



**THE PEW RESEARCH CENTER**  
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*NEWS Release*  
1615 L Street, N.W., Suite 700  
Washington, D.C. 20036  
Tel (202) 419-4350  
Fax (202) 419-4399

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## CALLING CELL PHONES IN '08 PRE-ELECTION POLLS

*FOR FURTHER INFORMATION CONTACT:*

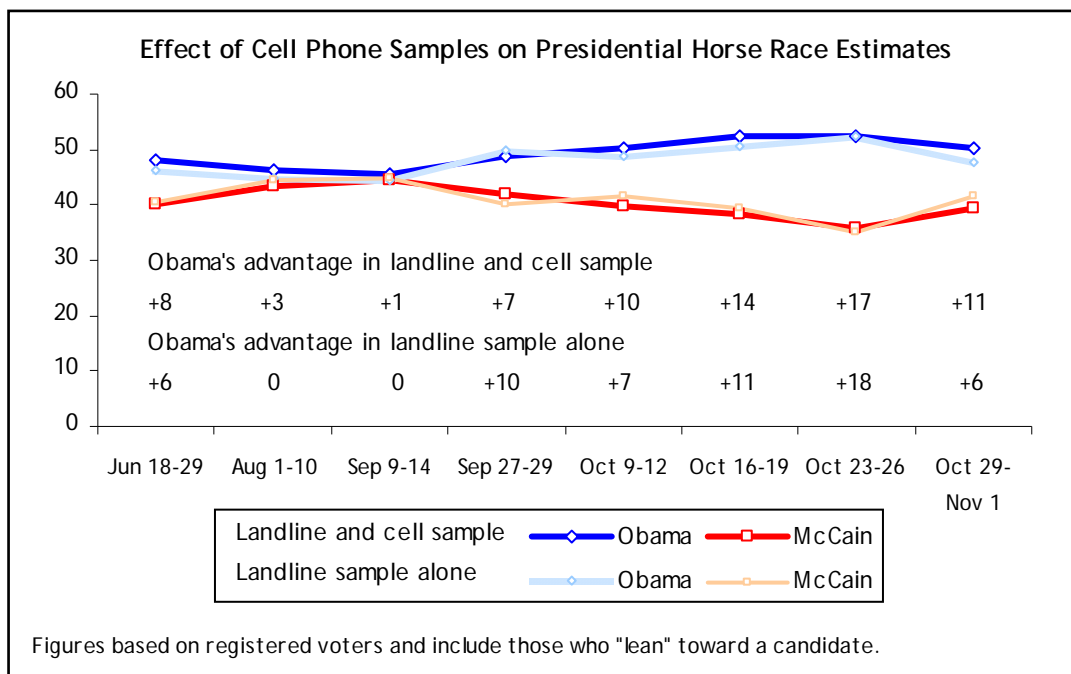
Scott Keeter, Director of Survey Research  
Michael Dimock, Associate Director  
Leah Christian, Research Associate  
Pew Research Center for the People & the Press  
202/419-4350

<http://www.people-press.org>

## CALLING CELL PHONES IN '08 PRE-ELECTION POLLS

Public opinion polling faced many challenges during the 2008 presidential election. None was more daunting than the rising number of “cell phone only” voters who could not be reached over the landline telephones. The latest estimates from the National Health Interview Survey – the most comprehensive measure available – suggest that nearly 18% of households are wireless only, and the NEP Exit Polls conducted on Nov. 4 found 20% of Election Day voters saying they were cell only.

To address this challenge, the Pew Research Center for the People & The Press included cell phone samples in all of its fall election polls, and many other major pollsters took similar steps. All of the Pew Research Center’s election survey reports were based on data from both landline and cell phone interviews, using a methodology described below. The addition of cell phone interviewing had at most a modest effect on estimates of candidate support in most of those individual surveys. When looked at in the aggregate, however, clear patterns emerge.



This study describes the differences between estimates of the horse race and other political measures that Pew reported this fall with those that would have been derived from surveys conducted only by landline. It also addresses the difference between supplementing landline surveys with a sample of people who are “cell only” vs. interviewing all cell respondents even if they also have a landline phone. In this regard there is growing concern that some people have come to rely so heavily on a cell phone that even though they still have a

landline telephone they are virtually unreachable on it. Finally, this report describes the operational and cost issues raised by the inclusion of cell phones.

### The Bias in Landline Samples: Small But Real

An analysis of six Pew surveys conducted from September through the weekend before the election shows that estimates based only on landline interviews were likely to have a pro-McCain tilt compared with estimates that included cell phone interviews. But the difference, while statistically significant, was small in absolute terms – smaller than the margin of sampling error in most polls. Obama’s average lead across the six surveys was 9.9 points among registered voters when cell phone and landline interviews were combined. If estimates had been based only on the landline samples, Obama’s average lead would have been 7.6 points, indicating an average bias of 2.3 percentage points. Limiting the analysis to likely voters rather than all voters produces similar results. Obama’s average lead among likely voters was 8.2 points across all six surveys versus 5.8 points in the landline sample.

	Landline/ cell phone sample %	Landline/ cell phone only %	Landline sample %
<b>Registered voters</b>			
Obama	49.9	49.4	48.5
McCain	40.0	40.3	40.9
Other/DK	<u>10.1</u>	<u>10.3</u>	<u>10.6</u>
	100	100	100
<i>Obama Adv.</i>	<i>+9.9</i>	<i>+9.1</i>	<i>+7.6</i>
Sample size	(11,964)	(10,039)	(9,228)
<b>Likely voters</b>			
Obama	49.8	49.2	48.5
McCain	41.6	42.1	42.7
Other/DK	<u>8.6</u>	<u>8.7</u>	<u>8.8</u>
	100	100	100
<i>Obama Adv.</i>	<i>+8.2</i>	<i>+7.1</i>	<i>+5.8</i>
Sample size	(10,819)	(8,767)	(8,143)

Figures based on weighted data from surveys conducted 9/9-11/1/2008 and include those who “lean” toward a candidate.

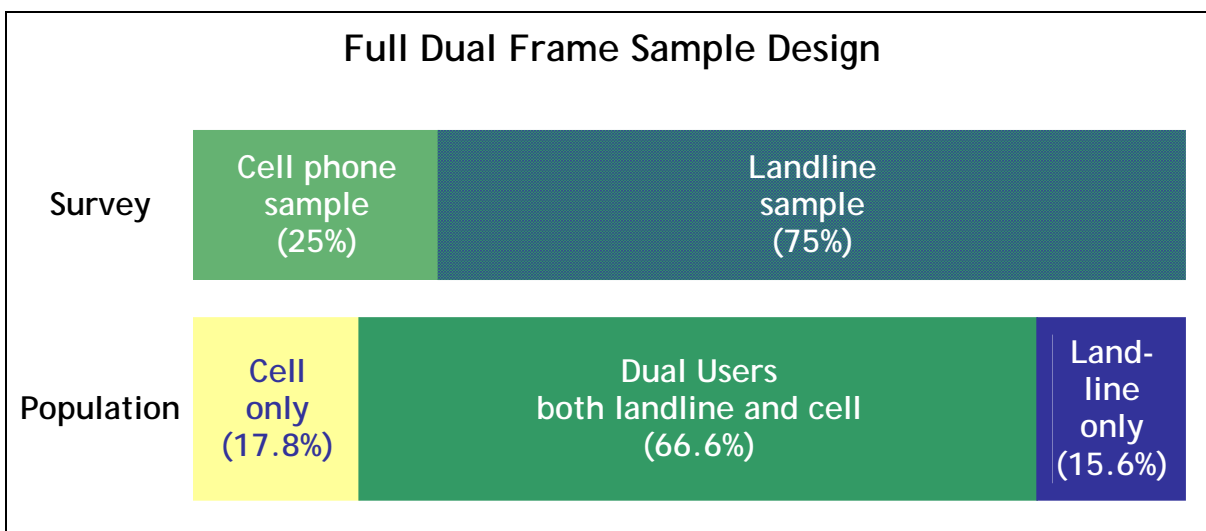
While estimates based only on landline interviews typically exhibited a pro-McCain bias, the pattern was not uniform. For example, Pew’s August survey showed Obama with a three-point edge, but an estimate based only on landline interviews was tied. And in Pew’s final election weekend survey, Obama led McCain by 11 points in the overall survey, but by six points if only landline interviews were considered.

But in two surveys this pattern did not hold. In late September and late October, Obama’s lead was slightly narrower in the combined landline and cell survey than in the landline survey alone.

### Two Approaches to Cell Phone Sampling

Unlike most other polling organizations, Pew’s election surveys involved a “full dual frame design,” in which people reached by cell phone who also have a landline are interviewed, as well as cell-only respondents. In contrast, most pollsters who included cell phones in their election surveys screened their cell samples for cell-only respondents.

The difference between these two approaches can be seen as a tradeoff in methodological challenges. Supplementing a landline sample with cell-only respondents has the advantage of not “double covering” respondents who have both types of phones. This makes combining the samples more straightforward, but assumes that the landline sample is capable of accurately reaching all adults equally. If some adults have landline phones that they rarely or never answer because they favor their cell phones, they will be underrepresented in these surveys. Pew’s approach of interviewing all adults in both the landline and cell phone samples ensures that every adult with a telephone is covered by the survey, but raises challenges in combining the data because some adults had a greater chance to participate if they have more than one telephone. Pew’s methodology accounts for this double coverage by weighting respondents with both kinds of phones according to their probability of selection and the regularity with which they use each kind of telephone.



Pew’s data collection strategy allows a direct comparison of the full dual frame design with one that limits the cell sample interviews to cell-only respondents. The cell-only approach tends to produce results that fall in between the full dual frame and landline-only approaches. Aggregating the six polls, Obama led by 9.1 percentage points among registered voters when cell-only respondents were included with the landline survey. This compared with 9.9 points in the full dual frame design, and 7.6 points when the landline survey stands alone. The pattern is similar when the analysis is limited to likely voters (an aggregate Obama lead of 8.2 in the full dual frame, 7.1 in the landline plus cell-only and 5.8 in the landline alone). In sum, Pew’s full dual frame approach resulted in slightly more support for Obama than a landline-plus-cell-only approach, but both methods of incorporating cell phones typically resulted in a larger Obama advantage than interviewing conducted only by landline.

## Differences in Other Political Measures

Beyond the horse race, there were similarly small differences among the samples for other political items, including party affiliation, political ideology, and engagement and interest in the campaign. The percentage of respondents who identified as Democratic or leaned Democratic was two points higher in the combined landline and cell phone sample (51%) than in the landline sample alone (49%); Republican affiliation was two points lower in the combined sample. There was a one-point difference in the percentage identifying as conservative: 38% in the combined sample, versus 39% in the landline sample.

A somewhat larger difference was seen on a measure of voters' main campaign news source. In the combined sample, 36% reported using the internet as a top source; in the landline sample 32% did so. One-third (33%) of the landline plus cell-only sample cited the internet. A similar difference was observed on a measure that asked if the respondent ever uses social networking sites such as MySpace or Facebook; 28% in the full dual frame sample said they use social networking sites compared with 25% in the landline sample.

There also were very small differences between the samples on some measures of engagement, with respondents in the full dual-frame samples exhibiting slightly lower levels of interest and fewer saying they were registered to vote. Overall, most differences between the full dual frame samples, those that blended landlines and cell-only voters, and those based solely on landline were quite modest. The landline plus cell-only design produced results on these measures that fell in between those from the full dual-frame design and the landline sample alone.

Party Affiliation, Ideology and Engagement			
	Landline/ cell phone sample	Landline/ cell phone only	Landline sample
<i>Party Affiliation</i>			
	%	%	%
Republican/Lean Rep.	37	38	39
Democrat/Lean Dem.	51	50	49
No lean	<u>12</u>	<u>12</u>	<u>12</u>
	100	100	100
<i>Ideology</i>			
Conservative	38	38	39
Moderate	36	36	36
Liberal	21	21	19
Don't know	<u>5</u>	<u>5</u>	<u>6</u>
	100	100	100
A lot of thought given to the election	72	73	75
Closely following campaign news	47	48	49
Registered to vote	80	82	83
Sample size	(13,890)	(11,590)	(10,430)
<i>Among registered voters:</i>			
Ever voted in precinct*	84	84	86
"Always" vote*	57	57	57
Know where to vote*	84	83	84
Sample size	(11,964)	(10,039)	(9,228)
<i>Campaign News Source**</i>			
Television	68	71	72
Internet	36	33	32
Newspapers	32	37	38
Radio	16	15	16
Magazines	3	5	6
Sample size	(1,500)	(1,239)	(1,125)
MySpace/Facebook user***	28	27	25
Sample size	(3,016)	(2,531)	(2,264)

Most figures based on weighted data from surveys conducted 9/9-11/1/2008. \*Based on registered voters. \*\*Campaign news source was asked on a voter recontact survey conducted Nov. 6-9. \*\*\*Social networking question asked Oct. 16-19.

## Young Voters and Cell Phones

The upward trend in the number of cell-only adults began even before the election of 2004, leading the television networks and the Associated Press to add a telephone service question to the national exit poll that year. The results showed that cell-only voters favored John Kerry more than other voters, but they were politically similar to voters within their own age cohort. For this reason, as well as the fact that only 7 percent of voters were cell-only, estimates based on landline election surveys in 2004 were generally accurate since standard demographic weighting helped to correct any potential bias caused by the absence of cell-only voters.

This election year there were far more cell-only voters. And while the cell-only voters remain fairly similar politically to landline voters of comparable age, this correspondence is weaker now than it was four years ago. Analysis of the NEP exit polls shows that Kerry's advantage over Bush in 2004 was only three points larger among 18-29 year olds who were cell-only than among those with a landline phone. In the 2008 NEP exit poll, the gap between cell-only and other young voters had grown to 10 percentage points.

In Pew's polling this fall, there was a gap of similar size in Obama's advantage between cell-only young voters and those reached by landline, though this difference was not statistically significant given the relatively small sample of young cell-only voters. Among cell-only voters under 30, Obama led by 38 points (66%-28%); among those in the landline sample, Obama's lead was 29 points (61%-32%).

Perhaps as a result of this pattern, Obama ran slightly better in Pew's dual frame samples of young voters than in the weighted landline samples alone. As with overall voter estimates, the differences are small but statistically significant. Obama led McCain by 33 points (63%-30%) in the full dual-frame sample, compared with his 29-point advantage in the landline sample.

The sample difference among likely voters under 30 was even larger. Obama led in the full dual frame sample by about 33 percentage points; in the landline sample his lead was 26 points. According to the national exit poll, Obama won this age group by 34 points, 66%-32%.

	Landline/ cell phone <i>sample</i>	Landline/ cell phone <i>only</i>	Landline <i>sample</i>
<i>Registered voters</i>	%	%	%
Obama	63.3	62.9	60.6
McCain	30.2	30.0	31.8
Other/DK	<u>6.5</u>	<u>7.1</u>	<u>7.6</u>
	100	100	100
<i>Obama Adv.</i>	<i>+33.1</i>	<i>+32.9</i>	<i>+28.8</i>
Sample size	(1,322)	(1,033)	(633)
<i>Likely voters</i>			
Obama	64.2	62.6	59.9
McCain	31.7	32.4	34.2
Other/DK	<u>4.1</u>	<u>5.0</u>	<u>5.9</u>
	100	100	100
<i>Obama Adv.</i>	<i>+32.5</i>	<i>+30.2</i>	<i>+25.7</i>
Sample size	(1,032)	(728)	(451)

Figures based on *weighted* data from surveys conducted 9/9-11/1/2008 and include those who "lean" toward a candidate.

## The “Dual Users”

While including adults who are cell only in telephone samples is the most critical adjustment many pollsters made in the 2008 election cycle, there is a further question about how to most effectively survey “dual users” – the majority of Americans who have both landline *and* cell phones. Most pollsters who included cell phones in their election surveys this year only interviewed cell-only voters. They did not interview dual users reached by cell, on the assumption that these dual users could be contacted on their landline telephone. Pew’s survey design, which interviews duals reached in either sampling frame, permits an assessment of whether duals reached by landline are different politically and demographically from those reached by cell.

Analysis of Pew’s election surveys from the fall of 2008 finds that duals reached by cell were somewhat different politically from those reached by landline. More duals reached by cell than those reached by landline supported Obama (53% vs. 46%). Similarly, more duals reached by cell considered themselves Democrats or leaned Democratic (54% vs. 47%). More also described their political views as liberal (22% vs. 18%). These patterns may help explain why the full dual frame design produced voter estimates that were slightly more favorable to Obama than the landline plus cell-only design.

Fewer dual users reached by cell were registered to vote, compared with those reached by landline (80% vs. 88%). And registered voters who were reached by cell were slightly less engaged and not as likely to have voted in the past

compared with dual voters reached by landline. Compared with their landline counterparts, fewer duals reached by cell said they were giving a lot of thought to the upcoming election (80% vs. 85%) or following news about the election “very closely” (52% vs. 58%).

Duals Reached by Cell Differ Politically			
	<i>Reached...</i>		All
	By landline	By cell	duals
	%	%	%
<i>Party affiliation</i>			
Republican	31	26	30
Democrat	34	38	35
Independent	30	31	30
Other/Don't know	5	5	5
	100	100	100
<i>Party with “leaners”</i>			
Republican/Lean Rep.	43	37	42
Democrat/Lean Dem.	47	54	49
No lean	10	9	9
<i>Ideology</i>			
Conservative	40	38	40
Moderate	38	37	38
Liberal	18	22	19
Sample size	(6,121)	(1,698)	(7,819)
Registered voter	88	80	86
Sample size	(8,032)	(2,266)	(10,298)
<i>Among registered voters...</i>			
<i>Presidential vote</i>			
Obama/lean Obama	46	53	47
McCain/lean McCain	44	40	43
A lot of thought given to the election	85	80	84
Ever voted in precinct	89	81	87
“Always” vote	59	55	58
Voted in 2004	88	78	86
Sample size	(7,293)	(1,898)	(9,191)
Following news about election “very closely”	58	52	56
“Definitely” will vote	90	85	89
Sample size	(5,709)	(1,486)	(7,195)
Figures based on weighted data from surveys conducted 9/9-11/1/2008.			

Similarly, fewer duals reached by cell than by landline said they had ever voted in their precinct (81% vs. 89%), that they “always” vote (55% vs. 59%) or that they voted in the 2004 presidential election (78% vs. 88%). And although 85% of duals reached by cell said they would “definitely” vote this year, a larger percentage of those reached by landline (90%) said this.

### Demographic Differences of the Dual Users

Many of the political differences between dual users reached by cell phone and by landline may be a result of demographic differences between these groups. In particular, duals reached by cell were younger and more likely to be African American. Among those reached by cell phone, 20% were under 30 compared with 9% of duals reached by landline. Duals reached by cell were also less likely to be married (58%, vs. 65%). Twice as many of those reached by cell phone were African American (14% vs. 7%). Overall, a significantly smaller proportion of duals reached by cell phone were non-Hispanic whites (70%, vs. 81% of those reached by landline).

A majority of dual users reached by cell phone were men (54%), while a majority of those reached by landline were women (52%).

Compared with dual users reached by landline, duals reached by cell are more similar to dual users in the National Health Interview Survey in terms of age, race and education. Thus, including duals from the cell phone frame makes the sample more representative of the population. However, the gender and marital status of duals reached by landline is more similar to the NHIS parameters. With respect to region, differences between duals reached by cell or by landline are small.

**Demographic Characteristics of Duals Reached By Cell Phone and By Landline**

	NHIS parameter <u>all duals</u> <sup>1</sup> %	<i>Duals</i> <i>reached by</i>		All <i>duals</i> <sup>2</sup> %
		<u>land</u> <sup>2</sup> %	<u>cell</u> <sup>2</sup> %	
Men	48	48	54	49
Women	52	52	46	51
	100	100	100	100
18-29	19	9	20	11
30-44	29	24	27	25
45-64	38	44	42	44
65+	14	23	11	20
Non-Hispanic white	71	81	70	79
Non-Hispanic black	10	7	14	9
College grad	32	47	40	46
Some college	29	24	26	25
H.S. grad	28	25	28	25
Some H.S. or less	11	4	6	4
Northeast	18	20	18	20
Midwest	23	26	24	25
South	35	36	38	37
West	24	18	20	18
Sample size	(15,356)	(8,032)	(2,266)	(10,298)
Married	64	65	58	63
Sample size	(15,356)	(5,209)	(1,439)	(6,648)

<sup>1</sup> Figures based on weighted data from the National Health Interview Survey, July-December 2007.

<sup>2</sup> Figures based on unweighted data from Pew surveys



The demographic profile of all dual users in a particular survey will depend upon the relative mix of interviews conducted by landline and cell phone, given the demographic differences between dual users reached by landline and by cell. Pew's standard design during the election was to maintain a ratio of approximately three landline interviews to each cell phone interview. This ratio was based on an analysis that attempted to balance costs and fieldwork considerations as well as the resulting demographic composition of the sample. Under this methodology, approximately 22% of the dual users included in our surveys come from the cell phone sample. In addition to improving the demographic composition of dual users as benchmarked against the NHIS parameters, these respondents also make the overall sample more demographically representative, at little additional cost.

### Wireless Adoption

The wireless-only population has been growing steadily as many young people enter adulthood without ever getting a landline and others drop their landline telephone service. Our projection for the fall of 2008, based on previous data from the National Health Interview Survey, is that 18% of adults are wireless only, with a rate of increase of roughly 3% annually.

To understand who among those who currently have a landline might become wireless only, an October 2008 survey asked "how likely are you to stop using your regular home phone and switch instead to using only a cell phone?" Overall, 8% of adults with a landline phone said they are very likely to drop their service, while 13% are somewhat likely; however, three-fourths are not that or not at all likely to stop using their landline. This is similar to a March 2006 survey in which 8% said they were very likely and 15% were somewhat likely to drop their landline service.

Not surprisingly, the likelihood of dropping landline service is highest among the same demographic groups who already show a high incidence of being cell only. Nearly one-fourth (22%) of people ages 18-29 with a landline are very likely (and an additional 17% are somewhat likely) to

Who Is Likely to Become Cell Only?					
<i>Percent already cell only<sup>1</sup></i>		How likely to become cell only? <sup>2</sup>			
		<i>Very</i>	<i>Some what</i>	<i>Not that/ not at all</i>	<i>DK/ Ref</i>
<i>%</i>		<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>
18	Total	8	13	75	4=100
19	Men	11	13	72	4=100
16	Women	6	13	77	4=100
15	White	7	14	76	3=100
24	Black	11	13	70	6=100
44	18-29	22	17	60	1=100
15	30-49	8	15	74	3=100
9	50-64	5	13	79	3=100
3	65+	3	7	83	7=100
9	\$75,000+	6	16	75	3=100
17	\$30,000-\$74,999	8	14	76	2=100
29	<\$30,000	11	12	75	2=100
--	Dual cell mostly	27	24	47	2=100
--	Dual some calls each	5	15	79	1=100
--	Dual landline mostly	4	10	84	2=100
--	Dual from cell	14	17	67	2=100
--	Dual from land	8	14	76	2=100
--	Landline only	4	8	81	7=100

<sup>1</sup> Based on weighted data from surveys conducted 9/9-11/1/2008  
<sup>2</sup> Figures are from a survey conducted 10/16-19/2008. Based on those who have a landline telephone.

stop using their landline. According to Pew’s estimates, 44% of this age group was already cell only in fall 2008. In contrast, fewer than 10% of those in other age groups are very likely to switch to using only a cell phone. Nevertheless, fully 60% of young people who have a landline say they are “not very” or “not at all” likely to drop their landline.

More than one-fourth (27%) of cell-mostly dual users (who receive all or almost all of their calls on a cell phone) are very likely, and another 24% are somewhat likely, to drop their landline phone. In contrast, only 20% of dual users who receive some calls on each phone and 14% of the landline-mostly dual users (who receive all or almost all of their calls on their landline) are very or somewhat likely to stop using their landline.

### Practical Considerations in Including Cell Phone Interviews

Pew’s experience with more than a dozen cell phone surveys over the past year indicates that cell phone surveys are just as feasible operationally as conventional landline surveys. For all of these surveys, the questionnaires were nearly identical for the landline and cell phone samples. A summary of contact and cooperation statistics from election surveys conducted between September and November shows that a nearly identical percentage of cell phone users and landline households were reached by an interviewer during the calling period (77% for landline numbers, 76% for cell phone numbers). And a nearly identical percentage of eligible respondents cooperated with the interview (31% vs. 30%). Because contact, cooperation, and completion rates were so similar, so too were final response rates, estimated at 22% for landline cases and 21% for cell cases.

Cell Respondents Just as Cooperative, But Many Fewer are Eligible		
	Landline sample %	Cell sample %
Contact rate	77	76
Cooperation rate	31	30
Completion rate	91	92
Response rate	22	21
Eligibility rate	87	55
Average rates for surveys conducted from 9/9-11/1/2008.		

The response rates in Pew’s cell phone surveys may benefit from the decision to offer cell respondents a modest \$10 reimbursement for the potential phone charges they may incur during the interview, a practice consistent with recommendations made by the American Association for Public Opinion’s Cell Phone Task Force. In contrast, landline respondents are not offered any reimbursement.

While these results show that cell phone surveying is feasible, it is also very expensive. On average, cell phone interviews cost approximately two to two-and-a-half times as much as landline interviews. Much of the additional cost is because nearly half of people (45%) reached

on a cell phone are ineligible for the interview; most of these are under the age of 18.<sup>1</sup> This means that substantially more interviewer effort is required to reach and interview a typical cell phone respondent than a landline respondent.

An analysis of the field effort and expense involved in cell phone interviewing makes it possible to categorize the additional cost, relative to landline surveys. Reimbursements account for about 30% of the additional cost, and the volume of screening necessary to reach eligible respondents adds about 30%. The fact that cell phone numbers must be dialed manually by the interviewers and may not be dialed by an automatic dialing device, as is standard practice for most landline surveys, adds 20% to the cost.

Cell phone interviewing involves a number of other administrative and scheduling modifications that add to the cost. About 10% of the additional cost results from the use of more experienced interviewers (who are paid at a higher than average rate), and from the fact that cell phone interviews are conducted during a more limited set of hours than landline interviews. Finally, calling cell phones adds to administrative costs because of additional monitoring, tracking, data processing and weighting that are required; collectively these account for about 10% of the extra costs.

What Accounts for the Extra Cost of Conducting Cell Phone Interviews?		
<i>Estimated cost factor vs. landline interviews</i>	Cell phone	Cell phone only
	2-2.5 X	4-4.5 X
<i>Percent of extra cost for...</i>	%	%
Reimbursements	30	10
Screening	30	50
Manual dialing	20	30
Staffing/scheduling	10	5
Administration	10	5
	100	100
Analysis by Princeton Survey Research Associates International.		

The alternative approach of only interviewing respondents who are cell only, rather than all eligible cell phone respondents who are reached in the cell sample, results in even higher costs per completed interview. Interviews with cell-only respondents are estimated to cost four to four-and-a-half times as much as landline interviews. Of this additional cost, 50% is estimated to result from the additional screening necessary to reach adult cell phone users who do not also have landlines. (In Pew’s election surveys, 34% of respondents reached on a cell phone said they had no landline phone.) Related to the additional screening is the effort involved in manual dialing, which adds 30% to the cost. Compared with landline interviewing, reimbursements account for 10% of the cost differential. Staffing and scheduling accounts for 5%, as does administration.

<sup>1</sup> Unlike a landline phone, a cell phone is assumed by Pew to be a personal device. This means that no effort is made to give other household members a chance to be interviewed. In practice this assumption is not always correct, as some people share cell phones. But the feasibility of sampling among shared phones is still undetermined.

## ABOUT THE DATA

Results for this report are based on combined data from six surveys conducted from September 9 through November 1, 2008. The data are from telephone interviews conducted under the direction of Princeton Survey Research Associates International and Abt SRBI, Inc. among a nationwide sample of adults, 18 years of age or older. Across all six surveys, 10,430 were interviewed on a landline telephone and 3,460 on a cell phone, including 1,160 who had no landline telephone. This sample composition is based on a ratio of approximately three landline interviews to each cell phone interview. This ratio is based on an analysis that attempted to balance cost and fieldwork considerations as well as the resulting demographic composition of the sample and the need for a minimum number of cell only respondents in each survey. The landline and cell phone samples were provided by Survey Sampling International.

The full dual frame sample that includes all interviews from the landline and cell samples is first weighted to account for the fact that respondents with both landline and cell phones have a greater probability of being included in the sample. Respondents with only a landline or only a cell phone are given a weight of 2, respondents with both a landline and cell phone are given a weight of 1 and respondents whose phone status is unknown are given an average weight for the sample based on which phone we reached them on.

The full dual frame sample is then weighted using demographic parameters from the U.S. Census Bureau's Current Population Survey (March 2007 Annual Social and Economic Supplement). This analysis produces population parameters for age, education, race/ethnicity, region, and population density of households with adults 18 years of age or older, which are then compared with the sample characteristics to construct the weights. In addition to the demographic parameters, the sample is also weighted to match current patterns of telephone status and relative usage of landline and cell phones (for those with both), based on extrapolations from the July-December 2007 National Health Interview Survey (NHIS). The final weights are derived using an iterative technique that simultaneously balances the distributions of all weighting parameters.

Fall 2008 Weighting Parameters For Phone Status and Usage	
Cell phone only	17.8
Dual	66.6
All or almost all calls on cell	14.7
All/almost all/some calls on landline	51.9
Landline only	15.6
	100
Based on Pew Research Center extrapolations from NHIS data for July-Dec. 2007.	

For comparisons of the full dual frame design with other designs, the landline plus cell-only sample and the landline sample are each weighted using an iterative technique that matches gender, age, education, race/ethnicity, region, and population density to parameters from the March 2007 Annual Social and Economic Supplement to the CPS. The landline plus-cell only sample is also weighted to match current patterns of telephone status and usage, based on extrapolations from the 2007 National Health Interview Survey (NHIS). There is no first stage weight applied to either of these samples because all respondents are assumed to have only one chance of being included in the sample.

The significance tests comparing the estimates based on landline respondents with those based on the combined landline and cell respondents and the combined landline and cell phone-only respondents account for the overlap in the two samples due to the landline sample cases being included in the combined estimates. The tests were conducted using software that accommodates complex survey samples.

## ABOUT THE CENTER

The Pew Research Center for the People & the Press is an independent opinion research group that studies attitudes toward the press, politics and public policy issues. We are sponsored by The Pew Charitable Trusts and are one of seven projects that make up the Pew Research Center, a nonpartisan "fact tank" that provides information on the issues, attitudes and trends shaping America and the world.

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All of the Center's research and reports are collaborative products based on the input and analysis of the entire Center staff consisting of:

Andrew Kohut, Director

Scott Keeter, Director of Survey Research

Carroll Doherty and Michael Dimock, Associate Directors

Michael Remez, Senior Writer

Juliana Menasce Horowitz, Robert Suls, Shawn Neidorf, Leah Christian, Jocelyn Kiley and Neha Sahgal,  
Research Associates

Kathleen Holzwart and Alec Tyson, Research Analysts

Courtney Kennedy of the University of Michigan was a consultant on this project.

Larry Hugick and Jonathan Best of Princeton Survey Research Associates also contributed to this report.