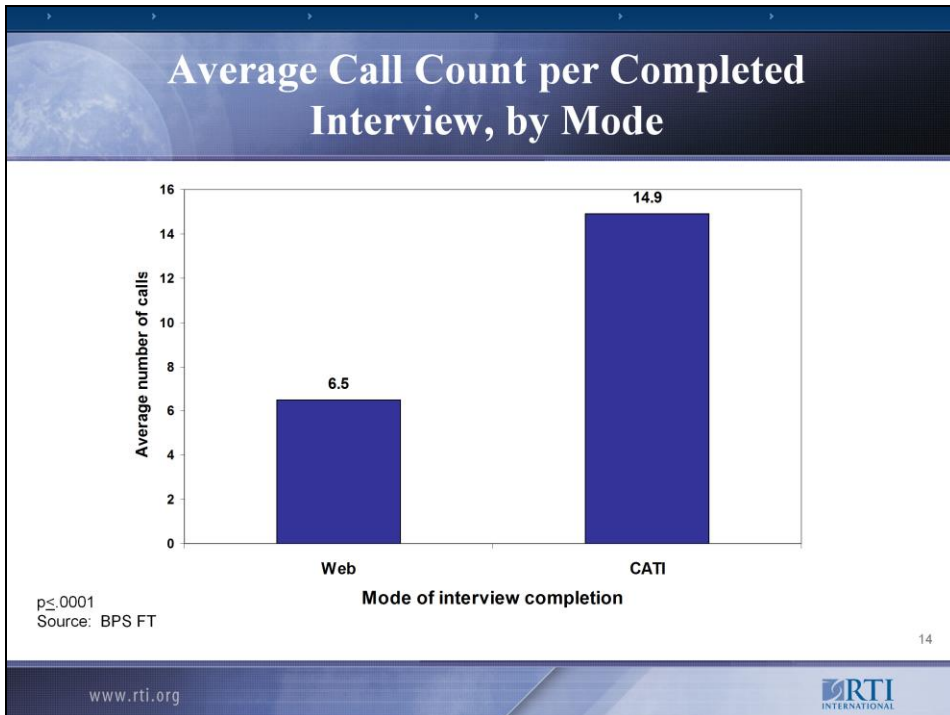
* $p \leq .05$
Source: BPS FT

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- Another important finding from the prompting experiment
- This was the first follow-up in a longitudinal series
- Response rates among base year respondents did not vary with the prompting condition – they were as likely to participate whether or not they were prompted.
- Base year nonrespondents, however, were more likely to participate when prompted
- Most interesting finding is that there was no difference in response rates among base year respondents and nonrespondents when prompted. In other words, the prompting treatment seems to have reduced the likelihood of nonresponse among those who didn't participate in the base year interview that we typically see.
- Value of telephone, even for the web option – it's still a critical part of data collection
- The union of web and phone together – how we've combined them for successful data collection



- Despite the additional calls made for prompting, the average call counts for those who completed during the early period were still lower than for CATI respondents.

- Prompting has the added advantage of helping us to get an early start on tracing activities.

Multimode Design Adaptations

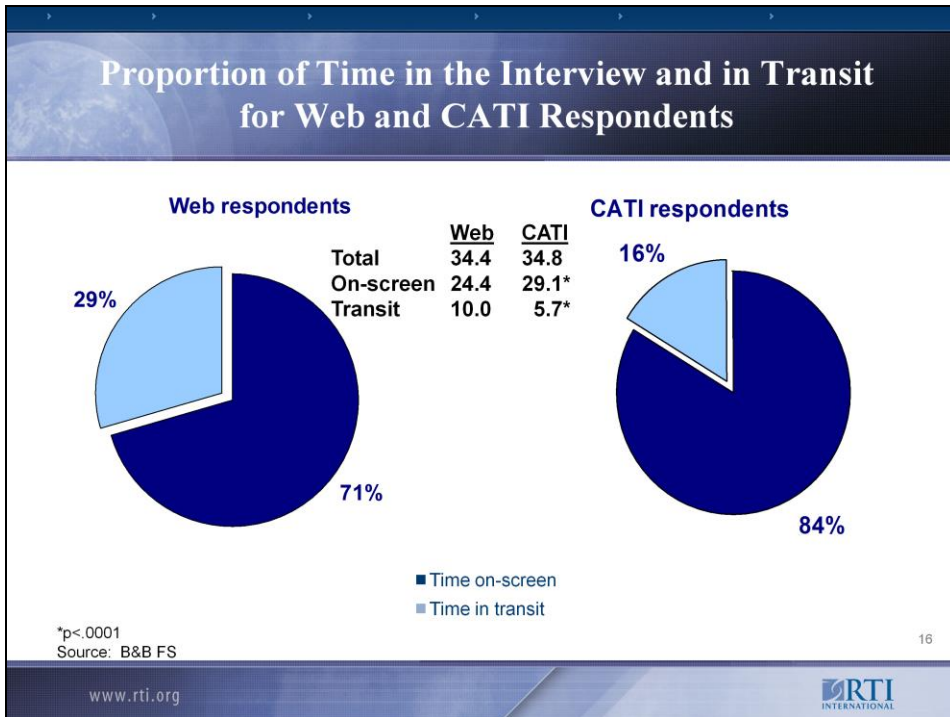
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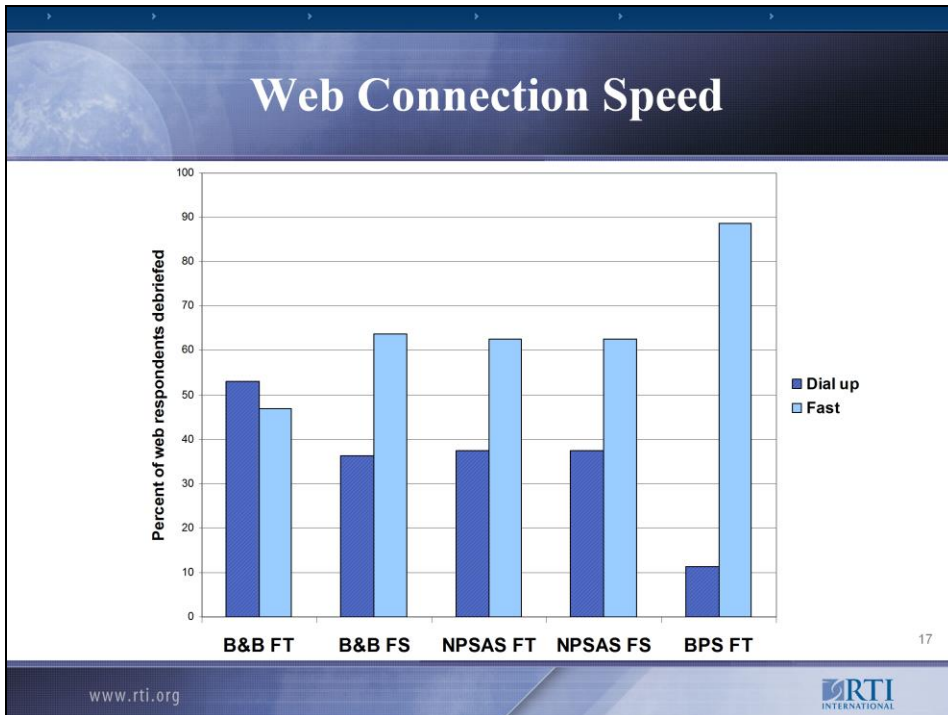
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- Timing is another aspect of the multimode approach that we wanted to monitor
- Ensuring that respondents in one mode didn't experience greater time in the interview than in other modes
- 2002 we saw really long transit times
 - Time between clicking "continue" and when the next screen is displayed
- Those doing web took longer to complete than CATI interviews
- Several related issues
 - Still lots of respondents using dial-up modems. We have since encouraged telephone interviews unless there is access to a fast connection
 - Our programmers have since worked to streamline the program code and database structure to ensure that it's working at maximum efficiency
 - Dept of ED expanded the server pipeline
- We have since seen a more equitable overall completion time, regardless of mode.



- As just mentioned, the overall times for web and CATI interviews are about the same
- However, that same amount of total time is spent differently depending on mode
- Web:
 - 71% on screen
 - 29% in transit
- CATI
 - 84% on screen
 - 16% in transit



- Much of the difference in transit time is related to the speed of the internet connection
- Our materials and data collection notifications suggest those without fast access call in for a telephone interview
 - Still eligible for the early response incentive

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•Next, going to talk about the resources and support systems we have in place to make sure that all respondents have a similar interview experience, regardless of administration mode.

•The first of these is the HELP DESK, which involves a core staff of specially-trained interviewers available to receive calls from SMs attempting to complete the web interview during the early response period

•Trained to

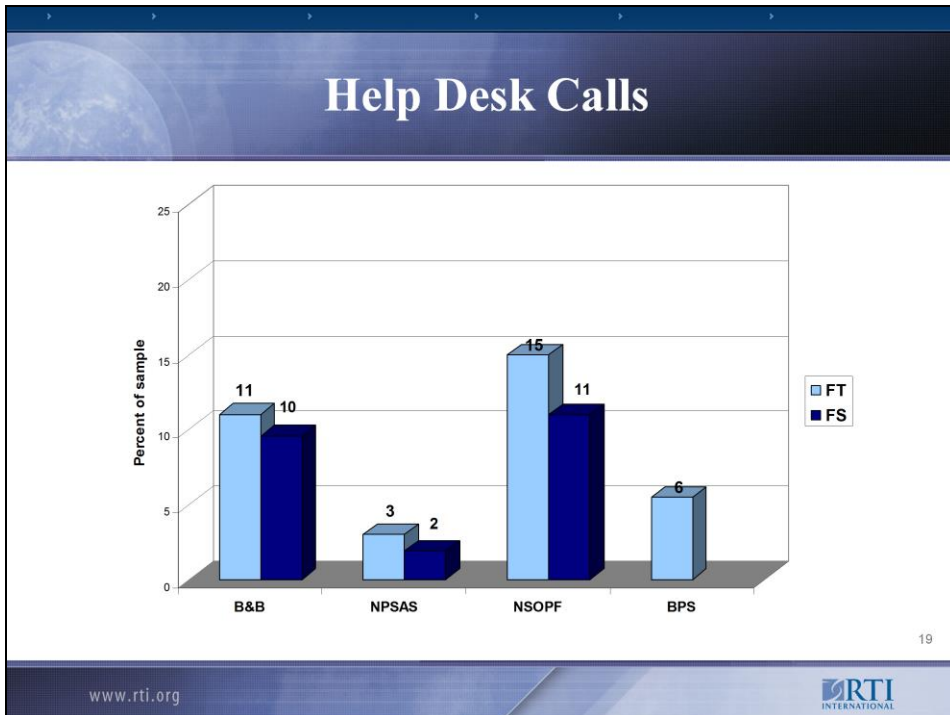
- assist w/ logging in to the secure areas of the website
- Provide important study info (purpose, confidentiality, legitimacy, etc)
- Technical aspects, (browser settings, pop-ups, etc)
- And to complete interviews if requested

•The other is HELP TEXT

- Provides information about interview questions
- Accessible for every interview screen

•TO IMPLEMENT THE INTEGRATED TECHNOLOGY SUCCESSFULLY, WE WANT TO HAVE THE WEB OPTION MIMIC THE BEST FEATURES OF THE INTERVIEWER-ADMIN – do what we can to have the web self-admin option

as good as the TI option



- We have a help desk available to provide assistance to self-admin respondents
- Less than 15% of the sample uses it
- Most frequently cited reason for contacting HD is to get study login information

On-Line Help Text

Question BA10 : BACKGROUND/KEPARST
Name: JOHN DOE CASEID : NA2

Completion: Section A: ✓ Section B: ✓ Section C: ✓ Section D: ✓ Section E: ___ Section F: ___

Progress in E: _____

INTERVIEWER: PROBE AS NECESSARY.

For all questions about your parents, please answer about the parent(s) or guardian(s) from whom you receive the greatest amount of financial support.

What is the current marital status of your parent(s) or guardian(s)?

- Married or remarried
- Living together or domestic partners but not
- Single
- Divorced or separated
- Widowed

Continue →

← Back

http://edsurveysdev.rti.org - BPS:04/06 -- Help - Microsoft...

Select the option which describes the marital status of your parents/guardians.

If your parents are both alive and living together, answer this question about them.

If your parent is widowed or single, answer this question about that parent. If your widowed parent is remarried as of today, answer the questions about that parent and the person whom your parent married (your stepparent).

If your parents are divorced or separated, answer this question about the parent who provided more financial support during the last 12 months, or during the most recent year that you actually received support from a parent. If this parent is remarried as of today, answer the questions on the

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- Another resource in place to assist both self-admin and interviewer-admin respondents is the Help Text on every screen

Rate of Help Text Access by Mode

Description	Number administered to	Number of help text accesses	Percent		
			All modes	Self-administered	Interviewer-administered
Type of associate's degree	12,770	1,300	10.2	2.8	14.2
Class level for non-degree students	6,990	570	8.2	1.9	11.8
School-related job	52,490	3,540	6.7	1.9	10.4
Received vocational rehabilitation services	5,900	390	6.6	1.1	10.7
Graduate assistantships	9,290	480	5.2	1.9	10.6
Type of employer	39,680	2,000	5.0	0.5	8.7
Other aid received	13,920	660	4.7	1.3	9.3
Completed postsecondary class before 7/1/2003	21,400	1,010	4.7	1.9	6.4

p<.0001
Source: NPSAS FS

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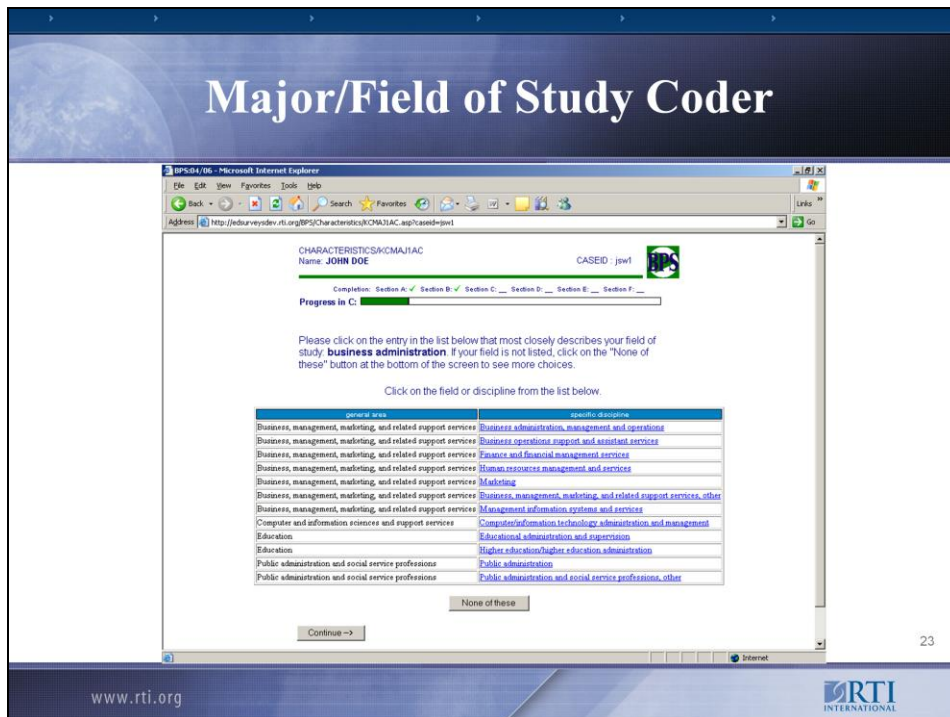
- Results from analysis of HELP TEXT usage from a recent FS study
- Summary of typical finding
 - HT used very little
 - We do see a mode difference
 - CATI uses it more b/c TIs are trained to use it
- We are still concerned about how Rs are understanding our questions

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- Next set of challenges deals w/ potential error introduced by using a multimode approach to data collection
 - One of these challenges is -- How to ensure consistency across modes in the way open-ended responses are coded
 - Our response has been to use "assisted coders"



- Types of items that we typically code:
 - Schools attended
 - Occupation and industry
 - Major/field of study (shown here)
- Our coding systems have been developed for use in all modes
- Also recognize that it has to be clear enough to use without the assistance of an interviewer
- In the past, we have used a series of drop boxes, categorizing things from more general to more specific
- We have found that auto-coders or assisted coders work well
- Means of evaluation: EXPERT CODERS
 - Compare strings and codes
 - Look at error rates overall and by mode
- Overall summary of findings
 - Have seen some mode differences
 - No obvious patterns in one direction or another
 - Few to no mode differences w/ assisted coders

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- Another challenge

- Can we achieve the same level of item reliability now that we have introduced a new data collection method?

Mode Differences in Item Reliability

- Very few items with significant differences between modes, with no patterns evident
- Some studies – NSOPF FT and BPS FT – showed no mode differences on any items

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- In our FTs, we conduct a reinterview of a subset of items from the main interview
- Conducted 3-6 weeks later
- In same mode as main interview
- Reinterviews include items that are new or newly revised, or have been troublesome in past administrations
- Item reliability is evaluated overall and by administration mode
- Here are results from one of our reinterviews
 - Similar response rates for both modes
- Only a very few differences in rate of agreement by mode
- No real patterns were evident
- In 2 of 4 reinterviews, there were no mode differences at all

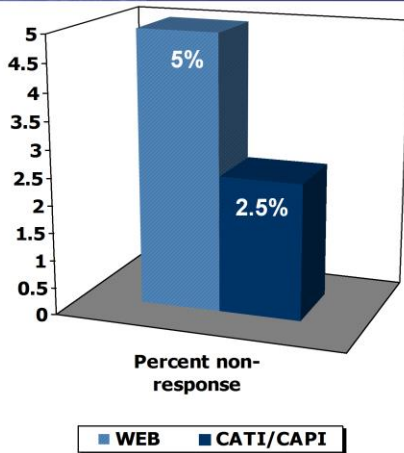
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- Finally, what to do about item nonresponse in the absence of an interviewer?
- *Many issues for web surveys are similar to those in PAPI or any other form of self-administration*
 - *Anonymity*
 - *Social desirability (lack of pressure for it)*
 - *Not as accountable as when there is an interviewer present*

Percent of Indeterminate Responses, by Mode



Source: B&B FT

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- 38 interview questions, and over 26 percent of those in the finance section, had nonresponse rates of at least 10 percent
- CATI/CAPI respondents provided an indeterminate response for nearly 2.5 percent of all responses.
- Web respondents provided an indeterminate response for nearly 5 percent of all responses ($p < .05$).

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- Prior to web surveys, our CATI surveys always included options for DK and RE
- These weren't offered explicitly, but were there as a means for Tis to proceed through the interview
- We required an input to each item
- In our first web survey in 2002, we included these options in the web version
- Web Rs were TWICE as likely to use DK/RE as were CATI Rs

Response Conversion Text for Selected Items

Source: B&B FS

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- our response to this challenge
 - First, removed DK/RE options
 - Allowed nonresponse to continue
 - Pop-up message after 3 consecutive blanks to remind them of the importance of their responses
 - We identify key items and attempt to convert nonresponse
 - If unanswered, we display the screen again w/ additional text explaining why it's important

Use of Conversion Text


- Percent converted to an explicit response ranged from 0 percent to 100 percent in the B&B FS; comparable rates (18 to 100 percent) were observed in the BPS FT
- Items less likely to convert: dollar amounts related to income, monthly expenses, and overall debt (28 to 73 percent)
- Web respondents in the BPS FT were more likely than interview respondents to convert on two items – race and undergraduate loan debt; no other mode differences were observed

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- Seems to be a pretty effective strategy to counteract nonresponse
- Converted up to 100% for some items
- Items about personal finances are still less likely to convert for all modes
- Of all items w/ conversion text in the 2005 FT, only 2 items w/ a mode difference
 - Web Rs less likely to respond for race and UG loan debt

Next Steps?

- Different incentive amounts at different points in data collection
- Prompting difficult subgroups
- Evaluate the use of help text relative to item-level nonresponse and reliability
- Continue efforts to assess differences in data quality across modes

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•What we're currently pursuing -- Trying to understand where mode differences are likely to occur and how to counteract them

•Measurement error

- Social desirability
 - We've seen mode diffs in response patterns for interviewer-administered respondents
 - More favorable
 - Our response: we changed response options from VERY/SOMEWHAT/NOT and asked them to check which they felt most strongly about – recognizing that all in list are important and just asking them to choose
- Order effects (primacy/recency)
 - Well-documented in the literature
 - We use random-starts for items w/ lists of response options to control this type of error
- Another thing we can look at
 - Compare estimates for key items in FS
 - Older CATI-only studies vs. the new multimode studies
 - Control for the factors that we know are related to mode choice (inst. Level, income, gender) and then see if there is a diff in the estimate by mode

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