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## Should Surveys be Conducted Online or On Paper ? A Comparison

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### Introduction

Internet consumer surveys have become increasingly popular in agricultural and food research. This study compares the results of an identical survey instrument implemented in Kentucky and Ohio both by mail and online. Aspects compared include survey logistics, timeline, costs, consumer demographic and socioeconomic features, observed univariate variables, and multivariate regression coefficient estimates and predictions.

Table 1. Internet and Mailed Survey Design: Cost and Timeline						
	Mailed	Internet				
Sample size	6,000	-				
Bad addresses, deceased, under 18 years of age	218	-				
Net sample size	5,782	-				
Refused to complete	92	-				
Completed surveys	1,994	1,039				
Timeline						
Mailed survey, letter, return envelope	10/16/2008					
Mailed postcard reminder	10/23/2008					
2nd mailing - survey, letter, return envelope	11/7/2008					
Internet survey prepared and sample specifications submitted to Zoomerang/Market Tools		11/17/2008				
All surveys returned and data entry complete	1/5/2009	11/21/2208				
Costs						
Purchase sample list	1,410	5,114				
Survey materials and reproduction	5,002	-				
Stuffing of envelopes	1,146	-				
Postate	6,364	-				
Incentives (lottery for 50 \$10 gas cards)	513	-				
Data entry	1,246	-				
Total costs of data collection and entry	15,681	-				
Average cost per completed survey	7.86	4.92				

Table L. Estimated Number of Visits to Grocery otores during a two month relied
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	Mean-Kentucky		Mean-Ohio		Mean-Two State	
	Internet survey	Mailed survey	Internet survey	Mailed survey	Internet survey	Mailed survey
National grocery chain (e.g., Kroger, Giant Eagle, etc.)	6.82	6.32	7.16	6.97	7.07	6.80
National "Big Box" retailer (e.g., Wal-Mart, Meijer, etc.)	7.08	6.31	5.39	5.91	5.83	6.02
Locally owned grocery	2.63	3.23	2.82	3.25	2.80 <sup>i</sup>	3.24 <sup>i</sup>
Convenience store	2.49	2.52	1.99	2.27	2.12	2.33
Specialty food store (organic, natural, ethnic foods, etc.)	0.76	0.48	0.83	0.94	0.81	0.82
Farm or farmers' market	1.22	1.36	1.13	1.42	1.15	1.41 <sup>ii</sup>
<sup>i,ii</sup> Statistically different at at least the 5% significance level.						

Results show that demographic and socioeconomic features of the two samples both resemble actual census data well. A multivariate regression analysis was conducted using "number of times shopping at national chain grocery stores in the past 2 months" as the dependent variable and a series of demographic variables as independent variables. Parameter equality was tested between coefficient estimates under the mail and Internet surveys. Overall equality is rejected, but when each pair of coefficients is compared under the two samples, no difference can be found.

Table 3. Predicted and Observed Mean and Standard Deviation in Within Sample and Holdout Sample							
	Mailed Survey						
	Predicted Mean (after averaging "r" number of replications) <sup>a</sup>	Std. Dev. of Predicted Mean (after averaging "r" number of replications)	Actual Mean (after averaging "r" number of replications)	Std. Dev of Actual Mean (after averaging "r" number of replications)			
Within sample	6.828 (0.001) <sup>b</sup>	0.859 (0.001)	6.630 (0.001)	4.903 (0.001)			
Holdout sample <sup>c</sup>	6.832 (0.003)	0.862 (0.003)	6.606 (0.015)	4.886 (0.010)			
	Internet Survey						
Within sample	7.093 (0.002)	1.158 (0.003)	7.028 (0.002)	5.584 (0.001)			
Holdout sample <sup>c</sup>	7.090 (0.004)	1.169 (0.005)	7.045 (0.017)	5.583 (0.010)			
2							

<sup>a</sup> r = 1,000; larger number of replications were tested. No qualitative changes were detected and numerical values changed minimally.

<sup>b</sup> Sampling standard errors are in parentheses.

<sup>c</sup> Holdout sample size = 100; holdout sample sizes of 200, 300 and 500 were also compared and results did not change qualitatively. Detailed results of comparisons based on different combinations of r and holdout sample sizes are available upon request from the authors.



Figure 1. Equivalency between Mailed and Internet Surveys in Observed and Predicted Number of Visits to National Grocery Chains

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## Key Findings

Internet survey took much less time and money.

Neither survey mode offers an unambiguously superior selection of samples.

Multivariate regression does show some difference in prediction between models that use the two samples. The difference is not sufficient to favour one approach over the other.

> Therefore, either sampling approach is acceptable.