TESTING AN AUTOMATED REFUSAL AVOIDANCE TRAINING METHODOLOGY

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Background

Interviewers play a critical role in gaining cooperation for a survey (e.g., Morton-Williams, 1993; Groves and Couper, 1998; Billiet and Loosveldt, 1988). A theory proposed by Groves and Couper (1998) focuses on the ability of interviewers to "tailor" and "maintain" interactions with respondents in order to gain their cooperation. Interviewers "tailor" their statements by addressing the respondents' specific concerns. Interviewers "maintaining interactions" by engaging respondents in conversation in order to learn more about those concerns.

Groves and McGonagle (2001) tested a training methodology based upon this theory. The method begins with a series of focus groups in which experienced interviewers enumerate the types of objections they tend to encounter, and their responses. The responses are categorized into thematic sets. The training concentrates on breaking down the interviewer's task into several basic steps: 1) identifying the respondent concern, 2) classifying it into the existing themes, 3) providing an appropriate response (including how to deliver the best way to deliver the response), and 4) performing tasks 1-3 above as fast as possible. The material is taught through lecture, written and oral practices and role-playing in pairs and small groups.

This training regimen is based on situations where the interviewer has extended face-to-face interactions with respondents, perhaps over multiple visits to the household. There is less research on this approach when it is used with telephone surveys of households. The limited interactions on the telephone restrict the diversity of concerns that respondents may express. In telephone surveys of households, respondents typically refuse to participate within the first few seconds of the interaction, without providing much information from which to tailor a response (Oksenberg and Cannell, 1988; Couper and Groves, 2002). In many cases, it is unclear what respondents listen for when deciding to participate. Research has not found that the actual content of the introduction makes much difference (Singer, 1993; Dillman et al., 1976).

Groves and McGonagle (2001) note their methodology may not apply as neatly to household telephone surveys. Their empirical results were for telephone surveys, but of organizations, rather than households. Shuttles et al. (2002) tested this method for an RDD sample to recruit respondents to complete a diary for watching television. A series of focus groups with experienced interviewers developed 8 themes of respondent objections. A 3-day training was then held which emphasized methods to respond. While the authors report very positive feedback on the training, their evaluations did not find any significant effect of the training on cooperation rates. Mayer and O'Brien (2001) also tested the training method for a random digit dial (RDD) survey. They did find rates increased as much as 14 percentage points compared to the interviewers who did not receive the training (see also Groves and McGonagle, 2004). They found evidence that the effect of the training was manifested several weeks into the data collection period.

Some research suggests that it may not be as much what the telephone interviewer says, but how it is said. Oksenberg and Cannell (1988), for example, hypothesized that voice characteristics, the speed of delivery and other aspects of the aural presentation might play a primary role in at least maintaining the initial contact with respondents. Houtkoop-Steenstra and van den Bergh (2002) hypothesized that when interviewers are allowed to vary the style in which they introduce the study, without altering the content, they are more likely to get cooperation.

purpose of this paper is to report the results of an evaluation of a computer automated system that helps interviewers train to invite telephone respondents to take a survey. The system was intended to help interviewers refine their skills in reading the introduction and quickly responding to respondent concerns. Standard refusal avoidance training (e.g., lectures, interactive presentations, role plays) does not typically prepare interviewers for "live" situations with respondents. For many surveys, interviewers learn this process in the first few weeks of production, rather than beforehand. An important advantage of practicing the interview in live situations is to increase the interviewer's confidence in their ability to implement the study procedures. Previous research has found that interviewers that are more confident are, in fact, more successful (Groves and Couper, 1998; Snijkers, Hox and de Leeuw, 1999).

The training module tested, called Automated Refusal Avoidance (ARA), simulated actual exchanges between a respondent and interviewer. The system was developed with existing CATI, telephony and Interactive Voice Response (IVR) systems to produce an interchange that made an interviewer feel as if she was making an actual telephone call and speaking to a respondent. In ARA training, interviewers sat at their carrels and work a case as though they were actually making a call. The telephony system dialed a toll-free number which was linked to the

IVR system. The interviewer saw the same CATI screens that would be seen on the project. The IVR system then played a recording of an actual respondent, making objections, interrupting or asking a question. The pre-recorded statements, questions, and interruptions were based on respondent comments taken from observations of previous surveys.

In order to test the effectiveness of the module, this study was intended to address several questions:

- Does ARA training improve interviewers' ability to gain respondent cooperation?
- How does the effectiveness of ARA training vary by:
  - interviewer experience,
  - interviewer level of confidence, and
  - stage in data collection?
- What do interviewers think of the new method?

These questions were based on a model which views respondent cooperation as a function of both interviewer and respondent characteristics. On the interviewer side, it was expected that both the experience and the confidence of the interviewer are positively related to gaining cooperation. We expected that the ARA training would have a positive effect on the interviewer's skills to convince respondents. It was also expected that there would be an interaction between the ARA and experience/confidence. Those with the least experience and lowest confidence levels would benefit most from the training. This finding would be consistent with the results observed in the studies cited above, where the interviewers with the lowest cooperation rates benefited most from the training.

Method

Description of the System

The automated system presented a series of recorded scenarios, such as the following:

The telephone rings

IVR: A female, sounding annoyed answers "Hello!" *(There is background noise of a baby/children screaming.)*

The IVR system is silent as the interviewer speaks.

IVR: "How did you get this number, its unlisted?"

IVR waits a few seconds and then,

IVR: "Why don't you interview someone else?"

IVR waits and then tells interviewer the scenario has ended and is instructed to go on.

Twelve different scenarios were designed with background noises to mirror real life situations. Each scenario has the possibility of two different greetings and four different respondent concerns. The IVR system randomly plays one greeting and two objections in each scenario. Thus ARA could produce 96 different combinations. The system was not interactive in the sense that it responded specifically to what the interviewer is saying. The IVR was programmed with pre-determined responses which were timed to either interrupt or wait long enough so the interviewer is done speaking.

This module emphasized self-paced learning that can be adapted to the individual strengths and weaknesses of the interviewer. All exchanges occurring on the system were recorded. This feature allowed interviewers to hear what they sound like during the introductory phase, as well as their response to objections. The recording also allowed interviewers and supervisors to evaluate what happened during each exchange and discuss the results. Interviewers could practice at their own pace. Interviewers were instructed to practice with the ARA until they felt comfortable with their performance. Once satisfied, they play their session with a supervisor to discuss the results. Interviewers could learn through trial and error, without being embarrassed in front of peers and are able to devote as much time as they feel they need to become proficient. The trainer could work with the interviewer on specific problems.

The Evaluation Design

The ARA training was evaluated in conjunction with a telephone survey of nonrespondents to a mail survey. The initial questionnaire was mailed to a sample of medicare-eligible men and women. Those that did not return the questionnaire were followed up by telephone to complete the survey. The interviewers were randomly assigned to either the treatment group who completed ARA training or a control group.

Two telephone centers participated in the evaluation. Each center administered a standard training that was twelve hours in length. The trainers provided the interviewers with background about the study, details on the questionnaire and the standard refusal avoidance material. The latter included interactive lectures that familiarized the interviewers with the questions (and answers) that were anticipated by respondents. An additional 2 hours of training was dedicated to refusal avoidance. During this two hours, the treatment group completed the ARA training while the control group completed additional contact role plays.[1] As part of the ARA training interviewers were instructed to complete up to 8 scenarios. After finishing 4 scenarios, interviewers listened to the interaction and made decisions on what they needed to improve upon. The last four scenarios were played back for the interviewer and team leader, who discussed the results. Interviewers were allowed to record additional scenarios until they felt comfortable with their avoidance techniques.

[1] The contact role plays covered all types of situations related to contacting a household. A subset of these were situations where the respondent refuses to participate. The other role plays covered other situations, such as making appointments, determining if a number is a business, leaving messages, etc.

Two trainings were held in each of the telephone centers. Interviewers attended the training according to availability. The first cohort of interviewers attended project training on December 6th and 7th, 2003 and completed the ARA training or additional contact role plays between December 7th and 11th, 2003. Cohort 2 attended project training on December 13th and 14th, 2003 and completed ARA training or additional contact role plays between December 14th and 17th, 2003. Data collection began on December 15th for interviewers who had completed all training sessions.

Measures

At the end of 12 hour training and before the supplementary 2 hour sessions, every interviewer was asked to complete a questionnaire. All of the 109 interviewers who completed training and collected data during the study completed this questionnaire. Topics covered by the questionnaire items included interviewer demographics, self efficacy, interviewer attitudes about how to handle different situations and an adjective check list. The self efficacy items were included to measure the interviewer's confidence in their ability to address respondent concerns and to code call results appropriately. These consisted of 11 items in which interviewers rated their level of confidence in handling specific types of situations, including the following:

-Answer a respondent who hears that I am conducting a survey and says "I am too busy now!

-Determine that a respondent has a language problem.

-Answer a respondent who says "Take me off your list!"

-Answer a person who answers the telephone by shouting "Hello!" in an angry, annoyed tone of voice.

The attitude questions asked interviewers whether they agreed or disagreed with how to handle particular situations. Many of these were drawn from previous research on the interviewer performance (de Leeuw, et al., 1998). The adjective check list was a series of questions for which responses would be used to classify some aspect of the interviewer's personality (Wiggins, 1995).

During the first week of data collection the project staff observed the initial telephone interactions for a majority of interviewers participating in the evaluation. Each interaction was coded using seven items:

- Did the Respondent hang up without responding?
- Did the Interviewer finish entire introduction?
- Did the Interviewer read the introduction verbatim?
- Did the Interviewer use "up speak"?
- Did the Respondent raise an issue or question?
- Was the Interviewer's response to the issue quick enough?
- Was the Interviewer's response to the issue adequate?

Approximately three weeks after data collection began (the week of January 5th), interviewers were asked to complete a second questionnaire. The questionnaire included the same self-efficacy questions as the first questionnaire. Interviewers in the treatment group were asked an additional set of questions about their thoughts and opinions on the ARA training.

Results and Discussion

Out of the 109 interviewers that began the study, 52 (46.8%) were in the ARA training group and 59 (53.2%) were in the control group. As noted above, the interviewers were divided into two training cohorts, based on availability. Fifty-five percent did the training approximately a week before the survey went into the field (Cohort 1) and 45% completed the training just prior to the fielding of the survey (Cohort 2).

To study the impact of the training upon the self-efficacy measures, a factor analysis was conducted with the 11 items administered on the first questionnaire. This resulted in two factors. The first explained approximately half the variance in the 11 items (eigenvalue = 5.58), with the second factor explaining approximately 9% (eigenvalue = 1.1). The factor loadings, after an orthogonal rotation, are shown in Table 1. Factor 1 is distinguished by situations that require the most judgment on the part of the interviewer to assess the situation and decide on the appropriate action. Definite statements like "I don't have time" or "I am too busy" are very close to refusals. Interviewers may perceive these as very different from the types of questions that load on factor 2, which imply much more of a dialogue between the interviewer and respondent ("how long does it take?"; "What's this study about?"; "How did you get my number"). Similarly, factor 1 includes a response in an angry tone and determining whether there is a language problem. Both situations require judgment on the part of the interviewer to determine what they need to do to convince the respondent to participate on the study. For purposes of analysis, factor scores were computed for each of these factors and used as variables in subsequent analysis. These are labeled "confidence 1" and "confidence 2" for the factor scores from the first and second factors, respectively.

The results of the randomization process are shown in Table 2, which displays selected characteristics of interviewers across the two different groups. Interviewers did not differ along these characteristics by ARA and control groups.

Table 3 provides the results of the experiment for 6 outcome measures. These outcome measures are aggregated without regard to interviewer. Parallel descriptive analyses were done that took an average of each interviewer and then computed a mean of these averages. The results are the same as reported below. The first

measure is the cooperation rate, which was computed by dividing the number of completed interviews by the number of completes plus the number of refusals (COOP3 from AAPOR, 2000). These are restricted to the initial resolution of the case for the survey. Calls that were not resolved because of setting appointments, no answers, etc. are not included in this calculation. Also, these do not include attempts at conversion, where the household had refused to cooperate on a previous call. The other measures included in Table 3 are from the behavior coding. These represent a subset of the interviewers, since not all interviewers were observed. Also note that some of the measures only apply to those calls where the situation actually came up (e.g., to respond to an objection, the respondent had to initially raise an objection).

These results show a mixed picture of the effect of the ARA training. For the most important measure of cooperation rate, the ARA training did not result in any noticeable effect. The cooperation rates are practically the same across both groups. The picture is a bit different for the behavior coding measures. There is a pattern whereby the ARA group had fewer people hang-up, more interviewers finishing the entire introduction, reading the introduction verbatim, responding quicker and adequately. Although, none of these differences are large.

One of the hypotheses discussed above was that the effects of the training would differ by the level of experience of the interviewer. Table 4 provides the cooperation rates by whether or not the interviewers had previously done a study at Westat. As one might expect, experienced interviewers achieved higher cooperation rates than the non-experienced interviewers by 8% - 10%. The effect of the ARA, however, did not vary by experience. If anything, it was in the direction opposite of our hypothesis.

Mayer and O'Brien (2001) found there to be a learning effect associated with the training. Interviewers seemed to take 1 or 2 weeks to learn to apply the techniques taught in the training. This was manifested by the effect of the training getting larger several weeks into the field period. This was tested for the ARA by computing cooperation rates for the first and second bi-weekly periods of interviewing (weeks 1 and 2 vs. 3 and 4). The rates of the two experimental groups during the two bi-weekly periods were nearly identical.

As noted above, there were two training cohorts. The first training was conducted a week prior to the field period and the second was administered a week later (just before the field period). Implementation of the training did differ by cohort in at least two important ways. For the first cohort, there were technical difficulties with interviewers accessing the recordings. During the first few days of the training, interviewers could not consistently get through the entire training. This problem was corrected towards the end of the first week of implementing the ARA. The second problem was the lack of consistent feedback from the supervisors. As noted above, ARA was designed to have the interviewers go through the recordings and then discuss these with a supervisor to get a critique and an OK to move into production. It took a few days for this process to be worked out among the supervisors. The result was inconsistent coaching for the first cohort.

For this reason, the analysis examined the results by training cohort. As can be seen from Table 4, there is a relationship between cohort and the effectiveness of the training. For cohort 1, there seemed to be a negative effect of the ARA (difference of 4.4%), while for cohort 2 there is a positive effect of the ARA (difference of 5.1%).

When breaking this result further by experience, there was a three-way interaction between ARA, cohort and experience. For experienced interviewers in the first cohort, there was not an effect of the ARA training. For the non-experienced interviewers in the first cohort, the ARA training actually had a negative effect (-10.9%). The results were different for cohort 2, where the training had a positive effect for both experienced and non-experienced interviewers.

None of the above analyses accounts for the clustered nature of the data-set. The cooperation rates represent multiple observations for the 109 interviewers who participated in the study. Testing for statistical significance was accomplished by estimating a hierarchical linear model (HLM; Bryk and Radenbush, 1992). An advantage of this procedure is that it allows for controlling for variables that are also thought to be related to obtaining cooperation from respondents. It is important to control for other variables, since the experiment did not randomize assignment across the different training cohorts. It may be the case, for example, that interviewers with higher cooperation rates were disproportionately assigned to the experimental group at the second cohort.

The HLM model that was estimated took the form:

Call-level (Level 1)

$$\Pr ob(Cij) = B_{0j} + B_{1j}(Evening) + B_{2j}(Weekend)$$

Interviewer-level (Level 2)

$$Boj = \gamma_{00} + \gamma_{01}(ARA) + \gamma_{02}(Cohort\,2) + \gamma_{03}(Experience) +$$
$$\gamma_{04}(Confidence\,1) + \gamma_{05}(Confidence\,2) + \gamma_{06}(ARA\ and\ Cohort\ 2) + Uoj$$

$$B_{1j} = \gamma_{10}$$

$$B_{2j} = \gamma_{20}$$

Where *Cij* is (0, 1) variable indicating whether or not the respondent cooperates on the call.

The variables included were the time the call was made, the experience of the interviewer and the confidence of the interviewer (factor scores from the factor analysis described above). The time of day variable had three

categories: 1) weekday day, 2) weekday evening and 3) weekend. To estimate the equation, the weekday day category was left out of the equation, so the coefficients for the other two categories represent differences from this time period. Experience and cohort represented differences from the non-experienced and first training cohort, respectively.

The model assumed the cooperation rate would vary by interviewer and would be a function of confidence, experience, cohort and ARA training. The analysis above suggested there would be a significant interaction between ARA and training cohort. All of these variables were used as predictors of the level-1 intercept term. The effects of the different time periods were assumed to be fixed effects. The level-1 equation was estimated as a logistic regression.

The result is shown in Table 5. All of the coefficients were in the expected direction. Cooperation rates were the highest during the weekday day. Interviewers with the most confidence and those with experience had higher cooperation rates. Generally, the cooperation rates seemed to go down between the two training cohorts, although this was not statistically significant. The interaction between ARA and the training cohort was positive, indicating the ARA effect is positive for the 2nd cohort, but it was not statistically significant.

Other analyses (not shown here) examined the relationship between the ARA and the confidence of the interviewers. The second questionnaire, administered several weeks into the field period, included identical measures as the first questionnaire. We conducted analysis that tested whether there were differences in confidence at this point in the field period between the ARA and the control groups. This analysis did not find a difference across the groups. This analysis does show that the confidence of the interviewers did increase over time (relative to the beginning of the data collection period) and that confidence 3 weeks into the field period was positively related to cooperation rates.

Feedback from the interviewers about ARA was generally positive. This feedback was collected in the debriefing sessions and on the second questionnaire. There were two features the interviewers thought were especially helpful. One was that the ARA prepared them for what to expect once they were on the telephone. The other was the ability for the interviewers to listen to themselves. Experienced interviewers especially commented on finding speech patterns that they never realized were occurring. This might have included, for example, saying “UH” too much in the middle of sentences or reading the introduction at a different pace than desirable. The virtues of listening to their own sessions may explain why the ARA did not seem to show any interaction with the level of experience of the interviewer.

On the negative side, the interviewers thought the interactions with the ARA were not as realistic as they would have liked. While the context of the sessions were convincing (e.g., working on a terminal, dialing the phone, initial greetings by respondents), the responses of the system were too mechanical. The scenarios were administered in a serial fashion, ignoring what the interviewer said in response to any particular objection. In addition, for some of the sessions, the sound quality was problematic. When some interviewers listened to their sessions, they were not able to clearly hear what they actually sounded like.

Conclusion

Given the initial start-up problems we experienced, it is encouraging that there were indications that the ARA had a positive effect on cooperation rates. It should be possible to modify the ARA training to improve it technically and to make it a more realistic experience for the interviewers. With these changes, the methodology seems encouraging as an addition to the tools that can be used to train interviewers on refusal avoidance.

There are several important limitations when applying these results to other telephone surveys of households. One is that the evaluation was conducted with a list sample of elderly respondents. Relative to other age groups, this population is more cooperative. This can be noted, in part, by the relatively low percentage of persons that hung up the telephone on the interviewer (30% -- Table 3). On a related point, this survey was conducted as a follow-up to a mail questionnaire, using a list-based sample. Most respondents had already received a cover letter and questionnaire from the sponsoring agency and were at least familiar with the attempts to complete a survey. Interviewers were able to call into the household asking for a particular individual. This is somewhat different from other types of telephone surveys, such as those using RDD frames, where there is a good chance the person who happens to answer the telephone will not have seen any advance material about the survey. For both of these reasons (restricted age range of the sample, advanced mailing to a list sample), we would expect that convincing respondents in this sample might be different than convincing a more general population, with less prenotification.

Table 1. Factor Loadings* for Self-Efficiency Items from First Interviewer Questionnaire

How confident you feel that you can…	Factor Loadings	
	1	2
1. Respond to "I'm too busy."	.84	.19
2. Determine a language problem	.78	.16
3. Respond to "Take me off your list."	.49	.57
4. Determine a business phone	.62	.30
5. Respond to an angry greeting	.76	.20
6. Respond to "What's the study about?"	.38	.56
7. Respond to "I don't have time."	.71	.48
8. Respond to "How did you get my number?"	.50	.68
9. Respond to "How long does the survey take?"	.32	.66
10. Respond to cautious people	.35	.76
11. Distinguish between busy signals	-.006	.72
Eigenvalue	5.58	1.10

* Varimax with orthogonal rotation.

Table 2. Characteristics of interviewers by experimental group

		ARA	Control	Whole sample	χ^2
Age	18-24	16.3%	8.8%	12.3%	5.95
	25-34	16.3%	24.6%	20.8%	
	35-49	42.9%	29.8%	35.8%	
	50-64	18.4%	33.3%	26.4%	
	65 or over	6.1%	3.5%	4.7%	
Gender	Female	68.6%	55.2%	61.5%	2.07
	Male	31.4%	44.8%	38.5%	
Experience	New	39.2%	39.7%	39.4%	.002
	Experienced	60.8%	60.3%	60.6%	
Training cohort	1	54.9%	56.9%	56.0%	.04
	2	45.1%	43.1%	44.0%	
Confidence 1		.065	-.056	0	.39 (F score)
Confidence 2		.013	-.11	0	.02 (F score)
Sample size		52	59	109	

Table 3. Cooperation and Behavior Codes by Experimental Group (interviewer level)

	ARA (%)		Control (%)	
Cooperation rates	61	(n=3511)	61	(n=4740)
Hang-up	4	(n=228)	5	(n=318)
Finishing the intro	69	(n=258)	61	(n=351)
Reading intro verbatim	92	(n=258)	83	(n=349)
R raising issues	67	(n=256)	65	(n=346)
Responding quickly	88	(n=174)	82	(n=228)
Responding adequately	74	(n=174)	66	(n=222)
Up-speak	20	(n=256)	23	(n=349)

Table 4. Cooperation Rates by Experimental Group and Selected Characteristics

	ARA	Control	Difference (%)
Experience			
New interviewer	56.1%	58.4%	-2.3
Experienced interviewer	66.0%	64.4%	1.6
Week			
1st period	58.0%	59.4%	-1.4
2nd period	64.5%	64.1%	.4
Training Cohort			
Cohort 1	60.7%	65.1%	-4.4
Cohort 2	60.8%	55.7%	5.1
Training Cohort x Experience			
Cohort 1 – New	53.4%	64.3%	-10.9
Cohort 1 – Experienced	65.8%	65.6%	.2
Cohort 2 – New	57.9%	53.6%	4.3
Cohort 2 - Experienced	66.5%	60.8%	5.7

Table 5. Results of Hierarchical Linear Model Predicting Cooperation Rates

	Coefficient	t-ratio
Call level fixed efforts		
Shift		
Weekday evening	-.203	-2.75
Weekend	-.039	-.64
Interviewer level fixed		
Intercept, (γ_{00})	.658	2.76
ARA training, (γ_{01})	-.096	-.67
Cohort 2 (γ_{02})	-.184	-1.30
Experienced (γ_{03})	.210	1.68
Confidence 1 (γ_{04})	.105	1.89
Confidence 2 (γ_{05})	.056	1.31
ARA x cohort 2 (γ_{06})	.196	.96
Variance of γ_{00}	.211	

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