Change the Rule

Exhibit II - The study of Dr. Clifford Young, head of U.S. Public Affairs at the polling firm IPSOS, which explains his quantitative analysis demonstrating the bias in the CPD's polling-based rule.

This study shows that an independent candidate would need extremely high name recognition to satisfy the CPD's rule, and that, even if he or she could achieve it, the inaccuracies of polling in a three-way race would often result in his or her exclusion from the debates.

EXPERT REPORT OF DR. CLIFFORD YOUNG

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BACKGROUND

1. I am President of Ipsos' Public Affairs practice in the United States, and also lead Ipsos' global election polling and political risk practice. I have over a decade of experience in public opinion polling and forecasting. I work with a wide variety of corporate, government, media, and political clients, and am the spokesperson for Ipsos Public Affairs in the United States. I also currently oversee Ipsos' U.S. public opinion polling for Thomson Reuters.

2. I earned my BA from the University of Illinois at Urbana-Champaign (Magna Cum Laude, Phi Beta Kappa) and completed my graduate work at the University of Chicago (MA and PhD in Sociology with a concentration in statistics and pubic opinion). I also trained as a survey statistician at the University of Michigan and in political psychology at Stanford. I am an adjunct professor at Johns Hopkins School of Advanced International Studies and an instructor at Columbia University School of International and Public Affairs, where I teach courses on public opinion, reputation management, election polling, and political risk. I have written and presented extensively in the fields of public opinion, election polling, election forecasting, and survey methodology.

3. In my time at Ipsos Public Affairs U.S., I have worked on a variety of projects for federal government, private sector, and global clients including: the U.S. Department of State, Thomson Reuters, Booz Allen Hamilton, Inbev, the National Intelligence Council, the Eurasia Group, and the British Council, among others. Before coming to Ipsos Public Affairs North America, I was Managing Director of Ipsos Public Affairs Brazil where I started the practice for Ipsos and established it as the leading public opinion research firm in Brazil. In this capacity, my primary responsibilities included project and staff management, sample design, questionnaire

design (qualitative and quantitative), data analysis, report writing, sales, client servicing, product and service development, and ensuring the profitability of the company.

4. My expertise includes political and public opinion polling, and I have polled on over 80 elections around the world. The elections I have researched include the 2012 U.S. presidential election, 25 state-level races for the U.S. midterms in 2010; the Nigerian presidential and gubernatorial elections in 2011; the federal and parliamentary elections in Canada in 2011; the Russian presidential elections in 2012; the Egyptian and Kuwaiti parliamentary elections in 2011/2012; the Venezuelan presidential elections in 2012 and 2013; the 2014 Brazilian presidential elections; and the 2014 U.S. mid-term elections. Trained in survey sampling and survey methods design, I have also led more than 100 full public opinion sample designs and post-survey analytics in the following countries: Mexico, Argentina, Bolivia, Peru, Ecuador, Colombia, Venezuela, Chile, South Africa, Russia, India, Indonesia, China, Egypt, Saudi Arabia, Turkey, Palestine, China, Lebanon, United Arab Emirates, Iraq, Afghanistan, Canada, United Kingdom, France, Spain, Italy, Nigeria, Mozambique, Angola, Guinea Bissau, and New Caledonia. I am a frequent writer, analyst, and commentator on elections, communication, and public opinion.

SCOPE OF REPORT

5. The Commission on Presidential Debates ("CPD") sponsors presidential debates held before the general election. The CPD has established three criteria to govern who is included in the debates: 1) the candidate must fulfill the constitutional requirements to be president, 2) the candidate must have ballot access in sufficient states to win a majority of the electoral college, and 3) the candidate must average a vote share of at least 15% in five public polls in September of the presidential election year.

6. I have been tasked with investigating the 15% vote share threshold established by the CPD. This expert report examines two different subjects: First, it addresses the relationship between this 15% vote share threshold and candidate name recognition through an analysis of public polling data from multiple sources over the last twenty-two years. The discussion of that subject begins at paragraph 7. Second, it addresses polling error in three-way races with independent candidates. The discussion of that subject begins at paragraph 33.

CORRELATION BETWEEN NAME RECOGNITION AND VOTE SHARE IN THE ELECTORAL CONTEXT

SUMMARY

7. In opinion research there is an adage, "you have to be known to be liked." The aggregated data shows that this adage holds true in all domains: the public sector, the private sector, and politics. In particular, it holds true for presidential candidates where, generally speaking, vote share is predicated on favorability which is in turn predicated on knowing who a candidate is. Or to put it another way, a candidate is first known, then liked, then supported.

8. In order for a candidate to achieve the CPD's 15% vote share threshold, that candidate must be known by a significant number of people. In layman's terms, the question that this part of the report addresses is what percentage of American voters needs to know who a candidate is before 15% of them are willing to vote for that candidate. In polling, the percentage of people who know a candidate is referred to as name recognition. Another way to phrase the question, then, is what level of name recognition does a candidate need to achieve in order to reach 15% vote share.

9. There is, of course, no uniform answer to this question that holds true across all candidates and all elections. Multiple factors, many of them beyond a candidate's control, influence a candidate's vote share. But that does not mean the answer to this question is entirely unknowable. For a candidate unaffiliated with the two major parties, some level of name recognition is necessary for a candidate to achieve 15% vote share. One would expect that the requisite level of name recognition is higher than 15%, since it is unlikely that 100% of people with knowledge of a candidate would be inclined to vote for that candidate. The question is whether it is possible to estimate, on average, the minimum amount of name recognition such an

unaffiliated candidate would need to achieve in order to expect to be able to claim a 15% vote share.

10. My examination of public opinion trends yields such an estimate. The data show that there is a positive correlation between name recognition and vote share. While multiple factors influence vote share, this correlation enables me to model the relationship between name recognition and vote share. Presidential polling data from the past 22 years demonstrate that on average, an independent candidate must achieve a minimum of 60% name recognition, and likely 80%, in order to obtain 15% vote share.

ACADEMIC AND THEORETIC BASIS

11. This analysis is based on extensive foundational research from the cognitive psychology and attitudinal formation literature. These scientific studies outline the thought process that leads to opinions and behaviors. The fundamental model is that an individual has to know something exists before he/she can hold an opinion about it. Once that recognition is established, an individual can evaluate the subject and form positive or negative associations with it. The individual then is able to form his/her own position toward the subject. With his/her attitude formed, the individual then is equipped to act. (Azjen 1991; Campbell & Keller 2003; Zaller 1992). This attitudinal formation process applies to decisions on voting for presidential candidates: voters first learn of the existence of a candidate, then develop some sort of favorable opinion towards the candidate, and that opinion leads them to vote for that candidate. (Abramowitz 1975; Prior 2007).

DATA SOURCES AND METHODS

12. The public opinion data used in this report is sourced from major public opinion research organizations including Gallup, Reuters/Ipsos, Opinion Research Corporation, Pew Research Center, Bloomberg, Associated Press-GfK, ABC News, NBC News, CBS News and others. These opinion research organizations include most of the major media public opinion pollsters and include many of the organizations relied upon by the CPD. The data was collected from multiple "polling aggregators" including Polling Report, Pollster.com, the Roper Center, and Real Clear Politics which provide central clearinghouses for polling research. The data set is made up of over 800 separate observations – that is 800 instances of poll results measuring both the name recognition and vote share of the same individual candidate – from the 1992, 1996, 2000, 2004, 2008, and 2012 presidential elections.

a. The public opinion data cited in this analysis samples several different portions of the American population. These include **all Americans** (all American adults), **registered voters** (Americans who are registered to vote), **likely voters** (Americans who, based on a variety of criteria, are considered likely to vote in the upcoming election), **Democratic voters** (Americans who identify as Democrats), and **Republican voters** (Americans who identify as Republicans).

b. On name recognition questions, this analysis includes samples of all Americans, registered voters and likely voters.

c. On primary election ballot questions, the sample is almost always either Democratic or Republican voters (depending on the partisan identification of the candidate).

d. General election ballot questions most commonly use samples of registered or likely voters. However, in earlier time periods, samples of all Americans are also present.

13. The public opinion poll data in this report is analyzed using regression analysis. Regression analysis is a statistical analysis technique that allows the user to determine correlation between variables, i.e. to determine if change observed in one variable is related to change seen in another variable. This report uses regression analysis to examine the relationship between our variables: name recognition and vote share. Regression analysis contains four analytic concepts cited in this report, "variables", an "r square", a "regression equation", and "linear vs. non-linear (logarithmic) line fits".

a. Most simply a **variable** is an object of interest, ideally expressed in some sort of mathematic form. In this report poll results for name recognition and vote share are variables. In research, variables are often referred to as "dependent" or "independent". **Independent** variables (also referred to as explanatory variables) represent the inputs or causes in an experiment or model. The **dependent** variable (also referred to as a response variable) represents the output or effect. In this report, name recognition is the independent variable while vote share is the dependent variable.

b. The **r square** is a measure of how well data "fits" together, that is how much of the variation in one variable is explained by observations of another variable. R square (R^2) is measured on a 0 to 1 scale where 1 indicates a perfect fit with 100% of the variance in the dependent variable explained by the independent variable,

and 0 would indicate that there is no correlation between the variables. Thus, the higher the R^2, the more reliably predictive the model is.

c. The **regression equation** is a mathematical expression of the relationship between two variables. It is expressed as "y = bx+e" where y is the dependent variable, x is the independent variable, b is the parameter (how the relationship between independent and dependent is modified) and e is the error term (the average of what is not predicted).

d. Standard regression analysis posits a fixed relationship between the variables being investigated; that is for the entire range of possible responses the change in the independent variable is associated with the same magnitude of change in the dependent variable. This fixed relationship is referred to as a **linear** regression. However, non-linear relationships exist and in many cases provide better explanatory power. A **non-linear** relationship indicates that the magnitude of the relationship between the independent and dependent variables are not fixed across all values and can change in some mathematically derived equation. In a non-linear relationship you have concepts such as "diminishing returns".

14. This analysis is based on understanding the general trends in public opinion data. It is designed to explain the hypothetical "average" presidential candidate. As such it is built from looking at data on many different candidates over many different election cycles and not at any one individual's experience. As with any statistical analysis, it is possible to pick individual cases that may be outliers in the context of this model (like Ross Perot in 1992). However, these cases do not invalidate the macro-level analysis in this report, as this analysis includes that experience and all others in developing the model.

TERMINOLOGY

15. "Public opinion" is a term used to simplify the discussion of the aggregated views and opinions of a particular population. In modern use, public opinion most frequently refers to public opinion polls or samples of the public that are meant to represent the opinion of the entire population. The rest of this report will use the terms public opinion and polls interchangeably to mean these public opinion polls.

16. "Name recognition" refers to the percentage of the population that is aware of a particular individual, organization or event as measured in public opinion polls. Name recognition is most often ascertained through the use of direct questions such as "have you ever heard of any of the following people…". Name recognition is also often extrapolated as part of other questions (such as familiarity or favorability) that have multiple response options where one option includes "I have never heard of this." In this case, the other answer categories are jointly thought of as representing the percentage of people who are aware of the person in question. Both versions of name recognition questions, the direct and the extrapolated, return similar results.

a. The term "familiarity" is often used interchangeably with name recognition. However, in public opinion research, familiarity refers to a specific condition. It is the percentage of the population that both recognizes a subject (i.e. name recognition) and possesses some level of deeper knowledge or understanding about that subject. While familiarity is a useful and important indicator, it is not central to this report.

17. "Favorability" is the measure of the percentage of the population that voices positive opinions about a subject. Favorability is most often measured through the use of a direct

question with a Likert scale (scale with two symmetrical poles) response set. Favorability questions generally resemble the construction, “based on all of your knowledge or experiences, are you generally favorable or unfavorable towards X or do you have no opinion? Is that strongly favorable/unfavorable or somewhat favorable/unfavorable?”

18. “Vote share”, also, frequently called horse race or ballot questions, refers to the percentage of votes a candidate would get in a hypothetical election matchup presented by the poll. Vote share questions are commonly asked like the following, “if the election for president were held today, whom would you vote for candidate X or candidate Y?” Late in the election cycle vote share questions only include the individuals still running for the particular office, often with candidates who have dropped out and perennial or third-party contenders excluded. Earlier in the election cycle, vote share questions are often asked as a series of match-ups using a broad list of actual and potential candidates.

a. Vote share questions are often divided into “general election” and “primary election” ballot questions. **Primary** election ballot questions are restricted to candidates competing within a particular party’s primary election contest, i.e. only the Democrats or Republicans competing for their respective parties’ nomination.

b. **General** election ballot questions are the two-way (occasionally three-way) vote share questions matching the hypothetical or actual final party nominees for the office. Most often this is represented by a single Democratic candidate vs. a single Republican candidate.

19. In public opinion research on political issues, name recognition, familiarity, favorability, and vote share are frequently measured for major candidates for public office – especially for presidential candidates. However, the set of candidates included for measurement

is determined by the individual pollsters so the candidate set can and does frequently change over the course of an election cycle. This analysis aggregates the findings from multiple polls and multiple different pollsters to try to capture the broadest set of candidates possible and minimize the effects of variation in any one poll.

ASSUMPTIONS

20. The opinion formation process for presidential candidates is a very compressed affair. The election campaign season condenses this process into at most two years and often a much shorter time period as candidates are introduced to the public, become familiar figures and ultimately win or lose. The dynamic of the election season introduces a number of complications into the opinion formation process:

a. A successful campaign is predicated on increasing a candidate's name recognition and vote share. As a consequence, candidates generally have stronger name recognition scores later in the election cycle than earlier.

b. Additionally, the main purpose of an election is to narrow a larger field of candidates to a single election winner. This means, on average, that observations from later in the electoral cycle will include fewer candidates as the other candidates have lost elections, run out of money, or ended candidacies for other reasons.

c. Taking "a" and "b" together, the presidential election cycle can be typified into two periods, an **early** period where there are numerous candidates with (widely) divergent levels of name recognition and vote share, and a **late** period where there are few candidates that are mostly well known by the public. In this analysis we are categorizing **early** as before the first caucus in Iowa and **late** as after the

primary elections begin. The dividing line does not neatly coincide with a drop in the number of candidates, as there may still be numerous candidates at the time of the first primary election. But candidates are generally better known by the start of the primaries, and in subsequent weeks and months the number of candidates competing in the primaries typically decreases.

d. The goal of this report is not to proclaim that name recognition is the only factor affecting candidate vote share. Many other factors including fundraising, candidate positioning, election results, and idiosyncratic events also exert influence over the course of the election. However, these other factors can be minimized, to an extent, by looking at the early time period when candidates are just establishing their name recognition. If they "have to be known to be liked," they also have to be known for these other factors to take an effect as well.

21. In American electoral politics there is a strong 'party halo effect' where no matter who the candidates representing the Republican and Democratic parties might be, they garner a minimum vote share in the general election ballot from being associated with a party. This ultimately complicates any analysis because a virtual unknown who runs on the Republican or Democratic ticket can poll a hefty general election vote share, independent of name recognition and timing. This effect can be seen in polls from the early primary period when pollsters test hypothetical general election matchups. These hypothetical matchups can include Democratic and Republican candidates who are not yet well known. For instance, Herman Cain in June 2011 was only known to 48% of Republicans and had a primary election vote share of 7% but had a general election vote share of 34%. Another example is Mike Huckabee in September 2007, who was only known to 50% of Republicans and had a primary vote share of 4%, but his general

election vote share was 36%. Voters will be induced to express a preference for one candidate, even not knowing who he or she is, because he or she is affiliated with one of the two major parties. When included in the data analyzed, this effect tends to lower the name recognition necessary to achieve 15% vote share. Candidates unaffiliated with the major parties (often referred to as "independent" candidates in this report), however, do not benefit from this effect. (Bartels 1988; Prior 2006; Kam & Zechmeister 2013).

22. This 'party halo effect' only occurs in polling of general election matchups. In primary election polling, all the candidates have the same partisan identification and therefore people are not primed to express a preference for a candidate merely by virtue of his or her party affiliation. Accordingly, this party halo effect can be controlled by focusing on primary election matchups.

23. Constructing a model of the relationship between name recognition and vote share calls for some decisions about how to organize the data. Particularly, we must make decisions about looking at data from the **early** vs. **late** time periods, using **primary** vs. **general** election vote share numbers, and if the relationship is **linear** or **non-linear**.

a. An **all elections** model involves looking at all observations across both the early and late time periods and using both the primary and general election vote share questions in a single model. This model allows us to say if the relationship between name recognition and vote share exists even in the face of complicating variables like party effects and fundraising advantages. However this model will not present the clearest view of the relationship between name recognition and vote share because of the other variables.

b. An **all primary** model uses all the primary election vote share questions across both the early and late time periods. This model reduces the effect of party halos in the data and includes the entire time series of observations of primary vote share. However, it contains multiple late election observations where the candidates' name recognition is at or above 90% and exhibits limited variation. As such, these late cases mute some of the relationship between name recognition and vote share.

c. The **early primary** analytical model examines primary election data from the early time period. This approach allows for the clearest view of the relationship between name recognition and vote share. Specifically, it reduces the impact of party halos and provides multiple observations of candidates with significantly varying levels of name recognition and vote share.

FINDINGS

24. The first step of the analysis of attitude formation is examining the relationship between name recognition and vote share. The direct correlation between name recognition and vote share varies based upon the assumptions built into the model. However all models point to a need for significant levels of name recognition – in excess of 60% of the American public – before a vote share of 15% can be reached. Various models are presented below:

25. **All Elections Model** (early and late observations of both primary and general election ballot questions, non-linear): Observations from both presidential election types across all time periods introduce a number of other variables that limit the predictive power of name recognition on its own. In this model the R^2 relationship is 0.41, a moderate to low level of

correlation. Under this model, a candidate would need to have 70% name recognition in order to reach the 15% vote share.

26. While this gives us a "real world" sense of the relationship between name recognition and vote share, because of the inclusion of late and general election observations, it includes a potentially wide variety of un-accounted for variables depicted by the low R^2. These variables include potential areas like partisan effects, the effect of fundraising, the impact of news events and primary election results. This conforms to an intuitive understanding of politics; later in the election the polls focus on two candidates who are universally known among likely voters, and thus changes in vote share are likely to be unrelated to changes in name recognition. A model that more clearly represents the conditions faced by an independent candidate in reaching 15% vote share would remove the effects of partisan halos and is present in the all primary model.

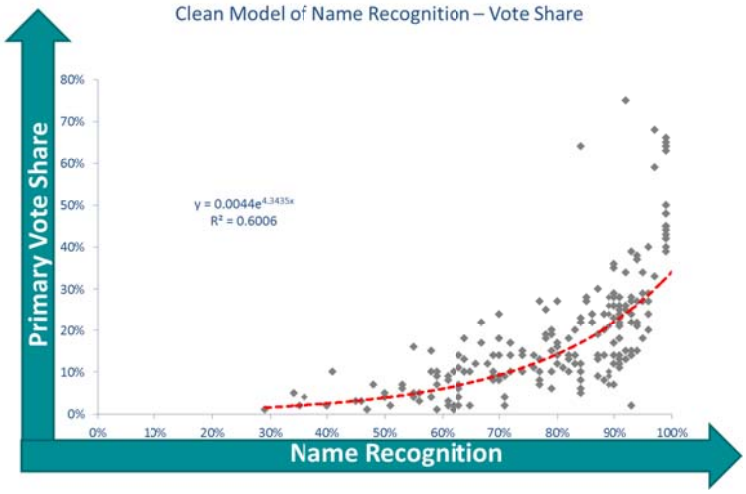
27. **All Primary Model** (early and late observations in primary elections, non-linear): Observations from all time periods of the primary election (before and after the elections begin) show a similar trend to the all election model. However, by removing the general election observations this model minimizes the effects of partisan identification on vote share and has a commensurate increase in predictive power. The all primary model has a R^2 of 0.56, a moderately strong correlation. Under this model, a candidate would need to have 80% name recognition in order to reach the 15% vote share.

28. This model presents a clearer depiction of the conditions that an independent candidate would experience by minimizing the impact of party halo effect in the dataset. However, this model is still encumbered by the effects of the primary elections winnowing down the field of candidates and leaving the best known, highest vote share individuals. The best

simulation of the conditions for an independent presidential candidate would remove the effects of the primary elections by looking at the early time period – before vote share begins to collapse into the single ultimate winner.

29. **Early Primary Model** (primary election data from early time period, non-linear): This model presents a clear picture of the relationship between name recognition and vote share in conditions where partisan effects are minimal, elections have not begun to winnow the field and there is large variation among the range of possible name identification levels. This model suggests that the relationship between name recognition and vote share is non-linear; that name recognition has increasing value as a candidate nears the top of the scale. That is, a candidate has to reach a certain critical mass of recognition before their electoral support really begins to take off.

30. This model predicts about 60% of the variation in vote share (R^2 of 0.6) and suggests that a candidate needs name recognition above 80% to reach a 15% vote share threshold.



31. Further models are listed in Appendix 1.

CONCLUSIONS

32. All things being equal, independent presidential candidates need to be recognized before they have the opportunity to earn votes. The models presented here suggest that in ideal circumstances – ones that might not exist in a typical election – a typical candidate needs to be recognized by at least 80% of the public before he or she can reach a vote share of 15%. Alternate scenarios modify this name recognition intercept but in all cases the typical candidate needs to be recognized by more than 60% of the public before he or she can reach a vote share of 15%.

POLL ERROR IN THREE-WAY RACES WITH INDEPENDENT CANDIDATES

SUMMARY

33. In this section of the report, I ask two central questions. First, is election polling conducted in three-way races more error prone than in two-way races? Second, given a particular level of error, what is the probability of a false negative when a candidate is just above the 15% threshold at the date of the poll?

34. To answer these questions, I will first examine the extant theoretical literature on poll (or survey) error.[1] I then will describe the data and methods employed for the analysis. I finally will examine over 300 observations from 16 competitive three-way gubernatorial races over the past fifteen years. I benchmark my analysis against 40 two-way gubernatorial races and 6 presidential races. I do not focus exclusively on presidential races in this report given the relative lack of polling observations for competitive three-way races.

35. In my analysis, we find that three-way races are more error prone than two-way races and that such error rates are especially onerous for candidates at the cusp of the CPD's 15% threshold. Depending on the specific conditions, the probability of such a candidate being falsely excluded from the debate by the CPD 15% threshold ranges from 37% to 41%.

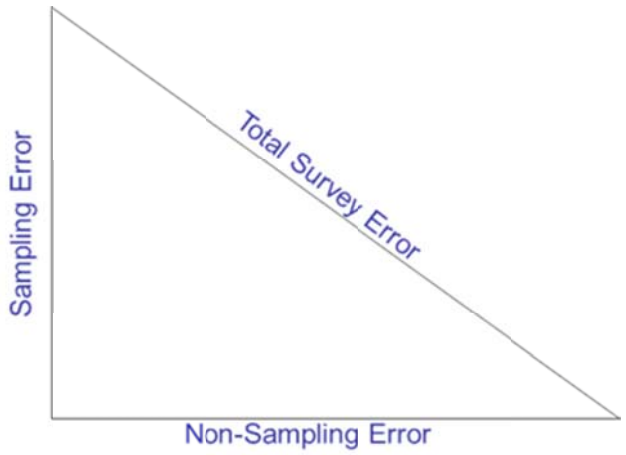
ACADEMIC AND THEORETIC BASIS

36. Opinion research polls are subject to two broad classes of error: 1) sampling error – or margin of error – and 2) non-sampling error. Non-sampling error includes three sub-types: 1) coverage bias, 2) nonresponse bias, and 3) measurement error. (Groves 1989 and Weisberg 2005). Coverage bias occurs when the poll sample is systematically different from the population

[1] Throughout this exhibit, I use poll and survey interchangeably.

of interest. An example would be excluding poor nonwhites from the survey sample or using incorrect assumptions about the makeup of the electorate on Election Day. Nonresponse bias occurs when those people who respond to a poll are systematically different from those who do not. Measurement error includes different families of error ranging from interview bias, to question and questionnaire bias, to issue saliency for the respondent.

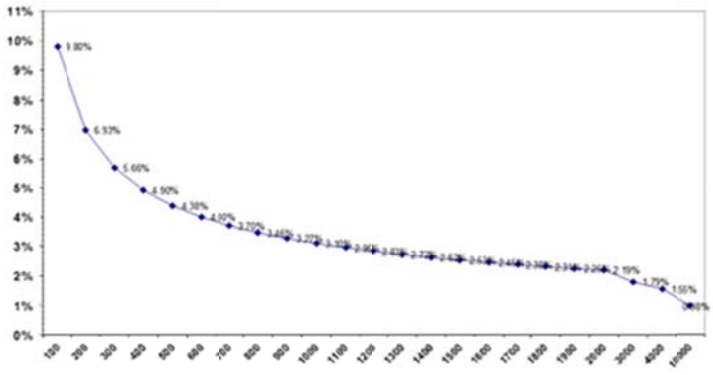
37. These two classes of error – sampling and non-sampling – are typically thought of as orthogonal (or unrelated) and together are referred to as total survey error and depicted by the triangle below. The central focus of pollsters and survey researchers is to minimize such error both at the survey design stage as well as the post-survey stage through weighting and other statistical calibration methods.



38. Sampling error, typically referred to as the margin of error (MOE), is a function of the square root of the sample size. Specifically, a MOE with a 95% confidence interval can be depicted mathematically as the following where "n" is the size of the sample:

$$MoE = \pm \frac{0.98}{\sqrt{n}}$$

39. Perhaps the easiest way to visualize a MOE is showing it in graphical form. Here a sample size of 400 has a margin of error of +/- 4.9%; while one of 10,000 has a MOE of +/- 0.95% (see graph below).



40. The MOE on a poll of 400 can be interpreted in the following way: 95 times out of 100 the population parameter (let's say actual vote share for Obama) is within +/- 4.9% percent of the sample estimate. So, if we have a poll with Obama at 45% vote share, the true population value ranges somewhere between 40.1% and 49.9%. However, one out of twenty times the poll estimate might be completely outside the MOE's range. (Lynn Vavreck, New York Times).

41. To reduce such error, pollsters increase their sample size to the extent possible. This is easier said than done, given the high cost per interview. As such, in the U.S., the simple 'rule of thumb' is that a nationally representative poll should have around 1,000 interviews with a MOE of +/- 3.1%, which is a reasonable cost versus error compromise. For state and local level polling, the industry standard varies from 400 to 800 interviews with a MOE ranging between +/-4.9% to +/- 3.5% given greater cost-sensitivities

42. To gain analytical robustness, many election analysts and forecasters aggregate multiple polls from multiple firms to reduce poll estimate uncertainty (Young 2014; Jackman 2005). In effect, poll aggregation is an approach to minimize the MOE. Nate Silver, among other election forecasters, employed this technique during the U.S. 2012 presidential election to good effect. Given the volume of publically available polls, the standard 3.1% MOE for a typical

1,000 interview poll can be significantly reduced by aggregating it with other polls. Take the last day of the U.S. presidential election as an example. By aggregating all polls on that day, the total sample size comes to over 13,000 interviews with a corresponding MOE of +/-0.9%.

43. Election polling can suffer from all types of non-sampling error. In my experience, election polls are especially vulnerable to coverage bias and specific kinds of measurement error associated with low levels of election salience among voters as well as strategic voting. The empirical evidence and election literature support my opinion. (See Traugott and Wlezien 2008; Blumenthau 2012; Linzer 2013; Jackman 2005). Let me explain each in greater detail:

a. First, the central challenge of any survey researcher is to ensure that the poll sample represents the population of interest, or, in technical terms, to minimize **coverage bias**. This task is especially challenging for the pollster who *a priori* does not know exactly who, or what population, will show up on election day. To minimize such uncertainty, pollsters often employ "likely voter models" to predict the profile of voters who will actually vote (for an overview see Young and Bricker 2013).

b. For the typical U.S. general election, only about 65% of registered voters show up on election day. Those who show up on election day are usually quite different from those who do not.

c. Likely voter models can take on many forms. But most of them predict future behavior based on past behavior. Whether the past behavior metric is taken directly from the survey as a stated behavioral response or from external data sources, such as the Census Bureau Current Population Survey, or voter files,

pollsters use them to predict a given respondent's likelihood to vote based upon said information.

d. Such methods work well in stable political environments but break down when underlying realities change either from an attitudinal or demographic standpoint. Case in point is in the 2012 U.S. presidential elections. The Romney campaign believed that he would win until the final moments. Why? They believed that the 2008 election actually was an aberration and that the electorate would revert back to the *status quo ante*: more white, affluent, and older. The problem with their assumption was that the U.S. electorate had shifted demographically, becoming less white, younger, and poorer.

e. The same can be said in Italy in the 2013 parliamentary elections. The polls as a class got the election wrong because they underestimated voter discontent and, consequently, support for the comedian candidate *Grillo (the Cricket)*. He was, in practice, a 'protest' vote for disillusioned people fed up with the system who also were not habitual voters but who on this occasion came out to vote *en masse*. The polls assumed that the electorate would be the same as in years past. Ultimately likely voter models can and do often break down. This, in turn, can increase ***coverage bias***—where the poll's sample systematically differs from the relevant population—and thereby reduce poll accuracy.

f. Second, election polls especially suffer from two specific types of measurement error: (1) ***election salience*** among voters at the time of the poll and (2) ***strategic voting*** decisions at the time of the vote which are at odds with poll responses.

g. On point one, the research literature and experience show that the farther a poll is out from election day, the more error prone it will be. (Wlezien and Erikson (2007; Holbrooke 1996; Popkin 1994). Many explanations exist, but the most common one relates to ***diminished election salience*** among voters at the time of the poll. Put differently, at the early stages of the electoral cycle, people are not paying attention to the candidates and issues.

h. In this context, a disinterested voter population is also prone to the vagaries of events, e.g. party conventions**,** which have a momentary impact but diminish in effect, over time, as voters forget.

i. Pollsters can measure election saliency in a number of different ways. First, often pollsters employ a simple question, such as 'are you paying attention to the election". They also use candidate familiarity as a proxy for greater (or lesser) voter attention and election saliency. Whatever the measure though, voters typically only start paying particular attention close to election day. In my experience, this window varies from one day to several months before election day depending on the specific circumstances.

j. In sum, polls are more variable when they are conducted at length from election day. The average voter is worried about more relevant "bread and butter" and 'quality of life" issues than politics and elections. And, as such, it is not until quite close to the election that voters begin to pay attention and hence their responses are more considered and polls more accurate.

k. Multi-candidate races have an added element of complication because voters often engage in what political scientists call ***strategic voting***. (See Abramson et al.

1992; Burden 2005; Cox 1998; Riker 1976; Schaffner et. al. 2001). Strategic voting can take on two forms. First, voters might initially state a preference for a third-party or unaffiliated candidate but, on election day, go with a candidate that has a higher probability of victory. In this case, the poll would overstate the outsider or third-party and unaffiliated candidate vote share. Alternatively, voters might actually opt for a candidate at the time of voting for no other reason than to 'send a message' as a protest vote. The two forms of measurement error cited above can and do increase poll error as it relates to the final vote tally.

DATA SOURCES AND METHODS

44. Returning to the two research questions, is election opinion polling conducted in three-way races more error prone than in two-way races? And with a particular level of error, what is the probability of a false negative where a candidate just above the 15% threshold would be excluded from the debates?

45. To answer my two questions, I use data sourced from public opinion research organizations. This includes data from 95 firms, over 1,000 polls and approximately 2,500 observations.

a. This includes polling firms such as CNN, USA Today, Ipsos, SurveyUSA, Field Poll, Gallup, Braun Research, Field Research Corp., Public Policy Polling, Quinnipiac, and state-level university and newspaper polls including, Brown University, Southeastern Louisiana University, Minnesota Public Radio, Los Angeles Times, Portland Tribune, Suffolk University, and others. These opinion research organization include most of the major media public opinion pollsters and include many of the same organizations relied upon by the CPD.

b. The data set includes observations from gubernatorial elections both with and without prominent third party candidates or unaffiliated candidates in over 40 states between 1998 and 2013.

c. The data comes from multiple "polling aggregators" including Polling Report, Pollster.com, U.S. Election Atlas, and Real Clear Politics, which provide central clearinghouses for polling research.

46. To analyze error in election polling, I employ an often used and widely-accepted measure of poll accuracy or error, known as the Average Absolute Difference (AAD). (Mitofsky, 1998).

47. The AAD is a simple difference measure which takes (1) the absolute difference between the actual results on election day for a given candidate minus the polled vote share for that same candidate and then (2) takes the average of each absolute candidate difference.

48. An example would be a simple two-way race. To demonstrate the logic, I include two scenarios: scenario 1 with an AAD of zero (0) and scenario 2 with an AAD of 2.

	Actual Election	Poll Result	AAD	Poll Result	AAD
Candidate A	45%	45%	0	47%	|-2|
Candidate B	55%	55%	0	53%	|+2|
Total	100%	100%	0	100%	2

49. The AAD can also be depicted mathematically as:

$$\mathrm{ADD} = \left(\sum \left| AR_i - PR_i \right|\right) / c$$

where AR is the actual election result for candidate i; PR is the poll result for candidate i ; and c is the number of candidates in a given race.

50. The AAD can be looked at as a measure that combines sampling and non-sampling error. Here pollsters will typically evaluate whether the AAD for their given poll falls

within the MOE of the poll. An AAD equal to the MOE of a poll can be thought of as having no, or minimal, non-sampling error. Alternatively, pollsters typically treat a poll with an AAD larger than the MOE as one having some form of non-sampling error.

51. Additionally, forecasters who are aggregating polls will assess whether their estimate falls within AAD of the aggregated sample size. Again, the market will assess an AAD smaller or equal to the MOE positively, and an AAD larger than the MOE negatively. At its core, the polling profession understands that MOE is a function of sample size (n) and hence cost constraints, while non-sampling error can and should be minimized via best practices and optimal pre- and post-survey design.

FINDINGS: AVERAGE ABSOLUTE DIFFERENCE

52. To assess the error in two-way versus three-way races, I employ the AAD in gubernatorial races given the relative paucity of three-way races at the presidential level

53. I find that, in two-way gubernatorial races, the AAD increases the more distant from election day the poll is conducted (see table 1 below). Specifically, the analysis shows that the AAD one week out is 3.58% – approximately equivalent to the MOE for a "gold standard" survey sample of 1000 (3.1%). In contrast, the AAD is 9% a year out from the election. Two months before election day – the approximate period when the CPD is reviewing polling – the AAD for two-way races is 5.5%.

54. Again, comparing AAD and MOE gives a 'rule of thumb" indication of the presence and effect of non-sampling error. At one week before the election, the AAD is minimal and estimates show little potential non-sampling error (3.58% versus 3.1%). However, at two months out, the AAD is larger than the MOE, suggesting problems with non-sampling error.

Table 1: Average Absolute Error in Two-Way Races

Time before election	Two-way gubernatorial races	
	Average absolute difference	Average margin of error
One week	3.58%	3.1%
One month	4.02%	3.1%
Two months	5.54%	3.1%
Three months	6.89%	3.1%
Six months	7.48%	3.1%
Nine months	8.26%	3.1%
Twelve months	9.06%	3.1%

55. We find the same pattern when examining three-way races. That said, the AAD is, on average, larger than that of two-way races. Indeed, the typical three-way gubernatorial race has an average AAD of 5% a week before the election and over 8% two months prior to election day.

56. Again, when compared to the MOE, even at one week, the AAD suggests significant non-sampling error (5.06% versus 3.1%). And at three months out, the AAD is much larger than a MOE of a "gold standard" 1000 interview survey (8.04% versus 3.1%).

Table 2: Average Absolute Difference in Three-way Races

Time before election	Three-way gubernatorial races	
	Average absolute difference	Average margin of error
One week	5.06%	3.1%
One month	6.65%	3.1%
Two months	8.04%	3.1%
Three months	9.10%	3.1%
Six months	9.23%	3.1%
Nine months	11.35%	3.1%
Twelve months	13.89%	3.1%

57. Here it is worth noting that gubernatorial races are more error prone than presidential races (see table 3 below). On average, the AAD for two-way gubernatorial races is 2 percentage points higher than that of presidential races. This could be a function of smaller sample sizes or greater non-sampling error. The table below compares the gubernatorial AAD with presidential-level AAD at one week, three months and one year.

Table 3: AAD for Presidential and Gubernatorial Races

Time before election	Average Absolute Difference			
	Presidential races	Two-way gubernatorial	Three-way gubernatorial	"Adjusted" three-way
One week	1.7%	3.58%	5.06%	3.06%
Three months	4.8%	6.89%	9.10%	7.10%
Twelve months	7.9%	9.06%	13.89%	11.89%

58. In our sensitivity analysis below I include a two-month AAD for a three-way gubernatorial race (8.04%) as well as an "adjusted" two-month three-way gubernatorial race AAD (6.04%) to simulate conditions that might be encountered in three-way presidential polling.

FINDINGS: POWER ANALYSIS

59. Is an AAD of 6% or 8% large or small? Here I argue that it truly depends on what you are measuring. If the CPD 15% rule is being applied to a typical two-party candidate who has a vote share in the 40's, then probably such an AAD does not matter. However, for a candidate at the cusp of the 15% threshold, then such error rates can produce undesirable rates of 'false negatives' (incorrectly excluding candidates that should have qualified). This is especially worrisome given that the inherent advantages of the two-party system means that any independent candidate is more likely to be at or near the 15% mark than either major party candidate.

60. The central question is: is the 'ruler' being applied precise enough to correctly identify those independent candidates?

61. To answer this question, I employ 'statistical power analysis'. Statistical power analysis is a widely-used technique employed in hypothesis testing. It can be thought of conceptually as:

62. Power = P (Reject Null Hypothesis | the Null Hypothesis is False) where P means probability; and | means 'given'

63. Specifically, statistical power analysis can be thought of as the ability to detect an effect, if the effect actually exists, of falsely accepting the null hypothesis when it is false. Put differently, statistical power analysis assesses the probability that a type II error (false negative) will occur. The greater the power, the less likely it is to accept a false negative.

64. I base my statistical power analysis on the actual AAD rates for 1,400 polls which includes observations of presidential, two-way and three-way gubernatorial races.

65. I develop a statistical power analysis simulator that allows us to assess the probability of a 'false negative' under different conditions. Specifically, I examine a hypothetical major-party candidate with an actual vote share of 42% versus a hypothetical independent candidate at 17%. For the purpose of this model, the actual vote share does not necessarily mean the vote share as polled – the point of the model is to assess the likelihood of the poll accurately measuring the actual vote share. I also look at different AAD rates which include: a three-way race three months out (9%) and two months out (8%) as well as adjusted AAD rates for two and three months out (6% and 7%).

66. In this hypothetical, the chances of the major party candidate at 42% vote share experiencing a false negative result in polling is only 0.04% (or .001% adjusted) two months out, whereas the independent candidate at 17% will falsely poll below the CPD threshold 40.2% of the time (or 37% adjusted) two months out.

Table 4: False Negative Rates for Independent Candidates

	Vote share	3 months out	2 months out	3 months out Adjusted	2 months out Adjusted
(AAD rate)	--	*(9.10%)*	*(8.04%)*	*(7.10%)*	*(6.04%)*
		False Negative Rate		**False Negative Rate**	
Major party candidate	42%	**0.2%**	**0.04%**	**0.01%**	**0.001%**
Independent candidate	17%	**41.3%**	**40.2%**	**38.9%**	**37%**

67. Or consider a few example of actual candidates. Tom Horner was polling at 18% in September of the 2010 Minnesota gubernatorial election. At that point in time he had a 31% chance of a false negative result barring him from participating in debates applying a 15% threshold for admission.

68. In the 1998 Minnesota Gubernatorial Election, independent candidate Jesse Ventura was only polling at a 15% vote share one months prior to the election – indicating that he had an approximately 50% chance that the five polls the CPD would use would result in him being barred from the debates. However, Ventura ended up winning the election with 37% of the vote.

CONCLUSIONS

69. Opinion polling includes many sources of error that can impact the accuracy of poll, including sampling and non-sampling error. Non-sampling error is of special concern in election polling because it can lead to inaccurate polls when comparing them to the actual vote. While varied, election polling can especially suffer from two types of non-sampling error: coverage bias and measurement error (election salience and strategic voting).

70. The average absolute difference (AAD) is a widely-used measure of error in election polls and can be used as a proxy for assessing error (non-sampling error) above and beyond the MOE (sampling error).

71. In my analysis, I find that three-way races are more error prone than two-way races. Such error rates are especially onerous for candidates at the cusp of the CPD's 15% threshold. Indeed, depending on the specific conditions, the probability of being falsely excluded from the debate by the CPD's 15% rule for a hypothetical independent candidate at 17% ranges from 37% to 41%.

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September 5, 2014

Dr. Clifford Young

APPENDIX 1

ALTERNATIVE MODELS OF NAME RECOGNITION

a. Model: the type of regression model fit. Linear is a straight line, log-linear is a non-linear line based on an exponential relationship and log-log is a non-linear relationship based on exponential values on both variables.
b. Dependent Variable: The response variable. Either primary vote share or both primary and general election vote share.
c. Independent Variable: The explanatory variable. Name recognition in all conditions.
d. Stage in Election Cycle: The time period included. Total is all observations, early primary is before the primary elections begin, late primary is after the elections begin but before the general election.
e. Df: Degrees of freedom. The amount of variability included in the model.
f. R^2: The predictive power of the model. The scale is from 0 to 1 with 1 indicating a completely predictive relationship.
g. Constant: The value of the independent variable when the dependent variable equals "0".
h. B1 (Name Recog.): The mathmatic relationship between the independent and dependent variables.
i. Name Rec to hit 15%: The value of the independent variable when the dependent variable equalts 15%.

Model	Dependent Variable	Independent Variables	Stage in Election Cycle	df	R^2	Constant	B1 (Name Recog.)		Name Rec to hit 15%
Linear	Primary Vote Share	Name Recognition	Total	286	0.438	-37.44	0.733	*	71.5%
Linear	Primary Vote Share	Name Recognition	Early Primary	215	0.457	-30.274	0.627	*	72.2%
Linear	Primary Vote Share	Name Recognition	Late Primary	70	0.235	-84.186	1.289	*	76.9%
Log-linear	Primary Vote Share	Name Recognition	Total	286	0.557	-0.887	0.045	*	79.9%
log-linear	Primary Vote Share	Name Recognition	Early Primary	215	0.601	-0.812	0.043	*	81.9%
log-linear	Primary Vote Share	Name Recognition	Late Primary	70	0.134	-0.584	0.042	*	78.4%
log-log	Primary Vote Share	Name Recognition	Total	286	0.533	-10.564	3.045	*	78.2%
log-log	Primary Vote Share	Name Recognition	Early Primary	215	0.574	-9.963	2.897	*	79.3%
log-log	Primary Vote Share	Name Recognition	Late Primary	70	0.123	-12.551	3.512	*	77.1%
Linear	General & Primary	Name Recognition	Total	580	0.365	-26.928	0.694	*	60.4%
Linear	General & Primary	Name Recognition	Early Primary	368	0.344	-23.896	0.644	*	60.4%
log-linear	General & Primary	Name Recognition	Total	580	0.412	0.118	0.037	*	70%
log-linear	General & Primary	Name Recognition	Early Primary	368	0.419	0.021	0.037	*	72.4%
log-log	General & Primary	Name Recognition	Total	580	0.409	-8.419	2.633	*	68.4%
log-log	General & Primary	Name Recognition	Early Primary	368	0.417	-8.425	2.625	*	69.5%

APPENDIX 2

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