

Do You Really Mean What You Say? Doorstep Concerns and Data Quality in the National Health Interview Survey (NHIS)

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Abstract

Using paradata and health data from the National Health Interview Survey, we explore the associations between respondent mentions of “too busy,” “not interested,” and “privacy concerns” at first contact and item nonresponse and the amount of time devoted to the survey task. Mentions of “not interested” were consistently associated with less time spent in key sections of the interview, while mentions of all three concerns were generally associated with higher levels of item nonresponse. Preliminary results also suggest that mentions of multiple concerns at first contact foretell more quality problems than mentions of single concerns.

Key Words: Paradata, data quality, doorstep concerns

1. Introduction¹

Measurement error arising from respondent-interviewer interactions during the interview has received considerable attention among survey researchers. Less understood, however, are the effects on data quality of respondent concerns and reluctance expressed during initial survey introductions (Couper, 1997). At least two perspectives on the relationship between the introductory conversation and the subsequent interview have been described. The first, which we refer to as the relational perspective, suggests that all aspects of the initial interaction could be relevant to the data collected during the interview (Brehm, 1993; Bradburn, 1992). In other words, statements made by respondents during the initial request, such as “I’m too busy” or “I’m not interested,” may be indicative of their likely level of commitment to the interview and therefore predictive of measurement errors.

The second approach, the face-saving or politeness perspective, suggests that much of what a respondent says during the introductory conversation should not be taken literally (Maynard and Schaeffer, 1997; Maynard and Schaeffer, 2002). Expressions of reluctance are often throw-away lines with little intrinsic meaning, nothing more than a polite means of declining the survey request. Therefore, statements made by respondents during the initial request should be unrelated to measurement errors in the interview setting.

Given these two perspectives, we utilized nearly three years of data from the National Health Interview Survey (NHIS) to address the following research questions: Are statements of reluctance expressed during the initial survey request associated with the quality of data collected during the subsequent interview? More specifically, are respondent statements of reluctance made during survey introductions associated with more don’t know and refusal responses to questions during the interview? Are respondent statements of reluctance associated with the amount of time devoted to the survey task? And finally, do the results vary by the type of concern (e.g., “too busy,” “not interested”) expressed?

2. Data and Analysis

2.1 The NHIS and the Contact History Instrument (CHI)

The analysis relies on NHIS contact attempt history, frame, roster, and core health data covering quarters two, three, and four of 2005, and all of 2006 and 2007. The NHIS is an annual survey of the health of the civilian, noninstitutionalized household population of the United States, and is conducted by the National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention (CDC). Utilizing a multi-stage, clustered sample

¹ The findings and conclusions in this paper are those of the author(s) and do not necessarily represent the views of the National Center for Health Statistics, Centers for Disease Control and Prevention.

design, the NHIS produces national estimates on health insurance coverage, health care access and utilization, health status, and health behaviors.

Trained interviewers with the U. S. Census Bureau collect the survey data via computer assisted personal interviewing (CAPI). The survey contains four main modules: household composition, family, sample child, and sample adult. For the household composition module, a household respondent provides demographic information on all members of the household. For each family within a household, the family module is completed by one family respondent who provides sociodemographic and health information on all members of the family. Additional health information is collected from one randomly selected adult (sample adult) aged 18 years or over, and from the parent or guardian of one randomly selected child under age 18 (if there are children in the family).

The contact attempt data are collected with the Contact History Instrument (CHI). Interviewers use CHI to record information on each contact attempt they make with a household,² including the day and time and outcome of attempt. Of particular importance to this research is a screen that includes 21 categories of respondent concerns, behaviors, questions, and reasons for reluctance—“concerns”—that may be expressed during interviewer-respondent interactions. The screen utilizes a mark-all-that-apply format and is completed each time an attempt results in contact with household members. A “no concerns” and an “other-specify” category are also included (see Figure 1 for 16 categories that apply to the NHIS).

2.2 Data Used in the Analysis of Interview Section Times and Item Nonresponse

For our analysis of interview section times and item nonresponse, we utilize data from interviewed households with CHI records. To ensure greater correspondence between concerns and the person(s) who mentioned them, we focus on family respondents (n=86,432) and sample adults (n=51,676) who were also household respondents (since household respondents answer the initial survey questions). Also, to reduce the potential influence of concerns mentioned during the course of the interview, we limit the mention of concerns to the initial or first contact with the household. The analysis was unweighted and performed in SUDAAN (Research Triangle Institute, 2005) to account for the complex sample design.

2.2.1 Specific Concerns Explored in the Analysis

Figure 1 presents the percentage of eligible households where concerns were expressed at first contact. The most prevalent concerns mentioned were too busy (in just over 18% of households), privacy concerns (in roughly 10% of

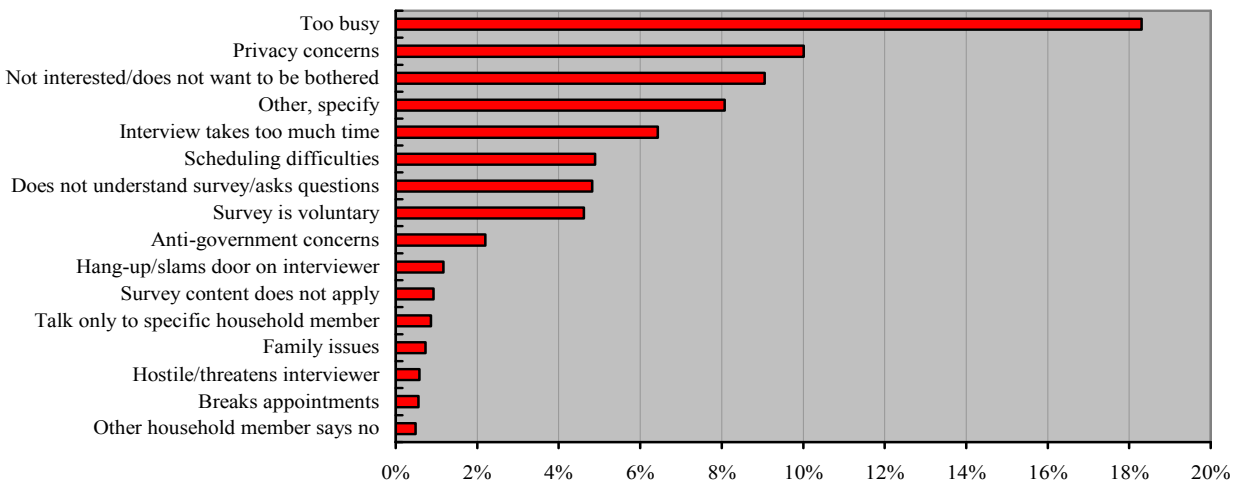


Figure 1: Percent of Eligible Households Where Household Members Expressed Concerns/Reluctance at First Contact (n=98,799): NHIS, 2005 (quarters 2-4) – 2007

² CHI data are collected at the “case” or family level. However, since over 98% of all eligible households contain one family, we use the term household throughout this paper.

households), and not interested/does not want to be bothered (in about 9% of households). With the exception of the other-specify category and “interview takes too much time,” each of the remaining concerns was mentioned in less than 5% of households. Given our research questions, and to be consistent with previous research (Campanelli, Sturgis, and Moon, 1996; Couper, 1997), we limit our analysis to the three most prevalent concerns: “too busy,” “privacy concerns,” and “not interested/does not want to be bothered.”³

3. Results

3.1 Section Times

One possible indication of satisficing—respondent behavior that reflects a lack of engagement in the interview—that may have adverse effects on data quality is the amount of time the respondent devotes to the survey task. We explored the time (measured in seconds) spent in seven key sections of the survey instrument, by whether or not a concern was mentioned at first contact.⁴ The first section analyzed was the family income section, the final section of the family module. We chose this section given its preponderance of sensitive items. The remaining six sections are located in the sample adult module: the adult sociodemographics section, the adult conditions section, the adult health status and limitations section, the adult health behaviors section, the adult access and utilization section, and the adult AIDS section. We focused on several adult sections since the questions focus on a single subject (sample adult), and responses are self-report.

Table 1 presents mean section times, in seconds, by whether or not each of our three primary concerns was mentioned at first contact. Two-tailed t-tests were performed to test for significant differences between mean section times. As an example, family respondents in households where “not interested” was not mentioned at first contact spent, on average, 129 seconds in the family income section, compared to only 107 seconds for family respondents from households where “not interested” was mentioned at first contact. The 22-second difference between mean times was statistically significant ($p < .01$). Summarizing the results of all the comparisons, mentions of “not interested” resulted in significantly shorter times for all seven sections, mentions of “too busy” produced significantly shorter times for five of seven sections (family income, adult conditions, adult health status and limitations, adult health behaviors, and adult access and utilization), and mentions of “privacy concerns” resulted in significantly shorter times for four of the seven sections (family income, adult sociodemographics, adult health behaviors, and adult AIDS).

Table 1. Mean Interview Section Times (in seconds), by Mentions of “Too Busy,” “Privacy Concerns,” and “Not Interested”

Concern	Section						
	Family Income	Adult Sociodem.	Adult Conditions	Adult Health Status and Limitations	Adult Health Behaviors	Adult Access and Utilization	Adult AIDS
“Too busy”							
No	130**	120	351**	131**	147**	204**	141
Yes	117**	117	321**	114**	139**	191**	135
“Privacy concerns”							
No	129**	120*	348	129	147**	203	141**
Yes	120**	114*	335	125	136**	198	131**
“Not interested”							
No	129**	121**	349**	129**	147**	203**	141**
Yes	107**	100**	306**	115**	121**	182**	114**

* $.01 \leq p < .05$; ** $p < .01$ (two-tailed t-tests)

³ For ease of presentation, we refer to “not interested/does not want to be bothered” as “not interested” for the remainder of the paper.

⁴ Section times were calculated by summing across individual item times. We capped item times longer than three minutes at three minutes. This threshold far exceeded the 99th percentile of the time distribution for any individual item. Taking this approach counteracts scenarios in which the interviewer leaves the instrument open on an item for long periods of time, and dramatically reduces the skewness (right) of the time measures. While section times were still somewhat right skewed, the results presented here are consistent with results from regressions using log transformations of time.

To address whether these effects hold in a multivariate context, we ran seven ordinary least square regressions, one for each section, with the section time as the dependent variable. We introduced our three primary concerns as independent variables, and included the following control variables: age; sex; education; race/ethnicity; employment status; marital status; born in the U.S. (yes/no); reported health status; functional limitation (yes/no); total family income; whether or not the residence is owned/being bought or rented/some other arrangement; number of adults in the family; children in the family (yes/no); mode of family or sample adult interview (primarily in-person or telephone); language of interview; Census Regional Office; Metropolitan Statistical Area status; number of noncontacts prior to first contact; day and time of first contact; any other concerns mentioned at first contact (yes/no); number of item visits; and survey year.⁵

Table 2 presents the results for our three primary concern measures for all seven regressions. As is clear, the bivariate results observed for mentions of “not interested” hold in the multivariate analysis. For all seven sections, mentions of “not interested,” net of our control measures, resulted in significantly less time being spent in the section. In contrast, most of the bivariate effects of mentions “too busy” and “privacy concerns” disappear when controls are introduced in the analysis.

Table 2. Summary of OLS Regression Results for Concern Measures Predicting Time (in seconds) Spent in Seven Interview Sections, Controlling for Respondent Sociodemographic, Family-Level, Social Environmental, and Paradata Measures

Concern	Section						
	Family Income	Adult Sociodem.	Adult Conditions	Adult Health Status and Limitations	Adult Health Behaviors	Adult Access and Utilization	Adult AIDS
	b ¹	b ¹	b ¹	b ¹	b ¹	b ¹	b ¹
“Too busy” Yes (versus No)	-3.55**	-0.11	-3.36	-2.52	-2.03	-2.91	-1.00
“Privacy concerns” Yes (versus No)	-3.80	-1.07	-11.53*	0.32	-2.85	-1.71	-1.05
“Not interested” Yes (versus No)	-14.05**	-12.79**	-32.69**	-11.99**	-14.96**	-16.78**	-12.56**

* .01 ≤ p < .05; ** p < .01; ¹ b = unstandardized regression coefficient

3.2 Item Nonresponse

Next we explored a more direct indicator of data quality: item nonresponse. As a first step, we compared refusal and don’t know rates by mentions (versus non-mentions) of our three primary concerns for 139 items in the family and sample adult portions of the interview. Two-tailed t-tests were performed to test for significant differences in item nonresponse rates by whether or not the concern was mentioned at first contact. To demonstrate the comparisons, Table 3 presents refusal and don’t know rates for three of the 139 items, broken out by mentions of “too busy,” “privacy concerns,” and “not interested.” Again, taking an example, we see that the refusal rate for the total family income item was 49.1% for family respondents in households where “not interested” was mentioned at first contact. This contrasts sharply with a refusal rate of 19.4% for family respondents in households where “not interested” was not mentioned at first contact. The difference between these two rates was significant (p < .01).

Table 4 summarizes the findings of the comparisons performed for all 139 items. Focusing on the comparisons of refusal rates, sample adults from households where “too busy” was mentioned at first contact, compared to sample adults from households where “too busy” was not mentioned, produced significantly higher refusal rates for 137 of 139 items. Similar results were observed for mentions of “privacy concerns” and “not interested.” In sum, mentions of our three primary concerns were consistently associated with higher item refusal rates. These results were surprising, especially for mentions of “too busy” and “not interested.”

⁵ Total family income and whether or not the residence is owned/being bought or rented/some other arrangement were dropped from the model used in the family income section analysis, and family size was used in place of number of adults and presence of children in the family.

Table 3. Refusal and Don't Know Rates for Three Example Items by Mentions of "Too Busy," "Privacy Concerns," and "Not Interested"

Concern	Total Family Income		Weight		Usual Source of Care	
	Refused (%)	Don't Know (%)	Refused (%)	Don't Know (%)	Refused (%)	Don't Know (%)
"Too busy"						
No	19.3**	12.4	2.7**	1.5	0.6**	0.0**
Yes	30.8**	11.1	5.5**	1.6	1.7**	0.2**
"Privacy concerns"						
No	18.7**	12.4**	2.7**	1.5	0.6**	0.1
Yes	45.1**	9.8**	6.7**	1.9	2.1**	0.1
"Not interested"						
No	19.4**	12.3**	2.7**	1.4**	0.6**	0.0*
Yes	49.1**	10.4**	9.8**	2.7**	3.9**	0.4*

* .01 ≤ p < .05; ** p < .01 (two-tailed t-tests)

Table 4. Summary of Item Refusal and Item Don't Know Rate Comparisons (139 items), by Mentions of Too Busy, Privacy Concerns, and Not Interested

Concern	Comparisons of Refusal Rates (139 items)	Comparisons of Don't Know Rates (139 items)
	Total Number of Significant Differences (p < .05)	Total Number of Significant Differences (p < .05)
"Too busy"		
Yes (versus No)	137	60 (1 lower)
"Privacy concerns"		
Yes (versus No)	138	21 (1 lower)
"Not interested"		
Yes (versus No)	138	113 (1 lower)

NOTE: In parentheses is the number of items where mentions of the concern produced a significantly lower rate.

For comparisons of item don't know rates, we observe some variation by concern. Mentions of "privacy concerns" produced the fewest significant differences in don't know rates. For only 21 of 139 items did the mention of "privacy concerns" at first contact produce a significantly higher don't know rate. We observed a higher number of significant differences for mentions of "too busy." For 60 of 139 items, sample adults from households where "too busy" was mentioned at first contact produced significantly higher don't know rates than sample adults from households where this concern was not mentioned. And, as anticipated, mentions of "not interested" produced the largest number of significant differences for comparisons of don't know rates. Sample adults from households where "not interested" was mentioned at first contact produced significantly higher don't know rates for 113 of 139 items compared to sample adults from households where "not interested" was not mentioned. These findings are more in line with initial hypotheses, and are fairly consistent with earlier work (Campanelli, Sturgis, and Moon, 1996; Couper, 1997).

Again, would these item nonresponse effects hold in a multivariate context? To address this question, we performed a series of logistic regressions, two each for six of the seven sections we explored in the time analysis (see Table 5). The following dependent variables were created: one or more refusal responses versus zero refusal responses to items in the section; and one or more don't know responses versus zero don't know responses to items in the section. We limited the items to those asked of all respondents. Our three primary concern variables were the independent variables, and a set of control variables consistent with those used in the time analysis were included in the models.

Table 5 presents adjusted odds ratios for our three concern measures, net of a set of controls, for each of the 12 logistic regressions. The top panel of the table presents the results for the six regressions predicting one or more refusal responses versus zero refusal responses, while the bottom panel presents the results of the six regressions predicting one or more don't know responses versus zero don't know responses. For the six logistic regressions predicting refusal responses, the results are fairly consistent with those observed in the bivariate analysis. Mentions of "too busy" at first contact resulted in significantly higher odds of one or more refusal responses in five of the six sections, while mentions

Table 5. Logistic Regression Results for Concern Measures Predicting Item Refusals and Item Don't Knows in Six Interview Sections, Controlling for Respondent Sociodemographic, Family-Level, Social Environmental, and Paradata Measures

Concern	1 or More Refusal Responses Versus 0 Refusal Responses					
	Family Income	Adult Conditions	Adult Health Status and Limitations	Adult Health Behaviors	Adult Access and Utilization	Adult AIDS
	AOR	AOR	AOR	AOR	AOR	AOR
“Too busy” Yes (versus No)	1.37**	1.68**	1.61*	1.28**	1.53**	1.24
“Privacy concerns” Yes (versus No)	2.55**	1.35*	1.23	1.35**	1.39*	1.14
“Not interested” Yes (versus No)	2.03**	2.44**	2.49**	1.79**	1.73**	1.71**
	1 or More Don't Know Responses Versus 0 Don't Know Responses					
	Family Income	Adult Conditions	Adult Health Status and Limitations	Adult Health Behaviors	Adult Access and Utilization	Adult AIDS
	AOR	AOR	AOR	AOR	AOR	AOR
“Too busy” Yes (versus No)	1.02	0.86	1.10	0.96	1.08	1.12
“Privacy concerns” Yes (versus No)	0.86**	0.91	0.85	0.93	1.14*	1.00
“Not interested” Yes (versus No)	0.93	0.92	1.14	1.04	1.00	0.96

AOR = adjusted odds ratio; * .01 ≤ p < .05; ** p < .01

of “privacy concerns” were associated with significantly higher odds of one or more refusal responses in four of the six sections. Mentions of “not interested” at first contact produced significantly higher odds of one or more refusal responses in all six sections, and the magnitudes of effects were consistently large with adjusted odds ratios ranging from 1.71 (adult AIDS section) to 2.49 (adult health status and limitations section).

In contrast to the bivariate results, the three concern measures were largely unrelated to one or more don't know responses in the multivariate analysis (bottom panel of Table 5). Only mentions of “privacy concerns” at first contact produced significant effects, two in total, with the effect for the family income section in the opposite direction from what was anticipated. In particular, the results for “not interested” were unanticipated.

3.2.1 Item Nonresponse Implications When a Concern is Mentioned Alone or in Combination with Other Concerns

An additional question of interest in our research is what the quality implications are if a concern, such as “too busy,” is the only concern mentioned at first contact or is mentioned along with one or more other concerns. As a first step in addressing this question we split our dichotomous concern measures into trichotomous measures: the concern was not mentioned at first contact, the concern was mentioned alone at first contact, and the concern was mentioned along with one or more other concerns at first contact.

Using these trichotomous measures we have conducted some preliminary bivariate analysis of item nonresponse. Table 6 presents item refusal and item don't know rates for the same three items presented in Table 3, except here the rates are broken out for our trichotomous concern measures. Using the same example we described earlier, we now observe that the refusal rate to the total family income question is 52.0% when “not interested” is mentioned along with one or more other concerns at first contact, 41.7% when “not interested” is mentioned alone at first contact, and 19.4% when “not interested” is not mentioned at first contact. Using two-tailed t-tests, we test for significant differences for each of the “mentioned” rates compared to the “not mentioned” rate. For this example, the refusal rates for “not interested” mentioned alone and “not interested” mentioned along with one or more other concerns were both significantly different from the refusal rate for households where “not interested” was not mentioned at first contact.

Table 6. Refusal and Don't Know Rates for Three Example Items, by Mentions of Too Busy, Privacy Concerns, and Not Interested

Concern	Total Family Income		Weight		Usual Source of Care	
	Refused (%)	Don't Know (%)	Refused (%)	Don't Know (%)	Refused (%)	Don't Know (%)
“Too busy”						
No	19.3	12.4	2.7	1.5	0.6	0.0
Yes, alone	24.5**	12.0	3.9**	1.0*	1.1*	0.1
Yes, with other	39.7**	9.8**	7.8**	2.4*	2.5**	0.3*
“Privacy concerns”						
No	18.7	12.4	2.7	1.5	0.6	0.1
Yes, alone	35.9**	10.7	4.1	1.4	1.0	0.1
Yes, with other	50.9**	9.3**	8.7**	2.2*	3.0**	0.1
“Not interested”						
No	19.4	12.3	2.7	1.4	0.6	0.0
Yes, alone	41.7**	12.9	6.9**	2.0	2.8**	0.2
Yes, with other	52.0**	9.4**	11.0**	3.0**	4.4**	0.5*
All comparisons to “No” (two-tailed t-tests); * .01 ≤ p < .05; ** p < .01 (two-tailed t-tests)						

Table 7 presents summaries of all the comparisons performed across the 139 items using our trichotomous concern measures. Focusing on the results of the item refusal comparisons, each of the three concerns, when mentioned along with one or more other concerns, generated significantly higher refusal rates for at least 136 of the 139 items. Similar results are observed for lone mentions of “not interested” (significantly higher refusal rates for 136 items, with 1 significantly lower refusal rate). When “too busy” was mentioned alone at first contact, significantly higher refusal rates were observed for 100 of 139 items, while lone mentions of “privacy concerns” resulted in significantly higher refusal rates for only 43 of 139 items.

Table 7. Summary of Item Refusal and Item Don't Know Rate Comparisons (139 items) by Mentions of Too Busy, Privacy Concerns, and Not Interested

Concern	Comparisons of Refusal Rates (139 items)	Comparisons of Don't Know Rates (139 items)
	Total Number of Significant Differences (p < .05)	Total Number of Significant Differences (p < .05)
“Too busy”		
Yes, alone (versus No)	100	10 (3 lower)
Yes, with other (versus No)	136	67 (1 lower)
“Privacy concerns”		
Yes, alone (versus No)	43	29 (28 lower)
Yes, with other (versus No)	138	46 (2 lower)
“Not interested”		
Yes, alone (versus No)	137 (1 lower)	43 (30 lower)
Yes, with other (versus No)	137	115 (1 lower)
NOTE: In parentheses is the number of items where mentions of the concern produced a significantly lower rate.		

Regarding comparisons of item don't know rates, results varied by whether a concern was mentioned alone or in combination with other concerns at first contact. This is best illustrated by viewing the results for mentions of “not interested.” When “not interested” was mentioned along with one or more other concerns at first contact, there were significantly higher don't know rates for 114 of 139 items (and 1 significantly lower don't know rate). However, when “not interested” was the only concern mentioned at first contact, significantly higher don't know rates were observed for only 13 of 139 items. Conversely, lone mentions of “not interested” at first contact were significantly associated with lower don't know rates on 30 of 139 items. A similar trend was observed for mentions of “privacy concerns” and “too busy.”

4. Conclusions

In response to our initial research questions, and consistent with work by Couper (1997) and Campanelli, Sturgis, and Moon (1996), concerns expressed at first contact appear to be associated with the quality of data collected during the subsequent interview. Mentions of each of the three concerns at first contact were associated with higher item refusal rates, and to a lesser extent with higher don't know rates (although these were largely explained away in the multivariate analysis). Furthermore, mentions of "not interested" were consistently associated with shorter section times in bivariate and multivariate analyses. This latter finding also highlights variations in the results by type of concern. Respondents who mentioned "not interested" provided important clues about their degree of commitment to the subsequent interview. These respondents devoted less cognitive resources to the task than respondents mentioning "too busy" or "privacy concerns," as indicated by shorter section times as well as more and larger item nonresponse effects.

We must temper these initial conclusions somewhat by noting that mentions of multiple concerns at first contact were associated with more item nonresponse than mentions of single concerns. And for lone mentions of all three concerns, many of the initial differences in don't know rates disappeared. To some extent, this is not surprising, as we would expect interviewers to be more capable of countering single concerns expressed during survey introductions. For example, we observed fewer adverse effects (item nonresponse) of privacy concerns when these were the only concerns expressed at first contact. Given the current survey-taking climate, we suspect that these are the types of concerns interviewers are most prepared to counter.

The multiple concern findings also raise some interesting questions for the theoretical perspectives on survey introductions and data quality. When a potential respondent presents multiple concerns at the doorstep, he/she may be uttering less than truthful, throw-away lines, as suggested by the face-saving perspective. The multiple concerns are a simple means of rebuffing the interviewer's request. Yet once the respondent agrees to participate, the outcome appears to be less desirable data, consistent with the relational perspective. Conversely, a single concern expressed at the doorstep may reflect genuine reluctance and honesty on the part of the respondent, as suggested by the relational perspective. That lone mention of a concern, however, may have more fleeting impacts on data quality, especially if the interviewer is well prepared to address that concern. Further analysis is necessary to tease out the implications of single versus multiple concerns (as well as patterns of multiple concerns) for both data quality and theoretical frameworks on survey introductions and participation.

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