Survey Data Collection; Online Panel Efficacy. A Comparative Study of Amazon MTurk and Research Now SSI/ Survey Monkey/ Opinion Access

Spencer H. Kimball
Emerson College

This study examined how the demographic composition of panels provided by Amazon MTurk compared with other prolific online panel firms (Research Now SSI (Dynata), Survey Monkey, and Opinion Access). Demographics used for comparison were gender, party affiliation, race, age, education, and regional distribution in each state. Nine polls were used from eight different U.S. states and one national US poll between June 25, 2018 and August 13, 2018. 54 chi-square tests were conducted to compare the panels and a significant difference was found in n=18 with age having the strongest relationship with a difference found in 7 of 9 polls.

LITERATURE REVIEW

Spending on survey research globally amounted to $6.7 billion U.S. dollars in 2016 according to CASRO (Council of American Survey Research Organization, 2017). Some suggest this is due to a widespread use of survey research across various disciplines as an effective and efficient method for better understanding one's audience. Research in cross-cultural studies of people from different regions, countries and cultures have also increased the use of cross-national surveys (Heeringa, et al. 2010).

There are five main modes of data collection to use for survey research: 1) live operators (LO), 2) automated systems such as interactive voice recognition aka auto polls (IVR), 3) online, 4) direct mail (DM), and 5) face to face. Increasingly, online panels are being used for cross-national surveys because of the benefits they offer. Among them include low cost, access to audiences, language translation capabilities, and logic options. A look at the distribution of global revenues in the market research field in 2017 finds the leading revenue producer were online surveys at 25% of the market share followed by telephone surveys at 14%. (ESOMAR, 2018). However, these advantages come with methodological considerations regarding the composition and representativeness of the panels.

The rising costs of conducting live operator phone calls, an increase in laws banning auto dialers, and the growing difficulty to reach younger segments of the public has sparked a change in the way data is collected for survey research (Simons, & Chabris, 2012; Difallah, Filatova, & Ipeirotis, 2018). The internet has become a means for researchers to access large, affordable data samples for professionals and academic engaging in quantitative research (Goodman, Cryder, & Cheema, 2012; Kees, Berry, Burton, & Sheehan, 2017; Schmidt, & Jettinghoff, 2016). Online panels have also become increasingly popular with researchers and developers for survey research around the globe (Ross, Irani, Silberman, Zaldivar, & Tomlinson, 2010; Lakkaraju, 2015).

To further demonstrate this change in the use of live operator and online panels, Kimball (2017) examined a number of statewide public pre-election polls conducted over the last three weeks of the presidential cycles in 2012 and 2016. He found that in 2012, there were n=54 online polls and in 2016 this increased to n=313 online polls; conversely, traditional live operator polls dropped from n=136 in 2012 to n=98 in 2016.

In the above-mentioned study, an empirical investigation was conducted on the validity and reliability of four popular modes of data collection: Live Operator (LO), Automated or Robo Polling (aka Interactive Voice Recognition, IVR), Online (OL), and a combination of two or all three modes which is referred to as Mixed Mode (MM). Statistical Accuracy (SA) is a metric used for assessing pre-election poll accuracy by comparing the difference between three differences, where the first difference is the estimate of the vote for the two leading candidates from a poll, the second difference is the election result for the same two candidates and the third difference is the magnitude of the deviation when compared to the poll's margin of error. Here is the formula:

SA if, *Poll Margin (r1 – d1) minus Vote Margin (R2 - D2) ≤ (MOE x 2)*   (1)

The first calculation is the typical measurement of which the public is most aware, where a news report might say Candidate A is leading by 5 and the public expectation is Candidate A will win by 5 points regardless if the outcome was 52% to 47% or 45% to 40%. The next calculation is the difference in the actual vote margin, continuing with the hypothetical Candidate A wins the election with 55% of the vote to 45% for Candidate B. The last number you will need is the sample size or the margin of error, but if you have the sample size you can calculate the margin of error with it and in this scenario we will use n=1,000 and a margin of error of +/-3 percentage points. Now plugging these numbers into the formula looks like this.

Poll Margin (52% – 47%) minus Vote Margin (55% - 45%) ≤ (3% x 2)
Poll Margin (5%) minus Vote Margin (10%) ≤ (6%)
5% ≤ 6%   (2)

Since 5% is less than or equal to 6% the poll results fell within the range of scores it was statistically to perform within and making it SA. Had the poll used a larger sample size and had a +/-2 percentage point margin of error it would not have been SA (5% is greater than 4%).

This SA metric was applied to U.S. statewide public pre-election polls from the 2012 presidential elections (n=330) and 2016 presidential races (n=538) conducted during the last 21 days of each election cycle. A "house effect" was found only in online data collection outlets ($\chi2$ (3, N = 296) = 23.87, p <.000), and not with the other polling outfits using a different mode of data collection: Live Operator ($\chi2$ (2, N = 24) = .44, p = .802), IVR ($\chi2$ (1, N = 31) = .74, p=.389), and Mixed Mode ($\chi2$ (2, N = 49) = 2.70, p =.259) (Kimball, 2017). A "house effect" can be defined as a systematic tendency caused by a particular polling methodology that bias a poll toward a particular issue or party candidate (Silver, 2012). Conclusions from the above study suggests that unlike traditional probability samples used in LO, IVR, and DM, online panels are non-probability samples which lead to proprietary issues where each panel provider has a different pool of respondents to draw from, creating variability among the different online panel providers.

This study builds on this previous work. It further examines the "house effect" of online polls in order to test whether the pool of respondents in online panels are representative of the universe at study and how online panels vary between different panel vendors based on the demographic compositions of the panels. A series of chi-square test of independence were used to examine if a relationship existed between the type of online panel used and the demographic makeup of the panel based on six variables. The null hypothesis for this test is that there is no relationship between type of panel used and each of the six demographics. The alternative hypothesis is that there is a relationship between the type of panel used and the six demographics (e.g. there are more males in SSI panels and more females in MTurk panels).

METHODS

This study uses panels provided by Amazon Mechanical Turk (MTurk), an online panel run by Amazon.com, as it provides quick turnaround on data collection and inexpensive access to online research participants (Goodman, Cryder, & Cheema, 2012). Three prolific online panel firms were also utilized for this study. Research Now SSI (SSI), they changed the name of the firm in 2019 to dynata and they operate globally with locations in the Americas, Europe, and Asia-Pacific, and are recognized as leader in the market research industry. According to their website, Survey Monkey (SM) was founded in 1999 by Ryan Finley and is a worldwide company that provides free access to create surveys, as well as a suite of paid back-end features including access to their online panels. Opinion Access (OA) was founded in 1995 and is a market research company out of New Hyde, New York.

As a backdrop for this study, there are many firms offering access to online panels of respondents to researchers (Arechar, 2016). Yet the costs for this data from online industry standard firms can be cost prohibitive. MTurk has positioned itself as a purveyor of low cost data (Peer, Vosgerau, & Acquisti, 2013). Each completed survey with MTurk is less expensive than those from other online panel data providers (Buhrmester, Kwang, & Gosling, 2011; Höglinger, & Wehrli, 2017). In this study, MTurk panel participants were paid $1 per completed survey. In comparison, the data collected by Research Now SSI cost $4 per complete, Survey Monkey was $4.15 per complete, and Opinion Access was $3.15 per complete.

A total of ten polls were conducted in nine different U.S. states (Arizona, Florida, Iowa, Michigan, Minnesota, New Mexico, Tennessee, West Virginia, and Wisconsin). Additionally, one national poll was conducted. The MTurk panels were only able to field a panel in West Virginia of n= 28 which were too small of sample sizes to conduct the statistical comparisons. The surveys were conducted by Emerson College Polling between June 25, 2018 and August 13, 2018.

Each survey asked the same questions to two panels of respondents, one panel was provided by MTurk, the other by one of the three prolific panel firms. Six demographic variables were utilized for comparison in the eight surveys; Gender, Party, Race/Ethnicity, Age, Education, and Congressional District/Region. The data was analyzed through a series of $\chi2$ (chi-square) tests at $p < .05$ to examine which questions within the polls had statistically significant variations. Data was further analyzed through a series of Dunn-Sidak tests at $p < .005$ to identify where the difference were between the variables.

The raw data from the prolific panels and MTurk were combined by the researcher and coded to indicate whether responses came from Amazon MTurk or another source. The study screened participants who were registered voters and those were not registered were eliminated. Incomplete responses were also removed from the sample. Results were then analyzed to uncover any trends.

FINDINGS

Overall, a series of 54 chi square tests were conducted to assess whether the demographic composition differed between MTurk panels and prolific online panel firms (see Table 1). The results found 18 of the 54 chi-square tests found significant relationship between the type of panel used in a study and a demographic variable. The strongest relationship was found with Age in 7 of 9 polls while Education was statistically significant in 4 of 9 polls; both variables had the largest variation. Gender (1 of 9) and Party Affiliation (1 of 9) showed the least variation in the polls. Race/ethnicity (2 of 9) and Congressional district (3 of 9) had slight variations.

TABLE 1
PANEL DEMOGRAPHICS COMPARISON BY STATE

	AZ	FL	IA	MI	MN	NM	TN	WI	USA	Total
Demographic	1	1	3	2	2	0	3	1	5	18
Gender	NH	NH	NH	NH	NH	NH	NH	NH	R	1
Party	NH	NH	NH	NH	NH	NH	R	NH	NH	1
Race	NH	NH	R	NH	NH	NH	NH	NH	R	2
Age	R	R	R	NH	R	NH	R	R	R	7
Education	NH	NH	R	R	NH	NH	R	NH	R	4
Con.district/state	NH	NH	NH	R	R	NH	NH	NH	R	3

NH = Null Hypothesis; R = Relationship

The New Mexico panel had no difference between the six demographic questions, while Wisconsin, Arizona and Florida each had a difference in Age. Michigan and Minnesota had two differences (both were the Congressional district variable; Michigan with also Education, Minnesota with also Age). Iowa and Tennessee had three differences, both had Education and Age while Iowa was significantly different based on Race and Tennessee based on Party Affiliation.

The National poll had the most variance with five of six demographics being significantly different; the only variable to stay steady was Party Affiliation.

Gender

The demographics looked at in the nine studies revealed that gender composition was not significantly different in seven of the eight studies. None of the statewide studies were statistically different but the national study did find a significant difference among gender distribution of the two panels. (χ^2 (1, N = 474) = 11.255, p =.001).

In the national study the MTurk panel was composed of 59% males/ 41% females while the Survey Monkey panel was comprised of 44% males and 56% females.

Party Affiliation

Party affiliation was not significantly different in seven of the eight studies. In Tennessee, a difference was found (χ^2 (2, N = 672) = 7.514, p =.023). Looking within the party affiliation numbers, MTurk was 41% Democrat, SSI was 28% Democrat; MTurk was 39% Republican while SSI was 50%. MTurk was 20% Independent and SSI was 22%.

Race/Ethnicity

The compositions of the panels based on race were not significantly different in six of the eight studies; in Iowa the difference was (χ^2 (5, N = 320) = 15.585, =.008), and in the national study it was (χ^2 (4, N = 474) = 41.490, p <.000).

In the Iowa study, MTurk had a panel of n=48, 46 of the respondents were white with one African American and one Native American. However the Opinion Access had n=272 with 191 (70%) white, 43 (16%) Hispanic, 16 (6%) African American. According to the 2017 American Community Survey 5 year estimates, Iowa is 86.5% white, 6% Hispanic, 3% African American.

In the National study, MTurk had a more representative sample than Survey Monkey with regards to race. MTurk was 72% white, 13% Asian/ Native American, 6% African American and 4% Hispanic. Conversely, Survey Monkey was 90% white, 3% Hispanic, 2% Asian/ Native American, and .4% African American.

Congressional District

The regional make-up of the panels was significantly different in three of the eight studies including in Michigan (χ^2 (13, N = 213) = 22.434, p =.049); Minnesota (χ^2 (7, N = 436) = 15.392, p =.031); and the National study (χ^2 (50, N = 474) = 67.865, p =.047).

In the Minnesota poll, 56% of the MTurk panel came from either Minneapolis (29.2%) or St. Paul (26.4%). The SSI data was more evenly distributed throughout the state with 34% coming from either Minneapolis (20.1%) or St. Paul (13.7%).

The Michigan data was skewed because the SSI panel did not have a respondent in the 12th congressional district (outside Detroit), but when this district is removed the remainder of the state is not significantly different.

In the National study, the MTurk and Survey Monkey differed in the Southern and Western regions of the United States. MTurk had 42% in the Southern states and 26% in the West while Survey Monkey had 29% in the Southern states and 36% in the West.

Education

Educational attainment was significantly different in half of the eight studies: National (χ^2 (3, N = 474) = 27.393, p <.000); Tennessee (χ^2 (3, N = 672) = 12.062, p =.007); Michigan (χ^2 (3, N = 214) = 14.847, p =.002); and Iowa, (χ^2 (3, N = 320) = 14.208, p =.003).

The disparity in the National panels were with college graduates and postgraduates. In MTurk panel, 49% had a college degree while 16% had a postgraduate degree. In the Survey Monkey panel, 33% had a college degree while 37% had a postgraduate degree.

A different pattern emerges in Tennessee where the SSI panel was 20% high school degree or less while MTurk was 8% in this attainment. The other disparity with college and postgraduates emerged but this time MTurk was 44% with a college degree and 21% with postgraduate compared with SSI was 31% and 19%.

Similar to Tennessee, Michigan data from SSI was composed of 14% with a high school degree or less while MTurk was 5%, other disparities continued including 58% with a college degree in the MTurk study while 32% in SSI had a college degree.

In Iowa, a similar trend continued but with Opinion Access data. The OA data had 17% with a high school degree or less while MTurk was 4%. 46% of the Turk panel had a college degree while OA had 37%. A greater disparity emerged with postgraduates where MTurk was 27% of the panel while with OA, postgraduates were 11%.

Age

Age distribution has the highest variability and a relationship was found in seven out of nine cases. MTurk data was skewed toward a younger demographic, while the more prolific online panels had a more normal distribution of people by age (see Figure 1).

FIGURE 1
AGE DISTRIBUTION BETWEEN MTURK AND SM/SSI/OA 18-34, 35-54, 55+
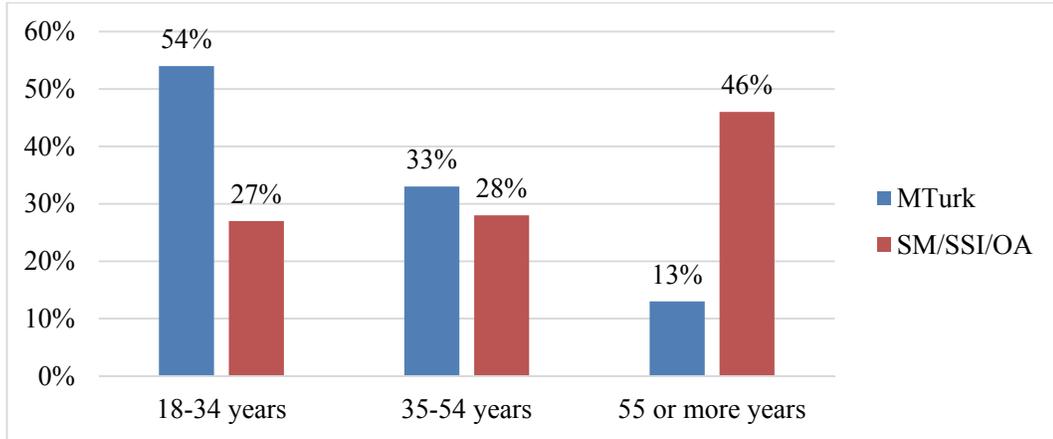
Six polls used age groups of 18-34, 35-54, and 55+. The results with data collected through MTurk had an overall panel composition of 54% 18-34; 33% 35-54; and 13% 55+; the panel composition for 18-34 year olds ranged from a low of 41% of the panel to a high of 63%. The 35-54 age groups ranged from a low of 25% of a panel to 44%. Those over 55 ranged from 6% of a panel to a high of 17%.

The results from the data collected through one of the prolific panel providers (Survey Monkey n=1, SSI n=4, Opinion Access n=1) had an overall panel composition of 27% 18-34; 28% 35-54; and 46% over the age of 55. A breakout of each group finds 18-34 year olds had a range of 17% of a panel composition to 42% of a panel composition; those 35-54 ranged from 24% to 39% of the panel while those over 55 ranged from 30% to 58%.

Regarding the age distribution, even the high range for prolific panels was 42% which is 12 percentage points below the average for MTurk (54%). Conversely, MTurk panels with those over 55, the high was 17% of the panel, 29 points below the prolific panels' average of 46%.

In three polls the age groups of 18-29, 30-49 and 50+ were used (see Figure 2). The results from the data collected by MTurk had an overall panel composition of 25% 18-29; 56% 30-49; and 19% for 50+. The 18-29 year old age group ranged from 18% to 28% of the panel. 30-49 year olds ranged from 50% to 67% while those over 50 ranged from 8% of the panel composition to 32%.

FIGURE 2
AGE DISTRIBUTION BETWEEN MTURK AND SM/SSI/OA 18-29, 30-49, 50+
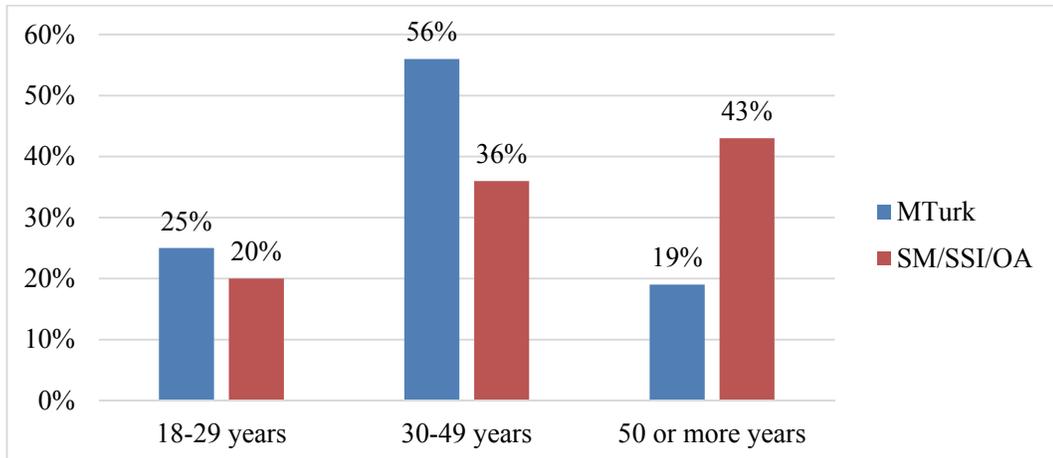
The results from the data collected through one of the prolific panel providers (Survey Monkey n=1, SSI n=1, Opinion Access n=1) had an overall panel composition of 20% 18-29; 36% 30-49; and 43% over 50. The range for 18-29 year olds was 15% to 23%. The range for 30-49 was 33% to 41% and the range for those over 55 was 36% to 49%.

Individual Poll Analysis by Age

In Poll 1 (National) a significant difference by age was found (χ^2 (2, N = 474) = 29.523, p <.000) as 63% of the MTurk sample was 18-34 while 17% of the SM sample were 18-34. Conversely, 44% of SM and only 6% of MTurk sample was over 55 years old.

In Poll 2 (Arizona) a significant difference by age was found (χ^2 (2, N = 241) = 18.941, p <.000) 53% of the MTurk sample was 18-34 compared with 35% of OA, but 42% of OA and 16% of Turk were over 55 years old.

Poll 3 (Florida) had a significant difference by age was found (χ^2 (2, N = 324) = 10.232, p =.006) with 58% of MTurk study being 18-34 with 42% of the SSI sample being 18-34, but 32% of SSI and 17% of MTurk was over 55.

Poll 4 (Iowa) saw the same pattern emerged and a significant difference by age was found (χ^2 (2, N = 320) =16.174, p <.000) as before with 36% of OA sample being over the age of 50 compared with 8% of the MTurk sample.

Poll 5 (Michigan) showed a similar pattern but not a significant difference by age (χ^2 (2, N = 214) = 5.673, p =.059) as 48% of the MTurk sample was 18-34 while SSI was 37% 18-34, but SSI had 30% over the age of 55 while MTurk had 16% of their sample over 55.

Poll 6 (Minnesota) found a significant difference by age in the sample compositions (χ^2 (2, N = 436) = 15.795, p <.000) with 46% of the SSI sample over the age of 50 compared with 21% of the MTurk sample.

Poll 7 (New Mexico) used 18-29 age groupings and no significant difference by age was found (χ^2 (2, N = 171) = 3.070, p =.215) the pattern however continues, with 49% of the SM sample being over 50 years old while 32% of the MTurk sample is over 50, the magnitude of the difference was not statistically significant.

In Poll 8 (Tennessee) a significant difference by age was found (χ^2 (2, N = 672) = 65.284, p <.000) with 41% of the MTurk sample 18-34 and SSI was 18% between the ages of 18-34. However, SSI had 58% of their sample over the age of 55 while MTurk was 15% of those over 55.

In Poll 9 (Wisconsin) a significant difference by age was found (χ^2 (2, N = 166) = 11.015, p =.004) with 56% of the MTurk sample 18-34 and SSI was 39% between the ages of 18-34. However, SSI had 39% of their sample over the age of 55 while MTurk was 10% of those over 55.

IMPLICATIONS

General trends in the data found the key relationship in MTurk panels were younger and better educated than the prolific panels.

The MTurk panel lacks the older age cohorts in all nine studies. In the studies that asked if you were 50 or older, MTurk panels were 19% composed of this age cohort while the prolific panels had 43% of their panels over the age of 50. A comparison of the data sets suggests that the prolific panels might have even older participants. With the studies that asked if you were over 55, the prolific panels increased the percent of their total composition to 46% with this cohort while the MTurk panel of those over 55 dropped 6 percentage points to 13%.

Deconstructing the younger age cohort provides another interesting revelation. In the five studies that asked the age distribution of 18-34, MTurk had 54% of their panel from this age group, but in the three studies that asked 18-29, this cohort dropped to 25% of the panel composition, a difference of 29 percentage points. This suggests that the age of 30-34 is potentially making up 29% of the MTurk panel composition. However, in the prolific panels, 27% of their panel composition was between the ages of 18-

34 while 20% in the other three studies were 18-29. This suggests that in the prolific panels their 30-34 age cohorts made up 7% of the sample.

In the three statewide polls that had significantly more college/postgraduate degree participants, MTurk panels had the larger panel compositions. In IA, MTurk had 73% of the panel with a college/postgraduate degree compared to OA with 48% of their panel having a college/postgraduate degree. In MI, 70% of MTurk had a college/postgraduate degree compared with 50% of SSI panel. In TN, 65% of MTurk had a college/ postgraduate degree compared with 50% of SSI panel.

This study also found that States in the U.S. lack panel participants via MTurk (West Virginia could not qualify for analysis) but that prolific panel firms were able to capture an audience in all nine states that were requested. Limitations of online panel sizes in parts of the United States and internationally should be further explored to identify regional deficiencies.

The research also found an overall significant difference in composition of the online panels provided by prolific panel firms and MTurk. Implications suggest that MTurk may be a reliable alternative for online data collection within certain demographics and with it a substantial cost savings of 75% (MTurk costing $1 and Research Now SSI at $4) but the use of MTurk on general population surveys at least in the United States would be biased as they would under represent older and less educated people.

As stated earlier in this paper, there is an increasing global demand for online panels to be used in survey research. This study furthers the understanding of how to obtain high quality data from these online panels of respondents and lays the groundwork for future research work.

REFERENCES

Arechar, A. A. (2016). Turking Overtime: How Participant Characteristics and Behavior Vary Over Time and Day on Amazon Mechanical Turk. *SSRN Electronic Journal*. doi:10.2139/ssrn.2836946

Buhrmester, M., Kwang, T., & Gosling, S. (2011). Amazons Mechanical Turk: A new source of inexpensive, yet high-quality, data? *PsycEXTRA Dataset*. doi:10.1037/e527772014-223

Council of American Survey Research Organizations (CASRO). (n.d.). *Encyclopedia of Survey Research Methods*. doi:10.4135/9781412963947.n112

Crespi, I. (1988). *Pre-election polling: Sources of accuracy and error*. New York: Russell Sage Foundation.

Difallah, D., Filatova, E., & Ipeirotis, P. (2018). Demographics and Dynamics of Mechanical Turk Workers. *Proceedings of the Eleventh ACM International Conference on Web Search and Data Mining - WSDM 18*. doi:10.1145/3159652.3159661

ESOMAR. (2018). *Global Market Research 2018. ESOMAR's annual Global Market Research Report is the only global analysis of market research spend* (p. 28, Rep.).

Goodman, J. K., Cryder, C. E., & Cheema, A. (2012). Data Collection in a Flat World: The Strengths and Weaknesses of Mechanical Turk Samples. *Journal of Behavioral Decision Making*, 26(3), 213-224. doi:10.1002/bdm.1753

Höglinger, M., & Wehrli, S. (2017). *Measuring Social Preferences on Amazon Mechanical Turk. Social Dilemmas, Institutions, and the Evolution of Cooperation*. doi:10.1515/9783110472974-025

Kees, J., Berry, C., Burton, S., & Sheehan, K. (2017). An Analysis of Data Quality: Professional Panels, Student Subject Pools, and Amazons Mechanical Turk. *Journal of Advertising*, 46(1), 141-155. doi:10.1080/00913367.2016.1269304

Kimball, S. (2017). 2016 Presidential Statewide Polling – A Substandard Performance: A Proposal and Application for Evaluating Preelection Poll Accuracy. *American Behavioral Scientist*. doi:10.1177/0002764217735622

Lakkaraju, K. (2015). A Study of Daily Sample Composition on Amazon Mechanical Turk. *Social Computing, Behavioral-Cultural Modeling, and Prediction Lecture Notes in Computer Science*, 333-338. doi:10.1007/978-3-319-16268-3_39

Peer, E., Vosgerau, J., & Acquisti, A. (2013). Reputation as a sufficient condition for data quality on Amazon Mechanical Turk. *Behavior Research Methods*, 46(4), 1023-1031. doi:10.3758/s13428-013-0434-y

Research Now Group, Inc. (2017, December 20). Research Now and SSI Merger Successfully Completed. Retrieved from https://www.prnewswire.com/news-releases/research-now-and-ssi-merger-successfully-completed-300573912.html

Ross, J., Irani, L., Silberman, M. S., Zaldivar, A., & Tomlinson, B. (2010). Who are the crowdworkers? *Proceedings of the 28th of the International Conference Extended Abstracts on Human Factors in Computing Systems - CHI EA 10*. doi:10.1145/1753846.1753873

Schmidt, G. B., & Jettinghoff, W. M. (2016). Using Amazon Mechanical Turk and other compensated crowdsourcing sites. *Business Horizons*, 59(4), 391-400. doi:10.1016/j.bushor.2016.02.004

Silver, N. (2012). Calculating 'House Effects' of Polling Firms. *New York Times*, 6/22/2012. Retrieved from https://fivethirtyeight.blogs.nytimes.com/2012/06/22/calculating-house-effects-of-polling-firms/

Simons, D. J., & Chabris, C. F. (2012). Common (Mis)Beliefs about Memory: A Replication and Comparison of Telephone and Mechanical Turk Survey Methods. *PLoS ONE*, 7(12). doi:10.1371/journal.pone.0051876

Vivian, J. (2011). *The Media of Mass Communication*, 10th edition. Pearson, 327.

APPENDIX

Arizona Mode

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Turk	118	49.0	49.0	49.0
	OpinionAccess	123	51.0	51.0	100.0
	Total	241	100.0	100.0	

Florida Mode

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Turk	112	34.6	34.6	34.6
	SSI	212	65.4	65.4	100.0
	Total	324	100.0	100.0	

Iowa Mode

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Turk	48	15.0	15.0	15.0
	OpinionAccess	272	85.0	85.0	100.0
	Total	320	100.0	100.0	

Michigan Mode

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Turk	81	37.9	37.9	37.9
	SSI	133	62.1	62.1	100.0
	Total	214	100.0	100.0	

Minnesota Mode

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Turk	72	16.5	16.5	16.5
	SSI	364	83.5	83.5	100.0
	Total	436	100.0	100.0	

New Mexico Mode

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Turk	34	19.9	19.9	19.9
	SurveyMonkey	137	80.1	80.1	100.0
	Total	171	100.0	100.0	

Tennessee Mode

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Turk	105	15.6	15.6	15.6
	SSI	567	84.4	84.4	100.0
	Total	672	100.0	100.0	

West Virginia Mode

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Turk	28	9.4	9.4	9.4
	SSI	270	90.6	90.6	100.0
	Total	298	100.0	100.0	

Wisconsin Mode

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Turk	39	23.5	23.5	23.5
	SSI	127	76.5	76.5	100.0
	Total	166	100.0	100.0	

National Mode

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Turk	208	43.9	43.9	43.9
	SM	266	56.1	56.1	100.0
	Total	474	100.0	100.0	

National Poll – Gender

Crosstab

			What is your gender?		Total
			male	female	
Mode	MTurk	Count	123	85	208
		% within Mode	59.1%	40.9%	100.0%
	SM	Count	116	150	266
		% within Mode	43.6%	56.4%	100.0%
Total		Count	239	235	474
		% within Mode	50.4%	49.6%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	11.255[a]	1	0.001		
Continuity Correction	10.643	1	0.001		
Likelihood Ratio	11.305	1	0.001		
Fisher's Exact Test				0.001	0.001
Linear-by-Linear Association	11.231	1	0.001		
N of Valid Cases	474				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 103.12.
b. Computed only for a 2x2 table

Tennessee Poll – Party Registration

Crosstab

			What is your party registration?			Total
			Democrat	Republican	Independent or Other	
Mode	MTurk	Count	43	41	21	105
		% within Mode	41.0%	39.0%	20.0%	100.0%
	SSI	Count	158	285	124	567
		% within Mode	27.9%	50.3%	21.9%	100.0%
Total		Count	201	326	145	672
		% within Mode	29.9%	48.5%	21.6%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	7.514[a]	2	0.023
Likelihood Ratio	7.224	2	0.027
Linear-by-Linear Association	3.896	1	0.048
N of Valid Cases	672		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 22.66.

Iowa Poll – Race / Ethnicity

Crosstab

| | | | For statistical purposes only, can you please tell me your ethnicity? | | | | | | |
			Asian	Black or African American	Hispanic or Latino	Native American	White	other or multiple races	Total
Mode	MTurk	Count	0	1	0	1	46	0	48
		% within Mode	0.0%	2.1%	0.0%	2.1%	95.8%	0.0%	100.0%
	OA	Count	9	16	43	4	191	9	272
		% within Mode	3.3%	5.9%	15.8%	1.5%	70.2%	3.3%	100.0%
Total		Count	9	17	43	5	237	9	320
		% within Mode	2.8%	5.3%	13.4%	1.6%	74.1%	2.8%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	15.585[a]	5	0.008
Likelihood Ratio	24.666	5	0.000
Linear-by-Linear Association	9.051	1	0.003
N of Valid Cases	320		

a. 5 cells (41.7%) have expected count less than 5. The minimum expected count is .75.

National Poll – Race / Ethnicity

Crosstab

			For statistical purposes only, can you please tell me your ethnicity?					Total
			Hispanic or Latino	White	Black or African American	Asian or Native American	other or multiple races	
Mode	MTurk	Count	9	150	12	27	10	208
		% within Mode	4.3%	72.1%	5.8%	13.0%	4.8%	100.0%
	SM	Count	7	238	1	4	16	266
		% within Mode	2.6%	89.5%	0.4%	1.5%	6.0%	100.0%
Total		Count	16	388	13	31	26	474
		% within Mode	3.4%	81.9%	2.7%	6.5%	5.5%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	41.490[a]	4	0.000
Likelihood Ratio	44.771	4	0.000
Linear-by-Linear Association	8.429	1	0.004
N of Valid Cases	474		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.70.

Minnesota Poll – Congressional District

Crosstab

| | | | What congressional district do you live in? | |
			1	2	3	4	5	6	7	8	Total
Mode	MTurk	Count	7	4	21	19	7	5	4	5	72
		% within Mode	9.7%	5.6%	29.2%	26.4%	9.7%	6.9%	5.6%	6.9%	100.0%
	SSI	Count	34	37	73	50	34	51	38	47	364
		% within Mode	9.3%	10.2%	20.1%	13.7%	9.3%	14.0%	10.4%	12.9%	100.0%
Total		Count	41	41	94	69	41	56	42	52	436
		% within Mode	9.4%	9.4%	21.6%	15.8%	9.4%	12.8%	9.6%	11.9%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	15.392[a]	7	0.031
Likelihood Ratio	15.451	7	0.031
Linear-by-Linear Association	3.677	1	0.055
N of Valid Cases	436		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.77.

Michigan Poll – Congressional District

			What congressional district do you live in or some other regional breakdown for voters to choose?														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
Mode	Turk	Count	3	3	10	9	3	7	9	5	7	7	3	5	6	3	80
		% within Mode	3.80%	3.80%	12.50%	11.30%	3.80%	8.80%	11.30%	6.30%	8.80%	8.80%	3.80%	6.30%	7.50%	3.80%	100.00%
	SSI	Count	11	10	14	20	9	11	11	9	3	9	16	0	7	3	133
		% within Mode	8.30%	7.50%	10.50%	15.00%	6.80%	8.30%	8.30%	6.80%	2.30%	6.80%	12.00%	0.00%	5.30%	2.30%	100.00%
Total		Count	14	13	24	29	12	18	20	14	10	16	19	5	13	6	213
		% within Mode	6.60%	6.10%	11.30%	13.60%	5.60%	8.50%	9.40%	6.60%	4.70%	7.50%	8.90%	2.30%	6.10%	2.80%	100.00%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	22.434[a]	13	0.049
Likelihood Ratio	24.523	13	0.027
Linear-by-Linear Association	3.319	1	0.068
N of Valid Cases	213		

a. 8 cells (28.6%) have expected count less than 5. The minimum expected count is 1.88.

National Poll – State

Mode * Regions Crosstabulation

			Regions				Total
			North-East	South	Mid-West	West	
Mode	MTurk	Count	32	88	34	54	208
		% within Mode	15.4%	42.3%	16.3%	26.0%	100.0%
	SM	Count	53	76	41	96	266
		% within Mode	19.9%	28.6%	15.4%	36.1%	100.0%
Total		Count	85	164	75	150	474
		% within Mode	17.9%	34.6%	15.8%	31.6%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.556[a]	3	0.009
Likelihood Ratio	11.579	3	0.009
Linear-by-Linear Association	2.072	1	0.150
N of Valid Cases	474		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 32.91.

National Poll – Education

Crosstab

			What is the highest level of education you have attained				Total
			high school or less	some college	college graduate	postgrad or higher	
Mode	MTurk	Count	9	64	102	33	208
		% within Mode	4.3%	30.8%	49.0%	15.9%	100.0%
	SM	Count	13	67	88	98	266
		% within Mode	4.9%	25.2%	33.1%	36.8%	100.0%
Total		Count	22	131	190	131	474
		% within Mode	4.6%	27.6%	40.1%	27.6%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	27.393[a]	3	0.000
Likelihood Ratio	28.444	3	0.000
Linear-by-Linear Association	10.328	1	0.001
N of Valid Cases	474		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.65.

Tennessee Poll – Education

Crosstab

			\multicolumn{4}{c}{What is the highest level of education you have attained?}			Total
			high school or less	some college	college graduate	postgrad or higher	
Mode	MTurk	Count	8	29	46	22	105
		% within Mode	7.6%	27.6%	43.8%	21.0%	100.0%
	SSI	Count	115	165	178	109	567
		% within Mode	20.3%	29.1%	31.4%	19.2%	100.0%
Total		Count	123	194	224	131	672
		% within Mode	18.3%	28.9%	33.3%	19.5%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.062[a]	3	0.007
Likelihood Ratio	13.583	3	0.004
Linear-by-Linear Association	7.172	1	0.007
N of Valid Cases	672		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 19.22.

Michigan Poll – Education

Crosstab

			What is the highest level of education you have attained?				Total
			High school or less	Some college	College graduate	Postgrad or higher	
Mode	MTurk	Count	4	20	47	10	81
		% within Mode	4.9%	24.7%	58.0%	12.3%	100.0%
	SSI	Count	19	47	43	24	133
		% within Mode	14.3%	35.3%	32.3%	18.0%	100.0%
Total		Count	23	67	90	34	214
		% within Mode	10.7%	31.3%	42.1%	15.9%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	14.847[a]	3	0.002
Likelihood Ratio	15.182	3	0.002
Linear-by-Linear Association	3.658	1	0.056
N of Valid Cases	214		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.71.

Iowa Poll – Education

<div align="center">Crosstab</div>

			What is the highest level of education you have attained?				Total
			high school or less	some college	college graduate	postgrad or higher	
Mode	MTurk	Count	2	11	22	13	48
		% within Mode	4.2%	22.9%	45.8%	27.1%	100.0%
	Opinion Access	Count	46	94	101	31	272
		% within Mode	16.9%	34.6%	37.1%	11.4%	100.0%
Total		Count	48	105	123	44	320
		% within Mode	15.0%	32.8%	38.4%	13.8%	100.0%

<div align="center">Chi-Square Tests</div>

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	14.208[a]	3	0.003
Likelihood Ratio	14.518	3	0.002
Linear-by-Linear Association	13.755	1	0.000
N of Valid Cases	320		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.60.

National Poll – Age

Crosstab

			What is your age range?			Total
			18-34 years	35-54 years	55 or more years	
Mode	MTurk	Count	130	66	12	208
		% within Mode	62.5%	31.7%	5.8%	100.0%
	SM	Count	45	105	116	266
		% within Mode	16.9%	39.5%	43.6%	100.0%
Total		Count	175	171	128	474
		% within Mode	36.9%	36.1%	27.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	129.523[a]	2	0.000
Likelihood Ratio	142.740	2	0.000
Linear-by-Linear Association	128.790	1	0.000
N of Valid Cases	474		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 56.17.

Arizona Poll – Age

Crosstab

			What is your age range?			Total
			18-34 years	35-54 years	55 or more years	
Mode	MTurk	Count	62	37	19	118
		% within Mode	52.5%	31.4%	16.1%	100.0%
	Opinion Access	Count	43	29	51	123
		% within Mode	35.0%	23.6%	41.5%	100.0%
Total		Count	105	66	70	241
		% within Mode	43.6%	27.4%	29.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	18.941[a]	2	0.000
Likelihood Ratio	19.512	2	0.000
Linear-by-Linear Association	15.688	1	0.000
N of Valid Cases	241		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 32.32.

Florida Poll – Age

Crosstab

			What is your age range?			Total
			18-34 years	35-54 years	55 or older	
Mode	MTurk	Count	65	28	19	112
		% within Mode	58.0%	25.0%	17.0%	100.0%
	SSI	Count	89	55	68	212
		% within Mode	42.0%	25.9%	32.1%	100.0%
Total		Count	154	83	87	324
		% within Mode	47.5%	25.6%	26.9%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.232[a]	2	0.006
Likelihood Ratio	10.608	2	0.005
Linear-by-Linear Association	10.122	1	0.001
N of Valid Cases	324		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 28.69.

Iowa Poll – Age

<div align="center">

Crosstab

			What is your age range?			Total
			18-29 years	30-49 years	50 or more years	
Mode	MTurk	Count	12	32	4	48
		% within Mode	25.0%	66.7%	8.3%	100.0%
	OpinionAccess	Count	62	111	99	272
		% within Mode	22.8%	40.8%	36.4%	100.0%
Total		Count	74	143	103	320
		% within Mode	23.1%	44.7%	32.2%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	16.174[a]	2	0.000
Likelihood Ratio	19.054	2	0.000
Linear-by-Linear Association	6.839	1	0.009
N of Valid Cases	320		

</div>

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.10.

Michigan Poll – Age

Crosstab

			What is your age range?			Total
			18-34 years	35-54 years	55 or more years	
Mode	MTurk	Count	39	29	13	81
		% within Mode	48.1%	35.8%	16.0%	100.0%
	SSI	Count	49	44	40	133
		% within Mode	36.8%	33.1%	30.1%	100.0%
Total		Count	88	73	53	214
		% within Mode	41.1%	34.1%	24.8%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.673[a]	2	0.059
Likelihood Ratio	5.902	2	0.052
Linear-by-Linear Association	5.086	1	0.024
N of Valid Cases	214		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 20.06.

Minnesota Poll – Age

Crosstab

			What is your age range?			Total
			18-29 years	30-49 years	50 or more years	
Mode	MTurk	Count	20	37	15	72
		% within Mode	27.8%	51.4%	20.8%	100.0%
	SSI	Count	76	121	167	364
		% within Mode	20.9%	33.2%	45.9%	100.0%
Total		Count	96	158	182	436
		% within Mode	22.0%	36.2%	41.7%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	15.795[a]	2	0.000
Likelihood Ratio	16.884	2	0.000
Linear-by-Linear Association	10.222	1	0.001
N of Valid Cases	436		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 15.85.

New Mexico Poll – Age

Crosstab

			What is your age range?			
			18-29 years	30-49 years	50 or more years	Total
Mode	MTurk	Count	6	17	11	34
		% within Mode	17.6%	50.0%	32.4%	100.0%
	SurveyMonkey	Count	20	50	67	137
		% within Mode	14.6%	36.5%	48.9%	100.0%
Total		Count	26	67	78	171
		% within Mode	15.2%	39.2%	45.6%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.070[a]	2	0.215
Likelihood Ratio	3.130	2	0.209
Linear-by-Linear Association	2.017	1	0.156
N of Valid Cases	171		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.17.

Tennessee Poll – Age

Crosstab

			What is your age range?			Total
			18-34 years	35-54 years	55 or more years	
Mode	MTurk	Count	43	46	16	105
		% within Mode	41.0%	43.8%	15.2%	100.0%
	SSI	Count	104	135	328	567
		% within Mode	18.3%	23.8%	57.8%	100.0%
Total		Count	147	181	344	672
		% within Mode	21.9%	26.9%	51.2%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	65.284[a]	2	0.000
Likelihood Ratio	70.179	2	0.000
Linear-by-Linear Association	58.366	1	0.000
N of Valid Cases	672		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 22.97.

Wisconsin Poll – Age

Crosstab

			What is your age range?			Total
			18-34 years	35-54 years	55 or more years	
Mode	Turk	Count	22	13	4	39
		% within Mode	56.4%	33.3%	10.3%	100.0%
	SSI	Count	49	29	49	127
		% within Mode	38.6%	22.8%	38.6%	100.0%
Total		Count	71	42	53	166
		% within Mode	42.8%	25.3%	31.9%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.015[a]	2	0.004
Likelihood Ratio	12.768	2	0.002
Linear-by-Linear Association	8.593	1	0.003
N of Valid Cases	166		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.87.