G. Nonresponse Analysis

This appendix examines the issue of the representativeness of our pooled sample. The sample was formed by pooling the two internet panel samples, as discussed in Chapter 6. Although the samples were drawn with probability methods that, in expectation, give an unbiased representation of the populations from which the samples were drawn, nonresponse can make the sample unrepresentative. OMB is responsible for granting clearance for most federally sponsored surveys and has periodically issued standards and guidelines for statistical surveys carried out by the federal government and its contractors. The most recent guidelines (OMB, 2006) call for an examination of the effects of nonresponse on the representativeness of the sample whenever the response rate for a survey goes below 80%.[1]

We address nonresponse in two ways in this study. First, Chapter 6 looks at the survey respondents' demographic characteristics and attitudes and compares them to national, population statistics. Post-stratification sampling weights were developed to address any differences found between our survey sample and the full, national population. These weights are discussed in more detail in Appendix C. The post-stratification weights address any systematic, nonresponse bias that would otherwise exist in the sample due to the demographic differences. Once demographic differences are accounted for, however, there remains the possibility of sample selection bias, which would occur if there is any systematic and unobservable difference between the types of people who chose to respond to the survey. Of particular concern is the question of whether nonrespondents are people who are more likely to be uninterested in the survey topic and therefore less likely to be willing to pay for the policy programs. If this is the case, then the WTP estimates presented in this report could be upwardly biased.

Although there are no data available to specifically describe and address any underlying differences between survey respondents and nonrespondents (other than demographics), the ANES dataset has two variables that might serve as proxies for the idea that different respondents might be more or less interested in participating in the survey. The first variable is "duration," which is defined as the difference between the time that a respondent began taking the survey until the time that the respondent completed the survey. Although there may be a number of possible explanations for why a respondent did not complete the survey in one sitting, including that the respondent was busy, it is likely that at least some of these respondents were not particularly interested in the topic. Duration, expressed in hours, is summarized in Table G.1. Duration ranges from 3 minutes (0.05 of an hour) to about 31 days (750 hours), with a mean value of approximately 24 hours.

1. More specifically, guideline 1.3.4 states that a survey should "[p]lan for a nonresponse bias analysis if the expected unit response rate is below 80 percent (see Section 3.2.9)." Section 3.2.9 describes several types of analysis that can be done to conform to this guideline.

Table G.1. Summary of duration and days delayed variables

Variable	Mean	Standard deviation	95% confidence interval	
Duration (hours)	23.850	81.593	0.050	750.417
Days delayed	6.309	7.532	0.000	34.000

The second variable is "days delayed," which represents the number of days that respondents delayed starting the survey after the survey was issued to them. Like duration, we expect that at least some of the respondents who delayed taking the survey were at least potentially less willing to pay for the programs. From Table G.1, the days-delayed variable ranges from 0 to 34 days, with a mean of 6.3 days.

We tested the hypothesis that respondents with higher values for duration and days delayed have lower WTPs by including the two variables, each interacted with the No-Fishing Zones and Reef Repair programs, in the WTP model of Chapter 8. The model is presented in Table G.2. The days-delayed variable interacted with the Reef Repair Program is positive and significant, implying that respondents who delayed starting the survey might, in fact, have higher WTPs for that program, which contradicts our initial hypothesis. We therefore reject the hypothesis that days delayed might reduce WTP, at least for that particular program. The days-delayed variable interacted with the No-Fishing Zones Program is positive but not significant. Neither of the two duration variables are significant. We therefore find no evidence that either of these variables significantly reduces WTP for the programs.

Table G.2. Nonresponse analysis estimation results

Covariate	Coefficient	Standard error	z	P>|z|	95% confidence interval	
Cost	–0.002	0.000	–4.320	0.000	–0.003	–0.001
Fish	0.160	0.087	1.830	0.068	–0.011	0.331
Ship	–0.039	0.074	–0.520	0.600	–0.184	0.106
Income X Fish	0.001	0.001	1.710	0.088	0.000	0.003
Education X Fish	0.055	0.024	2.300	0.022	0.008	0.103
Married_own X Fish	–0.170	0.073	–2.330	0.020	–0.313	–0.027
Strong environmentalist X Fish	0.757	0.135	5.620	0.000	0.493	1.021
Very strong environmentalist X Fish	0.347	0.214	1.620	0.104	–0.072	0.766
Def_visit X Fish	0.389	0.122	3.180	0.001	0.149	0.629
Times X Fish	0.008	0.003	2.990	0.003	0.003	0.014
Duration X Fish	0.000[a]	0.000	0.330	0.741	–0.001	0.001
Days_delayed X Fish	0.007	0.005	1.440	0.149	–0.002	0.016

Table G.2. Nonresponse analysis estimation results (cont.)

Covariate	Coefficient	Standard error	z	P>|z|	95% confidence interval	
Income X Ship	0.000[b]	0.001	0.360	0.717	–0.001	0.002
Education X Ship	–0.009	0.019	–0.450	0.654	–0.047	0.029
Married_own X Ship	–0.188	0.071	–2.650	0.008	–0.326	–0.049
Strong environmentalist X Ship	0.616	0.112	5.510	0.000	0.397	0.835
Very strong environmentalist X Ship	0.242	0.180	1.350	0.178	–0.110	0.594
Def_visit X Ship	0.298	0.126	2.370	0.018	0.052	0.544
Times X Ship	0.007	0.003	2.810	0.005	0.002	0.013
Duration X Ship	0.000[c]	0.000	0.100	0.921	–0.001	0.001
Days_delayed X Ship	0.009	0.005	1.950	0.052	0.000	0.018
lnsigma3	–0.119	0.058	–2.040	0.042	–0.233	–0.005
lnsigma4	0.512	0.051	10.090	0.000	0.413	0.612
atanhr3_2	0.877	0.082	10.700	0.000	0.716	1.037
atanhr4_2	1.326	0.089	14.970	0.000	1.152	1.500
atanhr4_3	1.194	0.092	12.970	0.000	1.014	1.375
sigma1	1.000 (base alternative)					
sigma2	1.000 (scale alternative)					
sigma3	0.888	0.052			0.792	0.995
sigma4	1.669	0.085			1.511	1.844
rho3_2	0.705	0.041			0.615	0.777
rho4_2	0.868	0.022			0.819	0.905
rho4_3	0.832	0.028			0.767	0.880

Alternative = 1 is the alternative normalizing location.
Alternative = 2 is the alternative normalizing scale.
Log simulated-pseudolikelihood = –6,176.2284.

a. The Duration X Fish coefficient is 0.000145.
b. The Income X Ship coefficient is 0.000255.
c. The Duration X Ship coefficient is 0.000046.

References

OMB. 2006. *Standards and Guidelines for Statistical Surveys*. Office of Management and Budget, Washington, DC.