

IMPROVING RESPONSE RATES TO INCOME QUESTIONS

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1. INTRODUCTION

Government surveys tend to yield higher levels of cooperation than do nongovernment surveys (e.g., Bradburn & Sudman, 1989). Despite this high compliance rate, income and other sensitive questions on government surveys continue to yield high nonresponse rates. The Consumer Expenditure Quarterly Interview Survey (CEQ) collects data on expenditures in a series of five interviews conducted at the same address every three months for five calendar quarters. During the second and fifth quarter interviews, income information is obtained. Respondents answer questions about their own income, income received by individual members of their consumer unit (CU, roughly equivalent to a household), as well as income received by the entire CU as a group. During the 1997 calendar year interviews (the most recent year for which data were available at the time of this study), the item nonresponse rate across all sources of income was 17.7%.

Brackets are categories or ranges that are offered to respondents who initially refuse or are unable to provide an exact income value. Brackets provide partial responses and can be seen as an imperfect remedy to item nonresponse. The use of brackets as follow-up questions originated in the Panel Study of Income Dynamics (PSID) (Juster and Smith, 1997). Brackets have been used in recent versions of the Health and Retirement Survey (HRS), the Asset and Health Dynamics among the Oldest Old Survey (AHEAD), and in the 1995 Survey of Consumer Finances (SCF). Previous research has demonstrated that brackets are successful in reducing item nonresponse (Heeringa, Hill & Howell, 1995; Juster & Smith, 1997; Kennickell, 1997). However, the introduction of follow-up questions, like bracketing questions, may increase respondent burden and risks alienating the respondent. There is also evidence to suggest that bracketing may make it less likely that interviewers probe for exact values, thereby sacrificing some precision and accuracy in the data obtained (Kennickell, 1997).

The present study investigated the usefulness of bracketing techniques for collecting income data on the CEQ. The study directly compared the relative costs and benefits of three

different bracketing techniques. The conventional bracketing technique presents respondents with a number of predetermined data ranges, printed on an information card. Respondents are asked to indicate the range within which their actual income falls. The unfolding bracketing technique asks respondents a series of yes/no questions designed to narrow down the respondent's income range. For example, a respondent might be asked, "During the past year, was your income in wages or salary greater than \$20,000?" If the answer is positive, the interviewer might then ask, "Was it greater than \$30,000?" The interviewer has the option of continuing with further bracketing questions or selecting the \$20,000-\$30,000 range. Heeringa et al. (1995) suggest that as few as three unfolding brackets may be sufficient for producing useful data. Respondent-generated intervals (Press, 1999) represent a third bracketing technique. Using this technique, respondents are asked to provide the upper and lower limits on their own income. For example, a respondent might be asked, "What is the least amount you think you could have earned in wages or salary during the past year?" and "What is the most you think you could have earned?" The authors know of no extant studies that have directly compared the quality of the data and the degree of respondent burden associated with various range techniques and none that has tested respondent-generated intervals (RGI) as a viable means of collecting income information.

2. STUDY DESIGN

Sixty adults (36 women, 24 men) residing in the metropolitan DC area participated in a mock CEQ interview followed by an intensive cognitive interview. Respondents first completed a self-administered demographic questionnaire followed by a face-to-face mock CEQ interview that included six questions about respondents' expenditures, five questions about the respondent's own sources of income, five questions about each CU member's sources of income and ten questions about the entire CU's combined sources of income.

2.1. Mock CEQ Interview

Respondents were randomly assigned to one of three income bracketing groups: conventional,

unfolding, or RGI¹. The reference period for the income section was the previous 12-months. For all income questions, eligibility status was first established by a positive response to a screening question, e.g., “During the past 12 months, did you receive any money in wages or salary?” Once eligibility was established, the bracketing technique to which the respondent had been assigned was implemented. For respondents in the conventional group, a range response card was presented and respondents were asked to select the range within which their income fell. Respondents in the unfolding group were presented with a series of three questions designed to determine the interval within which their income fell. Instructions to respondents in the RGI group were worded as follows, “I’d like you to give me a range within which you would feel almost certain that the actual amount would fall. This is like completing the sentence, ‘During the last 12 months, I must have earned between ____ and ____.’ After providing a bracketed response, all respondents were asked for the actual value of the requested source of income². Respondents used the same range technique to answer all income questions. The bracketing technique to which the respondent was assigned is referred to as the “primary condition.”

2.2 Cognitive Interview

Upon completion of the mock CEQ interview, a cognitive interview was conducted to evaluate respondents’ subjective experience of the interview. During the cognitive interview, respondents rated the primary condition range technique on three 5-point scales: willingness to provide income information (1 = very unwilling, 5 = very willing); ease of reaching an answer (1 = very difficult, 5 = very easy); and intrusiveness of questioning (1 = very intrusive, 5 = very unintrusive). Each of these ratings was further probed during the cognitive interview. Next, respondents were asked to

¹ Examples of each of the three bracketing techniques are included in Appendix A.

² It is important to note that requesting ranges first followed by requests for actual values is the inverse of the way in which brackets are implemented in the field. Brackets are only used as follow-up questions when respondents either don’t know (D/K) or refuse (REF) to provide an actual value. The order in which income data was collected in the lab was changed due to concerns that paid research participants might be overly compliant and might not provide sufficient item nonresponse to effectively test the utility of the bracketing techniques.

re-respond to one income question (usually wages or salary) using each of the alternative range techniques. For example, a respondent who reported income in wages or salary using the conventional technique was asked again to provide wage or salary income using the unfolding technique and again using the RGI technique. Presentation of the alternative range techniques was counterbalanced across subjects. Following their exposure to each of the range alternatives, respondents rated that alternative on each of the three 5-point scales described above. Lastly, respondents indicated which range technique they liked best and why. Responses to this open-ended question were coded for respondent burden, desire for controlled disclosure, and mode of exchange (i.e., verbal only vs. verbal + visual aid)

3. RESULTS

3.1 Demographic Composition of Experimental Groups

Fourteen women and 6 men comprised the conventional group, 10 women and 10 men comprised the unfolding group, and 12 women and 8 men comprised the RGI group. Groups were not significantly different from one another with respect to self-reported age, average personal income or average household income. However, the demographic composition of the study sample was significantly different from a comparison group comprised of DC area residents who participated in the 1997 CEQ. First, the two samples differed with respect to racial make-up, $\chi^2 = 11.93$, $p < .01$. Significantly fewer Whites and significantly more Blacks participated in the laboratory study than participated in the 1997 CEQ. The study sample was also comprised of individuals who had attained a significantly higher level of education than those who participated in the 1997 CEQ, $\chi^2 = 23.21$, $p < .01$, and participants in the study reported a significantly higher mean household income ($M = 72,342.72$, $SD = 57,747.97$) than did participants in the 1997 CEQ ($M = 51,504.63$, $SD = 49,743.14$), $t(59) = 2.53$, $p < .05$.

3.2 Item Nonresponse

Across conditions, respondents reported between one and seven sources of income for their consumer unit ($M = 3.8$, $SD = 1.41$, mode = 3). There were no significant differences between experimental groups with respect to the number of sources of income reported.

Across conditions, 37 of 60 respondents were complete reporters – i.e., they provided an exact

value for all eligible sources of income. Of the remaining 23 respondents, the majority did not provide an actual value for one source of income (20% of the total sample). Nine of 23 incomplete responders failed to provide an actual value for two sources of income and two did not provide an actual value for four eligible income sources.

Table 1 presents the frequency and type of nonresponse (D/K or REF) by income source. When only the absence of actual values is considered, the overall nonresponse rate was 18.1%. The inclusion of brackets reduced the nonresponse rate to 9.5% -- the percentage of respondents who did not provide a range or an actual value. There were no significant differences between experimental groups with respect to their nonresponse rate.

Table 1

Source	# reporters	D/K	REF
Self			
Salary	42	3	0
Self-employment	19	4	0
Farm	1	1	0
Retirement	11	0	0
SSI	0		
Proxy			
Salary	39	8	1
Self-employment	10	1	0
Farm	0		
Retirement	7	0	2
SSI	3		1
Consumer Unit			
Unemployment	0		
Workers comp	3	0	0
Public assistance	0		
Food stamps	3	1	0
Earned interest	42	10	1
Dividends	26	7	0
Pension	21	2	2
Child Support	5	0	0
Alimony	1	0	0
Other	10	0	0

As indicated in Table 1, thirty-seven D/K responses were obtained when actual values were requested. For twenty-two (59.5%) of the D/K responses, range data were provided. However, none of the respondents who refused to provide an actual value provided a range.

Lastly, respondents in the RGI condition performed differently than did respondents in the other two conditions. Five respondents (25%) in the RGI group chose to provide actual values instead of

self-generated ranges. This did not occur in either the conventional or the unfolding groups.

3.3 Preference Ratings

Each respondent rated each of the three conditions (conventional, unfolding, and RGI) on each of the three 5-point rating scales. For each respondent, an overall preference score was calculated by taking the mean of each of the three ratings. Thus, each respondent contributed four ratings for each of the three range techniques: willingness, ease, intrusiveness and overall preference.

There were no differences between groups with respect to their overall preference ratings, their willingness to provide income information, or the ease with which they were able to arrive at an answer. However, a significant between-groups difference was obtained for respondents' ratings of the intrusiveness of the unfolding technique, $F(2,56) = 4.486, p < .02$. Post-hoc Scheffe's F-test yielded a significant mean difference between the conventional and unfolding bracketing groups (mean diff = 1.366, s.e. = .4026, $p < .01$) and between RGI and the unfolding bracketing groups (mean diff = 1.254, s.e. = .4026, $p < .02$). Thus, respondents who answered all income questions using the unfolding technique rated it as significantly more intrusive than did respondents who experienced the unfolding technique for only one income source.

Across experimental groups, the conventional technique received the highest overall preference rating and it was rated as the easiest with which to reach an answer. Notably, willingness to provide income information was unaffected by type of range technique that was used. Mean (and standard deviations) preference ratings, pooled across groups are presented in Table 2.

Table 2

	Overall	Willingness	Ease	Intrusive
Conv.	4.42 (.77)	4.72 (.84)	4.66 (.92)	3.88 (1.3)
Unf.	4.05 (.82)	4.42 (.98)	4.41 (1.0)	3.31 (1.4)
RGI	4.16 (.89)	4.48 (1.0)	4.20 (1.1)	3.78 (1.2)

3.4 Favorite Range Technique

At the end of the interview, all respondents answered an open-ended question that asked them to select their favorite range technique. There were no

differences between groups with respect to their choice of favorite technique.

Overall, 29 of the 60 (48.3%) respondents chose the conventional bracketing technique as their favorite. Eighteen (30%) participants chose RGI and 13 (21.7%) participants chose the unfolding technique as their favorite.

Choice of a favorite range technique was also looked at with respect to a number of demographic variables: race, gender, age group, educational attainment, individual income level, and household income level. These data are presented in Table 3.

Table 3

	Chose conventional	Chose unfolding	Chose RGI
<u>Race</u>			
Black	11 (46%)	6 (28%)	7 (29%)
White	18 (53%)	5 (15%)	11 (32%)
<u>Gender</u>			
Male	12 (54%)	5 (21%)	6 (25%)
Female	16 (44%)	8 (22%)	12 (33%)
<u>Education</u>			
HS grad	3 (100%)	0	0
AA/college	8 (57%)	4 (14%)	2 (14%)
College grad	6 (29%)	7 (33%)	8 (57%)
Masters	10 (63%)	2 (14%)	4 (25%)
Professional	2 (33%)	0	4 (67%)
<u>Age</u>			
18-39	6 (30%)	5 (25%)	9 (45%)
40-64	17 (59%)	4 (14%)	8 (28%)
65-74	4 (50%)	4 (50%)	0
75+	2 (67%)	0	1 (33%)
<u>Individual Income³</u>			
Low	16 (50%)	8 (25%)	8 (25%)
Middle	6 (43%)	3 (21%)	5 (36%)
High	7 (50%)	2 (14%)	5 (36%)
<u>Household Income⁴</u>			
Low	9 (48%)	5 (27%)	5 (26%)
Middle	4 (44%)	3 (33%)	2 (22%)
High	16 (50%)	5 (16%)	11 (34%)

As seen in Table 3, level of educational attainment significantly affected choice of favorite, $\chi^2 = 16.22$, $p < .04$. College graduates were significantly more likely than high school graduates

³ The following income designations were used: low income = \$0-\$24,999, middle income = \$25,000-\$49,999, high income = \$50,000-\$101,000.

⁴ Low = \$0-\$34,999, middle = \$35,000-\$64,999, high = \$65,000-\$101,000.

were to select RGI as their favorite technique. No other demographic variables influenced choice of favorite.

Respondents' answers to the final open-ended question, "What was it about this technique that made you select it as your favorite?" were coded along three dimensions: limited respondent burden, limited disclosure, and mode of exchange. A response was considered indicative of limited respondent burden when it included references to the ease and/or speed with which an answer could be reached. An answer was considered indicative of limited disclosure when it included references to the amount of information the respondent had revealed, and the degree to which the technique felt personal or impersonal. An answer was considered indicative of mode of exchange when respondents specifically mentioned that they liked visually-aided interviews.

Twenty-nine respondents selected the conventional technique as their favorite. Sixteen of the 29 (55%) respondents who chose the conventional technique did so because it imposed limited respondent burden. They specifically mentioned that the technique was easiest because *the interviewer provided the ranges* and it required that they only recognize, not recall, their income. Fifteen respondents (52%) said that the conventional technique afforded them limited disclosure mainly because the predetermined ranges were *very wide, especially for people in the higher income brackets*. Respondents indicated that they liked being able to say the category number on the response card rather than the actual dollar amounts. Lastly, 18 of the 29 respondents (62%) who selected the conventional technique as their favorite did so because they liked having a *visual aid*.

Eighteen respondents selected the RGI technique as their favorite. All 18 respondents who selected RGI as their favorite did so because of the limited disclosure it afforded them. All indicated that they *liked having control over the information they revealed*.

Thirteen participants selected the unfolding technique as their favorite. The limited respondent burden that this technique imposed was the main reason for its selection as a favorite. The majority of these respondents, (8 of 13, 62%) favored the unfolding technique because they *did not have to do any calculations* and because they could *simply respond with a "yes" or "no"* which felt somewhat impersonal to most respondents. Seven of 13 respondents (54%) chose the unfolding technique because it permitted limited disclosure. As with the conventional technique, the ranges provided by the interviewer *were sufficiently wide so as to feel as if very little information had been revealed*.

4. DISCUSSION

All three range techniques are viable methods for obtaining some income information from respondents who might otherwise provide none. The nonresponse rate on the mock CEQ interview was 18.1% when the interviewer requested actual values. This rate is comparable to that obtained on the 1997 CEQ conducted in the DC area (17.7%). The inclusion of brackets in the mock CEQ interview reduced the nonresponse rate to 9.5%.

The results from this study indicate that the unfolding technique, despite its wide use in other surveys, is the least popular with respondents. Thus, while field studies indicate that respondents will answer unfolding bracket questions, this study finds that when given a choice, they prefer other range options. While preference may not be an issue for surveys that rely on only one interview, it is a consideration for surveys like the Consumer Expenditure survey that rely on multiple interviews that are usually conducted with the same respondent.

This study highlighted another important issue for survey designers. Researcher-generated ranges, like those used in the conventional brackets, tend to get larger as income increases. One implication of this is that the nature of the conventional bracketing task may be different for high-income respondents. Specifically, high-income respondents may prefer the conventional technique because the ranges within which they fall are large and therefore, disclose minimal personal information.

Respondent-generated intervals may be a viable alternative to the conventional technique. The technique has much to recommend it. First, participants liked the RGI technique primarily because it afforded them some degree of control over their disclosures. Surprisingly, when respondents were given freedom to choose their own ranges, they did not opt for huge, relatively meaningless ranges that obscured their real financial situation. Instead, respondent-generated intervals tended to be smaller than those generated by the researchers. In this study, RGI was the only technique that resulted in respondents providing an exact value rather than a range. The problems associated with RGI are its relative difficulty and its implementation would introduce a less standardized, more conversational tone to the interview (see Schober & Conrad, 1997).

Lastly, although there was not a significant age effect, the data suggest that there may be a relationship between age and choice of range technique. Older adults (65+ years old) were less likely than younger adults to select the RGI technique as their favorite. This may reflect an interaction

between the difficulty inherent in self-generating ranges and age-related declines in cognitive resources. Unlike the conventional technique that is essentially a recognition memory task, the RGI technique is a 2-step recall task. The respondent must first estimate the actual amount and then decide how to bound that amount. If age is associated with reduced working memory capacity, this 2-step process may prove more difficult for older than younger adults. However, the data also suggest that one way respondents may choose to limit the complexity of the RGI task is by skipping the second step, i.e., they provide the exact value rather than decide how to bound that value and provide a range. Given that exact values are preferred to range responses to income questions, the complexity of the RGI task actually may lead to improved data quality.

5. REFERENCES

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Appendix A

A.1 Sample Conventional Bracket

Wages & Salary

1. \$0 - \$2,499
2. \$2,500 - \$4,999
3. \$5,000 - \$7,499
4. \$7,500 - \$9,999
5. \$10,000 - \$12,499
6. \$12,500 - \$14,999
7. \$15,000 - \$19,999
8. \$20,000 - \$24,999
9. \$25,000 - \$29,999
10. \$30,000 - \$39,999
11. \$40,000 - \$49,999
12. \$50,000 - \$69,999
13. \$70,000 and over

A.2 Sample Unfolding Decision Tree

During the past 12 months, did you receive any money in wages or salary?

Did you receive more than \$20,000 in wages or salary?

If greater than \$20,000

Did you receive more than \$40,000?

If "yes," did you receive more than \$70,000?

If "no," did you receive more than \$30,000?

If less than \$20,000

Did you receive more than \$10,000?

If "yes," did you receive more than \$15,000?

If "no," did you receive more than \$5,000?

A.3 Sample RGI Instructions

While we're talking about income, what I'd like you to do is tell the range within which you would feel almost certain that your actual income would fall. This is like completing the sentence, *'Oh yes, during the past 12 months, I must have earned between _____ and _____.*

During the past 12 months, did you receive any money in wages or salary?

What do you think the range for that would be?