THE REPORTING OF NONRESPONSE ANALYSES IN SURVEY RESEARCH

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ABSTRACT

Because survey respondents may not be representative of the population being studied, the external validity of many research conclusions may be of concern. Nonresponse analyses helps address this concern. The purpose of this paper is to identify how frequently nonresponse analyses are reported, and what variables are related to these rates. We find that less than a third of the survey studies include nonresponse analyses. A number of journal and article quality measures and sample characteristics were found to be related to the reporting of nonresponse analyses.

Surveys are an important data collection method in the behavioral sciences because they can provide information that is not attainable by any other means. However, because surveys usually involve sampling, their use raises a number of concerns. An important concern is the external validity of the research conclusions. If the respondents are not representative of the population, showing a nonresponse bias, the generalization of the findings to the population are more questionable (Viswesvaran, Barrick, & Ones, 1993). Nonresponse analyses provides important information about the representativeness of the sample. The purpose of this paper is to identify how frequently nonresponse analyses are reported, and what variables affect these rates.

BACKGROUND

In survey research, if respondents are not representative of the population being studied, questions about the applicability of the findings to the population arise because these differences may affect the relationships among the variables being studied (Sackett & Larson, 1992). One way to increase the representativeness of the sample is to increase the response rate, which is affected by numerous factors, including the length and tone of the questionnaire, the order of the items, the follow-up mechanism, and the personal connection of the survey (Dillman, 2000; Rogelberg & Luong, 1998; Viswesvaran et al., 1993). However, even with a large response rate, a number of phenomenon (e.g., volunteer bias) may affect who responds to a survey, creating differences between the respondents and nonrespondents beyond sampling error (Roth & BeVier, 1998; Viswesvaran et al., 1993), resulting in nonresponse bias. This nonresponse bias may result in study findings not being applicable to the population if the differences between the population and sample affect the applicability of the

study findings. In such cases the external validity is reduced and the value of the study is diminished.

There are numerous ways to test for nonresponse bias (see Rogelberg & Luong, 1998, Rogelberg, Conway, Sederburg, Spitzmuller, Aziz, & Knight, 2003). This analysis frequently consists of respondents being compared to nonrespondents or the population on archival data or data gathered by a follow-up survey. When nonrespondent or population data is not available, a procedure comparing late and early responders (wave analysis) is still possible. Other methods include looking at response intentions and statistical approaches (Rogelberg & Luong, 1998; Rogelberg et al., 2003). Because each method has distinct limitations, the best way to show that nonresponse bias does not exist is to use a number of the procedures and show convergence (Rogelberg & Luong, 1998). Thus, a systematic method for extracting the impact of nonresponse on survey results and analyses is required to reduce concerns about external validity (Rogelberg & Luong, 1998; Viswesvaran et al., 1993), suggesting that survey research should report nonresponse analyses whenever possible.

METHOD

This exploratory study investigates what factors relate to the reporting of nonresponse analyses. The factors analyzed include journal and study quality, and sample characteristics. To explore which factors were related to the reporting of nonresponse analyses we looked at all the studies in 9 management journals over 5 years (2000-2004). The nine journals were chosen because they cover all tiers of journal quality. Some articles involved multiple studies and we coded these as one observation per study. The second and third author coded the studies independently. We found the coders agreed on 3453 of 3595 codings or 96.1% of the time. When there was a disagreement, the coders discussed the differences and came to a consensus on the correct value.

We only included survey studies in our sample where participation was voluntary and participants were not part of a "captive audience". We did not consider such studies relevant since their participants did not really have the option to respond (Baruch, 1999).

Measures

Relevant survey studies were coded as "1" if they provided some nonresponse analyses, and "0" if they did not. This variable, reported nonresponse analyses, was our dependent variable.

Independent variables. Journal quality was measured in a number of different ways. The first was Journal Tier. Journal rankings tend to use three tiers: First, second, and third. We used the journal rankings presented by Extejt and Smith (1990), who assessed three tiers of 54 journals in the field of management. These findings were further validated with journal rankings by Johnson and Podsakoff (1994) and Tahai and Meyer (1999). We used three journals in each tier that were consistently ranked in quality across the studies. Journal Tier was coded as 1, 2 or 3, with 1st tier coded as 3, 2nd tier coded as 2, and 3rd tier coded as 1. It was coded this way to be consistent with all quality measures, such that higher scores indicate higher quality.

Several other measures tapping into aspects of journal quality were also included. First, journal rejection rate (obtained from Cabell's Directory of Publishing Opportunities in Management, 9th ed., 2004-2005) was included, under the assumption that higher quality journals have higher rejection rates. Second, average review time (in months) was included (also obtained from Cabell's Directory), under the assumption that more efficiently run journals are higher quality. This score was multiplied by -1, so that greater scores indicated higher quality. Finally, journal citation rate (obtained from EBSCO for all journal articles

from 2000-2004), was included, under the assumption that higher quality journals get cited more.

Study quality was measured using the proxy of study citation count. Because recent studies will have less citations because of the time lag in publishing, we divided the actual study citation count (obtained from EBSCO) by the average citations of all the studies in our 9 journals for that year. Because this count data was highly skewed, we followed the suggestion of Cameron and Trivedi (1998), and performed a ln (x + 0.5) transformation of the variable.

Sample characteristics were measured using the sample n, response rate, and sample type. The sample n was the final sample n of the study. The response rate was calculated as the usable (or final) n over the surveyed n. These variables were included because greater sample sizes and response rates reduce the probability of substantive nonresponse bias (Rogelberg & Luong, 1998). Sample type refers to the type of respondents, which may affect the ease of collecting follow up or archival nonresponse data. Sample type was categorized as either a student sample, employee sample, manager sample (supervisors, managers, team leaders, etc.), executive sample (CEOs, owners, VPs, executives, etc.) or other (which included applicants, customers, spouses, mixes of the other different types, etc.). The variable was coded as five separate dummy variables, coded as 1 if the sample was of the specified type and 0 if it was not. Executive sample was used as the base type and not included in the multivariate analysis.

Control variables. We included article year to control for any year effects. The five years were dummy coded as 1 if the study was published that year and 0 if it was not. The variable *2002* was used as the base year and not included in the multivariate analysis.

RESULTS

Table 1 reports the survey characteristics reported in the articles in the nine journals from 2000-2004 by journal and tier averages. In some cases the values were calculated from other reported figures (e.g., surveyed n from response rate and response n). When response n was reported but no final n was reported, we assumed they were the same. The findings show that in 1st tier journals, 33% of the studies were relevant survey studies, the average reported surveyed n equaled 1594, the average reported response n equaled 860, the average reported final n equaled 823, and the average reported response rate was 57%. In 2nd tier journals 34% of the studies were survey studies, the average surveyed n equaled 1613, the average response n equaled 902, the average final n equaled 879, and the average response rate was 54%. In 3rd tier journals 36% of the studies were survey studies, the average surveyed n equaled 1334, the average response n equaled 299, the average final n equaled 254, and the average response rate was 37%. Across all journals, the final n averaged 735 and the response rate averaged 52%. Although these seem high, they are similar to the average n(1040) and response rate(55.6%) Baruch (1999) found when looking at 5 journals over 20 years (sampling 3 years).

Table 1 also shows that articles in 1st tier journals report nonresponse analyses 29% of the time, articles in 2nd tier journals report it 34% of the time and articles in 3rd tier journals report it 27% of the time. Overall, 31 % of the relevant survey studies reported some type of nonresponse analyses.

Table 2 reports means, standard deviations, and the correlations among the variables. Response rate and executive sample are the only two variables significantly correlated with reporting nonresponse analyses. Studies with lower response rates and studies with executive samples are more likely to report nonresponse analyses.

For the multivariate analysis we used logistic regression as our analysis technique because our dependent variable is dichotomous. Table 3 shows the results of the logistic

regression with reported nonresponse analyses as the dependent variable. Of the control variables, only year 2003 is a significant predictor ($p<.05$) of reported nonresponse analyses. The overall model and the change in the model are both highly significant ($p<.01$) when adding the variables of interest. Of the added variables, journal tier and response rate are highly significant ($p<.01$) predictors of reporting nonresponse analyses. Journal citation rate, employee sample and other sample are significant ($p<.05$) predictors of reporting nonresponse analyses, while journal review time, journal rejection rate, study citations and manager sample are marginally significant ($p<.10$) predictors.

DISCUSSION

We find that very few studies report nonresponse analyses. In our sample, nearly 70% of the published survey studies did not report any nonresponse analyses. The multivariate analysis shows that studies in higher tier journals, studies in journals with shorter review times, studies in journals with higher rejection rates, and studies in journals with less citations are more likely to include nonresponse analyses in survey studies. Further, articles with low response rates, less citations, and an executive (rather than employee, manager, or other) sample are more likely to report nonresponse analyses. Thus, in our sample, measures of journal and article quality and sample characteristics are related to the reporting of nonresponse analyses. There are a number of insights that we believe can be taken from our findings.

First, it is clear that very few studies report nonresponse analyses. Overall, only 31% of the relevant survey studies in our sample reported some type of nonresponse analyses. Without the response analyses being reported, journal readers have no information with which to make a judgment about how the sampling may affect the generalizability of the findings.

Thus, we encourage researchers to include nonresponse analyses in their research and reviewers to insist on it being reported.

Second, in 1st tier journals only 29% of the relevant survey studies reported some type of response analyses, less than the 34% reported in 2nd tier journals, but more than the 27% reported in 3rd tier journals. However, the multivariate analysis reveals that when controlling for other factors, tier is a highly significant predictor. Tier and the other quality measures are positively related to the reporting of nonresponse analyses, with the exception of citations. An exploration of why both the number of article and journal citations are unexpectedly negatively related to the reporting of nonresponse is clearly a viable area of future research.

Third, the response rate of the survey study is highly significantly related to not reporting nonresponse analyses. Thus, researchers and reviewers appear to be more comfortable in not reporting nonresponse analyses when the response rate is high. However, as mentioned earlier, although greater response rates lower the probability of nonresponse bias, studies with large response rates may still have nonresponse bias if there are substantial differences between the respondents and nonrespondents on important variables (Rogelberg & Luong, 1988; Viswesvaran et al., 1993). Thus, even with large response rates, nonresponse analyses are useful in helping readers make an informed judgment on the study's generalizability. It has been suggested that it takes a response rate of 85% to conclude that nonresponse error is not a threat (Dooley & Lindner, 2003). We agree that researchers should provide both empirical and theoretical evidence refuting nonresponse bias whenever the response rate is less than 85% (which in our sample is 91.5% of the studies).

Fourth, this paper has focused on the issue of how frequently nonresponse analyses are reported and factors related to that reporting. Our findings raise serious concerns about the possible prevalence of nonresponse bias. However, we have ignored the issue of the quality of

the nonresponse analyses. The quality of the analyses could further affect our faith in the generalizability of the findings of many studies. Issues such as how many variables are compared, the convergence of the findings, the relevance of those variables, the nature of the comparisons, the nature of the population, and the statistical tests used may all affect the quality of the nonresponse analyses. See Rogelberg & Luong, (1998), Rogelberg et al, (2003) and Dooley & Lindner (2003) for excellent reviews of the types of nonresponse analyses methods and some guidance on conducting high quality nonresponse analyses. See Masters & Miles (2002) and Reuer and Arino (2002) for two examples of high quality response bias analyses that use multiple analyses, provide tables of the analyses, and critically evaluate the findings.

Limitations and Future Research

We believe that our study provides some valuable insights into the current state of affairs regarding nonresponse analyses. Nevertheless, this study has a number of limitations that should be noted. First, for simplicity's sake, our discussion of sample representativeness and nonresponse analyses presumes that the respondents and nonrespondents together comprise the population. We have ignored many important concepts such as sample prototypicality, sample relevance, convenience sampling, and sub-populations (see Sackett & Larsen [1992] for an excellent discussion of these). The representativeness of a sample is far more complex than depicted in our discussion. Future research should introduce this complexity into the analyses as well as the quality issue mentioned above.

Second, because of the limited scope of this paper we look at numerous variables that could influence whether researchers report nonresponse analyses. However, researchers may frequently not have the data available to conduct many types of such analyses. We found that articles with executive samples are more likely to report nonresponse analyses than articles

with managerial, employee or other samples. We speculate that this may occur because more information about executives is available in the public domain than the other sample types. Future research should consider other factors that may limit a researcher's ability to conduct the different methods of nonresponse analyses -- factors such as number of organizations surveyed, level of management support, level of researcher access, nature of the variables (e.g., private vs. public data), and type of survey (e.g., mail vs. telephone), which may all affect the ability to conduct some types of nonresponse analyses.

Third, this study only covers 9 management journals for 5 years. In that time frame 7 of those 9 journals had an editor change. Thus, for two of the journals we cannot be sure that it is a journal rather than editor effect. Increasing the time frame such that multiple editors are included for each journal would eliminate this limitation. Further looking at more journals, in different fields, over a greater length of time, will provide better evidence that these findings can be generalized to all the research in the behavioral sciences.

Finally, this study looks at the specific outcome of whether or not studies report nonresponse analyses. Although we identified a number of variables that significantly predict the reporting of nonresponse analyses, we are still only explaining about 11% of the variance. Much more research is needed to help identify other factors that can explain the reporting of nonresponse analyses. Perhaps looking at the process of publishing may provide greater insight into why nonresponse analyses are so frequently not reported. This could include surveying editors and reviewers to gain their insights and perspectives on various aspects of the reporting of nonresponse analyses.

CONCLUSION

The purpose of this paper was to identify how frequently nonresponse is being reported, and what variables affect these rates. We found that less than a third of the survey studies include respondent analyses. We also found that studies in lower tier journals, studies in journals with longer review times, studies in journals with lower rejection rates, studies in journals with more citations, studies with larger response rates, studies with more citations, and studies using employee, manager, or other samples were less likely to report nonresponse analyses. We hope that in the future, researchers and reviewers will be more concerned with sample representativeness and report nonresponse analyses in all survey research.

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Table 1

Survey Characteristics of Nine Journals from 2000-2004

Journal	Total Number of Articles	Percent of Relevant Survey Studies	Mean Surveyed n	Mean Response n	Mean Final n	Mean Response Rate	Percent Reporting Nonresponse Analyses
AMJ	329	39% (128)	1276.1 (121)	502.1 (122)	466.2 (122)	0.56 (118)	30% (38)
ASQ	127	11.8% (15)	1148.3 (15)	457.9 (15)	450.3 (15)	0.50 (15)	47% (7)
JAP	487	34.1% (166)	1939.4 (131)	1173.0 (159)	1131. (159)	0.58 (123)	28% (46)
1st Tier	943	32.8% (309)	1594.4 (267)	860.2 (296)	822.6 (296)	0.57 (256)	29% (91)
HR	299	8.7% (26)	900.0 (26)	402.4 (26)	394.7 (26)	0.52 (26)	23% (6)
JOB	262	63.7% (167)	2044.2 (145)	1242.9 (152)	1217. (152)	0.58 (133)	33% (55)
JOM	213	31.9% (68)	946.9 (66)	321.2 (67)	300.8 (67)	0.46 (65)	40% (27)
2nd Tier	774	33.7% (261)	1613.1 (237)	901.6 (245)	879.0 (245)	0.54 (224)	34% (88)
JSBM	151	51.0% (77)	1627.8 (70)	278.8 (73)	252.0 (73)	0.33 (68)	35% (27)
GOM	103	34.1% (35)	1059.4 (33)	422.2 (34)	310.8 (34)	0.47 (32)	20% (7)
SAM	125	18.4% (23)	789.1 (21)	177.7 (22)	176.0 (22)	0.36 (21)	13% (3)
3rd Tier	379	35.6% (135)	1334.5 (124)	299.31 (129)	254.1 (129)	0.37 (121)	27% (37)
Overall Average	2096	33.6% (705)	1550.1 (628)	767.4 (670)	734.5 (670)	0.52 (601)	31% (216)

Note: Number of studies in parentheses. AMJ = Academy of Management Journal; ASQ = Administrative Science Quarterly; JAP = Journal of Applied Psychology; HR = Human Relations; JOB = Journal of Organizational Behavior; JOM = Journal of Management; JSBM = Journal of Small Business Management; GOM = Group and Organization Management; SAM = SAM Advanced Management Journal.

Table 2
Correlation Matrix

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Means	.33	2.23	-2.52	0.86	4.15	719.3	0.52	0.17	0.04	0.49	0.15	0.18	0.13
(s.d.)	(0.47)	(0.76)	(0.45)	(0.04)	(2.44)	(5001)	(0.24)	(0.74)	(0.20)	(0.50)	(0.36)	(0.39)	(0.34)
1. Nonresponse Analysis	_												
2. Journal Tier[a]	.00	_											
3. Journal Review Time[b]	.05	.46**	_										
4. Journal Rejection Rate	.05	.36**	.38**	_									
5. Journal Citations	.01	.81**	.64**	.64**	_								
6. Sample Size	.01	.03	.01	-.02	.00	_							
7. Response Rate	-.17**	.27**	.06	.06	.18**	.06	_						
8. Study Citations	-.05	.38**	.29**	.24**	.37**	-.03	.07	_					
9. Student Sample	-.01	.09*	.02	.07	.09*	-.01	.11**	-.03	_				
10. Employee Sample	-.06	.16**	-.05	.03	.07	.08*	.26**	-.05	-.21**	_			
11. Manager Sample	.00	-.08	.03	.04	-.01	-.04	-.04	.01	-.09*	-.41**	_		
12. Executive Sample	.13**	-.28**	.05	-.01	-.10*	-.05	-.37**	.04	-.10*	-.46**	-.20**	_	
13. Other Sample	-.05	.11**	-.03	-.11**	-.03	-.02	.01	.04	-.08*	-.38**	-.17**	-.19**	_

NOTE: Two-tailed tests; n = 599; *p<.05; **p<.01.
[a]: Coded 1st tier =3; 2nd tier = 2; 3rd tier =1.
[b]: Multiplied by -1.

Table 3
Results of Logistic Regression Predicting the Reporting of Nonresponse Analyses[a]

Variables[b]	Model 1		Model 2	
Year 2000	0.37	(0.26)	0.31	(0.28)
Year 2001	0.24	(0.27)	0.17	(0.28)
Year 2003	-0.66*	(0.29)	-0.80**	(0.30)
Year 2004	0.18	(0.27)	0.30	(0.29)
Journal Tier			0.64**	(0.25)
Journal Review Time			0.54[t]	(0.29)
Journal Rejection Rate			6.51[t]	(3.49)
Journal Citation Rate			-0.23*	(0.10)
Sample n			0.00	(0.00)
Response Rate			-1.49**	(0.44)
Study Citations			-0.26[t]	(0.14)
Sample Type[c]				
Student			-0.48	(0.52)
Employee			-0.57*	(0.28)
Manager			-0.54[t]	(0.32)
Other			-0.75*	(0.36)
Constant	-0.75**	(0.18)	-4.19	(3.02)
-2 log-likelihood	743.1**		708.5**	
Chi-square	15.7**		50.3**	
Degrees of freedom	4		15	
Nagelkerke R^2	0.04**		0.11**	
ΔChi-square			34.6**	
ΔNagelkerke R^2			0.07**	

Note: [t]<.10; * p< .05; ** p<.01

[a] Standard errors are in parentheses; n=599.

[b] For exploratory purposes we included whether the article was part of a special issue, the number of editors the journal had over the five year period, and the number of associate editors the journal had over the five year period in the analysis as control variables. However, none was significant. Thus, they served no value as control variables and were not included in the final analysis.

[c] Executive sample was the omitted type.

Biographical Paragraphs

Steve Werner is an Associate Professor at the University of Houston. His research interests include compensation and international aspects of human resource management. His research has appeared in Academy Management Journal, Journal of Applied Psychology, Strategic Management Journal, Journal of Management, Journal of International Business Studies, Journal of Business Research, and Human Relations among others.

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