



**A Research Report from the
University of Pennsylvania
Graduate Division, School of Arts & Sciences
Center for Organizational Dynamics**

The Unexplained Exit Poll Discrepancy

Steven F. Freeman¹
stfreema@sas.upenn.edu

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Most Americans who listened to radio or surfed the internet on election day this year sat down to watch the evening television coverage thinking John Kerry won the election. Exit polls showed him ahead in nearly every battleground state, in many cases by sizable margins. Although pre-election day polls indicated the race dead even or Bush slightly ahead, two factors seemed to explain Kerry's edge: turnout was very high, good news for Democrats,³ and, as in every US

1 I would like to thank Jonathan Baron, Bernard B. Beard, Michael Bein, Mark Blumenthal, James Brown, Elaine Calabrese, Becky Collins, Gregory Eck, Jeremy Firestone, Lillian Friedberg, Robert Giambatista, Kurt Gloos, Gwen Hughes, Clyde Hull, Carolyn Julye, John Kessel, Mark Kind, Joe Libertelli, Warren Mitofsky, Michael Morrissey, John Morrison, Barry Negrin, Elinor Pape, David Parks, Kaja Rebane, Sandra Rothenberg, Cynthia Royce, Joseph Shipman, Jonathon Simon, Daniela Starr, Larry Starr, Barry Stennett, Roy Streit, Leanne Tobias, Andrei Villarroel, Lars Vinx, Ken Warren, Andreas Wuest, Elaine Zanutto, John Zogby, and Dan Zoutis for helpful comments or other help in preparing this report. I would also like to thank the many others who wrote to me expressing support, and apologize for not having had time to answer. I also apologize to those who may have sent helpful suggestions that I did not have time to read. I was overwhelmed with the response to the initial drafts of the paper.

2 This report was originally published on November 12, 2004 as Center for Organizational Dynamics Working Paper #04-10 (University of Pennsylvania, School of Arts & Sciences, Graduate Division). It was revised on November 21, 2004; the most important change was to use more conservative assumptions on the statistical accuracy of the exit polls. I made only minor clarifications since.

3 Nonvoters are generally more Democratic than voters. Democratic Party candidates generally benefit from higher turnout because the increase comes disproportionately from voters in socio-economic groups that traditionally vote Democratic. (Jack Citrin, Eric Schickler & John Sides (2003) "What If everyone voted? Simulating the impact of increased turnout in senate elections," *American Journal of Political Science*, 47(1):75-90)

presidential election with an incumbent over the past quarter-century, undecided voters broke heavily toward the challenger.⁴

But then, in key state after key state, counts showed very different numbers than the polls predicted; and the differentials were all in the same direction. The first shaded column in Table 1.1 shows the differential between the major candidates' predicted (exit poll) percentages of the vote; the next shaded column shows the differential between their *tallied* percentages of the vote. The final shaded column reveals the "shift." In ten of the eleven consensus battleground states,⁵ the tallied margin differs from the predicted margin, and in every one, the shift favors Bush.

Table 1.1⁶: Predicted vs. tallied percentages in battleground states

	Bush predicted	Kerry predicted	Predicted differential	Bush tallied	Kerry tallied	Tallied differential	Tallied vs. predicted
Colorado	49.9%	48.1%	Bush 1.8	52.0%	46.8%	Bush 5.2	Bush 3.4
Florida	49.8%	49.7%	Bush 0.1	52.1%	47.1%	Bush 5.0	Bush 4.9
Iowa	48.4%	49.7%	Kerry 1.3	50.1%	49.2%	Bush 0.9	Bush 2.2
Michigan	46.5%	51.5%	Kerry 5.0	47.8%	51.2%	Kerry 3.4	Bush 1.6
Minnesota	44.5%	53.5%	Kerry 9.0	47.6%	51.1%	Kerry 3.5	Bush 5.5
Nevada	47.9%	49.2%	Kerry 1.3	50.5%	47.9%	Bush 2.6	Bush 3.9
New Hampshire	44.1%	54.9%	Kerry 10.8	49.0%	50.3%	Kerry 1.3	Bush 9.5
New Mexico	47.5%	50.1%	Kerry 2.6	50.0%	48.9%	Bush 1.1	Bush 3.7
Ohio	47.9%	52.1%	Kerry 4.2	51.0%	48.5%	Bush 2.5	Bush 6.7
Pennsylvania	45.4%	54.1%	Kerry 8.7	48.6%	50.8%	Kerry 2.2	Bush 6.5
Wisconsin	48.8%	49.2%	Kerry 0.4	49.4%	49.8%	Kerry 0.4	No dif

The media have largely ignored this discrepancy (although the blogosphere has been abuzz), suggesting either that the polls were flawed, or that the differential was within normal sampling error, a statistical anomaly, or could otherwise be easily explained away. In this report, I examine the validity of exit poll data, sampling error, the likelihood of statistical anomaly, and other explanations thus far offered to explain this discrepancy.

4 There have been four incumbent presidential elections in the past quarter-century. On average, the incumbent comes in half a point below his final poll result; challengers exceed their final poll result by an average of 4 points. (Guy Molyneux, "The Big Five-Oh," *The American Prospect Online*, October 1, 2004) Exit poll data from the CNN website indicate that those who decided in the last three days chose Kerry over Bush 55% - 40%.

5 These eleven are classified as battleground states based on being on at least two of three prominent lists: *Zogby*, *MSNBC*, and the *Washington Post*. Another sometimes-mentioned state, Oregon, did not have a comparable exit poll because voting in the state is by mail. (These twelve states did in fact turn out to be the most competitive in the election; in no other state was the winning margin within 7%.)

6 Source: CNN website, November 3, 2004 12:21 a.m.

Exit Poll Data

The data I use for this report are those posted on the CNN website election night. CNN had the data by virtue of membership in the National Election Pool (NEP), a consortium of news organizations that pooled resources to conduct a large-scale exit poll, as was done in the 2000 and 2002 elections. NEP, in turn, had contracted two respected firms, Edison Media Research and Mitofsky International,⁷ to conduct the polls.

Calibrated and Uncalibrated Exit Poll Data

Part of the reason the issue went away for the media – and simultaneously raised suspicion on the web – is secrecy and confusion about the data and what exactly is being characterized as the exit poll. If you go to the CNN website or any other website on which 2004 exit poll data are available, you'll see numbers very different from those released on election day. This is because the survey results originally collected and presented to subscribers were subsequently “corrected” to conform to official tallies.

The pollsters explain this as a natural procedure: the “uncalibrated” data were preliminary; once the counts come in, they recalibrate their original data on the assumptions that the count is correct, and that any discrepancies must have been due to imbalanced representation in their samples or some other polling error. The pollsters have taken great pains to argue that their polls were not designed to verify election results,⁸ but rather to provide election coverage support to subscribers – as one set of data that the networks could use to project winners and to explain voting patterns, i.e., who voted for whom, and why people voted as they did.

Whatever the merits of calibrating exit poll data, it obscures the issue of *why* the uncalibrated polls were so far off and mostly in the same direction. Although this calibration process may seem perfectly natural to NEP, it confuses nearly everyone else, even sophisticated analysts intimately involved in voting issues. The MIT-Caltech Voting Project, for example, issued a

7 Warren Mitofsky, the founder of Mitofsky International, is credited with having invented the exit poll. (David W. Moore, Senior Gallup Poll Editor, “New Exit Poll Consortium Vindication for Exit Poll Inventor,” *Gallup News Service*, October 11, 2003)

8 Martin Plissner, “In Defense of Exit Polls: You just don't know how to use them,” *Slate*, November 4, 2004

report concluding that exit poll data were consistent with state tallies and that there were no discrepancies based on voting method, including electronic voting systems. But they used these adjusted data to validate the process. In other words, they used data in which the count is assumed correct to prove that the count *is* correct! Sadly, this report is being used to dismiss allegations that anything might be awry.⁹

It's an awful mistake, but entirely understandable – few of us realized that these data were corrected. Neither the CNN website, nor any other site of which I am aware, gives any indication that the data were anything other than what nearly all of us imagine exit poll data to be – data based solely on subjects surveyed leaving the polling place.

Data Used in This Report

For this report, I use data that apparently are based solely on subjects surveyed leaving the polling place. These data were reportedly not intended for public release,¹⁰ and were available to late evening election night viewers only because a computer glitch prevented NEP from making updates sometime around 8:30 p.m. that evening.¹¹ They were collected by Jonathon Simon, a former political survey research analyst, and are corroborated by saved screen shots (see Figure 1.1). I happened to have sixteen CNN exit poll pages stored in my computer memory from viewing the evening before, and in each case, his figures are identical to mine. The numbers are also roughly consistent with those released elsewhere (Appendix B shows *Slate* numbers at 7:28 EST).

To derive the “predicted values” used in Tables 1.1 and 1.5, I combine the male and female vote, weighted for their percentage of the electorate. Ohio exit poll data (Figure 1.1) indicate that 51% of men and 53% of women voted for Kerry. Since the electorate is 47% male/53% female, Kerry's overall share of the exit poll was calculated as $(51\% \times 47\%) + (53\% \times 53\%)$ or 52.1%.¹²

9 Tom Zeller, Jr., "Vote Fraud Theories, Spread by Blogs, Are Quickly Buried," *New York Times* (Front page); John Schwartz, "Mostly Good Reviews for Electronic Voting," *New York Times*; Keith Olbermann, *MSNBC Countdown*. All three on November 12, 2004

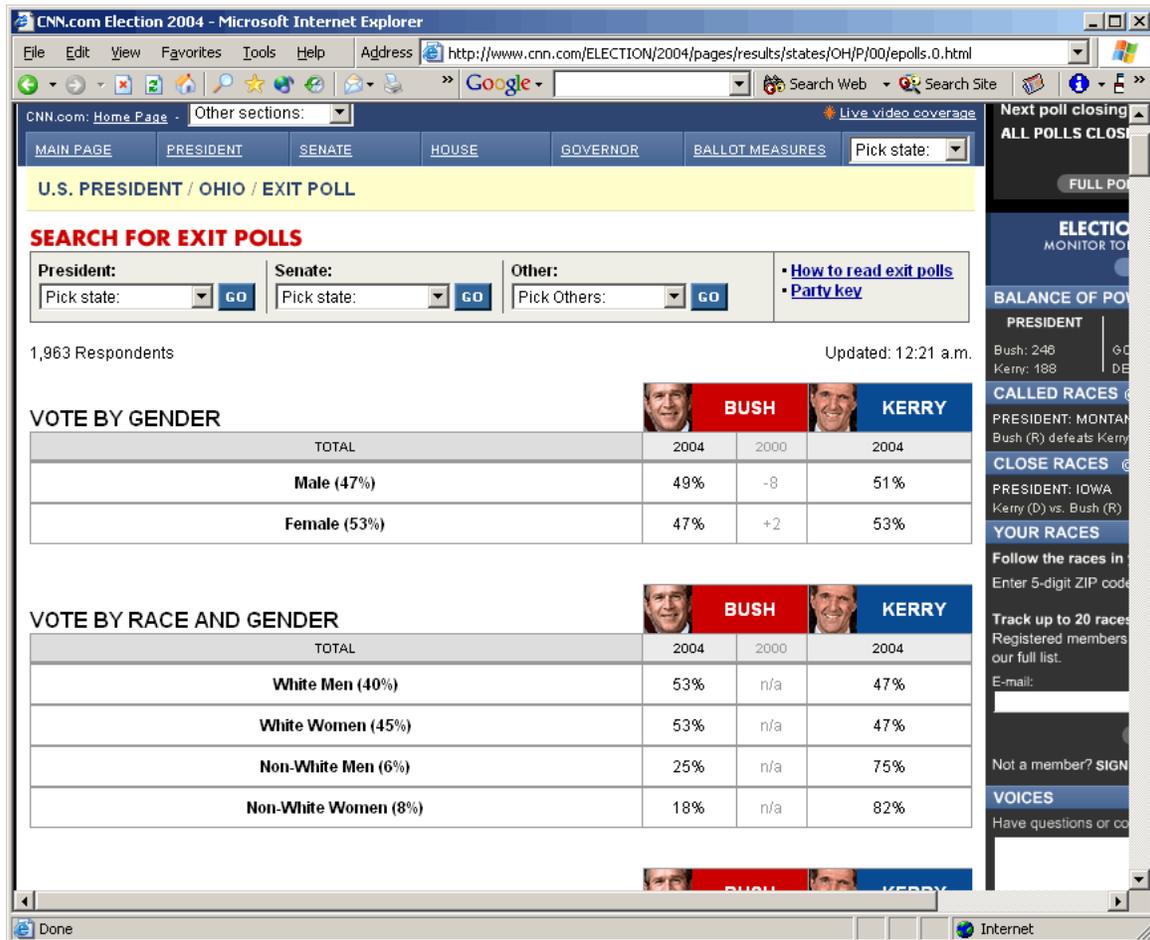
10 Martin Plissner, "In Defense of Exit Polls: You just don't know how to use them." *Slate*, Thursday, Nov. 4, 2004

11 Richard Morin, "New Woes Surface in Use of Estimates." *Washington Post*, November 4, 2004

12 Displaying these numbers out to one decimal point is not meant to imply that the numbers are precise to that level of significance, but rather to provide as much data as accurately as I can. Among the limitations of the CNN exit

Doing the same calculations for other battleground states and comparing these numbers with final tallies (*New York Times*, Nov. 7), I completed the columns in Tables 1.1 and 1.5.

Figure 1.1. CNN web page with apparently “uncorrected” exit poll data (12:21 am Wed, Nov. 3, 2004)



Are the Data Valid?

Some commentators on an early draft of this report rejected these data as unweighted, meaning that they have not been adjusted to appropriately weight demographic groups pollsters

poll data are the lack of significant digits. I did not want to unnecessarily degrade the data further by rounding numbers derived from calculations.

Because CNN data is provided without decimals, underlying percentages for the exit poll numbers may be rounded by as much as .5%. It's unlikely that the derived number would be that far off, because the data come from two groups, male and female, both of which would have to have been maximally rounded in the same direction. Despite this, the extent of the discrepancy is such that even if every number that I use in this report had been rounded the full .5% in an unfavorable direction, the basic findings would all still hold.

knowingly under- or over-sampled,¹³ but it makes no sense that NEP would *ever* distribute unweighted data to anyone, let alone publish them on the web election night. NEP's predecessor, Voter News Service, warns in bold letters in its 2000 methodology statement never to use unweighted data for any reason (see Appendix A). Pollsters want to get it right. Their customers are depending on it. Broadcasters want to be alerted to probable outcomes, so as to plan their coverage accordingly (e.g., pre-writing stories so they can be completed shortly after poll-closings, assigning top reporters to winners' headquarters, being prepared for when concession or victory speeches might be forthcoming, etc.). In this case, subscribers were taken by surprise. Anchor people were discussing who Kerry would choose for his cabinet, conservative radio hosts were warning how now we're going to see the true John and Teresa Heinz Kerry. Prominent pollster John Zogby trusted the data sufficiently to call the race for Kerry. In the end, network managers had to scramble for coverage; editors and journalists had to rewrite headlines and lead stories.

It is alternatively possible that the data were already partially calibrated to the count by 12:20 a.m., but given the news report of the computer glitch preventing NEP updates and an abrupt change shortly after 12:20 a.m.,¹⁴ that seems unlikely. If, in fact, the data already had been partially calibrated, however, it would mean that the uncorrected exit poll numbers favored Kerry to an even greater extent.

In summary, I'd rather have NEP data; lacking that (and unless NEP has a change of heart, no one is going to see those until well into 2005¹⁵), these CNN data look good, and can be used to generate some highly suggestive findings.

13 Using *unweighted* data, Democrats would almost always outpoll Republicans. Pollsters oversample minorities so that they have a sufficient sample size of important demographic groups – but then they negatively weight respondents in these groups to adjust for their actual percentage of the electorate.

14 An Ohio screen shot taken at 1:41 a.m. shows 2,020 respondents with the following percentages:

Male (47%):	Bush 52%	Kerry 47%
Female (53%):	Bush 50%	Kerry 50%

15 When the data are finally released, they may also be unusable for count verification purposes, because this would require original weighting assumptions rather than those that assume the count correct. First, we would need to know whether precincts were originally chosen randomly or to ensure sufficient subsamples of important demographic groups, i.e., minority precincts. Second, we would need to know the weighting of individual respondents to adjust for exit poll observations, e.g., African-Americans disproportionately participated in the poll, rather than weighting to make the numbers match up with the tallies, e.g., African Americans must have been oversampled because otherwise Kerry's vote total would have been higher.

On (Uncorrected) Exit Polls

Conducting an exit poll presents many challenges, several of which potentially might have caused errors that would have resulted in election day discrepancies. I'll discuss these at length in a subsequent report along with a discussion of potential count errors, but in general, we have reason to believe that exit polls, by which I mean *uncorrected* exit polls, are accurate survey instruments. Exit polls are surveys taken of representative respondents from the overall voting population. Both the logic behind them and experience suggest that these surveys should be able to predict overall results within statistical limits. It is relatively easy to get a representative sample, and there is no problem figuring out who is actually going to vote or how they will vote.

In Germany, as soon as the polls close, polling agencies release prognoses that have proven highly reliable. In the three most recent national elections there, poll percentages diverged from official counts by an average of only **0.26%** (Table 1.2). They have been almost as accurate for the German vote in the European Parliament Elections (Table 1.3), averaging **0.44%** differential from tallied results over the past three elections.

Table 1.2¹⁶: Exit Poll Predictions vs. Official Counts in German National Elections

Parties	2002 predicted	2002 tallied	2002 diff	1998 predicted	1998 tallied	1998 diff	1994 predicted	1994 tallied	1994 diff	average dif
SPD	38.0%	38.5%	0.5%	41.0%	40.9%	0.1%	36.5%	36.4%	0.1%	
CDU/CSU	38.0%	38.5%	0.5%	35.0%	35.2%	0.2%	42.0%	41.4%	0.6%	
Green	9.0%	8.6%	0.4%	6.5%	6.7%	0.2%	7.0%	7.3%	0.3%	
FDP	7.5%	7.4%	0.1%	6.5%	6.2%	0.3%	7.0%	6.9%	0.1%	
PDS	4.0%	4.0%	0.0%	5.0%	5.1%	0.1%	4.0%	4.4%	0.4%	
Rest	9.0%	8.6%		6.0%	5.9%		3.5%	3.6%		
Average differential			0.30%			0.18%			0.30%	0.26%

16 Source: Election data: <http://www.bundeswahlleiter.de/> (English: http://www.bundeswahlleiter.de/wahlen/e/index_e.htm)

Prognoses are those of Forschungsgruppe Wahlen, which has been conducting exit polls for ZDF, one of the two main German television stations. Other television stations employ other exit polling firms, two of which are 'infratest-dimap' and 'Forsa'. These predictions are, likewise, with rare exception within 1% of the final result (and also of each other.) When one polling company was off by 1.5% for one of the major parties in a recent election, this 'large' difference was a big surprise for the public as well as for the researchers/pollsters.

In sharp contrast to the opacity of NEP practices, the German exit pollsters fully disclose on their websites not only the prognosis made as the polls close, but that of every subsequent iteration of the data at intervals ranging from about 20 minutes to an hour. Like NEP, they also correct the data based on actual counts from polled precincts, but their processes are perfectly transparent, and the original uncorrected numbers remain available for anyone to see at any time. Their complete data sets can be accessed through the Central Archive for Empirical Social Studies of the University of Cologne.

Thanks to Dr. Andreas M. Wuest, Dr. Michael Morrissey, Kurt Gloos, and Lars Vinx for their help in compiling these data.

Table 1.3: Exit Poll Predictions vs. Counts in European Parliament Elections (German part)

Parties	2004 predicted	2004 tallied	2004 diff	1999 predicted	1999 tallied	1999 diff	1994 predicted	1998 tallied	1998 diff	average dif
SPD	22.0%	21.5%	0.5%	31.0%	30.7%	0.3%	33.0%	32.2%	0.8%	
CDU/CSU	45.5%	44.5%	1.0%	48.0%	48.7%	0.7%	40.5%	38.8%	1.7%	
Green	11.5%	11.9%	0.4%	7.0%	6.4%	0.6%	10.0%	10.1%	0.1%	
FDP	6.0%	6.1%	0.1%	3.0%	3.0%	0.0%	4.0%	4.1%	0.1%	
PDS	6.0%	6.1%	0.1%	6.0%	5.8%	0.2%	4.5%	4.7%	0.2%	
REP							3.5%	3.9%	0.4%	
Rest	9.0%	9.8%		5.0%	5.4%		4.5%	6.2%		
Average differential			0.42%			0.36%			0.55%	0.44%

To make the numbers more comparable to the US presidential election, I have grouped the parties into their coalitions in Table 1.4.¹⁷ The results are very accurate, in all cases predict correctly the winner, and show no systematic skew.

Table 1.4: Exit Poll Predictions vs. Counts for Coalitions in German National Elections

Election	Coalition	SPD/ Green predicted	CDU/CSU FDP predicted	Predicted differential	SPD/Gree n tallied	CU/FDP tallied	Tallied differential	Tallied vs. predicted
2004 European Parliament		33.5%	51.5%	CF 18.0	33.4%	50.6%	CF 17.2	SG 0.8
2002 National election		47.0%	45.5%	SG 1.5	47.1%	45.9%	SG 1.2	CF 0.3
1999 European Parliament		38.0%	51.0%	CF 13.0	37.1%	51.7%	CF 14.6	CF 1.6
1998 National election		47.5%	41.5%	SG 6.0	47.6%	41.4%	SG 6.2	SG 0.2
1994 European Parliament		43.0%	44.5%	CF 1.5	42.3%	42.9%	CF 0.6	SG 0.9
1994 National election		43.5%	49.0%	CF 5.5	43.7%	48.3%	CF 4.6	SG 0.9

In the US, exit polls have also been quite precise. Students at BYU have been conducting Utah exit polls since 1982.¹⁸ They write:

[...] results are very precise; In the 2003 Salt Lake [City] mayoral race, the KBYU/Utah Colleges Exit Poll predicted 53.8 percent of the vote for Rocky Anderson and 46.2 percent for Frank Pignanelli. In the actual vote, Anderson carried 54 percent of the vote to Pignanelli's 46 percent.

True to their word, predictions in this year's contests were quite accurate. In the Utah presidential vote, for example, they predicted Bush 70.8%, Kerry 26.5%. The actual was Bush 71.1%, Kerry 26.4%. Consistently accurate exit poll predictions from student volunteers, including in this presidential election, suggest we should expect accuracy, within statistical limits, from the

17 The FDP Freie Demokratische Partei (liberals) is aligned with the Christian Democratic Party, and the Social Democratic Party (SPD) is aligned with the Greens. PDS (socialists) and Republikaner (extreme right) are not in any coalition.

18 Information available at <http://exitpoll.byu.edu/2004results.asp>. As far as I have been able to determine, this was the only other exit poll conducted on the 2004 presidential election, aside from an LA Times poll, for which I could not determine whether or not the data were corrected.

world's most professional exit polling enterprise.

Not only can exit polls accurately predict actual voting, they have been widely used to verify elections. When Mexico sought legitimacy as a modernizing democracy in 1994, Carlos Salinas instituted reforms designed to ensure fair elections, and central among these were exit polls.¹⁹ Exit pollsters were hired again for the subsequent presidential election in 2000,²⁰ and not coincidentally, it was the first loss for the Institutional Revolutionary Party (PRI) in its 72-year history.

In Russia, and throughout the former Soviet block, exit polls have been used to verify elections. Last fall, international foundations sponsored an exit poll in the former Soviet Republic of Georgia during a parliamentary election. Just as happened recently in the Ukraine, exit polls projected a victory for the main opposition party, and when the sitting government announced that its own slate of candidates had won, supporters of the opposition stormed the Parliament and the sitting President resigned under pressure from the United States.²¹

Statistical Analysis of the Three Critical Battleground States: Ruling out Chance or Random Error

Three Critical Battleground States

Conventional wisdom going into the election was that three critical states – Ohio, Pennsylvania, and Florida – would likely determine the winner of the presidential election.

Typical analyst comments included:

Since Election 2000, Republicans and Democrats have banked their aspirations on an electoral trinity: Florida, Pennsylvania and Ohio. As the Big Three goes, so goes the nation.

- David Paul Kuhn, CBS News: "High-Stakes Battle for the Big 3" Oct. 26, 2004

Conventional wisdom for months, including RCP's, had been that whoever won two of the "big three" Ohio, Pennsylvania and Florida would almost certainly become President.

- Real Clear Politics: [posting 10/28/04](#)

19 Paul B. Carroll and Dianne Solis, "Zedillo's apparently clean win at polls diminishes threat of Mexican unrest," *The Wall Street Journal*, August 23, 1994

20 Rebeca Rodriguez, "U.S. political consultants signed to conduct exit poll in Mexico," *Knight Ridder Newspapers*, June 16, 2000

21 Georgia President Eduard A. Shevardnadze resigned under pressure from both the US and Russia. (Martin Plissner, "Exit Polls to Protect the Vote," *New York Times*, October 17, 2004)

The accepted wisdom is that whoever wins two out of the three states of Ohio, Pennsylvania and Florida will win the election.

- Rob Watson, BBC News: October 28, 2004

The numbers and logic were straightforward. Of the other battleground states: Michigan and Minnesota leaned Democratic; Colorado and Nevada leaned Republican. Iowa, New Hampshire and New Mexico don't have many electoral votes. Wisconsin has a long tradition as a liberal state, and only 10 electoral votes compared to 20, 21, and 29 for the big three.

Campaign activities were also consistent with this logic. Ohio, Pennsylvania, and Florida were the three states the candidates visited most, and in which they spent the most money.²²

Conventional wisdom proved correct. Bush won two of the three and ascended to electoral victory as a result. In each of these states, however, exit polls deviated significantly from recorded tallies (Table 1.5).

Table 1.5: Predicted vs. tallied percentages in the three critical battleground states

	Sample size	Bush predicted	Kerry predicted	Predicted differential	Bush tallied	Kerry tallied	Tallied differential	Tallied vs. predicted
Florida	2846	49.8%	49.7%	Bush 0.1 ²³	52.1%	47.1%	Bush 5.0	Bush 4.9
Ohio	1963	47.9%	52.1%	Kerry 4.2	51.0%	48.5%	Bush 2.5	Bush 6.7
Pennsylvania	1930	45.4%	54.1%	Kerry 8.7	48.6%	50.8%	Kerry 2.2	Bush 6.5

A Statistical Anomaly?

A basic question to ask on looking at such a discrepancy is whether it is just a statistical anomaly. It can happen, for example, that a fair coin tossed ten times will land heads each time, but it doesn't happen often (1 out of 1,024 times). If we witness this, we will at least suspect that the coin might be adulterated, especially if the stakes are high and we are not permitted to inspect the coin carefully.

Statistical significance, which means that the discrepancy is such that it is unlikely to occur by chance, depends on four factors – the size of the discrepancy, the size of the sample size, its characteristics, and the level of significance (just how unlikely does it have to be?) Table 1.5

²² See stories cited above

²³ Earlier exit polls, including one released by *Slate* at 7:28 EST, 28 minutes after the Florida polls closed showed Kerry leading 51% to 49% (Appendix B)

provides sample size and discrepancy. For statistical purposes, these samples are quite large. Two thousand or so respondents is roughly the size of most national polls.

Without access to the data and methodology, we cannot model the sample characteristics precisely. But we do know the general procedures by which exit polls are conducted. Appendix A provides the 2000 presidential election exit poll methodology and a bibliography of articles on the process from that and other elections. On this basis we can make a reasonable approximation.

A random sample of a population can be modeled as a normal distribution curve. Exit polls, however, are not random samples. To avoid prohibitive expense, exit poll samples are clustered, which means that precincts, rather than individuals, are randomly selected. This increases variance and thus the margin of error because of the possibility that precinct voters share similar characteristics which distinguish them from the rest of the state in ways that past voting behavior would not predict. An analysis of the 1996 exit polls estimated that the cluster sample design adds “a 30 percent increase in the sampling error computed under the assumption of simple random sampling” (Merkle and Edelman, 2000, p. 72). That study is particularly apt because the 1996 state exit polls involved roughly the same number of precincts (1,468) as this year’s polls (1,480).²⁴ Pollsters also have techniques to decrease variance, most notably stratification, which helps ensure that the sample is representative of the overall population.²⁵ In the analysis below, however, I conservatively assume no counterbalancing effects.

24 From the NEP Information page: <http://www.exit-poll.net/faq.html#a7>

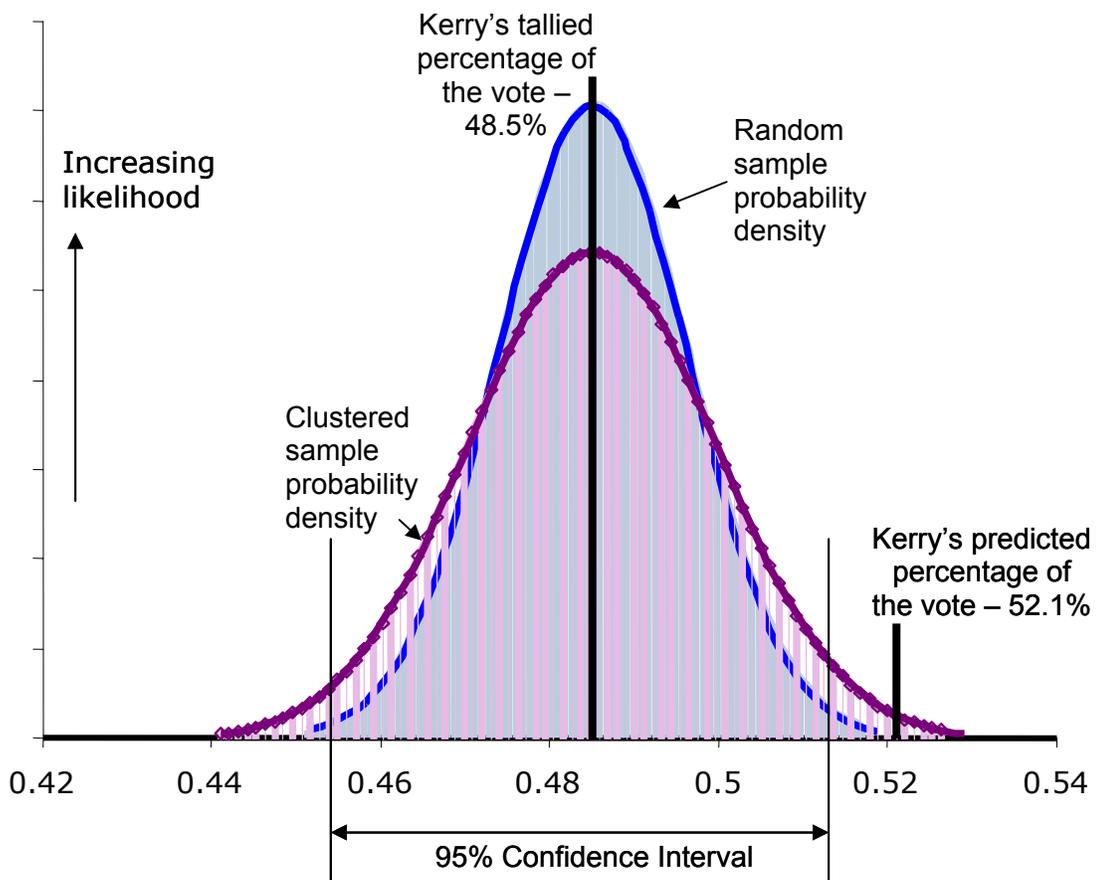
25 Stratification involves identifying key characteristics that predict voting behavior (race, sex, age, income, ethnicity, religion, party affiliation, etc...) and then seeking out subjects with specific demographic characteristics and/or weighting groups depending on their representation in the sample compared with that of the overall voting population. By getting samples in which minorities are over-represented (but subsequently negatively weighted), pollsters can ensure adequate sample sizes of each of these representative subgroups. Knowing exactly how much to weight over- or under-represented population depends on an accurate knowledge of overall demographics of the electorate. Historical data, census data, and registration roles, can be used to complement sampling site counts to try to weight the sample accurately.

An early draft of this paper based on an assumption that the effects of stratification could balance the effects of clustering, generated headline-grabbing probability of 250,000,000-to-one odds. In this analysis, I assume no counterbalancing effects at all due to stratification. Although, in principle, pollsters can ensure a more representative sample than chance alone would dictate, they face challenges in knowing exactly what weight to assign a group. The only measure of the demographics of actual voters on election day is the exit poll itself.

Figure 1.2 depicts the resulting distribution curve for samples of 1,963 randomly selected respondents from approximately 40 randomly selected precincts in Ohio, a state in which 48.5% of the vote went for Kerry. The thin blue density curve is that of a simple random sample; the wider purple curve is of a clustered sample with no stratification. The horizontal double arrow below the curve indicates the poll's statistical margin of error, the corresponding 95% confidence interval.²⁶ If one hundred unbiased samples were drawn from this population, we would expect

Figure 1.2. Normal distribution curve for sample predictions based on Kerry's tally in Ohio

If you were to conduct this poll 20 times, 19 times you should get a result between 45.6% and 51.4%. The likelihood of the NEP poll prediction exceeding the actual vote by as much as 3.6% is less than 1 in 100.



26 To determine the margin of error, calculate the standard error of a random sample using the formula $\sqrt{\frac{p(1-p)}{N}}$ where p = Kerry percentage of the vote and N is the sample size. (.0113). To adjust for the fact that this is a clustered sample, add 30% (.01466 or 1.47%). Sixty-eight percent of the time, a prediction from a sample this size would be within one standard error. Ninety-five percent of the time, it will be within 1.96 standard errors (2.87% in this case).

that in 95 (on average), Kerry would poll between 45.6% and 51.4%. And because half of the 1-in-20 cases that fall outside the interval would be low rather than high, 97.5% of the time we would expect Kerry to poll no more than 51.4%. It turns out that the likelihood that Kerry would poll 52.1% from a population in which he receives only 48.5% of the vote is less than one-in-one-hundred (.0073).

Conducting the same analysis for Florida, we find that Kerry's poll prediction of 49.7% of the vote is likewise outside the 95% confidence interval. Given a population in which he receives only 47.1% of the vote, the chances that he would poll 49.7% out of 2,846 respondents in an exit poll with no systematic error is less than two-in-one-hundred (.0164). In the third critical battleground state, Pennsylvania, Kerry's poll numbers are outside the 95% confidence interval as well. Although he did carry the state, the likelihood that an exit poll would predict 54.1%, given 50.8% support of the electorate is just slightly more than one-in-one-hundred (.0126).

Assuming independent state polls with no systematic bias, the odds against any two of these statistical anomalies occurring together are more than 5,000:1 (five times more improbable than ten straight heads from a fair coin). The odds against all three occurring together are 662,000-to-one. As much as we can say in social science that something is impossible, it is impossible that the discrepancies between predicted and actual vote counts in the three critical battleground states of the 2004 election could have been due to chance or random error.

Media Reports and Official Explanations

Media coverage of this exit poll discrepancy was strikingly limited in the days following the election. I could find few references among national newspapers or broadcasters that constitute NEP and virtually no analysis. The *New York Times* wrote that they obtained a report issued by pollsters debunking the possibility that the exit polls are right and the vote count is wrong²⁷, but

27 Jim Rutenberg, "Report Says Problems Led to Skewed Surveying Data," *New York Times*, November 5, 2004. The *Times* also ran a series in which Richard J. Meislin, *Times* editor of news surveys and election analysis, answered questions on exit polls and election results. In that piece, he deflected many questions such as I have raised here with the equally uninformative announcement that the people,

"who did them acknowledged yesterday that there had been more problems than were initially revealed to their news media customers. See Jim Rutenberg's excellent article today."

the *Times* does not explain beyond that declaration how the possibility was “debunked.” In fact, no evidence whatsoever is presented of skewed survey data or any problem at all with the polls except that “uncorrected” data were released to the public. *Slate*, in contrast, reported that Mitofsky and Lenski insisted that the polls were perfectly fine.²⁸ Mitofsky himself only says, “We are still investigating the source of the exit poll problem.”²⁹

The *Washington Post* reported that samples may have included too many women, too few Westerners, not enough Republicans, etc³⁰ One of the few people close to NEP to offer an explanation early on was Martin Plissner, former executive political director of CBS News (and self-described close friend of the pollsters), who identifies three problems widely used to dismiss the results:

The pollsters who work outside the polling stations often have problems with officials who want to limit access to voters. Unless the interviews have sampled the entire day's voters, the results can be demographically and hence politically skewed. Finally, it is of course a poll, not a set of actual recorded votes like those in the precinct samples collected after the polls close.³¹

Analysis of First Week Polling Error Explanations

None of these initial explanations is plausible:

It's Just a Poll (and polls can be wrong). Well, it's true (of course) that it's just a poll, but, as I have documented, the evidence and logic on exit polls suggest that we should expect them to be accurate within statistical limits. In the absence of systematic skew or count error, they could not have been as far off as they were.

Time-of-Day Bias. End of day numbers favored Kerry (not only early results). This report is based on end-of-day data, which happened to still be available at midnight (see page 4).

Pollster Access to Voters. Mitofsky and Lenski have been doing exit polls for decades. There is little reason to suspect that they could not manage relations with local election officials or train

28 Martin Plissner “In Defense of Exit Polls: You just don't know how to use them,” *Slate*, November 4, 2004; Jack Shafer, “The official excuses for the bad exit poll numbers don't cut it,” *Slate*, November 5, 2004

29 Warren Mitofsky, personal communication, November 10, 2004

30 Richard Morin, “New Woes Surface in Use of Estimates,” *Washington Post*, November 4, 2004

31 Martin Plissner “In Defense of Exit Polls: You just don't know how to use them,” *Slate*, November 4, 2004

their workers to do so. Moreover, even if pollsters did experience difficulties accessing voters, the worst that could happen would be increased general error. No suggestion has been offered for how access issues could might *skew* results so dramatically towards Kerry.

Gender Bias. Gender bias would seem an extremely unlikely mistake because exit pollsters can visually count who shows up to vote. This is one of the great advantages of the exit poll. The pollsters are instructed to note the demographic characteristics of those who refuse to participate as well as those who do. They might not always identify age or even race correctly, but they should nearly always be able to identify gender.

If males or females disproportionately participate, it doesn't matter. If the sample were 90% female, female preferences would still only be weighted for their share of the electorate; CNN and others released data as in Figure 1.1 showing male and female preferences separately and their appropriate weight (their percentage of the overall electorate).

Under-representation of Republican constituencies. Random imbalances are part of normal sampling error and result in the poll precision and confidence intervals that I have reported. Under such conditions, Republicans, Westerners, etc., are equally (un)likely to be over- or under-represented. Imprecise representation is incorporated within the margin of error. That's why we have the concept of probability densities, margin of error, etc.... If you could choose a perfectly representative sample, you could predict outcomes precisely. In principle, the samples should be better than random; techniques to ensure sample representativeness can render surveys more accurate than a purely random sample, thus making the observed discrepancies even more unlikely than my analysis indicates.

Bush voter unwillingness to participate and other “explanations”

Most recently, Senior *Gallup Poll* Editor David W. Moore, has quoted Mitofsky and Lenski as stating,

Kerry voters apparently were much more willing to participate in the exit poll than were Bush voters. The interviewers at each of the sample voting locations are instructed to choose voters as they exit from the voting booth -- every third, or fifth, or eighth voter -- some sequence of this sort

that is determined ahead of time. Many voters simply refuse to participate in the poll. If the refusers are disproportionately for one candidate or another, then the poll will be biased....³²

The first problem with this explanation is that the pollsters should make adjustments for voters who were missed or refused to be interviewed, based on their observed age, race and sex (see Appendix A). But, OK, if Bush voters of all stripes disproportionately refuse to participate, that *could* explain exit poll error. The question is whether we have evidence to support this.

It is *conceivable* that Kerry voters were much more willing to participate in the exit poll than were Bush voters, but although we can imagine why some Bush voters might not want to participate, we can similarly imagine why some Kerry voters might not want to participate either.

The problem with this “explanation” or even one that would have considerably more face validity (which means that it makes sense on the face of it), such as the possibility that absentee/early voters disproportionately favored Bush³³, is that it is not an explanation, but rather a hypothesis. It’s *apparent* that “Kerry voters were much more willing to participate in the exit poll than Bush voters” *only given several questionable assumptions*. An explanation would require independent evidence.³⁴

The Role of the Exit Poll

The pollsters have said repeatedly that the purpose of their poll was not to verify the integrity of the election; they were hired by the AP-Network consortium to provide supporting data for election coverage. In the 2004 US presidential election, however, concerns about this exit poll-count discrepancy are compounded by concerns about voting technologies, both new (especially electronic voting machines without paper trails) and old (punch card ballots still widely in use). Allegations about miscount and worse have been lighting up the Internet. In at least two cases, vote count errors have been acknowledged and corrected.³⁵ Additional sources of concern include

32 David W. Moore, Senior Gallup Poll Editor, “Conspiracies Galore,” *Gallup News Service*, November 9, 2004

33 To the best of my knowledge, the pollsters have not offered absentee/early voters as an explanation by anyone from NEP or close to the pollsters, presumably because they were able to predict any disproportionate support based on telephone interviews and patterns from previous elections.

34 I could imagine various types of supportive evidence. One possibility would be verifying sampled results versus actual voting patterns in random sample precincts where counts are unimpeachable.

35 “Glitch gave Bush extra votes in Ohio,” *CNN*, November 5, 2004

mistabulation through “spoilage,” (as we saw in Florida in 2000, large numbers of votes are commonly lost due to imperfections in the voting process), overuse of provisional ballots, and limited access by observers to some vote tallies.³⁶ Verifying the integrity of elections is important not only in Mexico, Venezuela, and former Soviet Union Republics. Whatever the original purpose of this particular exit poll, it could be used to help verify the integrity of this election if its data and methodology could be reviewed by independent investigators.

Summary and Implications

In this report, I have: (1) documented that, in general, exit poll data are sound, (2) demonstrated that it is exceedingly unlikely that the deviations between exit poll predictions and vote tallies in the three critical battleground states could have occurred strictly by chance or random error, and (3) explained why explanations for the discrepancy thus far provided are inadequate.

The unexplained discrepancy leaves us with two broad categories of hypotheses: the exit poll data are wrong (or misleading) in ways that have yet to be documented, or the count is off. The most important investigations concern verification of the tallies and allegations of fraud on one hand; and the exit poll data and methodology on the other. Particularly useful statistical analyses would compare the “shift” in states, counties and precincts where safeguards are strong vs. those where they are suspect, but such analyses require NEP’s raw data.

Given that neither the pollsters nor their media clients have provided solid explanations to the public, suspicion of mistabulation or even fraud is running rampant and unchecked. The fact that so many people suspect misplay undermines not only the legitimacy of the presidency, but faith in the foundations of the democracy.

Systematic fraud or mistabulation is as yet an unfounded conclusion, but the election’s unexplained exit poll discrepancies make it an unavoidable hypothesis, one that is the responsibility of the media, academia, polling agencies, and the public to investigate.

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36 Erica Solvig, “Warren’s [Warren County, Ohio] vote tally walled off.” *Cincinnati Enquirer*, November 5, 2004

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Appendix A: 2000 Voter News Service Exit Poll Methodology³⁷

METHODOLOGY STATEMENT

The VNS exit poll was developed and conducted by Voter News Service. The exit poll results are based on interviews with a probability sample of voters exiting polling places on Election Day, 2002.

Sampling

The samples were selected in two stages. **First**, a probability sample of voting precincts within each state was selected that represents the different geographic areas across the state and the vote by party. Precincts were selected with a probability proportionate to the number of voters in each precinct. Each voter in a state had the same chance to have his or her precinct selected. There is one exception. In some states, precincts that have large minority populations were sampled at a higher rate than other precincts. The sample weighting (described below) adjusts the representation of these precincts to their correct share of the total vote. **Second**, within each precinct, voters were sampled systematically throughout the voting day at a rate that gives all voters in a precinct the same chance of being interviewed.

The National sample is a subsample of the state sample precincts. The probability of selecting these precincts was the same as if the sample had been selected at a uniform rate nationwide, with the exception that minority precincts were again selected at a higher rate.

Weighting

The exit poll results are weighted to reflect the complexity of the sampling design. That is, the weighting takes into account the different probabilities of selecting a precinct and of selecting a voter within each precinct. For example, states that were selected at a higher rate receive a smaller weight than other precincts of the same size. There is also an adjustment for voters who were missed or refused to be interviewed, which is based on their observed age, race and sex.

³⁷ Description and data available at the University of Michigan Survey Research Center and the Roper Center at the University of Connecticut (<http://webapp.icpsr.umich.edu/cocoon/ICPSR-STUDY/03527.xml> or http://www.ropercenter.uconn.edu/usvns2002_2.html)

NOTE: THE EXIT POLL RESULTS ARE ONLY MEANINGFUL IF THEY ARE WEIGHTED. UNWEIGHTED TABULATIONS MAY BE SERIOUSLY MISLEADING AND SHOULD NOT BE USED FOR ANY REASON.

Appendix B: *Slate* Election Day Exit Poll Numbers

Updated Late Afternoon Numbers

Mucho flattering to Kerry; plus Nader makes an appearance.

By Jack Shafer

Updated Tuesday, Nov. 2, 2004, at 4:28 PM PT

Pennsylvania

Kerry 53
Bush 46

Florida

Kerry 51
Bush 49

Ohio

Kerry 51
Bush 49

Iowa

Kerry 50
Bush 49

New Jersey

Kerry 54
Bush 44
Nader 1

Arkansas

Kerry 45
Bush 54
Nader 1

Michigan

Kerry 52
Bush 46
Nader 1

Colorado

Kerry 49
Bush 50
Nader 1

New York

Kerry 62
Bush 36
Nader 2

Missouri

Kerry 47
Bush 52

Wisconsin

Kerry 51
Bush 48
Nader 1

Nevada

Kerry 49
Bush 48
Nader 1

New Hampshire

Kerry 54
Bush 44
Nader 1

West Virginia

Kerry 45
Bush 54
Nader 1

Minnesota

Kerry 52
Bush 46
Nader 2

New Mexico

Kerry 50
Bush 48
Nader 1