Journal of Official Statistics, Vol. 18, No. 1, 2002, pp. 1–11

Evaluating Socio-economic Status (SES) Bias in Survey Nonresponse

John Goyder,[1] *Keith Warriner,*[1] *and Susan Miller*[2]

Recent work by Groves and Couper reraises the issue of how typical upper SES bias is in survey response. Using data from the Kitchener-Waterloo area of Ontario, Canada, this issue is addressed through a set of local area surveys record-linked to sampling frame information. An innovation is the use of status-ratings of photographs of households in a pretest sample. These are used to generate regression weights for integrating three pieces of information – property value, ownership and dwelling type – into an index of residential SES. This index is then used for evaluating SES bias across seven of the local area surveys. Consistently, and across three modes of contact, the ''middle class bias'' to be expected from much previous work on nonresponse bias is present.

Key words: Survey nonresponse; middle class bias.

1. Introduction

The likelihood of socio-economic status (SES) bias from nonresponse on sample surveys returns to the top of the research agenda due to recent findings reported by Groves and Couper (1998). In an important new book *Nonresponse in Household Interview Surveys*, the authors used data from large-scale national surveys conducted by such prominent U.S. government agencies as the U.S. Bureau of Labor Statistics, the U.S. National Centre for Health Statistics and the U.S. Bureau of Justice Statistics (Groves and Couper 1998, p. 52), all linked to the census to give information on survey nonrespondents. The research concluded that *lower* SES people are *more* likely to respond to surveys than their higher strata counterparts. The finding was unexpected according to at least some prior research covering the past 50 years (e.g., Franzen and Lazarsfeld 1945, p. 300; Benson et al. 1951, p. 188; Champion and Sear 1969, p. 338; Goudy 1976, p. 363; Tucker 1983, p. 187), and raises the need for a re-evaluation of SES bias. One obstacle to the cumulation of knowledge about SES bias due to nonresponse is that researchers working in the academic or market survey sectors do not have access to a record-link with the census through which they can establish the

[1] Department of Sociology, University of Waterloo, Waterloo, Ontario, N2L 3G1, Canada.
Correspondence: John Goyder, e-mail: jgoyder@uwaterloo.ca
[2] Clarica Life Insurance, 227 King Street S., P.O. Box 1601, STN Waterloo, Waterloo, ON, Canada N2J 4C5. E-mail: susan.miller@clarica.com
Acknowledgments: The article is based on a presentation at the International Conference on Survey Nonresponse, October 28–31, 1999, Portland, Oregon. The KWMAS98 was funded in part from a grant from the UW-SSHRC grant program administered by the University of Waterloo. Coding of open-ended questions was performed by Kathleen McSpurren and Cathy Kergoat. Data entry was performed by Chris Goyder. Susan Miller (formerly Coutts) was fieldwork manager. Co-ordinated by John Goyder, other collaborators on the study were James Curtis, Serge Desmarais, John Michela, Ramona Bobocel, Keith Warriner, and Chris Alksnis. The 1988 data came about thanks to Charles Jones. We would also like to thank the three people who rated photographs for residential SES.

status of nonrespondents. Government-sponsored surveys, where the richest record-links are possible, are a special case due to their very success. When response rates cluster into the mid 90s, the nonrespondents record-linked against the census give just the tail of the distribution of resistors normal in the academic and market sectors. Area-based information is seldom useful due to the heterogeneity of neighborhoods no matter how finely coded (Demissie et al. 2000, p. 5). Sometimes administrative data for nonofficial surveys are available, but these will be for special-group samples such as employees in a company. Although it is noteworthy that several such studies have indicated high status within an organization to predict co-operativeness on a within-the-organization survey (e.g., Ford and Zeisel 1949, pp. 496–497; Zimmer, 1956; Kirchner and Mousley, 1963; Gannon et al. 1971), general statements about such bias require general surveys of general populations.

In the present work, we developed a new measure of SES suitable for metropolitan level surveys of general populations. Data come from a series of local surveys from the Kitchener-Waterloo area of Ontario, Canada, record-linked to socio-economic information obtainable from publicly available sources and validated by taking, and rating, photographs of each sampled household. The site is especially useful since under Ontario law householders have the right to direct their municipal tax payments to support either the public (state nondenominational) schools or the Catholic school board. This means that value of residence is assessed even for rental units.

2. Method, Design and Hypothesis

Data come primarily from the KWMAS98, or *Kitchener-Waterloo Metropolitan Area Survey 1998*, an omnibus local area mailed questionnaire survey conducted by the Survey Research Centre and the Department of Sociology at the University of Waterloo. The Kitchener-Waterloo Census Metropolitan Area (CMA) comprises three mid-sized Ontario towns (Waterloo, Kitchener, Cambridge) and two neighbouring rural areas (Woolwich and North Dumfries Townships). The population for the CMA in the 1996 Census was 382,940. A starting sample of 750 names was drawn from city tax assessment rolls. The sequence of contacts (conducted mainly over the months of November and December, 1998) for the main study was: precontact letter; first mailing of questionnaire; postcard follow-up; second mailing of questionnaire, with new cover letter; final reminder letter. The present analysis is based on two files. One is a record-link giving result of contact information together with tax assessment, housing type and owner/renter from the municipal assessment rolls sampling frame. As discussed below, socio-economic status information was derived from these links. This file has $N = 749$ (one case lost due to missing record-link information), and differentiates between contactability (i.e., correct address or not), a few deceased or geriatric cases, completions (early and conversion), and nonreturns. For some of the nonreturns we have definite refusals in the form of phone calls, notes, or blank questionnaires. The second file is a ''merged'' file for 364 respondents linked with the sampling frame data.[2] For this

[2] The proportion of post-office returns was, at 20 percent, high but in line with the experience from a survey employing identical methodology in 1994 (Warriner et al. 1996, p. 547). Analysis of 100 pretest cases from September 1998 showed that the ''moveds'' and ''no such address'' PO returns were disproportionately of lower SES. So as not to allow this source of bias to go unaddressed, we sent out a ''one in two'' follow-up mailing late in the fieldwork (i.e., took a 50 percent random sample of PO returns). These were addressed to ''The occupant(s)'' instead of a named individual. The 60 mailings gave 10 responses, 9 further PO returns (now reclassified to ''no such address'') and the remainder not heard from. For the present analysis, these 60 go into the nonresponses, since the experimental condition was altered by offering each the 5 CdnD postpaid incentive.

subset of respondents, there are socio-economic questions relevant to the present analysis. The study included an experiment with cash incentives in which randomly selected thirds received either no incentive, 5 CdnD prepaid, or 5 CdnD postpaid (i.e., sent to those who returned a completed questionnaire). In the present report, only passing reference shall be made to this component.

2.1. *Measuring SES*

Socio-economic status (SES) is a complex enough construct at the best of times. Issues raised long ago (e.g., Jackson and Curtis 1968) about the sociological meaning of SES do not go away with the passage of time. Indeed, SES may be a less crystallized construct today than a generation ago. Certainly, the concept of family SES is more ambiguous. In the paragraphs below the adequacy of residential tax assessment values and housing unit information as SES proxies is considered.

We mounted a fairly large pretest of 100 cases for the 1998 KWMAS, in part with SES measurement in mind. The pretest questionnaire was dropped off at the sampled household, following the mail-out of a precontact letter, and *a photograph taken*. All 100 households were photographed, including those for which the precontact letter was returned as undeliverable by the post office. Later, two of the photos were removed after it was learned that the addresses were in fact places of business, not residential units, leaving $N = 98$ for the photographic study.

Raters were asked to sort the photos into socio-economic categories numbered one to ten, low to high. We began with graduate students in a methodology course. Examining disagreements across their ratings, it became clear that it was not always self-evident from the photos whether a unit was a detached house or semi-detached. Three householders from the community were then recruited to perform the rating task, and they were advised which of the dwellings were semi-detached. One of the three is a real estate agent in town. The fourth rater was one of the authors, who had helped take the photos. Table 1 gives the correlations between these four ratings, showing a result consistently in the ''mid-70s.'' Since there is no basis from these results for privileging one rating over another, a measure named ''Evaluated Residential SES'' was constructed from the simple mean of the four.

Evaluated SES is linked reasonably closely with three pieces of information readily available from the sampling frame for the K-W area and indeed probably for urban places

Table 1. Intercorrelations among photo ratings, KWMAS98 pretest

	Rater			
	Area resident #1	Area resident #2	Real estate agent	An academic
Area resident #1	1.000			
Area resident #2	.761	1.000		
Agent	.773	.786	1.000	
An academic	.801	.737	.750	1.000
Means	3.29	4.21	3.08	5.30
S.D.	2.01	2.03	1.32	1.50

$N = 98$

in most countries. Thus the regression equation for predicting evaluated SES from owner status [= 1] (versus renter [= 0]), detached house [= 1] (versus the various forms of semi-detached and other multiple dwelling units [= 0]) and assessed value for municipal taxation purposes is shown below. The tax value is claimed by city authorities to be a market value and is expressed in 1,000s CdnD, herein (natural) logged since the distribution is positively skewed.

$$Evaluated\ SES = .828\,(owner) + .906\,(detached\ house) + 2.185\,(tax\ in\ log\ `000s) - 7.689$$

$$R = .774,\ adjusted\ R^2 = .587,\ all\ terms\ have\ p < .02$$

Clearly socio-economic status of residence includes all three dimensions – ownership, detached house and value of property – within each of those first two distinctions. The importance of ownership aroused some surprise, given that the photos gave no explicit information on that status. Apparently an owned property is sufficiently better cared for that the difference is detectable from photographs. It is not unreasonable to regard ownership of property as a dimension of social stratification. Even up until 1920, for example, a property requirement for at least some voters remained part of Canadian franchise law (Dawson 1970, pp. 320–322). As for housing type, the social status accruing from a detached dwelling has been documented in social stratification research at least since the time of Lloyd Warner (Warner et al. 1949, p. 123). The SES measure produced from the three residential variables summed with weights as per the regression formula above is referred to hereafter as ''*Estimated* Residential SES.'' This operationalization of SES focused on place of residence by necessity, since that is the information available from the sampling frame, but it can be noted in justification that status of residence is a key component of general socio-economic status (e.g., Artz et al. 1971).

Within the sub-set of KWMAS data pertaining to respondents (the ''merged file'' described above), none of the standard indicators of SES (e.g., education, occupation, income) inter-correlate very strongly. There is simply too much status inconsistency; too many complex, anomalous cases of low education combined with high earnings, high occupational status but low earnings etc. The socio-economic status of one's place of residence is part of this loose status mix, reflecting especially the consumption, income-related, component. Residential SES is more closely tied to the life cycle than some other status measures. This is seen with particular clarity for the taxation value component of the index. Table 2 shows regression analysis of factors accounting for tax value. Here, detached house and ownership status are covariates in the computation. Along with

Table 2. Model to account for assessed tax value of residence, KWMAS98 mergefile

	B	*Beta*	*P*
Age	.002	.066	.089
Household size	.072	.181	< .001
Detached house	.402	.379	< .001
Owner	.624	.483	< .001
Years of schooling	.021	.145	< .001

$N = 337$; $R = .814$

Scoring notes: Age in years, schooling in years, size as count of people, other variables are binary codes.

schooling having the expected (positive) relationship and the effect of detached house and owner, age of respondent and household size help determine tax value. The tendency for older people to be more expensively housed is only marginally significant, albeit intuitively reasonable. We also tested for the quadratic term for age, which was not significant. The stronger factor is the need for larger families to have more living space than smaller ones. It is frustrating that neither age nor household size can be learned from sampling frame information, and doubly frustrating that, up until the late 1980s, year of birth was part of the publicly available information in the tax rolls.

3. Evaluating SES Bias

The effect of SES on sample probability of response was assessed using a set of logistic regression models shown in Table 3. The models differentiate between contactability, early response (i.e., prior to the first follow-up), conversion (i.e., those who only responded after one or more follow-up mailings) and ''final response,'' meaning the early responses plus the conversions, but excluding the noncontacts. (Non)contactability refers to the 146 post office returns marked ''undeliverable,'' and ''final completion'' includes these post office returns in its denominator. Before computing ''early response,'' eight cases reported deceased or very infirm by next of kin or an agent with power of attorney, were deleted. There are too few such cases, which we could term ''ineligible,'' to support a separate tabulation. The measure of socio-economic status is as just described (the combination of ownership, house type and tax assessment into the single weighted index). Terms for cells within the experiment with cash incentives are included simply to enhance the accuracy of predictions from the model using back-transformations of different levels of SES.

Very clearly, the greatest amount of SES bias using the weighted index of residential status occurs at the contact stage. The effect here (logistic regression of .587) is driven largely by owners of a detached house being less likely than renters to have moved over the period between the last update of the city records and the mail-out for the survey.

Table 3. Logistic regression analysis of response outcomes, KWMAS98 data

	Logistic regression coefficients (Standard form in parentheses)				
	Contactability	Early response[1]	Conversion	Final response	Final completion
Estimated residential SES	.587* (.399)*	.150* (.087)*	.150* (.093)	.181* (.123)*	.365* (.268)*
Postpaid cell	.041 (.000)	.336* (.018)*	.276 (.000)	.357* (.035)*	.303 (.022)
Prepaid cell	.204 (.000)	.526* (.070)*	.560* (.074)*	.663* (.099)*	.606* (.087)*
Constant	−.157	−1.638	−1.082	−1.539	−1.551
N	749	594	406	594	741

[1] Eight ''ineligible'' cases (deceased, or stated by next of kin to be very infirm) have been subtracted from the computations at this stage).

*$p < .05$; one-tailed test for incentive cells.

Note: Standard form coefficients from method in SAS (1986: 271).

Early response, however, is also more likely the higher the residential SES. An effect of the same magnitude (coefficient of .150) for conversion is not significant at the .05 level due to erosion of case base down to $N = 406$ by this stage of the sequential model. The cumulative effect of higher early response rates among those contacted and greater probability of conversion the higher the SES is significant at $p < .05$ (logistic regression coefficient of .181).

We can assess the substance of SES effect in these KWMAS98 data through an example and back-transformation of the logits. Consider the Estimated Residential SES logistic regression coefficient of .365 for final completion. The metric here is a 1 to 10 scale. To compare Estimated Residential SES scores of, say four versus six is to move from, typically, a multiple unit residence in a not especially wealthy area to a modest detached house or perhaps an up-market semi-detached. The two unit change up in Estimated Residential SES multiplied by $.365 = .73$, exponentiating into an odds ratio of 2.1. The odds of a response on the KWMAS are twice for the 6-scoring household what they were for the 4-scoring household on the Estimated Residential SES scale. In the unincentivized part of the sample, the probabilities of completion would be .48 and .65, respectively, for the more modest and the more affluent households. Even with the strongest (the prepaid) incentive, the gap would be 15 points ($p = .63$ versus .78). As we have seen, a good part of this socio-economic effect derives from the migratory stability of higher SES households. Repeating the example with the same residential SES scores as above, but using the ''final response'' model in which noncontact is set aside, gives probabilities of response (assuming the prepaid incentive condition) of .46 and .55 for the lower and higher SES cases respectively.

4. Assessing Generality

4.1. The (non) effect of mode

Earlier in the history of social surveying in North America it was common to cite illiteracy as an impediment to low SES representation in mailed questionnaires (e.g., Franzen and Lazarsfeld 1945; Baur 1947; Wallace 1954). While we might expect today that illiteracy is a problem of the past, Statistics Canada (1991: 9) has estimated that 38 percent of Canadian adults aged 16 to 69 lack the reading skills to deal with ''most everyday reading requirements.'' Illiteracy may thus still be a factor, but we shall next show that it is not the only factor behind the ''middle class bias'' in surveying. On the contrary, the SES effect has occurred in surveys conducted in the same area covered by the KWMAS across all three common modes of contact. Results from this historical data base appear in Table 4, rank ordered by strength of SES effect on response rate using the same weighted index as above. Note for example that a 1982 personal interview survey shows an odds ratio for the Estimated Residential SES variable of 1.286 for response and 1.373 for completion (both significant at $p < .01$; with an odds ratio greater than 1.0 meaning the higher the SES the higher the odds of response). Another personal interview survey from 1988 gave corresponding odds of 1.349 and 1.466, respectively ($p < .005$ in each case). Our lone example of an RDD telephone survey has only minimal and nonsignificant middle class bias, but these records from a commercial market research company gave no information on ineligibles and the reported response rate is suspiciously high. In a survey using

telephone contacts for names from a sampling frame (see 1985 Survey on Surveys in Table 4) the odds ratios equalled 1.303 ($p < .01$). For comparison, the KWMAS98 logistic regression coefficients of .181 and .365, for response and completion, exponentiate into odds ratios of 1.198 and 1.441 respectively, somewhere in the middle of the range for the various modes described in Table 4.

4.2. Alternate measures of SES and alternate locale

Two of the surveys in Table 4 contained occupational SES as coded from city directories. Although these entries are hard to pin down into the detailed categories required for a scoring of occupational SES, with concerted back-checking across city directories of different years much information can be extracted. Champion and Sear (1969) used this method in their classic experiment in SES differences according to type of cover-letter appeal. From ''surveys on surveys'' for 1982 and 1985 merged (Goyder 1986), the effect of occupational SES on probability of response equates to a 1.525 odds ratio ($p < .001$), with virtually the same figure for probability of completion, reproducing the SES bias already observed using residential SES. The metric for occupation in this computation is the Blishen score recoded into first digit plus decimal places, giving essentially a 1 to 7 metric. In standard form, the logistic regression coefficient is .17.

In another replication we can address the issue of studying just one area. The 1988 work histories survey included in Table 4 was also fielded in Hamilton (1988 population for the CMA of 597,000) and Toronto (3.8 million). Response on the study was highest in Kitchener-Waterloo, less in Hamilton and least in Toronto (Goyder et al. 1992, p. 44). Odds ratios for probability of response predicted from the same Estimated Residential SES index used elsewhere herein are 1.209 ($p = .07$) for Hamilton and 1.158 ($p < .005$) for Toronto. Although Toronto's ratio is slightly lower than Hamilton's, the case base for the latter is 797 as compared to just 215 in Hamilton. Again the conclusion might be that SES effect is robust for this type of survey.

5. Conclusion

In surveys of general populations, and under conditions where response rates are likely to fall somewhere within the 40–70 percent corridor, there will often be the familiar ''middle class bias'' whereby the higher the SES of the sampled person the higher the probability of response. Since such academic and market-sector surveys will not normally have access to census data with which to link records, alternative methods must be found to measuring the socioeconomic status of all sample listings.

In the present article supplementary fieldwork was undertaken to photograph each sampled residence in the pretest. In surveys in which precontact letters are to be used, it will be economical, at least in urban areas, to employ workers to both drop off the letter and take a photograph of each household in the main sample. Or, if the sampling frame is being derived from field enumeration, picture-taking could be spliced into that stage. The additional effort seems worthwhile, for our results indicate that such photos can be rated for SES with acceptable consensus between judges.

In the Ontario urban setting examined herein, publicly available records exist on assessed property value, ownership status and dwelling type. Thus, we were able to

Table 4. Replications of SES bias across modes of contact: K-W area samples

Odds ratios for different data sets: predicting response probability from estimated residential SES					
Study Year Sampling frame Mode of contact *N*	Noncontactable (i.e., away or moved) Percent	Response Percent	Completion Percent	Odds Ratios	
				Response	Completion
Survey on Arts Centre[a] 1985 Phone directory Mail 70	5.7	47.0	44.3	1.918*	1.851*
Work Histories[b] 1988–9 Tax rolls Personal interviews 267	(20.2)	48.4	38.6	1.349*	1.466*
Survey on surveys[a] 1985 City directory Telephone 140	8.0	65.2	61.4	1.303*	1.337*
Survey on surveys 1982 City Directory Personal int., with mail then tel. follow-up 140	11.4	64.7	61.4	1.286* (1.741 for personal interview cases only)	1.373*

Table 4. Continued

Odds ratios for different data sets: predicting response probability from estimated residential SES					
Study Year Sampling frame Mode of contact *N*	Noncontactable (i.e., away or moved) Percent	Response Percent	Completion Percent	Odds Ratios	
				Response	Completion
Survey on Arts Centre 1978 Phone directory Mail 390	(2.1)	40.6	39.7	1.264*	1.256*
Newspaper readership 1983 RDD Telephone 413	nil	78.9	78.9		1.013

( ) = rough estimate *$p < .05$

Notes: [a] These studies had over-samples of city directory refusers and that variable is thus netted out in the comparison.
[b] This computation was based on the sample before substitutions for ineligibles. Response rate with substitutions was 57.7 percent, and SES effect is substantively the same as reported.

validate the archival information against the SES ratings of photos. Since there is about 60 percent shared variance between the two, either the property information or direct photos will be useful when available, for assessing SES nonresponse bias in surveys. Of course, access both to the status-rated photos and to property information would be optimal.

In the university and market research surveys that typically achieve mid-level response rate and that are described in the present article, SES bias due to nonresponse is robust in a double sense. First, we were able to present at least a little data replicating and reproducing SES bias beyond status conceptualized in terms of residential units, with occupational data coded from city directories. Thus, although socio-economic status is an innately diffuse and perhaps multi-dimensioned construct, different indicators give the same conclusion with respect to SES bias in surveys. Secondly, the bias is not just a matter of contactability, or of early response, or of convertibility. The mail surveys show that the effect is occurring at every stage. The next step in this area of research might be renewed attention to the *reason* for SES bias, looking beyond mode-specific factors such as literacy to some of the more generic conceptual domains including Groves and Couper's (1998, pp. 32–34; also Groves et al. 1992) social psychological factors.

6. References

Artz, R.D., Curtis, R.F., Fairbank, D.T., and Jackson, E.F. (1971). Community Rank Stratification: A Factor Analysis. American Sociological Review, 36, 985–1002.

Baur, E.J. (1947). Response Bias in a Mail Survey. Public Opinion Quarterly, 11, 594–600.

Benson, S., Booman, W.P., and Clark, K.E. (1951). A Study of Interview Refusals. Journal of Applied Psychology, 35, 116–119.

Champion, D.J. and Sear, A.M. (1969). Questionnaire Response Rate: A Methodological Analysis. Social Forces, 47, 335–339.

Dawson, R.M. (1970). The Government of Canada (5th Edition, revised by Norman Ward). Toronto: University of Toronto Press.

Demissie, K., Hanley, J.A., Menzies, D., Joseph, L., and Ernst, P. (2000). Agreement in Measuring Socio-Economic Status: Area-Based Versus Individual Measures. Chronic Diseases in Canada, 21, 1–7.

Ford, R.N. and Zeisel, H. (1949). Bias in Mail Surveys Cannot be Controlled by one Mailing. Public Opinion Quarterly, 13, 495–501.

Franzen, R. and Lazarsfeld, P.F. (1945). Mail Questionnaire as a Research Problem. Journal of Psychology, 20, 293–320.

Gannon, M.J., Nothern, J.C., and Carroll, S.J. (1971). Characteristics of Nonrespondents Among Workers. Journal of Applied Psychology, 55, 586–588.

Goudy, W.J. (1976). Nonresponse Effects on Relationships Between Variables. Public Opinion Quarterly, 40, 360–369.

Goyder, J. (1986). Surveys on Surveys: Limitations and Potentialities. Public Opinion Quarterly, 50, 27–41.

Goyder, J., Lock, J., and McNair, T. (1992). Urbanization Effects on Survey Nonresponse: A Test Within and Across Cities. Quality and Quantity, 26, 39–48.

Groves, R.M., Cialdini, R.B., and Couper, M.P. (1992). Understanding the Decision to Participate in a Survey. Public Opinion Quaterly, 56, 475–495.

Groves, R.M. and Couper, M.P. (1998). Nonresponse in Household Interview Surveys. New York: Wiley-Interscience.

Jackson, E.F. and Curtis, R.F. (1968). Conceptualization and Measurement in the Study of Social Stratification. In Methodology in Social Research, ed. H.M. Blalock and A.B. Blalock, New York: McGraw-Hill.

Kirchner, W.K. and Mousley, N.B. (1963). A Note on Job Performance: Differences Between Respondent and Nonrespondent Salesmen to an Attitude Survey. Journal of Applied Psychology, 47, 224–234.

SAS (1986). SUGI Supplemental Library User's Guide, Version 5 Edition. Cary, North Carolina: SAS Institute.

Statistics Canada (1991). Adult Literacy in Canada: Results of a National Study. Ottawa: Ministry of Industry, Science and Technology, Cat.89-525E.

Tucker, C. (1983). Interviewer Effects in Telephone Surveys. Public Opinion Quarterly, 47, 84–95.

Wallace, D. (1954). A Case for – and Against – Mail Questionnaires. Public Opinion Quarterly, 18, 40–52.

Warner, W.L., Meeker, M., and Eells, K. (1960 [1949]). Social Class in America: The Evaluation of Status. Chicago: Harper Torchbooks.

Warriner, K., Goyder, J., Gjertsen, H., Hohner, P., and McSpurren, K. (1996). Charities, no; Lotteries, no; Cash, yes: Main Effects and Interactions in a Canadian Incentives Experiment. Public Opinion Quarterly, 60, 542–562.

Zimmer, H. (1956). Validity of Extrapolating Nonresponse Bias from Mail Questionnaire Follow-ups. Journal of Applied Psychology, 40, 117–121.

Received November 1999
Revised February 2001