

RELATING VOTER TURNOUT WITH KNOWLEDGE AND ATTITUDES: A META-ANALYSIS OF 16 SURVEYS FROM ASK YOUR TARGET MARKET

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ABSTRACT

This article analyzes the results of a recent survey of 800 potentially swing voters across 256 counties in Wisconsin, Michigan, Ohio and Pennsylvania. Counties were selected based on information from their boards of elections about 2016 turnout and party votes. Respondents were quizzed on their knowledge of crime and tax statistics or local environmental degradation, shown a short video, and then quizzed again. Additional questions and demographic information permit the evaluation of initial knowledge, knowledge gain from the videos, and the level of curiosity increase. Findings include the substantially greater environmental knowledge of respondents in high turnout counties, the greater knowledge gain of respondents in highly Republican locations relating to taxes and crime information, and the lower gains of wealthy highly educated voters compared with highly educated poorer respondents.

1 INTRODUCTION

Do facts matter much in the current political debate? Would efforts to increase voter knowledge about key issues significantly affect not only how people vote in the coming elections but whether they make the effort to vote at all? Even if new knowledge did not affect partisan selections, might the politicians improve their policies and integrity if the voters were more curious and knowledgeable? A recent non-partisan survey conducted in five mid-western states provides affirmative answers to these questions. With control of both the U.S. Senate and U.S. House of Representatives at stake, these questions should be of primary concern for both parties especially in areas that are not solidly committed to one party or the other.

To explore these questions, we fielded surveys using a technique that enabled us to target 800 potentially swing voters across 256 counties in Wisconsin, Michigan, Ohio and Pennsylvania. The surveys tested voter knowledge about economic and social issues (taxes, crime, health) and the environment while gathering information about demographic characteristics, attitudes toward government and feeling of empowerment. The 14 questions included in the survey are listed in the appendix. Take the quizzes yourself at www.factSpread.org. Participants were then shown short animated videos that attempted to increase their understanding of key facts about these issues. They were then retested on the issues and asked whether their curiosity about each subject has increased.

The remainder of this article is organized as follows. In Section 2, 16 surveys are described which form a regular fractional factorial. Section 3 describes selected findings from the experimental design. Section 4 concludes with a brief discussion of the results and opportunities for future work. The appendix contains all the survey questions and their definitions.

2 SURVEY EXPERIMENT

2.1 Fractional Factorial Experiment

An experimental design with 16 runs was planned using a “resolution V” fractional factorial so that second order interactions can be estimated, i.e., the combined effects of pairs of inputs (see Allen, 2018 Chapter 3 for a descriptions and reference). The surveys differed by five factors. The first two related to the counties in which the respondents were located, the second two related to the specific respondents, and the last was

the video topics covered. The % of Republicans were cut off by (approximately) 60% for the President (high) or less than 40% for the president (low) in the 2016 election as learned manually through all the local boards of elections. Similarly, we learned the turnout level again with an (approximately) 60% or higher (high) or 40% or lower (low turnout). Then, we use the top four income levels (high, in general) or levels one through three (low). In some cases, we needed to adjust the ranges to keep the costs limited (no manual discussions were needed in all cases). The education levels were divided by top three (high) and bottom three (low) levels.

Ask Your Target Market (AYTM) permits users to pick the types of respondents but does not guarantee that they will be representative of their groups. Therefore, although we did try to pick the locations of the “swing voters” in the United States, the results are not guaranteed to be representative of all those voters.

Table 1. The 16 resolution V regular fractional factorial design involving five factors that determined the 16 Ask Your Target Market (AYTM) survey tool.

Run	County % Rep.	County Turnout %	Approx. Income Range	Education Level	Issue
1	Low	Low	Low	Low	Taxes
2	High	Low	Low	Low	Environment
3	Low	High	Low	Low	Environment
4	High	High	Low	Low	Taxes
5	Low	Low	High	Low	Environment
6	High	Low	High	Low	Taxes
7	Low	High	High	Low	Taxes
8	High	High	High	Low	Environment
9	Low	Low	Low	High	Environment
10	High	Low	Low	High	Taxes
11	Low	High	Low	High	Taxes
12	High	High	Low	High	Environment
13	Low	Low	High	High	Taxes
14	High	Low	High	High	Environment
15	Low	High	High	High	Environment
16	High	High	High	High	Taxes

2.2 Experimental Results

Each “run” or survey generated 50 sets of responses to the 14-15 questions in the appendix. One question (Q9) was simply to watch the related video. A sample of demographic information and a response is shown in Table 2. The counties were selected to be representative of swing votes using maps online from the 2016 election, i.e., where the counties who voted for Obama but switched to Trump live.

Using the answers for the 16 questions, the summary measures for each of the 16 counties are shown in Table 2. The first two questions were summed, averaged, and scaled (0-1) to create a distance-to-power metric (Hoppe, 2004). The next question was averaged and scaled to create a partisanship score. Then, the average scores (0 to 5 questions), before and after seeing the videos, and the curiosity score were scaled.

Table 2. Sample demographic information and responses for the AYTMs.

Gender	Age	Relationship Status	Children	Income	Career	Ethnicity	Education Level	Employment	State	County	City	Zip	Q1
1	50	4	1	1	16	6	1	5	Ohio	Mahoning County		44509	3
1	31	3	4	3	5	3	2	1	Pennsylvania	Philadelphia County		19133	3
1	71	6	3	1	16	6	1	3	Michigan	Wayne County		48184	3
1	48	1	4	1	16	1	1	5	Ohio	Cuyahoga County		44103	3
1	40	7	1	3	11	6	2	1	Ohio	Cuyahoga County		44137	4
2	27	1	1	2	1	6	2	1	Michigan	Wayne County		48126	3

Table 3. Summary responses from the 16 counties.

Avg. Power. Distance	Avg. Democratic	Avg. Initial Score	Avg. Info. Gain	Avg. Curiosity Increase
0.643	0.605	1.920	0.460	0.465
0.690	0.365	2.420	0.440	0.435
0.665	0.615	2.520	0.620	0.440
0.675	0.480	1.720	0.560	0.490
0.628	0.500	1.980	0.440	0.435
0.680	0.395	1.820	0.760	0.515
0.628	0.560	2.280	0.520	0.420
0.660	0.450	2.440	0.480	0.480
0.655	0.680	2.240	0.080	0.525
0.645	0.410	2.180	0.680	0.515
0.625	0.675	2.360	0.660	0.600
0.620	0.530	2.740	0.420	0.475
0.570	0.565	2.720	0.220	0.455
0.675	0.480	1.420	-0.260	0.490
0.575	0.650	3.040	0.380	0.490
0.580	0.420	2.220	0.780	0.460

2.3 Hypothesis Testing and Predictions

In the context of regular fractional factorials, a common analysis method is based on normal probability plotting the estimated effects, i.e., the averages of responses when each level is high minus the averages when the given level is low (Allen, 2018, Chapter 13). Then, using insight into the problem, lines are drawn (with admitted subjectivity) through the small effects in absolute value and the large ones off the lines are declared to be significant. Figures 1-3 show the normal probability plots of the estimated effects for responses initial score (out of five possible), score gain from watching the video (out of five possible), and the curiosity gain (if any) score.

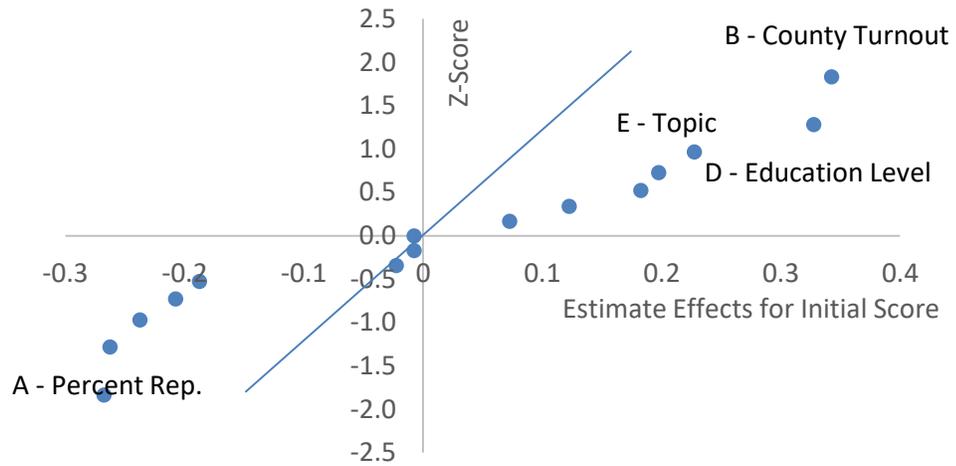


Figure 1. Probability plot of estimated effects for initial score showing significant effects.

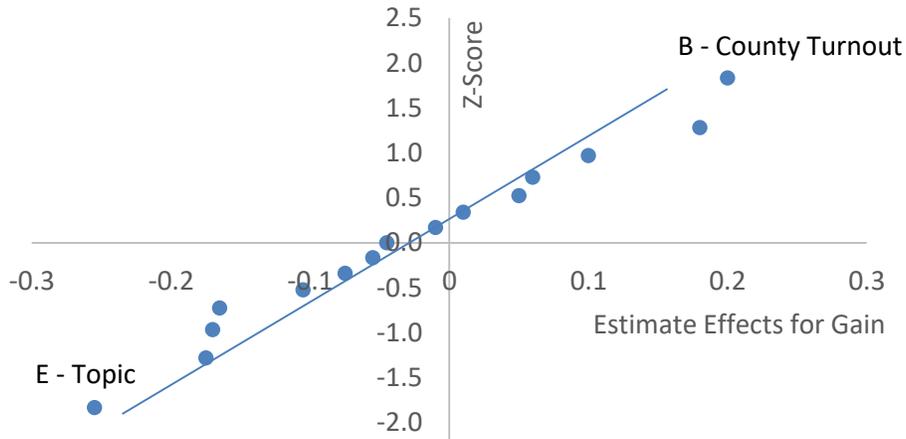


Figure 2. Probability plot of estimated effects for score gains showing significant effects.

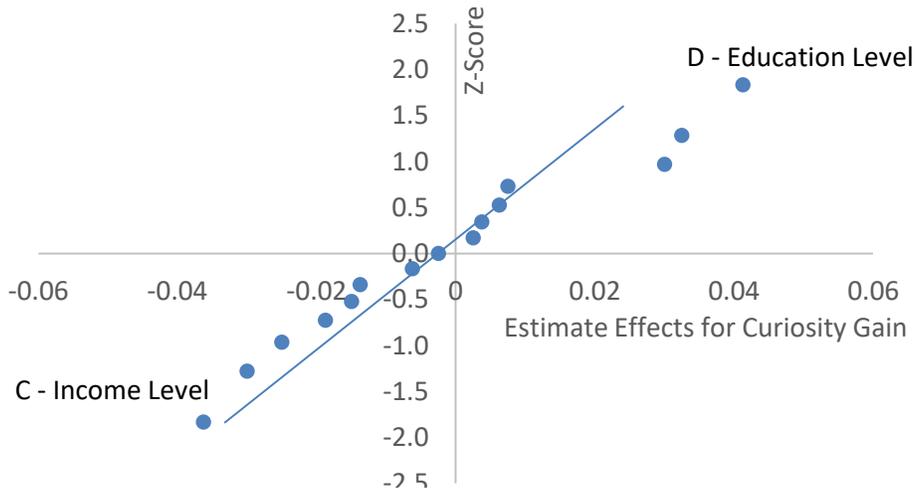


Figure 3. Probability plot of estimate effects for curiosity gain showing significant effects.

In Figure 1, the line is drawn (again with admitted subjectivity) declaring virtually all of the factors as significant for the average score. The county turnout is surprisingly the most important factor. Counties with higher turnout do seem to have high levels of initial knowledge. Also, the education level of the respondent predictably corresponds to the knowledge level (average core 0-5 of correct responses) as one might predict. The higher fraction of Republican voters also is associated with lower knowledge levels (a negative effect) but there are positive aspects of Republican voters with respect to knowledge and curiosity which are described below. Many interactions are significant also including the AE partisan-topic interaction as described in the next section.

Figure 2 describes the knowledge gains from the videos. The significant effects are declared to include the county turnout (an engagement measure) which positively relates to both starting scores and learning. Also, topic relates to knowledge gain as respondents generally learned more from the crime and taxes video than the environmental video. Several interactions are significant also. There is evidence from the interaction plots that Republican county participants, in particular, were not interested in the environmental video. Figure 3 show the significant effects for the curiosity gains. The more educated respondents were more curious. Also, the lower income respondents were less curious.

3 SELECTED FINDINGS FROM THE SURVEY

3.1 Average Initially Correct Out of Five

While initial knowledge levels varied by income, education, political affiliation, and professed interest in various topics, overall, initial respondent knowledge of substantive issues was not high. On average, respondents answer fewer than 2.25 basic questions correctly before viewing the explanatory videos out of 5. The exercise, however, provided some important lessons for political operatives in both parties about which types of voters might best be targeted with what sort of information. Key findings include:

- Counties with higher turnout levels in the 2016 presidential election have both higher average initial knowledge levels & higher knowledge gains after watching the videos. This raises the question of whether educating voters in lower turnout counties would increase voter participation. This is particularly true for environmental issues as shown in the figure below.

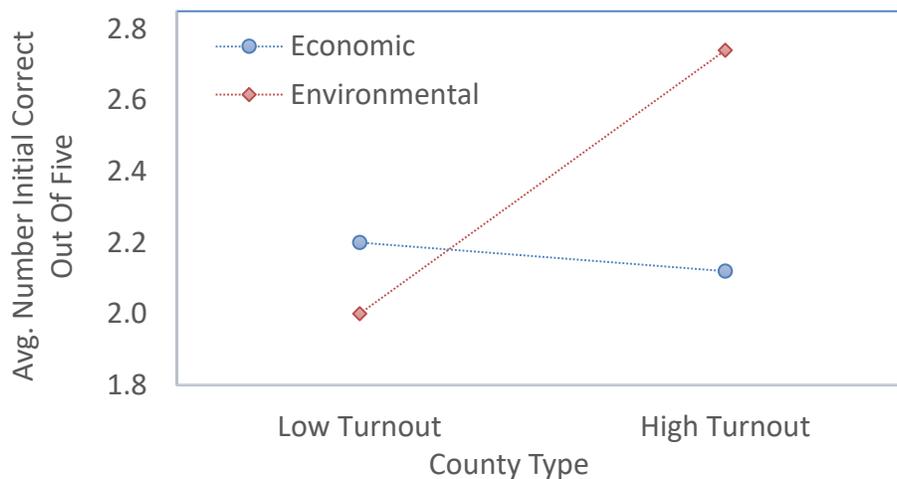


Figure 1: Average initial knowledge as a function of the topics and the selected county.

3.2 Average Knowledge Gain

While respondents in primarily Republican counties tend to know less about taxes and crime, they score above average on being “curious about taxes and crime,” and gain more knowledge than Democrats from the associated videos on these subjects.

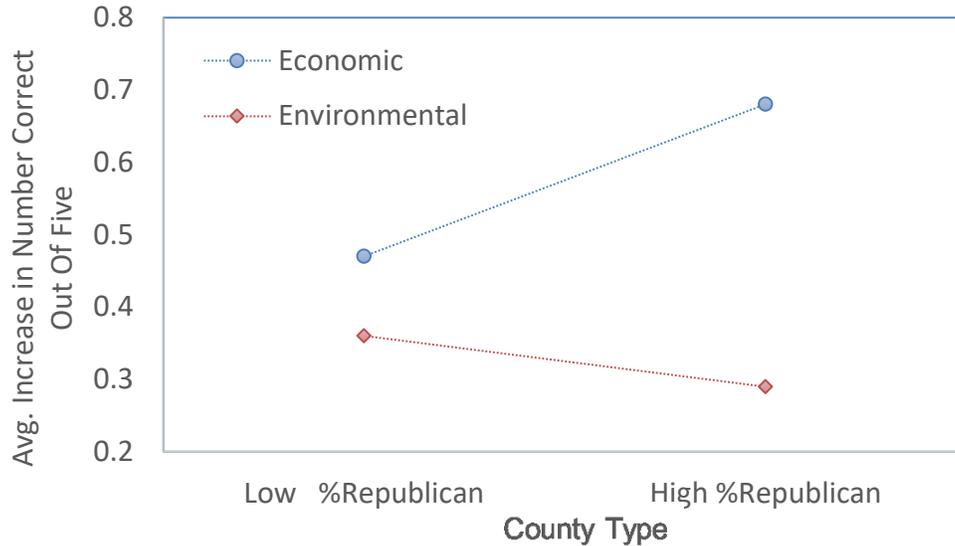


Figure 2: Average initial knowledge gain as a function of topic and county voting percentage.

3.3 Curiosity Gain

Results include:

- Respondents from Republican counties are less knowledgeable about the environment. Yet, they are also the least curious about environmental facts and gain the least from environmental information provided by the associated video, suggesting that voters tend to be resistant to facts that are inconsistent with their strongly held positions.
- Respondents from Democratic counties gained less from the videos on economic issues (see Figure) and attained a lower knowledge level on those issues.
- Potential voters with higher levels of education and higher incomes, while no more knowledgeable about many issues, report much less curiosity than well-educated participants with lower incomes. The latter group also expresses the most curiosity about the issues after viewing the videos (see figure).

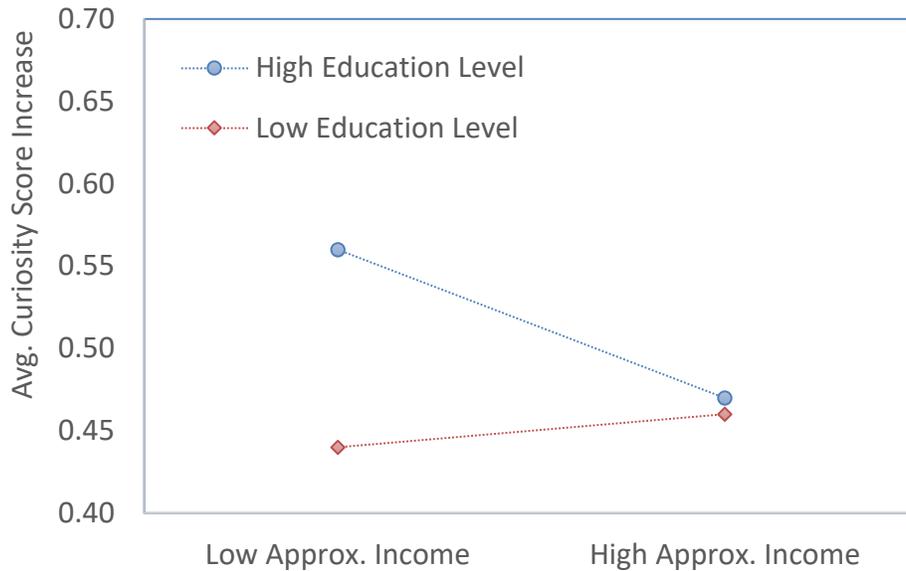


Figure 3: Average curiosity increase as a function of the respondent income and education levels.

- Income, education level, and Democratic affiliation are all significantly positively correlated with initial knowledge scores.
- On average, older people learned less from the videos perhaps because they also tended to be slightly less well-educated.
- Perhaps surprisingly, increases in curiosity about the subjects addressed in the videos were strongly and positively related to two factors: Feelings of powerfulness compared with the average U.S. citizen and the degree to which government money is wasted. Feeling powerful strongly correlated with curiosity gains. Perhaps stimulating curiosity might make citizens feel more powerful.

4 CONCLUSIONS AND FUTURE WORK

In this article, selected results from a recent survey are described. The intent was to provide a brief exploration of issues of potential interest many types of concerned citizens. Yet, many opportunities for additional contributions remain.

First, additional results from the same survey can be described. Second, additional details about the survey can be provided and presented together with statistical analyses. Third, additional topics can be explored. These will likely include gun safety and marijuana legalization. Fourth, additional populations and topics can be explored. Finally, the results can be related to optimization formulation designed to support the most effective targeting of groups to generate the largest knowledge and curiosity gains for fixed budgets.

5 APPENDIX: THE SURVEY QUESTIONS

- Q1 How powerful do you feel compared with the average US citizen?
- 1 Far below average
 - 2 Below average
 - 3 Average
 - 4 Above average

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- 5 Far above average
- Q2 In your opinion, how much of your tax money does government waste?
- 1 Very much
 - 2 Much
 - 3 Some
 - 4 Little
 - 5 Very little
- Q3 How do you tend to vote?
- 1 Very Republican
 - 2 Usually Republican
 - 3 Mixed
 - 4 Usually Democratic
 - 5 Very Democratic
- Q4 Where in our hemisphere are there huge areas have with no life?
- 1 Across Ohio because of particulates (because of coal power plants).
 - 2 There are dead zones in Lake Erie and the Gulf (because of fertilizer).
 - 3 Ozone holes cause no life in the Gulf (because of pesticides).
 - 4 Dead zones on land spread throughout Ohio (because of radiation).
- Q5 Major human-caused destruction includes?
- 1 The death of almost all fish in Lake Erie.
 - 2 Particulates killed birds across Ohio.
 - 3 The Aral Sea was largely destroyed by human activities.
 - 4 Acid rain killed deer in West Virginia.
- Q6 One powerful environmentally friendly step you can take is?
- 1 Eating less meat.
 - 2 Using coal-based electricity.
 - 3 Traveling to parks.
 - 4 Using gasoline-powered mowers.
- Q7 Major job growth is occurring because?
- 1 Fisheries in Lake Erie are growing.
 - 2 Solar energy is become more economical.
 - 3 Coal is a growing part of Europe's mix.
 - 4 Recycling is becoming hugely more effective.
- Q8 An exciting positive change for the environment is?
- 1 Cheap coal from hydraulic fracking.
 - 2 Electric cars powered by solar-charged batteries.
 - 3 Alberta oil sands with a major pipeline.
 - 4 Growth in the car ownership in India.
- Q9 Please watch the video. This should ideally help in re-answering some of the questions.
- 0 Not viewed
 - 1 Viewed
- Q10 Where in our hemisphere are there huge areas have with no life?
- 1 Across Ohio because of particulates (because of coal power plants).
 - 2 There are dead zones in Lake Erie and the Gulf (because of fertilizer).
 - 3 Ozone holes cause no life in the Gulf (because of pesticides).
 - 4 Dead zones on land spread throughout Ohio (because of radiation).
- Q11 Major human-caused destruction includes?
- 1 The death of almost all fish in Lake Erie.
 - 2 Particulates killed birds across Ohio.
 - 3 The Aral Sea was largely destroyed by human activities.

- 4 Acid rain killed deer in West Virginia.
- Q12 One powerful environmentally friendly step you can take is?
- 1 Eating less meat.
 - 2 Using coal-based electricity.
 - 3 Traveling to parks.
 - 4 Using gasoline-powered mowers.
- Q13 Major job growth is occurring because?
- 1 Fisheries in Lake Erie are growing.
 - 2 Solar energy is become more economical.
 - 3 Coal is a growing part of Europe's mix.
 - 4 Recycling is becoming hugely more effective.
- Q14 An exciting positive change for the environment is?
- 1 Cheap coal from hydraulic fracking.
 - 2 Electric cars powered by solar-charged batteries.
 - 3 Alberta oil sands with a major pipeline.
 - 4 Growth in the car ownership in India.
- Q15 Did the short video increase your curiosity about the subject?
- 1 Not at all
 - 2 Very little
 - 3 Little
 - 4 Some
 - 5 A lot

Correct Answers

Topic	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
Environment	2	3	1	2	2	1	2	3	1	2	2	5
Economic	3	2	1	4	3	1	3	2	1	4	3	5

Demographic Information Available in the Survey Includes the Following

- Gender
- 1 Female
 - 2 Male

- Age
- Relationship status
- 1 Single
 - 2 Engaged
 - 3 Living with a significant other
 - 4 Married
 - 5 Divorced
 - 6 Widowed
 - 7 It's complicated

- Parental status
- 1 no children
 - 2 1 child
 - 3 2 children
 - 4 3 children
 - 5 4 children
 - 6 5+ children

- Household Income (yearly)
- 1 \$0 - \$25,000

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- 2 \$25,000 - \$50,000
 - 3 \$50,000 - \$75,000
 - 4 \$75,000 - \$100,000
 - 5 \$100,000 - \$200,000
 - 6 \$200,000 - \$500,000
 - 7 >\$500,000
- Career
- 1 Accounting/Finance/Banking
 - 2 Advertising/Graphic design
 - 3 Arts and entertainment
 - 4 Clerical
 - 5 Healthcare
 - 6 Hospitality
 - 7 IT
 - 8 Legal
 - 9 Management
 - 10 Military
 - 11 Public safety
 - 12 Real estate
 - 13 Retail
 - 14 Small business owner
 - 15 Student
 - 16 Other
- Ethnicity / Race
- 1 African-American
 - 2 Asian-American
 - 3 Hispanic/Latino-American
 - 4 Indian-American
 - 5 Native American
 - 6 White American
 - 7 Multi-racial
 - 8 Other
- Education
- 1 No college
 - 2 Some college
 - 3 2yr degree
 - 4 4yr degree
 - 5 Grad school degree
 - 6 Professional degree
- Employment Status
- 1 Full time
 - 2 Part Time
 - 3 Retired
 - 4 Student
 - 5 Unemployed

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