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Effect of Interviewer Experience on Interview Pace and Interviewer Attitudes

Kristen Olson
Andy Peytchev

Abstract

Traditional statistical analyses of interviewer effects on survey data do not examine whether these effects change over a field period. However, the nature of the survey interview is dynamic. Interviewers' behaviors and perceptions may evolve as they gain experience, thus potentially affecting data quality. This paper looks at how interview length and interviewer evaluations of respondents change over interviewers' workloads. Multilevel models with random interviewer effects are used to account for the clustering of cases within interviewers and individual interviewer characteristics in the 1984, 1988, and 2000 National Election Studies. The 1984 and 1988 NES released sample in four replicates, minimizing the confound between order in an interviewers' workload and sample composition. We find that over the course of the studies, both measures change significantly. Interviewer prior survey experience also was significantly negatively related to the length of the interview. These findings have implications for interviewer training prior to and during studies, as well as suggesting future research to reveal why these behaviors and perceptions change.

Introduction

Interviewers set the rules of a survey interview for respondents. An interviewer's behavior and demeanor guides the survey interaction. Through this behavior, respondents infer their role, perhaps unknowingly (Kahn and Cannell 1957). Although standardized interviewer training is designed to encour-

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age interviewer behaviors such as standardized probing, feedback to the respondent, and consistent question administration, interviewers vary in these behaviors (Fowler and Mangione 1990).

Interviewers also learn their role as they gain experience in conducting interviews. An interviewer may have experience over her lifetime conducting surveys, experience within a particular survey organization, experience over multiple waves of a longitudinal survey, and experience that cumulates over a survey's field period. When experience is defined as general experience on any survey, experienced interviewers elicit higher quality data, such as less item missing data, higher correlations between key study variables, or more reports of sensitive items (Cleary, Mechanic, and Weiss 1981; O'Muirheartaigh and Campanelli 1998; Singer, Frankel, and Glassman 1983), and more interviewer behaviors in general—reading errors, speech variations, probes, and feedback (Bradburn, Sudman, and Associates 1979). However, when experience is operationalized as prior experience on the same survey in previous years, the findings are actually the opposite, at least for certain sensitive topics. Experienced interviewers elicited more item missing data to income questions (Bailar, Bailey, and Stevens 1977) and obtained lower reports of drug use than their less experienced counterparts (Chromy et al. 2005; Hughes et al. 2002; Turner, Lessler, and Devore 1992).

The last type of experience, interview order, which cumulates over the survey's field period, relates to the interviewer gaining familiarity with a particular instrument under a given set of survey conditions. As the number of completed interviews increases, what is learned in training may be gradually replaced by experience. At least some evidence exists that interviewer behaviors (van der Zouwen, Dijkstra, and Smit 1991), response distributions (e.g., reports of lifetime drug use in Hughes et al. 2002) and potentially response biases (hospitalization reports in Cannell, Marquis, and Laurent 1977) change as an interviewer interviews more people within a single study.

Two reasons have been suggested for why interviewers might change behaviors over a field period. First, researchers have hypothesized that interviewers become careless and accelerate the pace with which they administer a questionnaire over a field period (Fowler 1991; Pickery and Loosveldt 2001). From a response quality perspective, Cannell and his colleagues (1981) argued that the pace of an interview affects the attention given to the response task. Faster interviews could lead to lower response quality because the respondent is not able to devote adequate time to the response formation process. There is limited, mixed evidence that this happens (Hox 1994).

Second, other researchers have hypothesized that interviewers learn something from the early interviews that might change their attitudes about future interviews, and change their behaviors accordingly (Cannell, Marquis, and Laurent 1977). Interviewer behavior at a given question is partially a reaction to a respondent's uneasiness with that question, which may be inferred from reactions of respondents during prior interviews (Singer, Frankel, and Glass-

man 1983; Singer and Kohnke-Aguirre 1979; Sudman and Bradburn 1974; Sudman et al. 1977). Alternatively, interviewers may become fatigued after conducting many interviews (Cannell, Marquis, and Laurent 1977; Fowler 1991). As interviewers tire, training may be replaced by experience, and behaviors become less standardized.

We examine two measures that proxy for these interviewer behaviors and attitudes: for pace, since the rate at which the interviewer is actually speaking is unavailable, we use the overall length in minutes of conducting an interview. For interviewer attitudes, since interviewer's attitudes were not independently assessed, we use the interviewer evaluations of the respondent's interest in the survey interview. This study will address the following research questions:

- (1) Do interviewers alter their behavior over the course of the interviewing field period?
- (2) Do interviewers' perceptions of respondents change over the course of the interviewing field period?
- (3) Do interviewers with more experience, in general, differ in these behaviors from less experienced interviewers?
- (4) Are interview order effects, that is, experience over the course of the interviewing field period, different for inexperienced versus experienced interviewers?

Data and Methods

Data

We use data from the pre-election 1984, 1988, and 2000 National Election Studies, conducted by the Survey Research Center (SRC) at the University of Michigan (Burns, et al. 2001; Miller 2003a, 2003b). The National Election Studies (NES) are a nationally representative multistage area probability sample, with face to face interviews on political candidates, parties, American politics in general, and other related topics. Telephone interviews based on a random digit dial sample also were conducted in 2000. In 1984 and 1988, a random sample of the total workload was released every 2 weeks in four replicates over the 8 weeks prior to the elections. Thus, the type of respondents interviewed in the first 2 weeks of the survey are not different, on average, from the type of respondents interviewed in the last 2 weeks of the survey. The overall response rate for 1984, 1988, and 2000 were 72.1, 70.5 (Luevano 1994), and 61.2 percent (Burns, et al. 2001), respectively.¹ In 2000, the data were not collected in random replicates over the field period.

1. Response rates were calculated in NES technical reports prior to adoption of AAPOR standard response rates. Response rates for the face-to-face component of the 2000 NES were 64.8 percent, and were 57.2 percent for the telephone component (Burns, et al. 2001).

Table 1. Number of Interviewers and Respondents, National Election Studies, 1984, 1988, and 2000

	1984	1988	2000
All interviewers			
Number of interviewers	109	113	115
Number of respondents	2,257	2,040	1,807
Interviewers with at least 10 interviews			
Number of interviewers	92	89	83
Number of respondents	2,176	1,905	1,654
Average number of respondents per interviewer	24	21	20
Largest number of respondents per interviewer	59	53	41

However, both face to face and telephone interviews were conducted as part of an NES mode experiment. Thus, the 2000 data allow us to test whether these findings hold for more recent data collections and across modes.

Over 100 interviewers were used to collect data from about 2000 respondents in all 3 years. In order to achieve more stable estimates within interviewers, interviewers who had conducted less than 10 interviews or had worked in only one sample replicate were removed. Excluding interviewers with less than 10 interviews also avoids confounding of the effect of low experience with suggested differences of interviewers who terminate employment after a few interviews (Chromy et al. 2005). The remaining interviewers in all 3 years had workloads averaging 20–25 respondents, with the largest workload in each year roughly twice the average workload (Table 1). The 1988 and 2000 data also contain interviewer experience indicators; roughly half of the interviewers had worked at the SRC for at least 2 years.² Since cases may not be randomly assigned to interviewers within PSUs, estimates for individual interviewers contain area effects. However, our key independent variable requires random allocation of sample cases across the survey collection period, a strength of the 1984 and 1988 NES. We include respondent level demographic controls as robustness checks for our primary models.

Methods

It has become relatively common practice (Campanelli and O’Muircheartaigh 2002; Hox 1994; Hox, Leeuw, and Kreft 1991; O’Muircheartaigh and Campanelli 1998; 1999) to use multilevel models when studying interviewer effects, as the traditional statistical analyses fail to account for the clustering

2. Interviewer-level demographic and experience information was not publicly available for the 1984 data.

of respondents within interviewers and lead to biased parameter estimates and standard errors. Hierarchical models allow unbiased modeling of interviewer-level covariates, given a correctly specified model. We use HLM 5.45 (Raudenbush et al. 2001) to estimate two-level hierarchical linear models. The final model we estimate for each dependent variable is:

Level 1: Respondent Model

$$Y_{ij} = \beta_{0j} + \beta_{1j} \text{Ln}(\text{Order}_{1ij}) + \beta_{2j} (\text{R.Age} - \text{Age.})_{2ij} \\ + \beta_{3j} (\text{R.Educ} - \text{Educ.})_{3ij} + r_{ij}$$

Level 2: Interviewer Model

$$\beta_{0j} = \gamma_{00} + \gamma_{01} \text{InterviewerExperience}_{01} + u_{pj} \\ \beta_{1j} = \gamma_{10} + \gamma_{11} \text{InterviewerExperience}_{11} + u_{pj}$$

In this model, we allow the interviewer mean and order effects to vary randomly across interviewers, but constrain the effects of respondent age and education to be fixed across interviewers. We center the respondent level characteristics (other than interview order) around the grand mean, so that the interpretation of the intercept is simply the interviewer level mean controlling for these characteristics (Raudenbush and Bryk 2002).

Respondents may vary in terms of cognitive abilities and therefore susceptibility to interviewer effects; cognitive abilities may also have a main effect on our dependent variables of interest. Two respondent characteristics that proxy for cognitive abilities are included in the models as control variables: age (Rodgers and Herzog 1992; Sudman and Bradburn 1973) and education (Bradburn, Sudman, and Associates 1979; Knauper 1999; Krosnick and Narayan 1996; Sudman and Bradburn 1974), measured by whether the respondent has a high school degree or less.

Two measures of interviewer experience are used in this paper. First, we dichotomize prior interviewer experience as an interviewer-level indicator for whether the interviewer has one year of experience or less as a SRC interviewer ("Prior experience"). Our measure of prior experience was available only for 1988 and 2000 interviewers. The other experience measure, a respondent level variable, is a continuous sequential number of the interview conducted within each interviewer (experience over a survey's field period, or "Interview order"). An interviewer's first completed interview is assigned the value "1," her second completed interview is assigned the value "2," and so on.

First, we examine the length of time in minutes needed to conduct the interview. Interviewers recorded the start, end, and total time to conduct an interview for each case in 1984 and 1988; in 2000, these data were captured electronically. Second, we look at the interviewer's evaluation of the respon-

dent's interest in the interview, measured on a five-point Likert scale, and completed by the interviewer after conducting the interview. Although Likert scales are ordinal measures, we use a linear model in these analyses. Both hierarchical cumulative logit and linear models were estimated using the 1988 data, and the relationships were similar. The logit model did not converge in the 1984 data. For consistency in analyses across the three years, we use a linear model.

Findings

Table 2 presents two major sets of models for each dependent variable. The first set of models includes only respondent characteristics (Models 1 and 3). The second set adds interviewer covariates as predictors of the respondent outcomes (Models 2 and 4).

INTERVIEW ORDER

Interview Length

A one-way ANOVA model with random interviewer effects is estimated for the length of interview (results not presented). The obtained ρ_{int} values show that 22, 27, and 24 percent of the variance of interview length is between interviewers in 1984, 1988, and 2000, respectively. We note that this behavioral consistency within interviewer is much larger than estimates of ρ_{int} for survey responses (which are usually around 0.01, see e.g., Groves and Magilavy 1980).

In Model 1 (see table 2), the natural logarithm of interview order is entered as a random effect at the respondent level, controlling for the respondents' age and level of education. Based on this model, an interviewer's first interview in 1984 is estimated to be 84 min and the 20th interview is estimated to be about 72 min. Said another way, interviewers appear to pick up speed as they conduct more interviews, controlling for the age and education of the respondent. The inclusion of interview order explains between 13 and 15 percent of the variance among respondents in interview length. Additionally, from these models, the effect of interview order on pace varies randomly across interviewers (a significant variance component) in 1984 and 1988. That is, the rate of "speeding up" varies significantly across interviewers. For the 2000 NES data, dummy variables indicating whether the interview was conducted by telephone or taken in person were included as main effects and as interactions with interview order. There were no significant differences across the two modes.³

3. Results available from the authors upon request.

Table 2. Estimated Coefficients, Standard Errors, and Variance Components for Three Hierarchical Linear Models Predicting Length of Interview in Minutes and Interviewer-Reported Respondent Interest in Interview (1 = Low, 5 = High), 1984 and 1988

Coefficient (Standard error)	Length				Interest						
	Model 1		Model 2		Model 3		Model 4				
	1984	1988	2000	1988	2000	1988	2000	1988	2000		
Fixed effects											
Respondent level											
Intercept	84.49*** (2.05)	72.49*** (1.64)	78.72*** (1.87)	65.50*** (2.08)	72.25*** (2.32)	3.74*** (.07)	3.65*** (.07)	3.63*** (.10)	4.01*** (.07)	3.63*** (.10)	4.02*** (.09)
Ln(interview order)	-3.81*** (.70)	-2.18*** (.50)	-5.10*** (.59)	-.82 (.68)	-4.15*** (.82)	-.08*** (.02)	-.06* (.02)	-.06 (.03)	-.07** (.03)	-.06 (.03)	-.06 (.04)
Respondent age (Centered around grand mean)	.30*** (.02)	.27*** (.02)	.32*** (.03)	.27*** (.02)	.32*** (.03)	-.00004 (.001)	.0004 (.001)	.0004 (.001)	.0067*** (.001)	.0004 (.001)	.0067*** (.001)
Respondent education = High school degree or Less = 1 (Centered around grand mean)	-2.49*** (.86)	-3.36*** (.74)	-4.17*** (1.01)	-3.33*** (.73)	-4.16*** (1.01)	-.55*** (.04)	-.57*** (.04)	-.57*** (.04)	-.53*** (.04)	-.57*** (.04)	-.53*** (.04)
Interviewer level											
Less than 1 year of experience = 1				14.01*** (2.94)	15.11*** (3.48)			.04 (.15)		.04 (.15)	-.04 (.14)

Continued

Table 2. (Continued)

	Length								
	Model 1		Model 2		Model 3		Model 4		
	1984	1988	1988	2000	1984	1988	2000	1988	2000
Coefficient (Standard error)	311.78	209.41	209.29	357.70	.81	.76	.68	.76	.68
Interaction: Interview order * less than 1 year of experience			-2.75***	-2.13+				-0.001	-0.04
			(.97)	(1.17)				(.05)	(.05)
Random effects Sigma ²	311.78	209.41	209.29	357.70	.81	.76	.68	.76	.68
(Respondent level) T00 (interviewer means)	270.09***	160.28***	113.46***	96.84***	.14**	.19***	.11***	.20***	.12***
T11 (interview order)	23.35***	6.81***	5.36*	.00	.001	.002	.002	.002	.002
Proportional decrease of Sigma ² (from base ANOVA model)	15.1%	13.4%	13.4%	13.1%	6.9%	7.3%	10.0%	7.3%	10.0%
Deviance	18877.80	15817.58	15791.27	14434.9	5840.19	5014.08	4189.1	5021.13	4194.4
Effective sample size	2,170	1,905	1,905	1,639	2,161	1,893	1,640	1,893	1,640

*p < .05.
**p < .01.
***p < .001.

Random effects tested using a chi-square test.

Interview Interest

Based on the ANOVA model (results not presented), more than 15 percent of the variance in interviewer evaluations of the respondent's interest in the interview is between interviewers. This is expected, given that different interviewers may interpret the construct of "interest" differently, in addition to the nonrandom assignment of respondents. In Model 3 (table 2), we see that the inclusion of interview order has a weak but significant negative effect on the overall rating of interview interest that stays even after controlling for respondent characteristics in all 3 years of the survey. Interviewers are more likely to rate their respondents as being less interested in the interview as they conduct additional interviews. We would expect that respondents would actually be more interested in the interview in the later interviews since the actual election date is closer in time for the later interviews, so this finding suggests an interviewer effect is present on this interviewer-completed question (whether interviewer behavior is affecting respondent interest, whether it is merely changes in interviewer perceptions, or both). As with the length of interview, there were no significant differences across the modes in the ratings of interest or in how the ratings of interest changed over the field period in the 2000 data.⁴

INTERVIEWER EXPERIENCE

Interview Length

Inclusion of the interviewer-level dummy variable of 1 year or less prior SRC interviewing experience has a significant effect on the length of the interview (table 2, Model 2). We expected that inexperienced interviewers also "get faster" quicker than experienced interviewers because experienced interviewers have had the opportunity to adopt these behaviors during prior surveys. Thus, rates for increasing pace are allowed to vary for the two experience groups. The mean difference in interview length between the inexperienced and the experienced interviewers, accounting for interview order, the interaction between order and experience, and respondent age and education, is as high as 15 min. Significantly, interviewer experience introduces a substantively large shift on the mean interview length for the first interview and on the relationship between order of interview and length of interview. Inexperienced interviewers take significantly longer with their first interview than experienced interviewers. Every three interviews conducted by an inexperienced interviewer result in a decrease of 3 min in interview length, relative to experienced interviewers. Figure 1 illustrates this relationship in more detail. There is no difference in the interviewer experience effect across the two modes in the 2000 data.

4. Results available from the authors upon request.

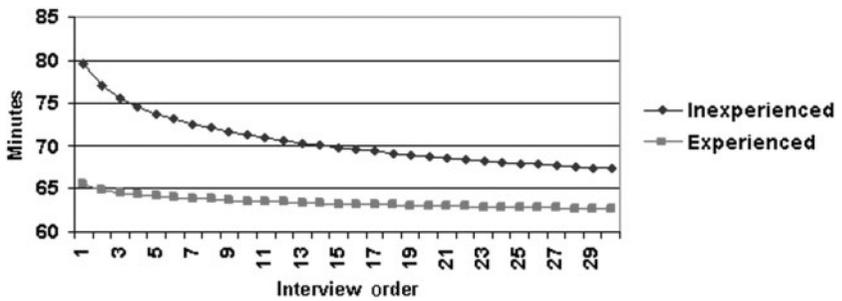


Figure 1. Predicted Effect of Interviewer Experience and Interview Order on Length of Interview, Controlling for Respondent Characteristics, 1988 (Model 2).

Interest

Interviewer experience clearly has a different relationship with evaluations of respondent interest than with interview length. There is no observed effect on the average evaluated level of respondent interest and has no relationship with the rate of change in this measure over interviews (Model 4).

Discussion

The analyses of the 1984, 1988, and 2000 National Election Studies show that, controlling for respondent age and education, interview order is negatively associated with the length of the interview and the interviewer-reported respondent interest in the interview. As an interviewer conducts additional interviews, the length of those interviews decreases and the interviewers perceive the respondents to be less interested. Especially notable in these findings is that the 1984 and 1988 samples were randomly allocated across the course of the survey, such that every 2 weeks had an equivalent pool of respondents. Identical models were run replacing interview order with the sample replicate, and similar trends were observed. Thus, the observed change is not due to changes in the respondent pool over the course of the survey. It is also worth noting that these findings are not a historical artifact, as the results were consistent on the 2000 NES, despite the lack of replicate samples. Furthermore, after accounting for interviewer clustering and controlling for interviewer experience and interview order, the finding by Holbrook, Green, and Krosnick (2003) that face to face interviews in the 2000 NES took more time than phone interviews was no longer supported.

Two or more years of prior survey experience also had a significant relationship with interviewer behavior, as more experienced interviewers conducted their interviews faster. The effect of interviewer experience was not statistically significant for interviewer evaluations of respondent interest.

Notably, the effect of interview order on interview length was present for both experienced and inexperienced interviewers, but was significantly different for the two groups. Although both experienced and inexperienced interviewers saw a decrease in the length of their interviews as they carried out additional interviews, inexperienced interviewers "sped up" interviews faster than those with more experience.

It is clear from these findings that the nature of the interaction between interviewer and respondent changes as interviewers conduct more interviews and gain experience. What remains unknown is what parts of the interaction are altered. For instance, the decrease in interview length may be due to interviewers asking questions at a much faster rate, but it may also be due to fewer deviations from the interview script. These deviations may be beneficial or detrimental. Interviewers may be less likely to engage in unnecessary feedback or unrelated conversation with later respondents. Alternatively, interviewers may be less inclined to probe and to provide in-depth feedback. Furthermore, faster interview pace may be discouraging respondents' attention from the cognitive task, potentially reducing data quality (Fowler and Mangione 1990). Interviewers may also use interviewing techniques such as directive probing that generate answers without as much dialog between the two actors (e.g., van der Zouwen, Dijkstra, and Smit 1991). In-depth examinations of interviewer/respondent interactions over multiple interviews by the same interviewer are required in order to evaluate how undesirable and which of these (or what combination of these) effects are occurring. Furthermore, validation measures and a wide array of questions (e.g. sensitive topics) are needed to evaluate data quality and measurement error.

Additionally, these results suggest that training practices may need to be reevaluated. New and experienced interviewers may receive different amounts or types of training prior to production. For instance, interviewing techniques in general may be covered only for the new hires, while experienced interviewers may join training that is specific to the study at hand, or receive at-home study materials plus telephone training. Such difference in training could explain some of the observed difference in length of interview for experienced and inexperienced interviewers at the first interview. Furthermore, interviewers generally are not retrained during the field period. If quick survey delivery by interviewers is associated with less adequate answers, retraining may be desirable for both experienced interviewers and also for interviewers with large workloads as the survey progresses. Of course, survey organizations vary widely in how interviewers are trained in the pace of questionnaire administration and in the frequency of monitoring (Viterna and Maynard 2002). It would be interesting to compare these findings across organizations that also vary in the level of standardization discussed during interviewer training. It is also important to note that while rate of speech may be undesirable for some purposes, it should not be trained out of interviewers blindly. Since interviewers with lower refusal rates have been identified

as speaking more quickly (Cannell, Miller, and Osksenberg 1981; Oksenberg, Coleman, and Cannell. 1986), tactics that may translate negatively into survey administration can indeed be valuable and necessary when encouraging a sampled unit to participate in the survey.

Although interview order and interviewer experience affect interview length and to some extent interviewer evaluations of respondent interest, further questions arise on the relationship between the observed effects. One possibility is that interview length and interview interest are related. For instance, if an interviewer conducts an interview more quickly, respondent may be less interested in the survey task. Another explanation could be that over multiple interviews, interviewers begin to expect respondents to be uninterested in the survey topic, thereby administering the survey in less time for all subsequent respondents. In order to understand the observed changes in interviewer behaviors, a more thorough investigation of what happens to interviewers as they conduct more interviews is needed.

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