

FOR RELEASE August 1, 2016

The Twilight of Landline Interviewing

Survey data quality tends to be at least as good when all interviewing is done with cellphones

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Survey data quality tends to be at least as good when all interviewing is done with cellphones

Now that over 90% of U.S. adults have cellphones,¹ survey researchers are considering whether it is necessary to continue dialing landline numbers in random-digit-dial (RDD) telephone polls. A new Pew Research Center study finds that, for polls already conducting a substantial share of interviews with cellphones, the answer is generally “no” – at least if data quality is the only issue of concern.

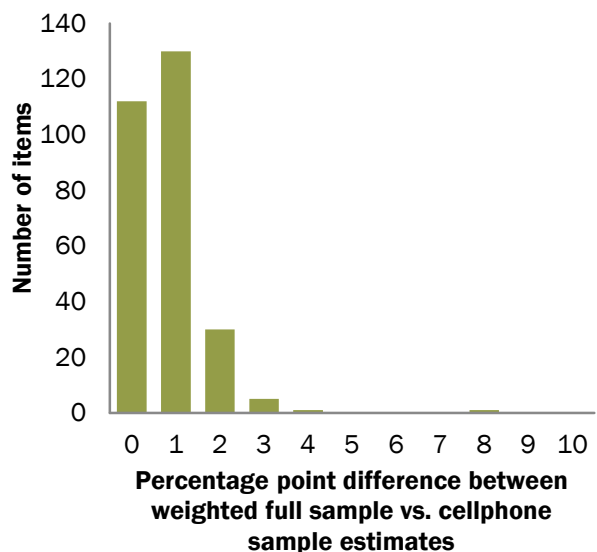
According to the study, poll results look nearly identical whether based only on those adults reached on cellphones or on a combination of cellphone and landline respondents. Analysis of more than 250 survey questions shows that when landlines are excluded, the estimates change by less than 1 percentage point, on average.

Contrary to concerns that polling is in some way broken, the study also shows that cellphone RDD samples are representative of the U.S. public on a number of key dimensions, particularly age, race and ethnicity. The amount of weighting needed to align the sample with demographic benchmarks is modest, with education and gender requiring the most adjustment.

Samples of adults reached via cellphone are much more demographically representative of the U.S. than samples of adults reached via landline. Consequently, replacing landline interviews with cellphone interviews reduces the degree to which survey data need to be weighted to be representative of U.S. adults. This in turn improves the precision of estimates by reducing the

Most estimates virtually unchanged when landlines are excluded

Of 279 survey estimates, most differ by 1 percentage point or less when landline interviews are excluded



Source: Surveys conducted September 2014-September 2015. “The Twilight of Landline Interviewing”

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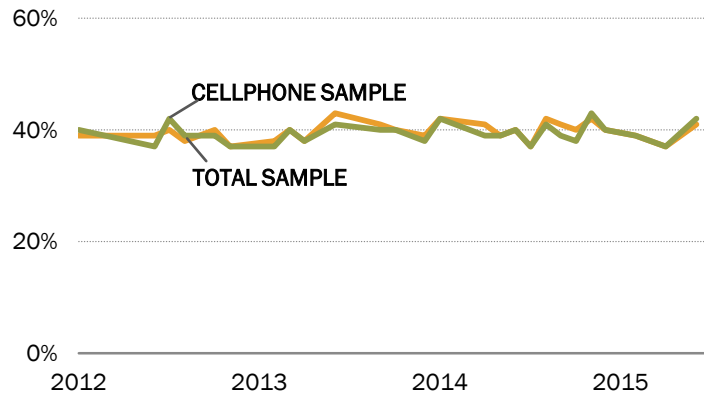
¹ Stephen J. Blumberg and Julian V. Luke. Wireless substitution: Early Release of Estimates From the National Health Interview Survey, July–December 2015. National Center for Health Statistics. May 2016. Available from: <http://www.cdc.gov/nchs/nhis.htm>.

margin of sampling error. Perhaps not surprisingly, one major survey was recently redesigned to feature 100% cellphone interviewing.²

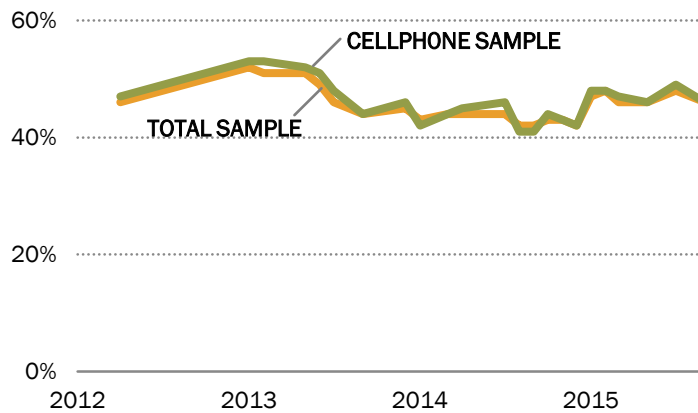
But while cellphone surveys can produce high-quality data that in some ways are superior to results of current dual-frame (landline plus cellphone) designs, neither Pew Research Center nor the telephone survey industry more generally is poised to immediately drop landline samples. Landline interviewing is roughly 30%-50% less expensive on a per-interview basis than cellphone interviewing. As a result, landlines remain an attractive option for achieving a fixed total sample size (e.g., n=1,000), even though the *effective* sample size after weighting is lower than would typically be achieved dialing only cellphones.³ There are also certain topics, such as experiences of elderly Americans and voter intention in low turnout elections,⁴ that landlines are still particularly useful for addressing.

Estimates using just cellphones track closely with full sample estimates

% Republican/lean Republican



% approve of Obama's handling his job as president



Source: Surveys conducted April 2012-September 2015.
"The Twilight of Landline Interviewing"

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² Charley Jiang, James M. Lepkowski, Tuba Suzer-Gurtekin, Michael Sadowsky, Richard Curtin, Rebecca McBee, Dan Zahs. 2015. "Transition from Landline-Cell to Cell Frame Design: Surveys of Consumers" Presented at the Annual Conference of the American Association for Public Opinion Research.

³ The ability to achieve a larger effective sample sizes with a cellphone only design relative to a dual-frame design is examined in detail in a recent article: Andy Peytchev and Benjamin Neely. 2013. "RDD Telephone Surveys: Towards a Single-Frame Cell-Phone Design." *Public Opinion Quarterly*, Vol. 77, No. 1, pp. 283-304.

⁴ Alan Reifman and Sylvia Niehuis. 2015. "Pollsters' Cell-Phone Proportions and Accuracy in 2014 US Senate Races." *Survey Practice*, Vol. 8, No. 5.

In anticipation of this impending transition to 100% cellphone surveys, Pew Research Center has created an experimental weight that uses only interviews conducted with cellphones in nearly every survey since 2012. The weight simulates what the survey results would have been if only cellphones were dialed.

For key, commonly asked questions such as partisan affiliation, the difference between the published total sample estimates – based on landlines and cellphones – and estimates based just on the cellphone sample has tended to be quite small. For example, in April 2012, the share of U.S. adults identifying as Republican or leaning Republican was nearly identical when computed using the total sample (39%) versus just the cellphone sample (40%). The result was highly similar in a September 2015 survey (41% for total sample versus 42% for the cellphone sample).

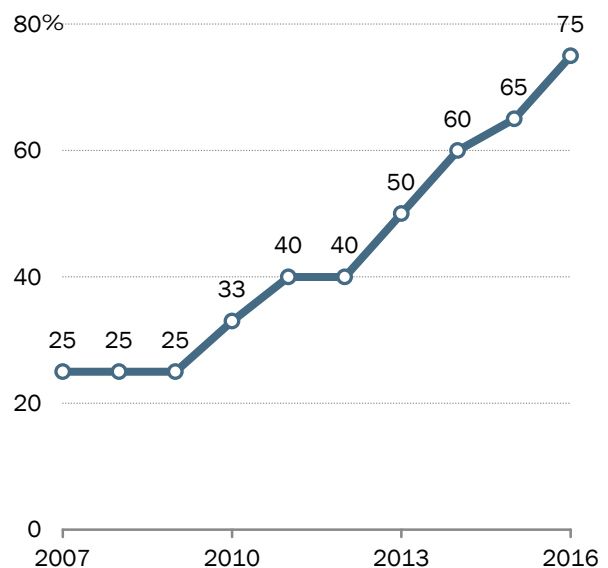
The contours of trends also appear to be largely unaffected by dropping landlines. Both the total sample estimates and the cellphone sample estimates show President Obama's job approval numbers increasing from the mid-40s to the low 50s in 2012, dipping in 2013-2014, and then rebounding slightly in 2015.

Pew Research Center has increased the share of interviews conducted on cellphones in typical surveys from 25% in 2007 to 75% in 2016 in response to the widespread adoption of cellphones. This means that any differences between cellphone sample estimates and total sample estimates should naturally narrow over time, as the former constitutes an increasingly large share of the latter.

This design change over time no doubt explains some of the similarity between the two types of estimates, particularly in recent years. It also means that, for surveys currently featuring a high proportion of interviewing via

At Pew Research Center, share of interviews via cellphone has been climbing

% of interviews conducted on cellphones in typical Pew Research Center surveys. Different organizations set this share at different levels.



Source: Surveys conducted 2007-2016. "The Twilight of Landline Interviewing"

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landline, conversion to 100% cellphone interviewing may not be seamless. The larger the current landline allocation, the greater the risk that estimates may change if the landline sample is abruptly excluded from the survey.

Testing the effect of dropping landlines on over 250 survey questions

While trends for a few key measures appear generally unaffected by the simulated exclusion of landlines, additional analysis is needed to determine whether this result holds for a broader set of survey questions. The effect from excluding landlines is fundamentally a question-level outcome. While it may be safe to exclude landlines when asking some questions, that may not be the case for other questions probing different topics.

To address this, we combined questions from eight different national dual-frame landline and cellphone RDD surveys conducted by Pew Research Center in the past two years into a large analysis. The measures range from attitudes about abortion, homosexuality and foreign policy to opinions about online dating, personal finances and views on the 2016 election. A complete listing is provided in the appendix.

For each of the 279 questions analyzed, we computed the difference between the weighted estimate based on the combined (cellphone plus landline) sample and the weighted estimate based on the cellphone sample alone.⁵ The average difference (absolute value) between these two estimates was less than 1 percentage point (0.78 points). The vast majority of questions (87%) showed either a 0 or 1-point difference.

Out of 279 questions, just one – “Do you have a cellphone, or not?” – showed a statistically significant difference. By definition, this estimate is 100% when just the cellphone sample is used. When landline interviews are included, the estimate is 92%. This finding is almost too intuitive to bother mentioning, as a survey that only dials cellphones would obviously be a nonsensical tool for measuring cellphone penetration. This result does, however, make the point that there are limits to what cellphone surveys can accurately measure.

It is also worth noting that while this analysis tested a large number of questions typical of those asked in public opinion surveys, it does not cover all possible survey domains. For example, questions about health, transportation or employment were not covered in the source surveys and

⁵ The experimental weight is computed using the same procedures as the full sample weight except that there is no first-stage adjustment and a phone use parameter is not included in the raking. No first-stage adjustment was computed because the probability of selection from the cellphone frame is treated as the same for all cases, there is no household-level selection procedure, and there is no adjustment for the number of cellphones each respondent uses.

therefore were not included in the analysis. As a result, researchers should be cautious if looking to generalize results from this study to other fields of inquiry.

Subgroup differences are largely confined to estimates for ages 65+

The fact that estimates for “all adults” generally are not affected by dropping landlines should provide some assurance to researchers facing this transition, but it does not address all concerns. Cellphone penetration rates are not uniform across all segments of the population. For segments where cellphone adoption is lagging (e.g., the elderly), discarding landline samples may have a more noticeable and problematic effect on survey estimates.

Examining the effect of excluding landlines on subgroup estimates is challenging because sample sizes for key subgroups are often relatively small and thus are subject to a fair amount of noise due to sampling error.

For example, a Pew Research Center political survey in September 2015 featured 1,502 total interviews, but the cellphone sample alone had 106 interviews with black non-Hispanics, 141 with Hispanics and 161 with adults ages 65 and over. These sample sizes do not provide strong statistical power to detect differences in total sample versus cellphone sample estimates.

Our solution was to perform the subgroup analysis using two very large national dual-frame RDD surveys. The 2014 political polarization and typology survey featured 10,013 interviews. The 2015 survey on government featured 6,004 interviews.

These studies have large enough subgroup sample sizes to support reliable tests of differences when simulating the exclusion of landlines. They also feature some overlap in questionnaire content. In order to assess the robustness of observed differences, we focused the analysis on questions asked in both of these large surveys. An exception to this is marital status, which is a common poll question but was only asked in the 2014 survey.

The analysis indicates that the effect on major subgroup estimates from dropping the landline sample tends to be small and is often inconsistent. For example, in the 2015 survey on government, the estimated share of Hispanics identifying as Republican or leaning Republican is 26% based on all the interviews versus 27% based on just the cellphone interviews. Similarly, on a 10-item index measuring [ideological consistency](#), the estimated share of black non-Hispanics classified as consistently or mostly conservative is 8% based on all the interviews versus 7% based on just the cellphone interviews.

That aside, not all of the differences are minor. The estimated share of adults who are married is 44% based on the cellphone sample versus 48% based on the total sample. According to the 2014 American Community Survey (ACS), the actual marital rate among U.S. adults is 51%. This indicates that if marital status is not adjusted for in the weighting, married adults may be somewhat underrepresented in cellphone RDD surveys.

Few consistent differences between subgroup estimates based on total sample versus only the cellphone sample

Percentage point differences: weighted estimate using cellphone sample minus weighted estimate using total sample

	All adults	Men	Women	18-29	30-49	50-64	65+	White non-Hisp.	Black non-Hisp.	Hispanic
2015 SURVEY ON GOVERNMENT										
Republican/lean Republican	0	0	0	-1	0	-1	2	0	-2	1
Consistently/mostly conservative	0	0	0	0	0	1	1	0	-1	0
Registered voter	-1	-1	-2	-2	0	-2	0	-1	-2	-1
Internet user	3	1	4	0	1	1	11	3	4	0
Protestant	0	0	0	0	2	-1	0	0	-2	0
Attend religious services weekly or more	-1	-1	-1	0	0	-1	-3	-1	-3	-1
Family income <\$30,000	0	0	-1	0	1	0	-3	-1	2	0
Unweighted cellphone n	3,891	2,204	1,687	848	1,281	1,069	636	2,564	401	563
2014 POLITICAL POLARIZATION AND TYPOLOGY SURVEY										
Republican/lean Republican	-1	0	-1	0	-1	-1	1	-1	0	1
Consistently/mostly conservative	-1	-1	-1	0	-1	-1	2	-1	-1	1
Registered voter	-2	-2	-3	0	-3	-3	-2	-2	-2	-2
Internet user	2	1	3	0	0	1	10	2	2	3
Protestant	0	-1	2	0	0	1	2	1	-2	0
Attend religious services weekly or more	-2	-2	-2	0	-1	-2	-5	-2	-1	-2
Family income <\$30,000	2	1	4	0	4	2	2	2	4	2
Married	-4	-3	-5	0	-6	-5	-2	-5	-2	-2
Unweighted cellphone n	5,003	2,876	2,127	1,208	1,598	1,363	787	3,289	588	615

Note: The % consistently/mostly conservative estimate is based on an ideological consistency scale created from 10 questions about political values and positions.

Source: Surveys conducted Jan. 23-March 16, 2014 (political polarization and typology) and Aug. 27-Oct. 4, 2015 (government). "The Twilight of Landline Interviewing"

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There is an even larger difference for estimates of internet usage among the elderly. When landline interviews are excluded, the estimated share of adults ages 65 and older who use the internet increases by at least 10 percentage points in both surveys. Dropping the landline interviews also reduces the estimated share of adults attending religious services weekly or more often. This is true for most of the major subgroups, but the change is most dramatic for those ages 65 and over.

The data also suggest that political ideology estimates for adults ages 65 and older become slightly more conservative when interviewing is done only on cellphones. The estimated share of seniors identifying as Republican or leaning Republican and consistently or mostly conservative tick up by 1 to 2 percentage points in both surveys when landlines are not used. Deeper digging shows that this difference

comes from the oldest members of that age group, in particular, those ages 80 and older.

In the 2014 political polarization and typology survey, when the landline interviews are excluded, the percent identifying as Republican or leaning Republican increases from 46% to 47% among the entire group of adults ages 65 and older. This reflects a 7-point increase among adults ages 80 and older and no change among adults ages 65 to 79 group. Similarly, on the political ideology index, excluding landlines triggers a 10-point increase in the share classified as consistently or mostly conservative among those ages 80 and over but no change for those ages 65 to 79.

The mechanism(s) behind this pattern can be difficult to tease out since the number of cellphone interviews with adults ages 80 and older tends to be small, even in a very large RDD survey. Attempts to detect differences within an already small subgroup quickly run out of statistical power.

Adults ages 80+ reached by cellphone tilt more conservative than those reached by landline

	Ages 65 to 79			Ages 80+		
	Cellphone sample	Total sample	Diff	Cellphone sample	Total sample	Diff
	%	%	%	%	%	%
Republican/lean Republican	47	47	0	52	45	+7
Consistently/mostly conservative	38	38	0	43	33	+10
Unweighted n	685	2,199		102	635	

Note: The % consistently/mostly conservative estimate is based on an ideological consistency scale created from 10 questions about political values and positions.

Source: Survey conducted Jan. 23-March 16, 2014 (political polarization and typology). "The Twilight of Landline Interviewing"

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Still, analysis of 481 cellphone interviews with adults ages 80 and older from 20 Pew Research Center surveys conducted in 2014 and 2015 indicates that this effect is confined to men. Among this advanced age group, men reached by cellphone are more Republican than those reached by landline. There is no such difference among women.

In sum, while some groups commonly parsed out in public opinion surveys do not appear to be systematically affected by the transition to cellphone only surveys, this does not hold true for the very elderly. Future research should examine whether there are other commonly studied segments of the population whose estimates are sensitive to the exclusion of landlines in surveys.

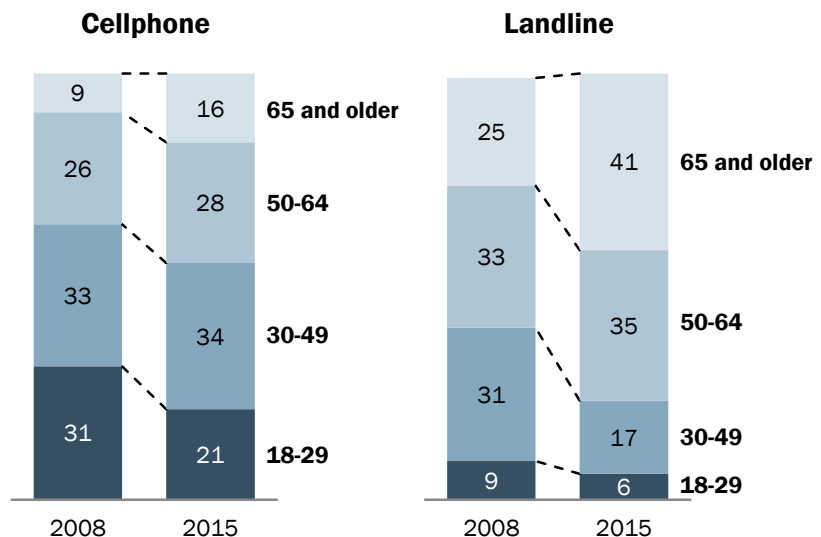
As cellphone samples improve demographically, landline samples deteriorate

While cellphone samples have become more and more representative of the U.S. public, the trend with landline samples has been just the opposite.

In 2008, both cellphone and landline samples had lopsided age distributions, albeit in different directions. In a September 2008 Pew Research Center survey, the unweighted cellphone sample underrepresented older adults – 9% were ages 65 and older, compared with an ACS benchmark of 19% – and overrepresented young adults, as 31% were ages 18 to 29, compared with an ACS benchmark of 21%. At the same time, the landline sample was underrepresenting young adults (9%) while overrepresenting older adults (25%).

Age profile of cellphone samples improves as landline samples continue to gray

Unweighted % of interviews from each sample



Note: Landline respondents include adults who do not have cellphones and those who have cellphones but were reached to complete the survey on their landlines. This second group may or may not have been willing to comply if they had been reached on their cellphones. "Don't know" and refused respondents are not shown.

Source: Surveys conducted Sept. 9-14, 2008 and Sept. 22-27, 2015. "The Twilight of Landline Interviewing"

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The story is quite different today, as cellphones are no longer the exclusive domain of the young. In a September 2015 survey, the unweighted age distribution of the cellphone sample was almost identical to ACS population benchmarks, including for those ages 65 and older (16% in the cellphone sample versus 19% in ACS).

Just as the improvement in cellphone samples has been rapid and dramatic, so has the deterioration of landline samples. From 2008 to 2015, the proportion of adults interviewed on landlines who are ages 50 or older has ballooned from 58% to 76%.

There are also stark difference between samples types on race and ethnicity. The important point here is not so much that cellphone samples are more representative in this respect than landlines – researchers have recognized this for several years – but rather that unweighted cellphone samples *by themselves* now look quite like the entire U.S. public.

In 2015, about one-in-ten cellphone respondents (11%) were black and about one-in-seven (14%) were Hispanic. These figures closely mirror the actual size of these groups in the U.S. adult population (12% and 15%, respectively). This indicates that a survey researcher could do a very good job representing these key subgroups using just a cellphone sample.

Cellphone sample more closely matches population distribution for race, age

Demographic profiles of adult population, cellphone respondents and landline respondents

	U.S. population benchmark	Cellphone sample	Landline sample
	Weighted	Unweighted	Unweighted
	%	%	%
White, non-Hispanic	65	64	82
Hispanic	15	14	6
Black, non-Hispanic	12	11	6
Other, non-Hispanic	8	9	3
18-29	22	21	6
30-49	34	34	17
50-64	26	28	35
65+	19	16	41
Male	48	56	45
Female	52	44	55
High school grad or less	41	30	30
Some college/associate degree	31	28	26
Bachelor's degree or more	28	41	44
Unweighted n	2,403,157	977	525

Note: Landline respondents include adults who do not have cellphones and those who have cellphones but were reached to complete the survey on their landlines. This second group may or may not have been willing to comply if they had been reached on their cellphones. "Don't know" and refused respondents are not shown.

Source: Survey conducted Sept. 22-27, 2015; for non-institutionalized adult population, 2014 American Community Survey (IPUMS). Statistically significant differences between cellphone and landline sample in **bold**. "The Twilight of Landline Interviewing"

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Landline samples, by contrast, skew heavily white non-Hispanic (82%) relative to the adult population (65%). As a result, many if not most RDD surveys that combine landlines and cellphones overrepresent whites on an unweighted basis and rely on weighting to correct for it.

Cellphone samples underrepresent women and adults with less education

While cellphone samples are quite representative on age and race/ethnicity, they do have their flaws. For one thing, they tend to skew male. The cellphone sample in the September 2015 survey was 56% male, 44% female, falling short of the ACS benchmark for women by 8 percentage points. This type of result is fairly common in contemporary cellphone RDD samples.

The mechanism behind this gender skew in cellphone samples is not well understood. For decades, landline samples have skewed female and continue to do so, but for presumably clear reasons. Women tend to live longer than men, and landline samples skew old. In addition, traditional gender roles may have contributed to women being somewhat more likely to answer the phone on behalf of the household.

For cellphones, there is no obvious narrative for the gender skew. One possible explanation is that men have lower levels of concern about privacy or telemarketing scams and are therefore more likely to answer calls from unfamiliar numbers, such as those from survey data collectors. Or perhaps men, on average, spend less time talking on their cellphones than women, making survey calls a slightly more novel experience for them. Hopefully future studies will move beyond speculation and shed some empirical light on the mechanism(s) behind this gender difference.

Education is a less mysterious but no less important challenge for both cellphone and landline samples. Both types of samples consistently underrepresent adults with lower levels of educational attainment, on an unweighted basis. Adults with a high school education or less constitute 41% of the public but less than a third of landline and cellphone sample respondents (30% for each sample type) in the September 2015 survey.

To address the gender and education disparities, as well as other demographic imbalances, Pew Research Center as well as other major survey organizations use weighting, in particular techniques such as raking, to align the survey sample to the population benchmarks.

Can dual users reached by cellphone represent those reached by landline?

To understand why there is generally little effect on weighted estimates from dropping the landline sample, it helps to understand the overlap. In the context of dual-frame RDD, the overlap refers to the fact that some people have both landlines and cellphones, meaning they could be sampled on either. This means that there is partial duplication in population coverage provided by the landline and cellphone sampling frames.

In each Pew Research Center telephone survey, landline respondents are asked if they have a working cellphone and cellphone respondents are asked if they have a working landline. Respondents who report having both types of phone are known as dual users. In a typical survey the Center conducted in 2015, approximately 29% of all respondents were dual users reached in the landline sample. An additional 27% were dual users reached in the cellphone sample.

In thinking about excluding the landline sample in a future survey, it is worth considering how well the dual users reached by cellphone represent those reached by landline. At first blush, dual users from the cellphone sample look to be poor proxies for those reached by landline. Cellphone-sample dual users are significantly younger, more male, more educated and more racially diverse relative to their landline-sample counterparts.

These groups also differ on key attitudinal and behavioral variables. For example, 37% of dual users from the cellphone sample report attending religious services weekly or more often, versus 44% among dual users reached by landline. Dual users from the cellphone sample are also less likely to consider themselves Republican or leaning to the Republican Party relative to their

Dual users reached by cellphone are younger, more male, less white than those reached by landline

Unweighted demographic profile of adults with both a landline and cellphone, by sample type

	Dual users reached on landline	Dual users reached on cellphone
	%	%
White, non-Hispanic	78	73
Hispanic	7	9
Black, non-Hispanic	8	10
Other, non-Hispanic	5	6
18-29	5	13
30-49	18	27
50-64	33	33
65+	43	25
Male	46	55
Female	54	45
High school grad or less	26	23
Some college/associate degree	29	29
Bachelor's degree or more	45	48
Unweighted n	1,767	1,590

Note: The difference between the distributions of the dual users reached by landline versus cellphone is statistically significant at the .05 level for each of these four demographic variables.

Source: Survey on government conducted Aug. 27-Oct. 4, 2015. "The Twilight of Landline Interviewing"

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counterparts from the landline sample. On a bivariate basis – that is, just looking at responses from dual users by sample – the unweighted difference was statistically significant on each of seven key variables examined.

Upon closer examination, however, the differences on key attitudinal and behavioral outcomes are largely explained by the demographic differences between landline and cellphone respondents discussed above. Each of the seven outcomes was predicted using a regression model that controlled for age, sex, race/ethnicity and education. Depending on the nature of the variable, a linear, ordinal or binary logistic model was used. In each model, the outcome was estimated using only dual users and regressed on sample type (landline vs. cellphone), age, sex, race/ethnicity and education. If the effect of sample type, which was significant in each of the bivariate analyses, remained significant in the multivariate regression analysis, this would be evidence that dual users from the landline sample were distinct from those reached by cellphone – even after controlling for the known demographic differences.

As it turns out, for six of the seven outcomes, the effect associated with the sample type disappears (is no longer statistically significant) when controlling for the demographics. This means that the dual users reached by cellphone are reasonable proxies for those reached by landline, after accounting for differences across demographic variables that are adjusted for in the survey weighting.

Many differences between dual users from landline and cellphone samples are explained by a few demographics

	<i>Dual users reached in the ...</i>			<i>Is the difference significant ...</i>	
	Landline sample	Cellphone sample	Diff	Without controlling for demo's?	Controlling for demo's?
	%	%	%		
Republican/lean Republican	49	46	3	Yes	No
Consistently/mostly conservative	38	33	5	Yes	No
Registered voter ("certain")	89	84	5	Yes	No
Use the internet at least occasionally	89	95	-6	Yes	No
Protestant	45	38	7	Yes	No
Attend religious services weekly or more	44	37	7	Yes	No
Annual household income < \$30,000	21	17	4	Yes	Yes

Note: Estimates are unweighted. The multivariate analysis ("controlling for demo's") consists of linear, ordinal or logistic regression modeling, depending on the nature of outcome variable. Each model regressed the outcome on the sample type (landline or cellphone) as well as four demographics: sex, age, education and race/ethnicity.

Source: Survey on government conducted Aug. 27-Oct. 4, 2015.
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Household income is the one estimate in this analysis where the difference by sample type is not fully explained by demographics. Dual users reached by cellphone tend to have higher incomes than those reached by landline, even after controlling for sex, age, education and race/ethnicity. This result suggests that, for researchers using cellphone surveys to measure outcomes related to income, it may be worthwhile exploring the addition of income or some correlate thereof to the weighting protocol in order to reduce the risk of bias.

Surveys that only dial cellphones provide smaller margin of error

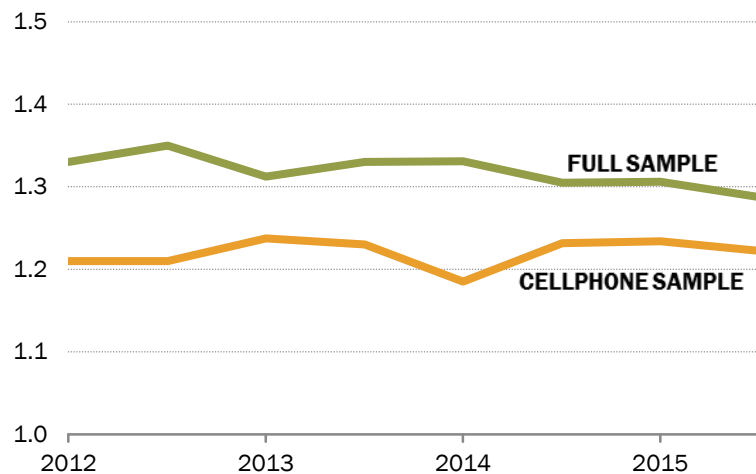
The effect on the precision of estimates (e.g. the margin of sampling error) is another important consideration in the transition to dialing only cellphones. Analysis of 27 national surveys of adults conducted by Pew Research Center between 2012 and 2015 shows that precision is consistently, though modestly, improved with a 100% cellphone design relative to a dual-frame landline and cellphone design, holding the total number of interviews fixed.

To investigate precision, researchers computed two approximate design effect⁶ values for each survey – one using the total sample weight and another using the experimental weight based only on the cellphone sample.

The approximate design effect is a useful metric for several reasons. It is a summary measure of how much weighting is needed to align the sample to demographic benchmarks for the target population. The more corrective weighting required, the larger the approximate design effect. In addition, the approximate design effect is well suited for comparison across different surveys because, unlike the margin of error, it is not a function of the number of interviews. The margin of error and the design effect are closely related, however. A design effect greater than 1 increases the width of the margin of error.

Cellphone sample weight has smaller design effect than full sample weight

Approximate survey design effects over time



Source: Surveys conducted April 2012-September 2015.
"The Twilight of Landline Interviewing"

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⁶ The approximate design effect is computed as 1 plus the squared coefficient of variation of the survey weights, as suggested in Leslie Kish. 1992. "Weighting for unequal Pi." *Journal of Official Statistics*, Vol. 8, pp. 183-200.

Between 2012 and 2015, the average approximate design effect of the experimental weight using just the cellphone sample was 1.22, which compares with an average of 1.32 using the actual survey weight based on both the landline and cellphone samples.

For a hypothetical survey with 1,000 interviews, the design effect difference translates into a margin of error at the 95% confidence level of plus or minus 3.4 percentage points using only cellphones versus plus or minus 3.6 points using both landlines and cellphone as allocated in the Pew Research Center surveys analyzed. In terms of statistical power, the cellphone-only survey would have roughly 60 more interviews than the dual-frame survey. In other words, cellphone-only designs tend to yield a larger effective sample size, all else being equal, than dual-frame designs.

The precision advantage of the design using only cellphones stems from three main factors. As discussed above, samples of adults reached by cellphone are much more demographically representative than samples of adults reached by landline, particularly with respect to age, race and ethnicity. This means that cellphone samples generally require less weighting correction than landline samples.

The other factors contributing to the precision advantage have to do with how survey weights are computed. When a survey has both a landline sample and a cellphone sample, the weight must include an adjustment to account for the fact that people with both landlines and cellphones could have been reached in both samples and, thus, have a higher chance of selection relative to adults with just one type of phone.⁷ This adjustment for the overlap in the sampling frames increases the variability in the weights and, in turn, the design effect. By contrast, surveys that only sample cellphone numbers do not need such an adjustment and avoid the penalty in precision.

Dropping the landline sample also arguably eliminates the need to include a weighting adjustment for respondent selection. Landlines are generally considered a household-level device. Typically, when interviewers dial landlines they select one adult to interview from among all the adults in the household. Researchers adjust for this by weighting up landline interviews proportional to the number of adults in the household.

Cellphone samples by and large do not feature this weighting adjustment because survey researchers tend to assume cellphones are a person-level device rather than a household-level

⁷ This assumes that the landline and cellphone samples are overlapping. Some surveys, particularly in the early years of dialing cellphones, only used the cellphone sample to interview people who had no residential landline. Such non-overlapping surveys do not use this particular weighting adjustment.

device.⁸ The fact that cellphone surveys do not require as many weighting corrections as dual-frame surveys contributes to their greater overall precision.

Conclusions

To be sure, there is still more to learn about the implications of dropping landline samples, and evidence from other analyses point to some challenges. Cellphones continue to be more expensive on a per-interview basis than landlines, and the rate of cellphone use is not uniform across all segments of the public. In particular, cellphone use has a negative relationship with age.⁹ There is a compelling argument for retaining landline samples in surveys that focus on senior citizens or attempt to estimate technology penetration rates. In addition, there is evidence that dropping the landline sample would have a negative effect on data quality for surveys of likely voters in low-turnout elections,¹⁰ at least in the near term.

For public opinion surveys intended to represent all U.S. adults, however, we find that cellphone RDD samples are a strength rather than a weakness. Demographically, cellphone samples are much more representative of the public than landline samples and, in turn, require less weighting. Relative to Pew Research Center's current design of fielding a majority of interviews with cellphones, moving to a 100% cellphone design would not meaningfully change most estimates.

⁸ The fact that some people share their cellphones means that this assumption does not always hold. But it is not clear from research to date that alternative approaches (e.g., within-household selection with cellphones and/or a weighting correction for sharing) work any better from the perspective of reducing the total amount of error in the survey estimates.

⁹ Stephen J. Blumberg and Julian V. Luke. Wireless Substitution: Early Release of Estimates from the National Health Interview Survey, July-December 2015. National Center for Health Statistics. May 2016. Available from: <http://www.cdc.gov/nchs/nhis.htm>.

¹⁰ Alan Reifman and Sylvia Niehuis. 2015. "Pollsters' Cell-Phone Proportions and Accuracy in 2014 US Senate Races." *Survey Practice*, Vol. 8, No. 5.

Acknowledgements

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Methodology

This report is based on data from numerous Pew Research Center surveys. Methodology summaries from the four main data sources are provided below.

Methodology of the 2015 Survey on Government

The analysis in this report is in part based on telephone interviews conducted Aug. 27-Oct. 4, 2015, among a national sample of 6,004 adults, 18 years of age or older, living in all 50 U.S. states and the District of Columbia (2,113 respondents were interviewed on a landline, and 3,891 were interviewed on a cellphone, including 2,227 who had no landline telephone). The survey was conducted under the direction of Abt SRBI. A combination of landline and cellphone random digit dial samples was used; both samples were provided by Survey Sampling International. Interviews were conducted in English and Spanish. Respondents in the landline sample were selected by randomly asking for the youngest adult male or female who is now at home. Interviews in the cellphone sample were conducted with the person who answered the phone, if that person was an adult 18 years of age or older. For detailed information about our survey methodology, see <http://www.pewresearch.org/methodology/u-s-survey-research/>.

Data collection was divided equally into two phases (A and B) with independent samples, non-overlapping interview dates and separate weighting. The questionnaire for each phase contained a core set of measures of political attitudes and values, political engagement and demographic characteristics.

The combined landline and cellphone sample data are weighted using an iterative technique that matches gender, age, education, race, Hispanic origin and nativity and region to parameters from the Census Bureau's 2013 American Community Survey and population density to parameters from the decennial census. The sample also is weighted to match current patterns of telephone status (landline only, cellphone only, or both landline and cellphone), based on extrapolations from the 2014 National Health Interview Survey. The weighting procedure also accounts for the fact that respondents with both landlines and cellphones have a greater probability of being included in the combined sample and adjusts for household size among respondents with landline phones. The margins of error reported and statistical tests of significance are adjusted to account for the survey's design effect, a measure of how much efficiency is lost from the weighting procedures.

The following table shows the unweighted sample sizes and the error attributable to sampling that would be expected at the 95% level of confidence for different groups in the survey:

Group	Unweighted sample size	Plus or minus ...
Total sample	6,004	1.5 percentage points
Cellphone sample	3,891	1.8 percentage points
Landline sample	2,113	2.4 percentage points

Methodology of the 2014 Political Polarization and Typology Survey

The analysis in this report is also based on telephone interviews conducted Jan. 23-March 16, 2014, among a national sample of 10,013 adults, 18 years of age or older, living in all 50 U.S. states and the District of Columbia (5,010 respondents were interviewed on a landline telephone, and 5,003 were interviewed on a cellphone, including 2,649 who had no landline telephone). The surveys were conducted under the direction of Abt SRBI. A combination of landline and cellphone RDD samples were used; both samples were provided by Survey Sampling International. Interviews were conducted in English and Spanish. Respondents in the landline sample were selected by randomly asking for the youngest adult male or female who is now at home. Interviews in the cellphone sample were conducted with the person who answered the phone, if that person was an adult 18 years of age or older.

The combined landline and cellphone sample are weighted using an iterative technique that matches gender, age, education, race, Hispanic origin and nativity and region to parameters from the Census Bureau's 2012 American Community Survey and population density to parameters from the decennial census. The sample also is weighted to match current patterns of telephone status and relative usage of landlines and cellphones (for those with both), based on extrapolations from the January-June 2013 National Health Interview Survey. The weighting procedure also accounts for the fact that respondents with both landlines and cellphones have a greater probability of being included in the combined sample and adjusts for household size among respondents with landline phones. Sampling errors and statistical tests of significance take into account the effect of weighting.

The following table shows the unweighted sample sizes and the error attributable to sampling that would be expected at the 95% level of confidence for different groups in the survey:

Group	Unweighted sample size	Plus or minus ...
Total sample	10,013	1.1 percentage points
Cellphone sample	5,010	1.6 percentage points
Landline sample	5,003	1.6 percentage points

Methodology of the September 2015 political survey

The demographic analysis in this report is based in part on telephone interviews conducted Sept. 22-27, 2015, among a national sample of 1,502 adults, 18 years of age or older, living in all 50 U.S. states and the District of Columbia (525 respondents were interviewed on a landline telephone, and 977 were interviewed on a cellphone, including 560 who had no landline telephone). The survey was conducted by interviewers at Princeton Data Source under the direction of Princeton Survey Research Associates International. A combination of landline and cellphone RDD samples were used; both samples were provided by Survey Sampling International. Interviews were conducted in English and Spanish. Respondents in the landline sample were selected by randomly asking for the youngest adult male or female who is now at home. Interviews in the cellphone sample were conducted with the person who answered the phone, if that person was an adult 18 years of age or older.

The combined landline and cellphone sample are weighted using an iterative technique that matches gender, age, education, race, Hispanic origin and nativity and region to parameters from the Census Bureau's 2013 American Community Survey and population density to parameters from the decennial census. The sample also is weighted to match current patterns of telephone status (landline only, cellphone only, or both landline and cellphone), based on extrapolations from the 2014 National Health Interview Survey. The weighting procedure also accounts for the fact that respondents with both landlines and cellphones have a greater probability of being included in the combined sample and adjusts for household size among respondents with landline phones. The margins of error reported and statistical tests of significance are adjusted to account for the survey's design effect, a measure of how much efficiency is lost from the weighting procedures.

The following table shows the unweighted sample sizes and the error attributable to sampling that would be expected at the 95% level of confidence for different groups in the survey:

Group	Unweighted sample size	Plus or minus ...
Total sample	1,502	2.9 percentage points
Cellphone sample	977	3.6 percentage points
Landline sample	525	4.9 percentage points

Methodology of the September 2008 survey

The demographic analysis in this report is also based on telephone interviews conducted Sept. 9-14, 2008, among a national sample of 2,982 adults, 18 years of age or older, living in the continental U.S. (2,250 respondents were interviewed on a landline telephone, and 732 were interviewed on a cellphone, including 254 who had no landline telephone). The survey was conducted by Princeton Survey Research Associates International and Abt SRBI Inc. A combination of landline and cellphone RDD samples were used; both samples were provided by Survey Sampling International. Interviews were conducted in English. Respondents in the landline sample were selected by asking for the youngest adult male who is now at home, and if no male was available interviewers asked to speak with the youngest adult female. Interviews in the cellphone sample were conducted with the person who answered the phone, if that person was an adult 18 years of age or older.

The combined landline and cellphone sample are weighted using an iterative technique that matches gender, age, education, race, Hispanic origin, region and population density to parameters from the Census Bureau's March 2007 Current Population Survey. The sample is also weighted to match current patterns of telephone status, based on the July-December 2007 National Health Interview Survey. The weighting procedure also accounts for the fact that respondents with both landlines and cellphones have a greater probability of being included in the combined sample. The margins of error reported and statistical tests of significance are adjusted to account for the survey's design effect, a measure of how much efficiency is lost from the weighting procedures.

The following table shows the unweighted sample sizes and the error attributable to sampling that would be expected at the 95% level of confidence for different groups in the survey:

Group	Unweighted sample size	Plus or minus ...
Total sample	2,982	2.1 percentage points
Cellphone sample	732	4.2 percentage points
Landline sample	2,250	2.4 percentage points

Sample sizes and sampling errors for other subgroups are available upon request. In addition to sampling error, one should bear in mind that question wording and practical difficulties in conducting surveys can introduce error or bias into the findings of opinion polls.

Appendix

This table presents the 279 survey questions used to compare weighted full total sample estimate to weighted cellphone sample estimates. For items asked in more than one survey, only the most recent result is included in this analysis in order to avoid double counting questions.

Survey	Question wording	Category of estimate	Total sample %	Cellphone sample %	Abs. diff.
Internet 2015	Next, do you have a cell phone, or not?	Yes	92	100	8
Feb 2015	Cares about the middle class	Yes, describes Democratic Party	60	56	4
Jan 2015	Which of these statements best describes you	Are you ABSOLUTELY CERTAIN that you are registered to vote at your current address	72	69	3
Mar 2015	Which of the following is more important to you in a presidential candidate?	Someone who will stick to their core values and positions	42	45	3
Sep 2014	2016 presidential election.... Immigration	Very important	61	64	3
Sep 2014	All in all, would you favor or oppose building a fence along the entire border with Mexico?	Favor	46	49	3
Internet 2015	Do you access the internet on a cell phone, tablet or other mobile handheld device, at least occasionally?	Yes	76	79	3
Jan 2015	Do you consider this year's State of the Union address to be...	More important	24	26	2
Jan 2015	The Democratic Party	Very unfavorable	21	19	2
Jan 2015	Thinking now about job opportunities where you live, would you say there are...	Plenty of jobs available	36	38	2
Jan 2015	U.S. ending its trade embargo against Cuba	Favor	66	68	2
Jan 2015	Do you consider yourself... / do you lean more to...	Rep/Lean Rep	40	38	2
Jan 2015	How good a job is the Democratic Party doing these days...	Excellent	8	10	2
Jan 2015	Do you think Barack Obama is... in his approach to foreign policy and national security issues?	Not tough enough	55	53	2
Feb 2015	How the recession affected your own personal financial situation	It had a major effect, and your finances have not recovered	30	32	2
Feb 2015	U.S. military campaign against Islamic militants in Iraq and Syria	Approve	63	61	2
Mar 2015	In your view, do you think the current Supreme Court is...	Conservative	28	30	2
Mar 2015	Have you heard of Hillary Clinton or not? [ASK IF HAVE HEARD:] How much of a chance is there that you would vote for Hillary Clinton if she is a candidate for president in 2016?	Have heard / Good chance	33	35	2

Mar 2015	When someone commits a crime like murder, the death penalty is morally justified	Statement #1	63	61	2
Mar 2015	Minorities are more likely than whites to be sentenced to the death penalty for committing similar crimes	Statement #1	52	54	2
Mar 2015	Who should have the final authority for approving any nuclear agreement between the United States and Iran?	Congress	62	64	2
May 2015	Immigrants today strengthen our country because of their hard work and talents	Statement #1	51	53	2
May 2015	Do free trade agreements make the American economy grow, slow the economy down, or not make a difference?	Make the economy grow	31	33	2
Jul 2015	Do you think that gun ownership in this country does more to...	Protect people from becoming victims of crime	54	56	2
Sep 2014	How often you vote...	Always	46	44	2
Sep 2014	Compared to previous congressional elections, are you more enthusiastic about voting than usual, or less enthusiastic?	More	39	37	2
Sep 2014	Thinking about elections for Congress, how important is the issue of... Terrorism	Very important	74	76	2
Sep 2014	Effect of the health care law on the country as a whole...	Mostly positive	33	31	2
Sep 2014	In the U.S., is there discrimination against... Evangelical Christians	Yes, there is a lot of discrimination	31	33	2
Sep 2014	2016 presidential election.... Health care	Very important	77	75	2
Sep 2014	2016 presidential election.... The federal budget deficit	Very important	69	71	2
Sep 2014	What would you like lawmakers who share your views on this issue to do?	Should they stand by their principles, even if that means the government shuts down	36	38	2
Sep 2014	If the federal government shuts down... who do you think would be more to blame?	Republicans	40	38	2
Internet 2015	Do you currently receive television via cable or satellite at home, or not?	Yes	76	74	2
Internet 2015	Used an online dating site or app	Yes	41	43	2
Internet 2015	Online dating is a good way to meet people	Agree	59	61	2
Internet 2015	Online dating is more dangerous than other ways of meeting people	Agree	58	56	2
Jan 2015	The way Barack Obama is handling his job as president	Approve	47	48	1
Jan 2015	The way things are going in this country today	Satisfied	31	32	1
Jan 2015	Close the U.S. military prison at Guantanamo Bay within the next few years	Good idea	42	43	1
Jan 2015	Have Barack Obama's economic policies made economic conditions...	Better	38	39	1
Jan 2015	How would you rate economic conditions in this country today	Excellent	4	3	1

Jan 2015	A year from now, do you expect that economic conditions in the country as a whole will be...	Better	31	32	1
Jan 2015	Which of these best describes your opinion	The economy is recovering strongly	16	17	1
Jan 2015	Do you think your family's income is	Going up faster	6	7	1
Jan 2015	Economy... Barack Obama	A great deal of confidence	18	19	1
Jan 2015	Economy... Republican leaders in Congress	A great deal of confidence	6	5	1
Jan 2015	Economy... Democratic leaders in Congress	A great deal of confidence	8	9	1
Jan 2015	U.S. re-establishing diplomatic relations with Cuba	Approve	63	62	1
Jan 2015	Over the next several years, do you think Cuba will become...	More democratic	32	33	1
Jan 2015	Thinking about financial regulation, which comes closer to your view	The government has gone too far regulating financial institutions and markets, making it harder for the economy to grow	45	44	1
Jan 2015	How well do you think the U.S. government is doing in reducing the threat of terrorism?	Very well	22	23	1
Jan 2015	From what you know, do you... with the Tea Party movement	Agree	17	18	1
Feb 2015	Do you... of the job... Republican leaders in Congress	Approve	26	27	1
Feb 2015	Do you... of the job... Democratic leaders in Congress	Approve	36	37	1
Feb 2015	Government aid to the poor does more harm than good, by making people too dependent on government assistance	Statement #1	44	43	1
Feb 2015	The United States government has a policy that it NEVER pays ransom money for hostages held by terrorist groups	Approve	70	69	1
Feb 2015	Is too extreme	Yes, describes Republican Party	50	51	1
Feb 2015	Is tolerant and open to all groups of people	Yes, describes Republican Party	35	36	1
Feb 2015	Is too extreme	Yes, describes Democratic Party	36	37	1
Feb 2015	Has strong principles	Yes, describes Democratic Party	57	56	1
Feb 2015	Is tolerant and open to all groups of people	Yes, describes Democratic Party	59	58	1
Feb 2015	Has good policy ideas	Yes, describes Democratic Party	52	51	1
Feb 2015	How fair do you think our present federal tax system is...	Very fair	4	3	1
Feb 2015	Which of the following statements comes closest to your overall view of the federal tax system in this country?	On the whole, the federal tax system works pretty well and Congress should make only minor changes to make it work better	38	37	1
Feb 2015	The amount you pay in taxes	A lot	27	28	1
Feb 2015	The complexity of the tax system	A lot	44	45	1

Feb 2015	The feeling that some wealthy people don't pay their fair share	A lot	61	60	1
Feb 2015	The feeling that some poor people don't pay their fair share	A lot	20	19	1
Feb 2015	Pope Francis	Very favorable	29	28	1
Feb 2015	Health care law passed by Barack Obama and Congress in 2010	Approve	45	44	1
Feb 2015	Regardless of your opinion of the health care law, do you think the major provisions of the law are...	Probably here to stay	50	49	1
Feb 2015	Training Ukrainian military troops	Favor	49	50	1
Mar 2015	Labor unions	Very favorable	11	12	1
Mar 2015	Business corporations	Very favorable	8	9	1
Mar 2015	Would you say your overall opinion of Barack Obama is...	Very favorable	18	19	1
Mar 2015	Would you say your overall opinion of Mitch McConnell is...	Very favorable	3	4	1
Mar 2015	Thinking about labor unions ... Police and firefighters	Yes, should be able to unionize	72	71	1
Mar 2015	Thinking about labor unions ... Public school teachers	Yes, should be able to unionize	71	72	1
Mar 2015	Thinking about labor unions ... Fast-food workers	Yes, should be able to unionize	62	63	1
Mar 2015	How much thought, if any, have you given to candidates who may be running for president in 2016?	A lot	22	23	1
Mar 2015	Jeb Bush	Have heard / Good chance	12	11	1
Mar 2015	Ted Cruz	Have heard / Good chance	11	12	1
Mar 2015	Mike Huckabee	Have heard / Good chance	11	12	1
Mar 2015	Bobby Jindal	Have heard / Good chance	7	6	1
Mar 2015	Rand Paul	Have heard / Good chance	11	12	1
Mar 2015	Rick Perry	Have heard / Good chance	7	8	1
Mar 2015	Marco Rubio	Have heard / Good chance	11	10	1
Mar 2015	Scott Walker	Have heard / Good chance	11	12	1
Mar 2015	Which of the following is more important to you in a presidential candidate?	Experience and a proven record	47	48	1
Mar 2015	Do you think the use of marijuana should be made legal, or not?	Yes, legal	53	54	1
Mar 2015	People used marijuana in public	Yes, would bother you	62	61	1
Mar 2015	Have you, yourself, ever happened to try marijuana?	Yes	49	50	1
Mar 2015	The Palestinians	A lot	11	12	1
Mar 2015	Do you... the death penalty for persons convicted of murder?	Strongly favor	23	22	1
Mar 2015	Do you happen to know if the number of prisoners put to death in the U.S. over the past ten years has been...	Increasing	21	20	1
Mar 2015	There is some risk that an innocent person will be put to death	Statement #1	71	72	1

Mar 2015	Heard about negotiations between the United States and Iran on Iran's nuclear program?	A lot	27	26	1
Mar 2015	From what you know, do you ... of the United States negotiating directly with Iran over the issue of its nuclear program?	Approve	49	50	1
Mar 2015	Do you think Iranian leaders are serious about addressing international concerns about their country's nuclear enrichment program, or not?	Serious	27	28	1
May 2015	Do you approve or disapprove of the way Barack Obama is handling ... Race relations	Approve	48	49	1
May 2015	Do you approve or disapprove of the way Barack Obama is handling ... The nation's immigration policy	Approve	37	38	1
May 2015	On balance, do you think the new Congress has accomplished... in its first 100 days...	More than expected	4	5	1
May 2015	Overall, what's your impression of the possible candidates running for the DEMOCRATIC presidential nomination?	Excellent	7	6	1
May 2015	Homosexuality should be accepted by society	Statement #1	63	64	1
May 2015	Could lead to retaliation from extremist groups	Very concerned	31	30	1
May 2015	Do you feel that giving people who came to the U.S. illegally a way to gain legal status is...	Like rewarding them for doing something wrong	36	35	1
May 2015	Hillary Clinton	Very favorable	21	20	1
May 2015	Jeb Bush	Very favorable	7	6	1
May 2015	Do you... allowing gays and lesbians to marry legally?	Strongly favor	28	29	1
May 2015	Do you think that free trade agreements between the U.S. and other countries have been a... for the United States?	Good thing	58	59	1
May 2015	Thinking about the financial situation of you and your family... Do you think free trade agreements have...	Definitely helped	4	5	1
May 2015	Do free trade agreements make the price of products sold in the U.S....	Higher	30	29	1
May 2015	Do free trade agreements create jobs in the U.S.	Create jobs	17	18	1
May 2015	Are free trade agreements... for people of developing countries...	Good	57	58	1
May 2015	Which comes closer to your view?	People are born gay or lesbian	47	46	1
May 2015	Do you think a gay or lesbian person's sexual orientation...	Can be changed	33	34	1
May 2015	Do you personally feel that there is a conflict between your religious beliefs and homosexuality, or not?	Yes, a lot of conflict	33	34	1
May 2015	Do you personally know anyone who is gay or lesbian, or not?	Yes	88	89	1
Jul 2015	Health care policy	Approve	46	47	1
Jul 2015	Global climate change	Approve	41	42	1

Jul 2015	They should consider what most Americans think	Statement #1	56	55	1
Jul 2015	They are often influenced by their own political views	Statement #1	70	71	1
Jul 2015	Do you think the U.S. Supreme Court has...	Too much power	36	35	1
Jul 2015	Our country has made the changes needed to give blacks equal rights with whites	Statement #1	32	33	1
Jul 2015	The best way to ensure peace is through military strength	Statement #1	30	31	1
Jul 2015	How big a problem is racism in our society today?	Big problem	50	51	1
Jul 2015	If this agreement is implemented, do you think the relationship between the U.S. and Iran will...	Improve	23	22	1
Jul 2015	Is more extreme in its positions	Republican Party	52	53	1
Jul 2015	Is more concerned with the needs of people like me	Republican Party	31	32	1
Jul 2015	What do you think is more important...	Protect the right of Americans to own guns	47	48	1
Jul 2015	Making private gun sales and sales at gun shows subject to background checks	Favor	85	86	1
Jul 2015	A ban on assault style weapons	Favor	57	56	1
Jul 2015	Do you think the National Rifle Association has... influence	Too much	40	41	1
Jul 2015	How much, if anything, have you read or heard about recent debates over the Confederate flag around the country?	A lot	64	65	1
Jul 2015	South Carolina state government recently voted to take down the Confederate flag... Was this the...	Right decision	57	58	1
Sep 2014	Thought given to coming November election...	Quite a lot	42	41	1
Sep 2014	Ever voted in precinct or election district	Yes	75	74	1
Sep 2014	Follow what's going on in government and public affairs?	Most of the time	51	50	1
Sep 2014	If Congress elections were held today, would you vote for / lean more to... in your district?	Republican/Lean Rep	42	43	1
Sep 2014	Thinking about elections for Congress, how important is the issue of... the economy	Very important	82	83	1
Sep 2014	Thinking about elections for Congress, how important is the issue of... Health care	Very important	77	78	1
Sep 2014	Thinking about elections for Congress, how important is the issue of... Abortion	Very important	48	49	1
Sep 2014	Should churches and other houses of worship keep out of political matters or express their views...	Should keep out of political matters	48	47	1
Sep 2014	Should churches and other houses of worship come out in favor of one candidate over another, or not?	Should come out in favor of candidates	32	33	1
Sep 2014	Do you think religion as a whole is increasing influence on American life or losing influence?	Increasing influence	22	23	1

Sep 2014	Do you agree with this statement...It's important that members of Congress have strong religious beliefs	Completely agree	21	22	1
Sep 2014	Is group friendly/neutral/unfriendly toward religion...The Republican Party	Friendly	47	48	1
Sep 2014	If a business provides wedding services.... should that business...	Be allowed to refuse those services to same-sex couples for religious reasons	47	46	1
Sep 2014	How cornered are you about the rise of Islamic extremism in the U.S...	Very concerned	53	54	1
Sep 2014	Overall effect of the health care law on you and your family will be...	Mostly positive	27	26	1
Sep 2014	Overall effect of the health care law on the country as a whole...	Mostly positive	37	36	1
Sep 2014	In the U.S., is there discrimination against... Muslims	Yes, there is a lot of discrimination	59	58	1
Sep 2014	In the U.S., is there discrimination against... Jews	Yes, there is a lot of discrimination	32	31	1
Sep 2014	In the U.S., is there discrimination against... Blacks	Yes, there is a lot of discrimination	54	55	1
Sep 2014	In the U.S., is there discrimination against... Hispanics	Yes, there is a lot of discrimination	50	51	1
Sep 2014	In the U.S., is there discrimination against... Gays and lesbians	Yes, there is a lot of discrimination	65	66	1
Sep 2014	Is it a sin to engage in homosexual behavior?	Is a sin	50	51	1
Sep 2014	If you had to choose, would you rather have a...	Smaller government, fewer services	53	54	1
Sep 2014	2016 presidential election.... Foreign policy	Very important	64	65	1
Sep 2014	Heard about the budget debate in Washington and the possibility of a federal government shutdown in the next few weeks?	A lot	26	27	1
Sep 2014	Were you aware that a child born to illegal immigrants in the U.S. is automatically a U.S. citizen...	Yes, aware	90	91	1
Sep 2014	Would you favor changing the Constitution so that the parents must be legal residents of the U.S. in order for their newborn child to be a citizen...	Favor changing Constitution	37	38	1
Internet 2015	Been in a long-term relationship with or married someone they met through an online dating site or app	Yes	29	30	1
Internet 2015	Online dating allows people to find a better match for themselves because they can get to know a lot more people	Agree	51	52	1
Internet 2015	People who use online dating sites are desperate	Agree	23	22	1
Internet 2015	In the last two years have you looked for a new job, or have you not done this?	Yes	34	35	1
Jan 2015	Which is more important for President Obama to focus on...	Domestic policy	67	67	0
Jan 2015	Thinking about the Democratic and Republican parties, would you say there is a...	A great deal	44	44	0
Jan 2015	The Republican Party	Very unfavorable	24	24	0

Jan 2015	Do you think Republicans and Democrats in Washington will...	Work together more to solve problems	22	22	0
Jan 2015	Read or heard about developments regarding the U.S. military prison at Guantanamo Bay	A lot	21	21	0
Jan 2015	How would you rate your own personal financial situation	Excellent shape	7	7	0
Jan 2015	Do you think the financial situation of you and your family will improve...	Improve a lot	11	11	0
Jan 2015	How worried... another terrorist attack	Very worried	25	25	0
Jan 2015	How much, if anything, have you heard about the U.S. re-establishing diplomatic relations with Cuba	A lot	34	34	0
Jan 2015	Republican congressional leaders' policies and plans for the future	Approve	40	40	0
Jan 2015	Do you think Republican leaders in Congress will be...	Successful	45	45	0
Jan 2015	What concerns you more about the government's anti-terrorism policies	That they have gone too far in restricting the average person's civil liberties	37	37	0
Jan 2015	Do you think the use of torture against suspected terrorists in order to gain important information can be...	Often justified	20	20	0
Jan 2015	How good a job is the Republican Party doing these days...	Excellent	2	2	0
Jan 2015	In general, would you describe your political views as	Very conservative	7	7	0
Feb 2015	Who in Washington do you think should take the lead in solving the nation's problems	President Obama	40	40	0
Feb 2015	The economic system in this country unfairly favors powerful interests	Statement #1	62	62	0
Feb 2015	Using overwhelming military force is the best way to defeat terrorism around the world	Statement #1	47	47	0
Feb 2015	Most people who want to get ahead can make it if they're willing to work hard	Statement #1	64	64	0
Feb 2015	Has strong principles	Yes, describes Republican Party	63	63	0
Feb 2015	Cares about the middle class	Yes, describes Republican Party	43	43	0
Feb 2015	Has good policy ideas	Yes, describes Republican Party	48	48	0
Feb 2015	Dealing with the economy	Republican Party	44	44	0
Feb 2015	Considering what you get from the federal government, do you think you pay...	More than fair share	40	40	0
Feb 2015	The feeling that some corporations don't pay their fair share	A lot	64	64	0
Feb 2015	Vladimir Putin	Very favorable	2	2	0
Feb 2015	Benjamin Netanyahu	Very favorable	13	13	0
Feb 2015	Compared with before the 2008 financial crisis, do you think the U.S. economic system is...	More secure today than it was before the 2008 economic crisis	34	34	0
Feb 2015	How well is the U.S. military campaign against Islamic militants in Iraq and Syria going?	Very well	7	7	0

Feb 2015	What concerns you more about the U.S. military action in Iraq and Syria?	That the U.S. will go too far in getting involved in the situation	46	46	0
Feb 2015	Would you... the U.S. sending ground troops to fight Islamic militants in Iraq and Syria?	Favor	47	47	0
Feb 2015	Overall, do you think the United States and its allies will... in their military campaign against Islamic militants in Iraq and Syria?	Definitely succeed	15	15	0
Feb 2015	Read or heard about tensions between Russia and Ukraine over territory in eastern Ukraine?	A lot	39	39	0
Feb 2015	Increasing economic and diplomatic sanctions on Russia	Favor	60	60	0
Feb 2015	Sending arms and military supplies to the Ukrainian government	Favor	41	41	0
Feb 2015	How important to the interests of the United States is what happens between Russia and Ukraine?	Very important	30	30	0
Feb 2015	Thinking about the relationship between the United States and Israel ... Is the U.S...	Too supportive	18	18	0
Feb 2015	If you were asked to use one of these commonly used names for the social classes, which would you say you belong in?	Upper class	1	1	0
Mar 2015	Congress	Very favorable	4	4	0
Mar 2015	The Supreme Court	Very favorable	8	8	0
Mar 2015	Would you say your overall opinion of John Boehner is...	Very favorable	4	4	0
Mar 2015	Would you say your overall opinion of Benjamin Netanyahu is...	Very favorable	10	10	0
Mar 2015	Thinking about labor unions ... Supermarket and retail sales workers	Yes, should be able to unionize	68	68	0
Mar 2015	Thinking about labor unions ... Factory and manufacturing workers	Yes, should be able to unionize	82	82	0
Mar 2015	Thinking about labor unions ... Public transportation workers	Yes, should be able to unionize	74	74	0
Mar 2015	Ben Carson	Have heard / Good chance	10	10	0
Mar 2015	Chris Christie	Have heard / Good chance	6	6	0
Mar 2015	Joe Biden	Have heard / Good chance	13	13	0
Mar 2015	Martin O'Malley	Have heard / Good chance	1	1	0
Mar 2015	Bernie Sanders	Have heard / Good chance	4	4	0
Mar 2015	Elizabeth Warren	Have heard / Good chance	12	12	0
Mar 2015	Jim Webb	Have heard / Good chance	1	1	0
Mar 2015	A store or business selling marijuana opened up in your neighborhood	Yes, would bother you	41	41	0
Mar 2015	People used marijuana in their own homes	Yes, would bother you	15	15	0
Mar 2015	Do you think the federal government... enforce federal marijuana laws in these states?	Should	37	37	0

Mar 2015	Israel	A lot	31	31	0
Mar 2015	The death penalty deters people from committing serious crimes	Statement #1	35	35	0
May 2015	Do you approve or disapprove of the way Barack Obama is handling ... The economy	Approve	43	43	0
May 2015	Do you think the Republicans in Congress are keeping the promises they made during the campaign	Yes, keeping promises	23	23	0
May 2015	Overall, what's your impression of the possible candidates running for the REPUBLICAN presidential nomination?	Excellent	5	5	0
May 2015	Do you approve or disapprove of the United States conducting missile strikes from pilotless aircraft called drones to target extremists...	Approve	58	58	0
May 2015	Are being conducted legally	Very concerned	29	29	0
May 2015	Endanger the lives of innocent civilians	Very concerned	48	48	0
May 2015	Could damage America's reputation around the world	Very concerned	24	24	0
May 2015	Which comes closer to your view about how to handle undocumented immigrants who are now living in the U.S.?	They should not be allowed to stay in the country legally	27	27	0
May 2015	Should LEGAL immigration into the United States be...	Kept at present level	39	39	0
May 2015	When it comes to reducing illegal immigration at U.S. borders, do you think there is...	A lot	51	51	0
May 2015	How important is the issue of same-sex marriage to you?	Very important	30	30	0
May 2015	Do free trade agreements make the wages of American workers...	Higher	11	11	0
May 2015	If you had a child who told you he or she was gay or lesbian, what do you think your reaction would be?	Very upset	17	17	0
Jul 2015	The nation's foreign policy	Approve	38	38	0
Jul 2015	The Republican Party	Very favorable	7	7	0
Jul 2015	The Democratic Party	Very favorable	12	12	0
Jul 2015	How much confidence do you have that Iran's leaders will uphold their side of the agreement	A great deal of confidence	3	3	0
Jul 2015	How much confidence do you have in the U.S. and international agencies ability to monitor Iran's compliance with the agreement	A great deal of confidence	12	12	0
Jul 2015	Can better manage the federal government	Republican Party	40	40	0
Jul 2015	Governs in a more honest and ethical way	Republican Party	29	29	0
Jul 2015	Dealing with immigration	Republican Party	40	40	0
Jul 2015	Laws to prevent people with mental illness from purchasing guns	Favor	79	79	0
Jul 2015	Creating a federal government database to track all gun sales	Favor	70	70	0
Jul 2015	What concerns you more about the U.S. military action in Iraq and Syria?	That the U.S. will go too far in getting involved in the situation	43	43	0

Jul 2015	When you see the Confederate flag displayed, do you have...	Positive reaction	13	13	0
Sep 2014	Plan to vote in Congressional election in November...	Yes	91	91	0
Sep 2014	Thinking about elections for Congress, how important is the issue of... Immigration	Very important	62	62	0
Sep 2014	Thinking about elections for Congress, how important is the issue of... the environment	Very important	58	58	0
Sep 2014	Thinking about elections for Congress, how important is the issue of... Gay marriage	Very important	33	33	0
Sep 2014	Thinking about elections for Congress, how important is the issue of... the federal budget deficit	Very important	64	64	0
Sep 2014	Thinking about elections for Congress, how important is the issue of... Foreign policy	Very important	61	61	0
Sep 2014	Thinking about elections for Congress, how important is the issue of... Birth control	Very important	39	39	0
Sep 2014	Thinking about elections for Congress, how important is the issue of... Economic inequality	Very important	58	58	0
Sep 2014	Do you think there has been... expressions of religious faith and party by political leaders?	Too much	30	30	0
Sep 2014	Is group friendly/neutral/unfriendly toward religion...The Democratic Party	Friendly	29	29	0
Sep 2014	Is group friendly/neutral/unfriendly toward religion...The Obama administration	Friendly	30	30	0
Sep 2014	Is group friendly/neutral/unfriendly toward religion...The Supreme Court	Friendly	21	21	0
Sep 2014	How concerned are you about rise of Islamic extremism around the world...	Very concerned	62	62	0
Sep 2014	In the U.S., is there discrimination against... Catholics	Yes, there is a lot of discrimination	19	19	0
Sep 2014	In the U.S., is there discrimination against... Atheists	Yes, there is a lot of discrimination	27	27	0
Sep 2014	Which statement comes closer to your own views...	The Islamic religion is more likely than others to encourage violence among its believers	50	50	0
Sep 2014	Member of a minority because of your religious beliefs...	Yes	21	21	0
Sep 2014	2012 presidential election... did things come up that kept you from voting or did you vote...	Voted	88	88	0
Sep 2014	Do you think abortion should be...	Legal in all cases	20	20	0
Sep 2014	Heard about large numbers of migrants fleeing violence in Syria and other countries and entering Europe?	A lot	55	55	0
Sep 2014	United States recently announced it will increase the number of refugees it accepts	Approve	51	51	0
Sep 2014	In general, do you think the United States... to address the refugee situation?	Should be doing more	44	44	0

Sep 2014	How likely is it that you will vote in either the Republican or Democratic primary for President?	Very likely	63	63	0
Sep 2014	2016 presidential election.... The economy	Very important	85	85	0
Sep 2014	2016 presidential election.... Abortion	Very important	43	43	0
Sep 2014	2016 presidential election.... Terrorism	Very important	73	73	0
Sep 2014	2016 presidential election.... The environment	Very important	59	59	0
Sep 2014	...possible government shutdown is about Planned Parenthood... Which comes closer to your view, even if neither is exactly right?	Any budget agreement must eliminate funding for Planned Parenthood	32	32	0
Internet 2015	Online dating keeps people from settling down because they always have options for people to date	Agree	32	32	0
Internet 2015	Online dating is easier and more efficient than other ways of meeting people	Agree	47	47	0