# The Use of Cognitive Interviewing to Improve Questionnaire Design Health Information National Trends Survey 2007 (HINTS 2007)

## Background

The Health Information National Trends Survey (HINTS) routinely collects nationally representative data about the American public's use of cancer-related information. The survey provides updates on changing patterns, needs, and information opportunities in health; identifies changing communications trends and practices; assesses cancer information access and usage; provides information about how cancer risks are perceived; and offers a testbed to researchers to test new theories in health communication. There have been three rounds of HINTS data collection, with the latest round commencing in 2007. Although the prior iterations of HINTS (2003, 2005) were conducted using a random dial digit (RDD) sample, HINTS 2007 used a mixed-mode design. The RDD sample completed a computer assisted telephone interview (CATI) survey, while the address-based sample completed a mail questionnaire.

## Purpose

Prior to fielding HINTS 2007, Westat conducted five rounds of cognitive interviews—three rounds for the CATI instrument and two rounds for the mail instrument. Cognitive interviewing is an in-depth, semi-structured administration of a survey instrument designed to improve questionnaire design by gathering insights into the cognitive sources of potential response errors. This presentation will highlight our observations and lessons learned from the two rounds of cognitive testing of the mail instrument. The cognitive interviewing of the mail instrument focused on the format of the questionnaire to ensure that it was "user friendly," since the extensive skip patterns and wide variety of item/response formats make HINTS a complex instrument for self-administration.

## Methods

At the beginning of each interview, the interviewer handed the respondent the survey package (for Round 1 this included four copies of the questionnaire and one cover letter, and for Round 2 this included three copies of the questionnaire with a cover letter attached to each), and asked the respondents to envision that they had just received the package in the mail at home. They were asked for their feedback on the package and then went on to fill out the majority of the questionnaire. Respondents were asked to read the questions and their selected responses aloud, and the interviewer documented any problems or difficulties respondents had, including missing skip instructions and other important instructions (e.g., mark all that apply, mark only one).

## Results

### **Round 1 Findings and Resulting Round 2 Formatting Changes**

The Round 1 version of the mail instrument was designed by a Westat instrument development specialist and was informed by the work of Don Dillman of Washington State University. The main concerns that Westat identified during Round 1 were lack of adherance to skip instructions and missing data. The next sections show how the questionnaire was changed after Round 1 to address these issues.

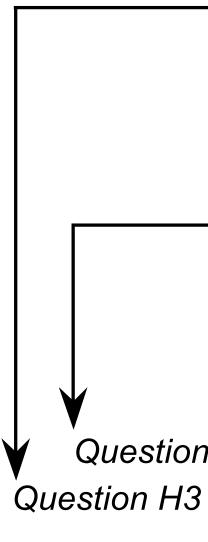
#### Adhering to Skip Instructions

Only one of the nine respondents followed all of the skip instructions applicable to them. Most respondents (n=5) missed only one or two applicable skips; one respondent missed the skips in the tobacco section, which had particularly complicated skip patterns. Two respondents overlooked every applicable skip instruction.

At the top of the next column is an example of how skip instructions were presented in the Round 1 version of the survey.

The error rate for Round 1 was consistent with self-adminstered surveys with a comparable number of skip patterns. Although there was no need for substantial changes to be made to skip instructions, a few changes were made in the attempt to further enhance the clarity of the instructions.

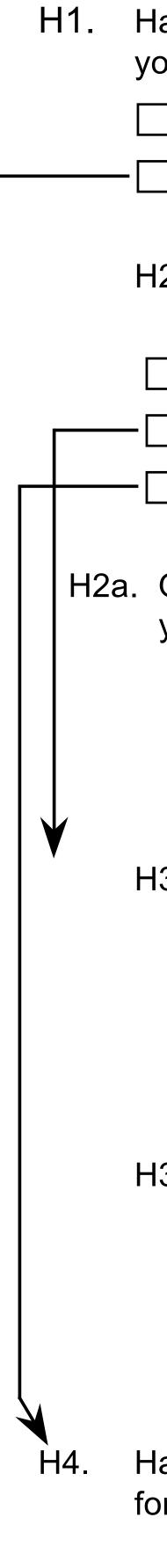
H1a.



For Round 2, simpler and m indicated that

The skip instru

Below is an exa instrument.



. Do yo	ou now smoke cigarettes	Missing Data
Every	/ day?	All of the questionnaires completed by Rou
a1. (	On the average, how many cigarettes do you now smoke a day?	usually three to six data items. Main factors
Write	in number and skip to Question H3.	<b>Overlooking items:</b> Respondents tended t
	Number of cigarettes per day	respondents overlooked the "Other, specif response option.
—□ Not a	t all? $\rightarrow$ Skip to Question H2	Here is an example of a Round 1 questic
Some	e days?	D3. During the past 12 months, di unconventional therapies suc supplements, acupuncture, cl homeopathy, meditation, yoga
	ars on the next page.	🗌 Yes
3 appears o	on the next page.	$\square No \rightarrow Skip \ to \ Question \ D4$
nore direct p	'Skip to" was changed to "Go to," since this is a hrase. During one cognitive interview, a respondent "Go to" was more understandable.	D3a. Did you discuss your u therapies with any of your u Yes
uctions were a	also bolded (instead of italicized) to make them stand out more.	
example of the	e skip pattern as it appeared in the Round 2 version of the	
Have you s our entire	smoked at least 100 cigarettes in life?	For Round 2, all questions were lined up questions.
] Yes		D3. During the past 12 mo
No G	Go to Question H8	unconventional therap supplements, acupun
	often do you now smoke	homeopathy, meditati
cigar	rettes?	
Every	day	$\square$ No $\rightarrow$ Go to Ques
Some	days Go to Question H3	
Not at	all Go to Question H4	D3a. Did you discuss your therapies with any of
	verage, how many cigarettes do	Yes
you now s	smoke a day?	∐ No
Write	e in number and go to Question H5	
	Number of cigarettes per day	<b>Grid format:</b> Three respondents were init series of items containing the same respondents that they should mark a box for only one
	now many of the past 30 days, did smoke a cigarette?	appropriately to the grid format in subse inconsistent in the way he responded to
	Number of days	Here is how question A5 appeared in Ro
		A5. Based on the results of your n

H3a. On the average when you smoked during the past 30 days, about how many cigarettes did you smoke a day?

Number of cigarettes per day

Have you ever smoked cigarettes every day for at least 6 months?

- a. It took a lot of effort to get the information you needed
- You felt frustrated during your search for the information
- c. You were concerned about the quality of the information
- The information you found was hard to understand

## Kisha I. Coa, MPH Jeffrey J. Kerwin, PhD

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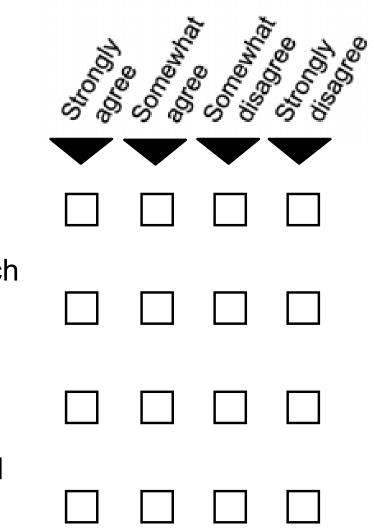
#### Question D4

our use of unconventional y of your doctors?

ere initially confused by the grid format for e response categories. Two respondents thought nly one item in question A5 but responded subsequent questions. Another respondent was led to questions in the grid format.

in Round 1:

Based on the results of your most recent search for health information, how much do you agree or disagree with the following statements?



For Round 2, the word "each" was added to the instructions, to emphasize that respondents should select a response for each question.

Question A5 appeared as follows in Round 2:

- A5. Based on the results of your most recent search for health information, how much do you agree or disagree with each of the following statements?
- It took a lot of effort to get the information you needed.
- You felt frustrated during your search for the information...
- You were concerned about the quality of the information...
- The information you found was hard to understand.

Entering a number while marking the unit: Several questions asked for an amount of time, and the survey needed to accommodate a wide variety of timeframes (e.g., months and/or weeks, hours and/or minutes). In some instances, respondents entered a unit without marking a number, or marked a number without entering a unit.

In Round 1, question B2 appeared as follows:

Think about the most recent time you looked for cancer information. About how long ago was that?

Write in number below and mark one box.

Days
Weeks
Months

Years

For Round 2, question B2 was modified as shown here so that the box filled in was associated with a specific timeframe:

B2. Think about the most recent time you looked for cancer information. About how long ago was that?

#### Write a number in one box below

Days	Weeks
Months	Years

In addition to the changes made to address specific difficulties respondents were having, the font size was increased for Round 2, and question-specific instructions were changed from black to blue to make them stand out more prominently.





### **Comparison of Round 1 and Round 2 Errors**

The changes made to the survey following Round 1 substantially reduced overlooking skip instructions and missing data.

The following table shows the number of applicable skips for each respondent and the number of those skips that were overlooked. This resulted in respondents answering question(s) that they should have skipped.

#### Skip Instructions\_

Round 1 Respondents		Round 2 Re	espondents
Applicable skips	Skips overlooked	Applicable skips	Skips overlooked
9	8	16	1
7	1	18	0
9	1	15	0
6	6	13	0
9	2	14	0
9	0	21	1
9	2	10	0
10	1	13	0
9	2	12	3

The following table shows the number of questions pertaining to each respondent that were left blank.

#### Missing Data

Round 1 Respondents	Round 2 Respondents
Number of Missing Items	Number of Missing Items
3	0
1	0
1	0
12	0
8	0
0	0
4	1
1	0
1	0

The Round 2 formatting of the instrument was retained for the pilot test and the main fielding with one minor modification — question-specific instructions (e.g., mark only one; write a number in one box below) were bolded instead of italicized to increase their visibility.

## Conclusion

This cognitive interviewing effort highlighted how formatting can influence data quality. We uncovered several formatting issues that affected the ability of respondents to appropriately answer certain questions. The format of the instrument was greatly improved between the first and second rounds of cognitive testing, as evidenced by the reduction in overlooked skips and missing data.



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H1a.	Do you now smoke cigarettes
	Every day?
	a1. On the average, how many cigarettes do you now smoke a day?
	- Write in number and skip to Question H3.
	Number of cigarettes per day
	Not at all? $\rightarrow$ Skip to Question H2
	Some days?
	appears on the next page. ears on the next page.

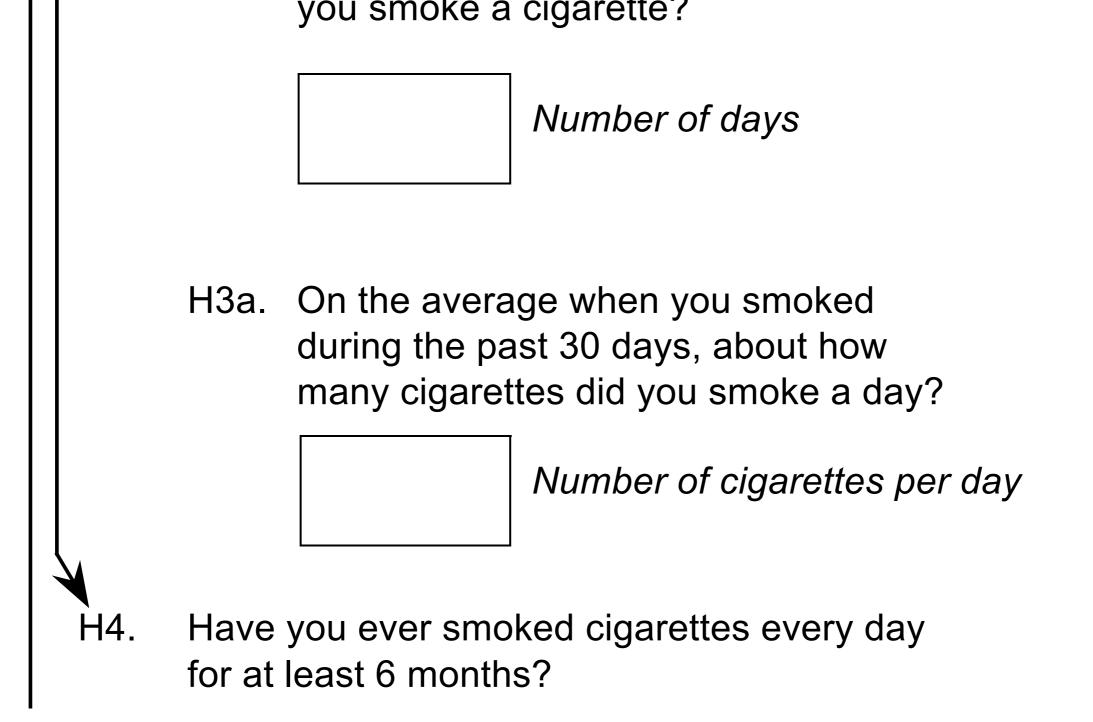
For Round 2, the phrase "Skip to…" was changed to "Go to…," since this is a simpler and more direct phrase. During one cognitive interview, a respondent indicated that the phrase "Go to" was more understandable.

The skip instructions were also bolded (instead of italicized) to make them stand out more.

Below is an example of the skip pattern as it appeared in the Round 2 version of the instrument.

H1.	Have you smoked at least 100 cigarettes in
	your entire life?

, 			
No	Go to Question H8		
	ow often do you now smoke garettes?		
Eve	ery day		
┌─── □ Sor	me days Go to Question H3		
Not	at all <b>Go to Question H4</b>		
H2a. On the average, how many cigarettes do you now smoke a day?			
И	/rite in number and go to Question H5		
	Number of cigarettes per day		
H3. O	In how many of the past 30 days, did		



#### Missing Data

All of the questionnaires completed by Round 1 respondents had some missing data, usually three to six data items. Main factors contributing to missing data included:

**Overlooking items:** Respondents tended to overlook indented items. A few respondents overlooked the "Other, specify" box that accompanied an "other" response option.

Here is an example of a Round 1 question with an indented item:

D3. During the past 12 months, did you use any unconventional therapies such as herbal supplements, acupuncture, chiropractic, homeopathy, meditation, yoga, or Tai Chi?

Yes

No  $\rightarrow$  Skip to Question D4

Did you discuss your use of unconventional D3a. therapies with any of your doctors?

Yes

No

For Round 2, all questions were lined up rather than indenting the followup questions.

During the past 12 months, did you use any D3. unconventional therapies such as herbal supplements, acupuncture, chiropractic, homeopathy, meditation, yoga, or Tai Chi?



#### No→ Go to Question D4

- D3a. Did you discuss your use of unconventional therapies with any of your doctors?
  - Yes

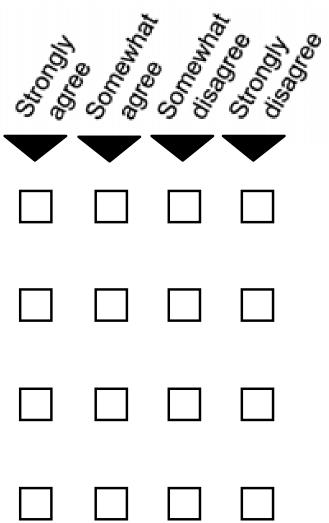
No

**Grid format:** Three respondents were initially confused by the grid format for series of items containing the same response categories. Two respondents thought that they should mark a box for only one item in question A5 but responded appropriately to the grid format in subsequent questions. Another respondent was inconsistent in the way he responded to questions in the grid format.

Here is how question A5 appeared in Round 1:

#### disagree with the following state

- It took a lot of effort to get the a. information you needed
- You felt frustrated during your search b. for the information
- You were concerned about the C. quality of the information
- d. The information you found was hard to understand

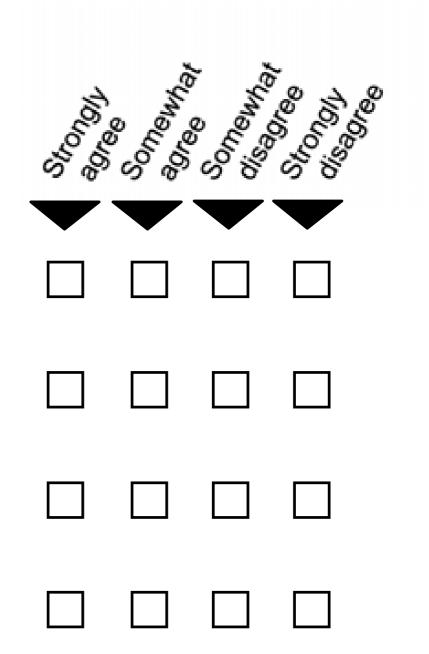


For Round 2, the word "each" was added to the instructions, to emphasize that respondents should select a response for each question.

Question A5 appeared as follows in Round 2:

following statements?

- a. It took a lot of effort to get the information you needed......
- b. You felt frustrated during your search for the information.....
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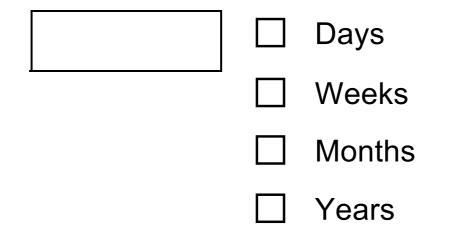


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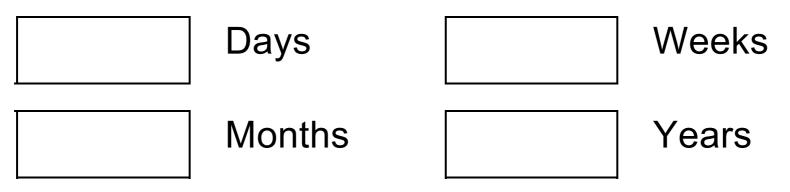
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