Report of the WAPOR Committee Reviewing the Pre-election Polls in the 2017 Presidential Election in Chile

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Introduction

The goal of this special report is to examine the performance of opinion polls in the Chilean presidential election of November 19, 2017. In the first round election, all the pre-election polls overestimated the vote share of the winner, Sebastian Piñera and significantly underestimated the vote share of the candidate who finished in third place, Beatriz Sánchez, generating a lot of controversy about the polls. The candidate who finished in second place, Alejandro Guillier, was well estimated. The performance of the polls in this case, as in many other elections elsewhere in the world, had an impact in the overall credibility of the polling profession and polling data in Chile, as reported below. It is therefore important to understand not only the various reasons why polls may get it wrong in a particular election but also what we might learn about the general conduct of polls and how they are reported that could improve their conduct and use in the future.

The World Association for Public Opinion Research (WAPOR) was asked by some of its members in the region to set up a special committee to document the record of the polls that were published, offer information about polls that were not published but were shared with the WAPOR special committee by some polling firms as a resource to find explanations for possible biases, and provide an in-depth discussion of various sources of error that may have contributed to misestimates in the polling. Those sources include both methodological aspects of the polls, as well as legal and contextual aspects of their publication, such as recent changes in election laws regarding compulsory and voluntary registration and voting as well as the enactment of a 15-day ban on the publication of polls before Election Day.

Polls and Elections

Public opinion polls are widely recognized as an essential element of democratic societies.[1,2] When properly conducted, they provide the public with invaluable insights into the general way in which a democracy is functioning, how the campaign is affecting groups of voters, and which issues and policies the public wants the candidates to address. Polls can do this in a manner that is otherwise unavailable. Public opinion research additionally plays a critical role in evaluating

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[1] Price, V. (2008). The public and public opinion in political theories. Pp. 11-24 in Donsbach & Traugott (Eds.) *The SAGE Handbook of Public Opinion Research*. Los Angeles: Sage.
[2] Herbst, S. (1993). *Numbered Voices*. University of Chicago Press: Chicago.

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the performance of elected governments and officials, and polls are closely followed by citizens, particularly in advance of national elections.

In recognition of the importance and potential impact of opinion polling on the public it serves, scholars have proposed several theories of the possible effects of reporting public opinion findings in advance of elections on the electoral outcomes themselves. Some of these include the *Bandwagon Effect*,[3] which proposes that some voters will be drawn to the candidates seen to be leading in pre-election surveys, and the *Underdog Effect*,[4] which suggests that some will be drawn to support those candidates who are behind in pre-election surveys out of compassion for the losers. Another established explanation derived from the *Spiral of Silence* theory,[5] suggests that public opinion findings discourage persons holding minority opinions from revealing them publicly. It has also been suggested that dissemination of public opinion polls may demotivate some from participating in elections.[6] Finally, some have also proposed that electoral polls are used by interested citizens to cast a strategic vote for someone other than their preferred candidate in order "not to lose their vote." [7] This type of voting behavior is said to occur when there is more than one candidate close to the citizen's views and/or when a voter determines it is more important to make sure that a given candidate will not be elected than to have his/her preferred candidate win. Empirical evidence regarding these and other theories remains mixed and inconclusive.[8]

Concern with these potential effects has encouraged some governments to institute restrictions on the conduct and/or reporting of public opinion research close to an election.[9] WAPOR is formally opposed to such restrictions for a number of reasons. Among them, such bans restrict the distribution of scientific information. These restrictions prevent an accurate assessment of the performance of the polls and therefore an improvement of electoral polling. In addition, citizens would not have access to information about what other citizens think. Furthermore, there is unequal access to information since some groups like the political parties and various

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[3] Van der Meer, T.; Hakhverdian, A. & Aaldering, L. (2016). Off the fence, onto the bandwagon? A large-scale survey experiment on the effect of real-life poll outcomes on voting intention. *International Journal of Public Opinion Research* 28(1): 46-72.

[4] Mutz, D. (1988). *Impersonal influence: How perceptions of mass collectives affect political attitudes*. Cambridge University Press.

[5] Noelle-Neumann, E. (1993). *The Spiral of Silence, Second Edition*. University of Chicago Press.

[6] Vowles, J. (2002). Did polls influence the vote? A case study of the 1999 New Zealand general election*. Political Science* 54(1): 67-78.

[7] Blais, A.; Gidengil, E. & Nevitte, N. (2006). Do polls influence the vote? PP. 263-279 in Brady & Johnston (Eds.) *Capturing Campaign Effects*. University of Michigan Press.
Fisher, Stephen D. (2004). Definition and Measurement of Tactical Voting: The Role of Rational Choice, British Journal of Political Science 34(1): 152-166.

[8] Hardmeier, S. (2008). The effects of published polls on citizens. Pp. 504-513 in Donsbach & Traugott (Eds.) *The SAGE Handbook of Public Opinion Research*. Los Angeles: Sage.

[9] Chang, R. (2012). The Freedom to publish opinion poll results. A worldwide update of 2012. Available at https://wapor.org/wp-content/uploads/WAPOR_FTP_2012.pdf

organisations may still conduct polls and have access to this information but not make it public.

Of course, public opinion polls are not perfect. Although there are many well-done, very high quality polls, there are also many potential sources of error that researchers must recognize and attempt to address in their data collection and analysis. Some common sources of error include non-random sampling of respondents, inadequate coverage of the population of interest, the use of poorly worded questions, and the unwillingness of the public to participate in surveys, which produces low response rates. Different public opinion surveys - and different public opinion pollsters - employ a variety of strategies to address and minimize these different sources of error and bias, with varying success.

Because of variability in the specific methods employed to conduct public opinion research and their potential effects on the quality and accuracy of findings, transparency in both the conduct and reporting of poll results is important. In recognition of this, WAPOR has established a set of professional standards for the conduct[10] and reporting[11] of polls, and it also adheres to the Transparency Initiative of the American Association for Public Opinion Research (AAPOR).

The Presidential Election of 2013, a prelude to 2017

While pre-election polls have been conducted in Chile for 60 years, their record of accuracy has been mixed. In the early years, many pollsters only conducted interviews in Santiago and/or Valparaiso and Concepción, representing the views of about one-third of the population; the views of citizens living in rural areas of the country were absent from reports. After a missing decade in the 1970's during the Allende regime when they were outlawed, political polls reappeared in the late 1980's in advance of the plebiscite regarding the Pinochet presidency. Many firms appeared to be aligned with specific parties and/or candidates, and allegations of ethical issues and conflicts of interest became common, especially when estimation errors occurred. As a result, public suspicion of polls increased. Some polling firms switched from face-to-face to computer assisted telephone interviewing (CATI) even as the penetration of landline telephones in the Chilean population remained below 70%. The cell phone penetration in the population now exceeds 100%. However, it is only recently that cell phones were included in the samples.

In addition to these political and technological issues, the electoral system in Chile has undergone a number of reforms in the past decade, and this has complicated the

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[10] ESOMAR (n.d.) ESOMAR and WAPOR key requirement for opinion polls and published survey. Available at https://www.esomar.org/uploads/public/knowledge-and-standards/codes-and-guidelines/ESOMAR_WAPOR-Key-Requirements-for-Opinion-Polls-and-Published-Surveys.pdf
[11] WAPOR (n.d.). Code of ethics. Retrieved from https://wapor.org/about-wapor/code-of-ethics/

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work of pollsters who conduct pre-election polls. Before 2012 voting was compulsory for Chilean citizens who decided to register to vote. In the 2013 election for the first time, the electoral system was changed so that registration became mandatory and voting became voluntary. As illustrated in the graph below, even before 2013, turnout as a percentage of those registered was declining but remained very high. However, turnout as a percentage of the voting age population had declined by almost one-third. This change necessitated the development of "likely voter" models, complicating the task of pre-election pollsters and introducing estimation errors in conjunction with the 2017 election.

Given the shift in the voting system on top of these historical issues of mode and geographical coverage, it is not surprising that the pre-election polls in Chile had estimation issues during the 2013 presidential election. That election was also the first time that regional council members were directly elected.

With the new voting system, turnout was expected to drop, and it did by significant amounts, as shown in Figure 1. It was not clear from the pre-election polls that Michelle Bachelet, the Socialist candidate, could win in the first round, and she didn't. But her steady lead in the polls in the first round resulted in a shift in news coverage and emphasis on the legislative elections. In the first round, she had a 20-percentage point lead which translated to an advantage of almost 1.5 million votes, although she generally outperformed the estimates provided by the pre-election polls. The results also suggested that some citizens abandoned some of the second tier candidates in favor of Evelyn Matthei. In the second round of presidential voting, Bachelet received the highest proportion and lowest number of votes of any winning presidential candidate in recent elections, including her own previous victory in 2005.

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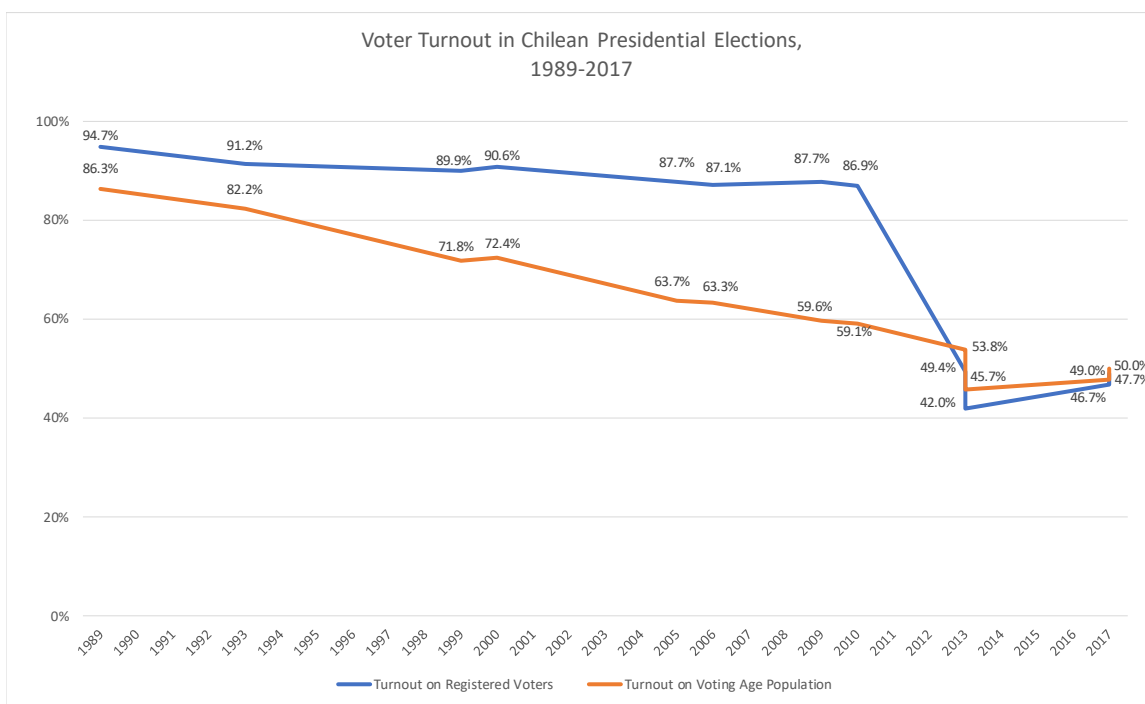
Figure 1

Figure 1. Electoral Turnout in Chile, Voting Age population, 1989 to 2017

Limited pre-runoff polling suggested an easy win for Bachelet, and turnout remained low. Under these conditions, the number of pre-election polls conducted before the second round dropped compared to past elections. The pollsters had to develop new turnout models in the face of factors like the expected decline in participation arising from the new administrative procedures, the large margin Bachelet had in the first round of voting, and the results of the pre-election polls before the second round. This implied that the pollsters' likely voter modeling had to be revised as well because it was likely that the composition of the electorate would change in relation to the characteristics of the general population and previous runoff elections.

There was a transition to a different mode of interviewing as well. Two firms began conducting interviews on the telephone instead of face-to-face as the others did; these firms produced relatively small margins for Bachelet in the first round. Only one conducted a pre-election poll in the second round on the phone, and it overestimated Bachelet's margin. The 2013 results are another reason for reexamination of polling methodology in Chile.

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The Pre-election Polls in the 2017 Election in Chile

In Chile, elections for all major offices -- presidential, senatorial, parliamentary and regional -- are held every four years on the same day. In 2017, 23 of the 43 members of the Senate[12] were elected for eight-year terms, as well as all of the 155 members of the Chamber of Deputies and all 278 members of the regional boards for four-year terms. The Chile Vamos (Chile, let's go) party held a presidential primary in which Sebastián Piñera, a former president, was the winner; and the Frente Amplio (The Broad Front) held a primary in which Beatriz Sánchez was the winner. Alejandro Guillier was chosen by the central committee of his party, the Nueva Mayoria (The New Majority), to be its candidate. There were five other candidates on the ballot; none of them received more than 8% of the vote.

The presidential election system in Chile allows for runoffs so that the winner will receive a majority of the votes in either the first or second rounds. In the 2017 election, a total of 6.6 million valid votes were cast in the first round on November 19, along with another 100,003 null or blank ballots. Piñera received 36.6% of the vote, Guillier, 22.7% of the vote, and Sánchez, 20.3% of the vote, 162,000 votes behind Guillier. A total of 2.84 million votes were cast between the second and third place finishers. In the second round conducted on December 17, Piñera received 3.8 million votes (54.6% of the total) while Guillier received 3.2 million votes (45.4% of the total vote). There were also about 75,000 null or blank ballots cast.

The polling during the campaign for the first round suggested that Piñera would win but with a larger share of the vote than he received, although not enough to stave off a second round campaign. It also suggested that Guillier would finish second, ahead of Sánchez but by a larger margin than he did. As we will show in more detail below, the overestimation of support for Piñera and underestimation of Sánchez's support by most pollsters from the beginning of the campaign was considered a major polling miss and triggered strong reactions.

There were five types of reactions to the polls. First, there was speculation regarding the possible consequences of the failure. Second, there were reactions attributing the polls' poor estimates to claims about the presumed political affiliation of some pollsters. Third, there were reactions comparing the Chilean polling miss to recent polling misses in other countries and referring to the usual explanations in terms of the influence of polls: the bandwagon, underdog, and "spiral of silence" effects. Fourth, there were reactions attributing the miss to recent changes in the electoral law in Chile regarding registration and mandatory voting

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[12] Presidential elections have taken place periodically since 1989: every six years between 1993 and 2006 and every four since 2006. Chile has a Congress divided into two chambers, a Senate and a Chamber of Deputies. Senators serve for eight years and Deputies for four. All adult citizens of Chile 18 years of age and older on Election Day as well as foreigners residing legally in Chile for at least five years are eligible to vote. Since 2014 Chileans have been allowed to vote overseas in presidential elections (including primaries) and referendums.

and the new ban on polls for the last two weeks of the campaign. Finally, some pointed to methodological and technical reasons, mostly to biased samples. We address these "explanations" one at a time below.

The Polling Firms in the 2017 Election

Five polling firms conducted polls in the three months preceding the first round election held on November 17.[13] However, only two of them – CADEM and Criteria -- conducted polls during the last month before the first-round election, held on November 23, and one – the Centro de Estudios Públicos (CEP), the month before. We briefly describe the background of the five firms.

The CADEM research institute (https://www.cadem.cl/) has been operating in Chile for 43 years. It offers both qualitative and quantitative research services. It does confidential work for clients and conducts public polls for wide dissemination. Its electoral polls combine two modes of administration, i.e. CATI among landlines and cell phones and intercept surveys in fixed points in different cities. During the 2017 election campaign, it conducted 15 polls, i.e. one poll every week from the beginning of August to 15 days before the election. The firm also conducted two polls during the two last weeks when there was an embargo. The results of these polls were published after the election.

The Centro de Estudios Públicos (CEP) (https://www.cepchile.cl/) is a private, nonpartisan and nonprofit academic foundation which started its polling program in 1987. CEP designs its own polls, including the sample design, weighting, and the likely voter model. It has contracted with a variety of firms for its field work, and in 2017 it contracted with CADEM, for that service. Its main survey programs are conducted with face-to-face interviews in respondents' homes. It has published a report of its pre-election poll methodology, including the details of its likely voter model (Gonzalez & McKenna 2017) and a review of that work (Marshall 2018). During the 2017 election campaign, the CEP conducted two polls, one from July 21 to August 17 and one closer to the election, from September 22 to October 16. They are the only polling operation to make their data generally available to the public.

CERC-MORI, founded in 1994, is a partner of MORI UK and Ipsos (http://morichile.cl/). MORI (Chile) S.A. is a market and opinion research company doing research in all areas: quantitative, qualitative, and cognitive interviewing. It has specialized in reporting to CEO´s and boards of corporations on industry evolution and

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[13] A poll was conducted at the end of September by the Universidad del Desarrollo (UDD) and reported in *El Mercurio* on October 1st. It was not evaluated for this report because it only covered three regions. It covered Santiago using SMS to contact respondents from its panel and conducted face to face polls in Region V (Valparaiso) and VIII (Concepción). It also conducted weekly SMS polls with typically three or fewer questions per week in Santiago only. See http://www.panelciudadano.cl/#metodologia for additional details.

corporate social responsibility as well as corporate image. MORI (Chile) S.A. has five monitoring instruments on different aspects of the evolution of Chilean society such as Education, Health, Politics and Democracy and Mining. Mori conducted one poll, early in the campaign, fielded from September 1 to 12.

Criteria Research (https://www.criteria.cl/), founded in 2002, can conduct surveys in a variety of modes but is increasingly relying on an Internet panel, which they recruited themselves. During the 2017 election campaign, it conducted two WEB polls, one from August 11 to 18, one from October 20 to 25.

GFK Adimark has been conducting polls in Chile for more than 40 years, and in 2005, it became a member of the GfK Group, which operates in more than 100 countries (https://www.adimark.cl/). The firm conducts both qualitative and quantitative studies, including surveys in a variety of modes and with an internet panel. They do confidential work for clients and public work that includes monthly measurement of consumer confidence in Chile and surveys on the popularity of soccer teams across the country. During the 2017 election campaign, they conducted only one poll, fielded from August 3 to August 29, using CATI. However, the question asked in that poll was not a vote intention question per se; it asked who the respondent would *prefer* to have as the next president.

The polls conducted by GfK-Adimark and by the CEP were all initially published in *El Mercurio*, while the polls conducted by MORI and Criteria were published in *El Mostrador*. The results from CADEM were presented initially on the television network *Canal 13.* All of the poll results received generally wide coverage after their initial release.

Public and Media Reactions to the Polling Miss

The polling miss in the 2017 presidential election in Chile was met with incredulity and some anger. Days, even hours, after the election, a number of articles were published in four daily newspapers– *La Tercera*, *El Mercurio*, *El Mostrador* and *The Santiago Times*. Overall, 12 articles were published with titles like the "Polls failed again,"[14] "When the polls don't know and don't answer,"[15] and "The polls sink and score mistakes."[16] Only a few articles came to the defense of pollsters, notably with

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[14] Otra vez fallaron las encuestas: Los errados pronósticos electorales en las presidenciales. (2017, November 19). *El Mercurio*. Available at http://www.emol.com/noticias/Nacional/2017/11/19/884000/Otra-vez-fallaron-las-encuestas-Los-fallidos-pronosticos-electorales.html.

[15] Jaque, J. M. and Córdova, M. (2017, November 24). Cuando las encuestas no saben ni responden. *La Tercera*. Available at http://www.latercera.com/noticia/cuando-las-encuestas-no-saben-responden/.

[16] Tapia, A. and Fuentes, F. (2017, November 19). Encuestas naufragan y anotan sendos errores en estimación presidencial. *La Tercera*. Available at http://www.latercera.com/noticia/encuestas-naufragan-anotan-sendos-errores-estimacion-presidencial/.

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pieces in *El Mostrador*,[17] and in *The Santiago Times*.[18] Perhaps the harshest criticism of all came from Presidential candidate Beatriz Sánchez, whose likely voter estimates in the last preelection polls put her at 14 percent although she ultimately received 20 percent. "I want an explanation tomorrow," she said, claiming that perhaps if the polls had been truthful she could have been in the runoff election.[19]

The speculation about the possible consequences of the underestimation of Sánchez and the overestimation of Piñera were probably the most vocal reactions in the hours following the publication of the election results in the first round. This reaction came spontaneously from Beatriz Sánchez herself and was echoed in the media and sometimes supported by others.[20] In summary, some speculated that if the polls had shown that support for Sánchez was close to support for Guillier and that she could conceivably make it to the second round, she would have probably gathered more votes. Others suggest that Guillier would not have been considered a serious candidate if the polls had not shown him second from the beginning of the election cycle in September 2016.[21] In short, according to some, the polls made up a story where Piñera was obviously first, Guillier second and Sánchez – and the others – far behind. This story was widely spread by the media, therefore harming Sánchez's chances.[22]

Following on this story, some attributed the bad estimates from CEP and CADEM to the presumed political affiliation of the two organizations.[23] The claims published in *El Mostrador* were directed at the CEP president, but they are disputed by the

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[17] Valdés, C. and Fernández W. (2017, November 26). Las encuestas sí son creíbles. *El Mostrador*. Available at http://www.elmostrador.cl/noticias/opinion/2017/11/26/las-encuestas-si-son-creibles/.

[18] Cocker, I. (2017, December 5). Election fraud or just inaccurate: the problem with political polling. *The Santiago Times*. Available at http://santiagotimes.cl/2017/12/05/election-fraud-or-just-inaccurate-the-problem-with-political-polling/.

[19] Beatriz Sánchez criticó duramente a las encuestas: "quiero una explicación". (2017, November 19). *Ahora Noticias*. Available at http://www.ahoranoticias.cl/noticias/politica/210219-beatriz-sanchez-critico-duramente-a-las-encuestas-quiero-una-explicacion.html.

[20] Lagos, M. (2017, November 21). Mea culpa: el error de las encuestas en las elecciones presidenciales de 2017. *El Mostrador*. Available at http://www.elmostrador.cl/noticias/opinion/2017/11/21/mea-culpa-el-error-de-las-encuestas-en-las-elecciones-presidenciales-de-2017/.

[21] Jaque, J. M. and Córdova, M. (2017, November 24). Cuando las encuestas no saben ni responden. *La Tercera*. Available at http://www.latercera.com/noticia/cuando-las-encuestas-no-saben-responden/.

[22] Lagos, M. (2017, November 21). Mea culpa: el error de las encuestas en las elecciones presidenciales de 2017. *El Mostrador*. Available at http://www.elmostrador.cl/noticias/opinion/2017/11/21/mea-culpa-el-error-de-las-encuestas-en-las-elecciones-presidenciales-de-2017/.

[23] Huneeus, C. (2017, December 5). Comportamiento político de los empresarios y el papel del CEP. *El Mostrador*. Available at http://www.elmostrador.cl/noticias/opinion/2017/12/05/comportamiento-politico-de-los-empresarios-y-el-papel-del-cep/.

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polling staff at CEP.[24] CIPER (Centro de Investigación e Información Periodística, i.e. the Center for Journalistic Inquiry and Information) also noted that the stakes were high for CADEM since it had numerous contracts with major private enterprises, with associations in the private sector, and with the government itself.[25]

Many commentators[26] referred to various recent "polling misses," like the U.S. election of 2016, the Brexit referendum, the referendum in Colombia regarding the agreement between the Fuerzas Armadas Revolucionarias de Colombia (FARC) and the government, or the last election in Peru. They proposed the usual explanations related to a bandwagon effect (aggravated, according to Torche, by an inadequate question order that introduced bias and by the fact that the results were heavily publicized) and to the spiral of silence. This implied that respondents would have underreported a preference for Sánchez, a left-wing candidate.[27] Mauricio Morales, a political scientist who writes on occasion for CIPER, suggested that the influence of polls may be more substantial with voluntary than with mandatory voting.

According to commentators, another important reason for the polling miss were the changes to the electoral law that were promulgated in recent years. Besides the 2012 changes that made registration mandatory and voting voluntary, a 15-day embargo on polls was promulgated in 2015. The fact that voting became voluntary is considered by many as a major problem since the pollsters did not have much previous information or experience that could help them estimate what the level of turnout would be and which population groups would be more likely to vote.[28] For

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[24] Communication from Ricardo Gonzalez and Bernardo Mackenna after review of an initial draft of this report.

[25] See Arellano, A. & Albert, C. (2017 November 29). Los factores que gatillaron la crisis de credibilidad del lucrativo negocio de las encuestas. CIPER. Available at https://ciperchile.cl/2017/11/29/los-factores-que-gatillaron-la-crisis-de-credibilidad-del-lucrativo-negocio-de-las-encuestas/.

[26] Jaque J. M. & Córdova, M. (2017, November 24). Cuando las encuestas no saben ni responden. *La Tercera*. Available at http://www2.latercera.com/noticia/cuando-las-encuestas-no-saben-responden/.
Tapia, A. & Fuentes, F. (2017, November 19). Encuestas naufragan y anotan sendos errores en estimación presidencial. *La Tercera*. Available at http://www2.latercera.com/noticia/encuestas-naufragan-anotan-sendos-errores-estimacion-presidencial/
Torche, P. (2017, November 20). El universo paralelo de Cadem y la derrota de Piñera. *El Mostrador*. Available at http://www.elmostrador.cl/noticias/opinion/2017/11/20/el-universo-paralelo-de-cadem-y-la-derrota-de-pinera/
Cocker, I. (2017, December 5). Election fraud or just inaccurate: the problem with political polling. *The Santiago Times.* Available at http://santiagotimes.cl/2017/12/05/election-fraud-or-just-inaccurate-the-problem-with-political-polling/

[27] This seems unlikely since usually the spiral of silence is hypothesized as acting against the right-wing candidates, like Piñera, candidates of the extremes (like Kast, on the extreme right) or positions that are less popular in the media. Kast was slightly underestimated by an insignificant amount (predicted at 7, he got 8%), but Piñera was substantially overestimated.

[28] Valdés, M. & Fernández, W. (2017, November 26). Las encuestas sí son creíbles. *El Mostrador*. Available at http://www.elmostrador.cl/noticias/opinion/2017/11/26/las-encuestas-si-son-creibles/

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Lagos, it meant that the sample had to be twice the usual size in order to reach a sufficiently large sample of likely voters who declared their vote intention.

However, the most criticized decision was the one that banned publication of poll results for the last two weeks of the campaign for the first round vote. Although in the last Chilean elections, polls showed relatively stable voting intentions in the three months preceding the election,[29] the possibility that voting intentions could have changed during the last two weeks exists, as can be seen in many presidential elections throughout the world (Great Britain and France in 2017, for example). Both Lagos and Huneeus, in *El Mostrador*, as well as Tapia and Fuentes in *La Tercera*, mentioned that issue. According to Lagos, close to 20 percent of the voters declare that they make up their mind during the campaign, which means that the ban on polls is problematic if one wants to obtain a reliable portrait of voting intentions. The recommendation to conduct polls until the last minute in the campaign dates from the "Great polling miss" of 1948 in the United States, a well-known event in the world of public opinion polling.[30]

The final point raised by commentators pertains to methodology. This criticism was leveled against the CADEM and the CEP polling for example – CADEM conducts the fieldwork for the CEP – suggesting that the selection of the primary sampling units (PSUs) for the face-to-face interviews could be biased in favor of some districts where voters are ideologically closer to the right, an assertion that is not testable since the identity of the PSU is not public and, to our knowledge, no assessment of the quality of the sample sites compared to their election results was conducted. These criticisms come from the same individuals who accused these two organizations of being politically biased. They suggest that this bias could have underrepresented parts of the electorate that are closer to Sánchez – the young and the low income groups -- and explain her underrepresentation, according to Méndez (cited by Diaz). In addition, there were accusations that CADEM called only landline phones. CADEM indeed at one time only conducted its telephone polls among landlines and complemented them with face-to-face intercept interviews. However, it now reports that it includes cell phones in the samples and covers 85% of the population.

Lagos, M. (2017, November 21). Mea culpa: el error de las encuestas en las elecciones presidenciales de 2017. *El Mostrador*. Available at http://www.elmostrador.cl/noticias/opinion/2017/11/21/mea-culpa-el-error-de-las-encuestas-en-las-elecciones-presidenciales-de-2017

Méndez, cited by Diaz, F. (2017). Roberto Méndez: "en las muestras de las encuestas, los jóvenes estuvieron subrepresentados. *La Tercera*. Available at http://www2.latercera.com/noticia/roberto-mendez-las-muestras-las-encuestas-los-jovenes-estuvieron-subrepresentados/

[29] Bunker, K & Bauchowitz, S. (2016). Electoral forecasting and public opinion tracking in latin America: application to Chile. *Política / Revista de Ciencia Política, Vol. 54 n2, pp207-233*

[30] See Mosteller, F. (1949). *The pre-election polls of 1948: report to the Committee on Analysis of Pre-election Polls and Forecasts.* New York: Social Science Research Council.

There were also criticisms regarding the fact that CEP uses a probability sample without quotas[31] (Huneeus in *El Mostrador*). In addition, Beyer (in Tapia and Fuentes) noted that the Census has not been revised recently and that quota-based samples that rely on the Census can be problematic in terms of sample selection as well as post-stratification weighting. CIPER equally noted that some, including the extreme-right wing candidate José Antonio Kast, questioned the non-probabilistic, quota-based samples of CADEM. One pollster – Criteria Research – used web polls (78% of the Chilean population uses the Internet) with good results, producing the closest estimates (Torche in *El Mostrador*; Méndez cited by Rivas, *La Tercera*). Méndez, who is a former pollster at Adimark, suggested that Chilean pollsters need to change their methods in order to reach the young, who are underrepresented using traditional methods. Finally, Torche also questioned the order of the questions, where it seems that some pollsters first ask who the respondent thinks is likely to win before asking voting intention.

In summary, after the election , a number of factors were proposed in the media as explanations for the polling miss. Most of them were quite similar to what is seen in other countries, like biased sampling, the use of quotas, and the possible influence of polls themselves on survey responses and eventually voting behavior (e.g., bandwagon, spiral of silence). Others were specific to the Chilean situation. The recent changes in the electoral law regarding mandatory voting and the 15-day ban on the publication of poll results may have contributed, according to many, to the difficulty of estimating the support for the candidates because there is no history of estimation of likely voters in relatively low turnout elections and no guarantee that voting intentions did not change in the last two weeks of the campaign. In addition, two related organizations, the ones who conducted polls more often and closer to the end, were suspected of responding to the supposed political affiliation of their directors, although no proof of these allegations was put forward.

In this report, we address these complaints and evaluate the role played by methodological and political features in the polling miss of the 2017 presidential election in Chile.

The Methods the Polling Firms Used

The methodological reports from the different pollsters were rather explicit in terms of the methods they described, but not all elements of their methods were described in detail. The following table gives the main information about the design of their polls. Two polling firms conducted face-to-face interviews only, and one used only computer-assisted telephone interviewing with interviewers (CATI). One polling firm used a mixed-mode sample of around 70% CATI and 30% intercept

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[31] The use of quotas is contrary to random sampling principles but it is widely used in commercial polls, including for electoral forecasts, in many countries where the information necessary to build random samples may be less easily available.

interviews conducted in fixed sample points using tablets. Finally, one pollster used the Web with a random sample of respondents drawn from its own panel.

The two polling firms who used face-to-face interviews used secret ballots. A secret ballot obviously cannot be used on the telephone. It is unclear whether respondents who indicate the candidate they intend to vote for on a self-administered web survey think of that as confidential or not. The two polling firms who conducted telephone interviews varied in the proportion of cell phones in their samples, i.e., 100% for CADEM but only 19% for GfK-Adimark.

All of the polling firms used a Likely Voter model, and in every case it reduced their sample size by more than half. The size of those reduced samples ranged from 44% to 49% of the original, which means that the pollsters attempted to get samples that reflect the estimated participation level. These reduced sample sizes had consequences for the margin of error around the estimates of candidate support that each one made, which some pollsters did not take into account explicitly in their designs or in the reports of their results.

Table 1

Table 1. Methodological Details from the Final 2017 Pre-election Polls in Chile, by Pollster

POLLSTER	CADEM	CEP	CERC-MORI	Criteria	GfK-Adimark
FIELD PERIOD	Oct. 31-Nov. 2	Sept. 22- Oct. 16	Sept. 1-12	Oct. 20-30	Aug. 3- 29
INTERVIEW MODE	CATI and Intercept Interviews	Face-to-face	Face-to-face	Web panel	CATI
NATIONAL COVERAGE	85%	99%	99%	Max. 77%	78%
TOTAL SAMPLE SIZE	1,423 (1,008 phone, 415 intercept)	1,424	1,200	1,500	1,050
LIKELY VOTER SAMPLE SIZE	796	627	540	724	514
% LIKELY VOTERS	48%	44%	45%	46%	49%
% CELL PHONE SAMPLE	100%	NA	NA	NA	19%
USED SECRET BALLOT	No	Yes	Yes	NA[1]	NA
WEIGHTING	Zone, Sex, Age, S.E.G.[2]	Unspecified	Unspecified	Zone, Sex, Age, S.E.G.	2002 Census

[1] For the web panel, it is unknown how respondents felt about the confidentiality of their expressed vote choice.

[2] The specific algorithm for combining the weighting variables was not supplied; in the case of multi-mode samples, the weighting of the relative proportions in the final sample was not provided.

The Measurement of Voting Intention

Information is provided in Table 2 showing the questions used to measure support for the different candidates. Four of the pollsters used a similar question asking for whom the respondent would vote if the election were held "next Sunday." GfK-Adimark – who polled only once in August before the campaign really got underway – asked a question about preference for who should be the next President. As noted above, CEP and MORI used a secret ballot to collect answers to their voting intention questions. Most of the polling firms seemed to use an open-ended question, i.e., they do not mention the names of the candidates. CADEM mentioned these names but there is no information on whether the order in which these names were presented was rotated at random. The data provided by CEP and CADEM show that the trial heat question is the first in the questionnaire. None of the polling firms used a "leaner" question whereby they ask those who said they were not sure or hadn't

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made up their mind about whom they would vote for or whether they were leaning toward supporting one of the candidates. This technique cannot be used with a secret ballot, of course.

Table 2: Wordings of the Vote Intention Questions by Pollster

Firm	Questions (Spanish)	Questions (English translation)
CADEM	Si las elecciones presidenciales fueran el próximo domingo y los candidatos fueran… ¿Por quién votaría usted?	If the presidential elections were next Sunday and the candidates were … Who would you vote for?
CEP	Si las elecciones presidenciales fueran el próximo domingo, y los candidatos fueran los siguientes… ¿Por quién votaría Ud.?	If the presidential elections were next Sunday and the candidates were the following … Who would you vote for?
CERC-MORI	En la elección presidencial de Diciembre de 2017 si los candidatos fueran los que están en la tarjeta, ¿Por quién votaría Ud?	For the presidential election of 2017, if the candidates were those shown in the card, who would you vote for?
Criteria	Si las elecciones fuesen el próximo domingo y los candidatos fueran los siguientes, ¿por quién votarías?	If the presidential elections were next Sunday and the candidates were the following. Who would you vote for?
Gfk-Adimark	Si las elecciones presidenciales fuesen el próximo domingo, ¿Quién preferiría Ud. que fuera el próximo presidente o presidenta de Chile?	If the presidential elections were next Sunday, who would you rather be the next president of Chile?

Public information about question order is generally missing. Except for the CEP study, the reports do not generally include the complete questionnaire and do not give information on the order of the voting intention questions or minimally, on the questions asked before that question

The Likely Voter Models

There are a number of ways that estimates of the likely electorate can be made (Traugott & Tucker 1984). All involve using one or more questions to identify a reduced sample of those who are most likely to vote. Multiple questions are combined to form an index or scale with a range of ordinal cut points. These scales are typically used in a cutoff model, where the candidate preferences of those with a certain score or value and higher are considered likely voters, and their candidate

preference distribution is reported. Those with lower scores do not have their preferences taken into account. Another possibility is to use a regression model that assigns every respondent a likelihood or probability of voting, ranging from close to zero to 100%. In this way, every respondent contributes something to the candidate preference distribution, even if in only a small way. All of the polling firms in Chile use one form or another of a cutoff model. None currently uses a regression model.

Furthermore, some pollsters use historical information to estimate what the likely turnout will be in the coming election and then use that proportion to reduce the full sample proportionately. Others use a scale or index and with the upper scores to define the proportion of their full sample who are most likely to vote. For example, one of the polling firms (MORI) used different cut points on their scale to look at the preference distribution in a low turnout, an average turnout and a high turnout election. One procedure used for evaluating likely voter models is with a validation study, where self-reports of self-described voters in either a pre- or post-election study are checked against administrative records of who voted (Clausen 1968; Traugott & Katosh 1978). It is not currently possible to conduct a validation study in Chile, so none of the likely voter models used by pollsters have been evaluated in this way.

The proportion of estimated likely voters varied between pollsters, from 44% (CEP) to 49% (Adimark-GfK). Table 3 shows the different methods and questions used to determine the likely voters. The questions used are precisely described by most of the polling firms. However, the exact method used to estimate the likely voters – the way in which the responses to the questions were combined to form an index and what cut points were used – is only well-described by CEP and MORI. All of these polls use a cutoff model for estimating likely voters. Marshall's (2018)[32] review of the CEP methodology recommends switching to a probabilistic model for future pre-election polling.

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[32] Marshall, P.(2018). Análisis Metodológico de la Encuesta del Centro de Estudios Públicos, retrieved from
 https://www.cepchile.cl/analisis-metodologico-de-la-encuesta-del-centro-de-estudios-publicos/cep/2018-05-17/155926.html

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Table 3. Questions Used to Define the Likely Electorate in the 2017 Chile Pre-election Polls, by Pollster

Pollster	Questions (Spanish)	Questions (English translation)
Cadem (48%)	El cálculo del votante probable se genera a partir de la combinación de tres preguntas: ❖Declaración de participación en las últimas elecciones con voto voluntario (Municipales 2016 y Presidencial 2013). ❖Interés en la próxima elección presidencial. ❖Disposición de ir a votar en las próximas elecciones presidenciales.	The calculation for the likely voter is generated from the combination of three questions: ❖ Reported participation in the last elections under voluntary voting (Municipal 2016 and Presidential 2013). ❖ Interest in the upcoming presidential election. ❖ Disposition to go vote in the upcoming presidential elections.
CEP (44%)	❖Paso 1: Se clasificará como votante a la persona que haya respondido "Sí, con toda seguridad irá a votar" a la pregunta "Y en su caso, ¿Irá Ud. a votar en las próximas elecciones presidenciales de 2017?" ❖Paso 2: Se clasificará como no-votante a la persona que haya respondido "Sí, con toda seguridad irá a votar" a la pregunta "Y en su caso, ¿Irá Ud. a votar en las próximas elecciones presidenciales de 2017?", pero que no haya votado en la elección presidencial pasada. ❖Paso 3: Los jóvenes que no tenían edad para votar en la elección presidencial pasada se clasificarán como votantes si respondieron "Sí, con toda seguridad irá a votar" a la pregunta "Y en su caso, ¿Irá Ud. a votar en las próximas elecciones presidenciales de 2017?" y han declarado estar "muy" o "bastante" interesados en la elección presidencial de 2017. ❖Paso 4: Se clasificará como votante a la persona que haya respondido "Probablemente sí" a la pregunta "Y en su caso, ¿Irá Ud. a votar en las próximas elecciones presidenciales de 2017?", haya votado en la elección presidencial pasada y haya declarado estar "muy" o "bastante" interesado en la elección	❖Step 1. A person will be classified as a voter if she or he answers "Yes, I will certainly vote" to the question: "In your case, will you go vote in the upcoming presidential elections of 2017? ❖Step 2. A person will be classified as a non-voter if she or he answers "Yes, I will certainly vote" to the question "In your case, will you go vote in the upcoming presidential elections of 2017?", but did not vote in the last election. ❖Step 3. Younger respondents that were not of age to vote in the last election will be classified as likely voters if they answer "Yes, I will certainly vote" to the question "In your case, will you go vote in the upcoming presidential elections of 2017?" and declare being "very" or "somehow" interested in the presidential election of 2017. ❖Step 4. A person will be classified as a likely voter if she or he answers "I will probably vote" to the question "In your case, will you vote in the upcoming presidential elections of 2017?", and she or he voted in the past elections and declares to be "very" or "somehow" interested in the presidential election of 2017.

	presidencial de 2017. ❖Paso 5: Se clasificará como votante a la persona que no sepa o no haya respondido la pregunta "Y en su caso, ¿Irá Ud. a votar en las próximas elecciones presidenciales de 2017?", haya votado en la elección presidencial pasada y haya declarado estar "muy" o "bastante" interesado en la elección presidencial de 2017.	❖Step 5. A person will be classified as a voter if she or he does not answer the question "In your case, will you vote in the upcoming presidential elections of 2017?" or declares not knowing, and she or he voted in the past elections and declared to be "very" or "somehow" interested in the presidential election of 2017.
CERC-MORI (45%)	❖Vida electoral: P. Ahora, ¿Me podría decir cómo ha sido su vida electoral? ¿Ha votado Ud. en todas las elecciones, en casi todas, en algunas, o no ha votado Ud. nunca en la vida? ❖ Recuerdo de voto: P. ¿Por cuál candidato votó Ud. en la segunda vuelta de las elecciones presidenciales del 15 de Diciembre de 2013? ¿Votó Ud. por Michelle Bachelet o por Evelyn Matthei? ❖ Intención de votar: P.¿Votará Ud. en las elecciones presidenciales del 19 de Noviembre de 2017? ❖ Probabilidad de votar: P. En una escala de 0 a 10, donde 0 es "No Votaré" y 10 es "Votaré" ¿Cuán probable es que vote en las próximas elecciones presidenciales del 19 de noviembre de 2017?	❖Electoral life: Now, could you tell me how has your electoral life been? Have you voted in all the elections, almost all, some, or have never voted in your life? ❖Vote memory: For which candidate did you vote in the presidential runoff of December 15th 2013? Did you vote for Michelle Bachelet or Evelyn Matthei? ❖Intention to vote: Will you vote in the presidential elections of November 19th 2017? ❖Probability of voting: On a scale from 0 to 10, where 0 is "I will not vote" and 10 is "I will vote", how likely is it that you will vote in the upcoming elections of November 19th 2017? Five scenarios using these questions. Selection of scenario 3.
Criteria (46%)	Votante probable es un algoritmo entre ❖Intención de voto, ❖Importancia atribuida a las elecciones, ❖Participación en últimas elecciones	The likely voter model is an algorithm using ❖Intention to vote, ❖Importance attributed to the election and ❖Participation in preceeding elections.
Gfk-Adimark (49%)	El votante probable se construyó en base a tres variables: ❖ Si participó o no en elecciones municipales 2016 ❖Intención declarada a participar en elecciones presidenciales 2017 ❖Interés/Identificación con la política. La combinación de estas tres variables construye un indicador que pretende	The likely voter model was based on three variables: ❖ If the respondent participated or not in the municipal elections of 2016. ❖ Declared intention to participate in the presidential elections of 2017. ❖Interest in/identification with politics.

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	identificar a quienes tienen mayor probabilidad de concurrir a votar.	The combination of these three variables builds an indicator that aims at identifying those who have a higher probability of voting.

Polling Before and During the Campaign

When polls do not provide a good estimate of the vote, one possibility is that voting intentions changed at the last minute, at the end of the campaign or in the quiet period when no poll results can be published. This is a common explanation used by pollsters and commentators to explain a polling miss as they speculate what happened during that period when data were absent. This is more relevant when there is a relatively lengthy period at the end of the campaign when no poll results can be published, hence data are typically not collected. Sometimes exit polls ask a question about the time of decision for candidate choice, and this can provide some information to substantiate or refute such speculation; but such information does not appear to be available for this election.

Estimates from the Total Samples

Information provided in Table 4 shows the estimates for the total sample from the 21 polls published from the end of July to just before the voting in the first round – 15 of them being CADEM polls – and including the two CADEM polls conducted during the embargo period but published only after the election.

Piñera was consistently in the lead in the full time series, and his estimates went from a low of 39.5% (CADEM at the beginning of August) to a high of 49.3% (CADEM at the beginning of October), with a notable exception for the Criteria web poll that estimated Piñera's support at 34.5% at the end of October, 2.2 percentage points lower than the eventual share of the vote he received. It should also be noticed that the last CADEM poll conducted during the embargo period estimated Piñera's support at 40% (3.3 percentage points higher than his share of the vote).

Estimates for Guillier ranged from 18.1% to 24.3%, remaining within the margin of error (he got 22.7%). In July and August, Guillier and Sánchez were equally supported in the polls, but Guillier moved slightly ahead in September and for the rest of the campaign. Overestimation for Piñera was generally accompanied by a similar underestimation of support for Sánchez, whose estimated support ranged from 12% to 25% (in August). Again, as can be expected from the other estimates, Criteria had the closest estimate (20.7%).

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Table 4

Table 4. Estimates of Candidate Preference in the Total Sample across the Full Polling Period, by Pollster

| | | | | Total sample without undecideds/refusals | | | | | | | | Undecideds/ |
DateDEB	DateEND	Pollster	Muestra	Piñera	Guillier	Sánchez	Kast	Goic	Enríquez	Otros	Total	refusals
26.07.2017	28.07.2017	Cadem	557	42.1	19.7	22.4	3.9	3.9	5.3	2.6	100	24.0
03.08.2017	04.08.2017	Cadem	555	39.5	19.7	23.7	3.9	6.6	2.6	3.9	100	24.0
09.08.2017	11.08.2017	Cadem	553	40.3	23.4	20.8	5.2	5.2	5.2	0.0	100	23.0
21.07.2017	17.08.2017	CEP	1057	43.6	22.0	17.9	3.5	5.0	4.6	3.8	100	25.5
11.08.2017	17.08.2017	Criteria	715	39.8	19.3	25.0	6.8	5.7	3.4	0.0	100	12.0
17.08.2017	18.08.2017	Cadem	540	43.4	22.4	18.4	6.6	5.3	3.9	0.0	100	24.0
23.08.2017	25.08.2017	Cadem	512	45.8	18.1	20.8	4.2	4.2	6.9	0.0	100	28.0
03.08.2017	29.08.2017	Adimark	819	43.6	20.5	19.2	2.6	6.4	1.3	6.4	100	22.0
30.08.2017	01.09.2017	Cadem	493	47.8	18.8	18.8	4.3	5.8	4.3	0.0	100	31.0
01.09.2017	12.09.2017	CERC-MORI										
06.09.2017	08.09.2017	Cadem	534	46.7	21.3	18.7	4.0	4.0	2.7	2.7	100	25.0
13.09.2017	15.09.2017	Cadem	554	45.5	20.8	18.2	3.9	5.2	3.9	2.6	100	23.0
20.09.2017	22.09.2017	Cadem	526	45.9	20.3	20.3	4.1	4.1	5.4	0.0	100	26.0
27.09.2017	29.09.2017	Cadem	534	45.9	24.3	16.2	4.1	5.4	2.7	1.4	100	26.0
04.10.2017	06.10.2017	Cadem	1005	49.3	21.1	15.5	5.6	4.2	4.2	0.0	100	29.0
11.10.2017	13.10.2017	Cadem	1042	46.6	20.5	16.4	5.5	5.5	5.5	0.0	100	27.0
22.09.2017	16.10.2017	CEP	1005	48.9	21.8	12.0	3.1	4.2	8.6	1.1	100	29.4
18.10.2017	20.10.2017	Cadem	1038	45.8	20.8	16.7	5.6	5.6	4.2	1.4	100	28.0
24.10.2017	26.10.2017	Cadem	1039	45.2	23.3	16.4	5.5	4.1	5.5	0.0	100	27.0
20.10.2017	30.10.2017	Criteria	1365	34.5	20.7	20.7	9.2	8.0	5.7	1.1	100	13.0
31.10.2017	02.11.2017	Cadem	1067	44.0	21.3	14.7	6.7	5.3	6.7	1.3	100	25.0
08.11.2017	10.11.2017	Cadem	1058	40.0	21.3	14.7	8.0	5.3	9.3	2.7	100	25.0
14.11.2017	16.11.2017	Cadem	1071	40.0	21.3	17.3	6.7	5.3	8.0	1.3	100	25.0
Results Elections November 19, 2017				**36.6**	**22.7**	**20.3**	**7.9**	**5.9**	**5.7**	**0.9**	**100**	**NA**

The proportion of non-disclosers – including respondents who declared being undecided, who refused to reveal their preferences or declared they will cancel their vote – ranged globally from 22% to 31%, except for the Criteria web polls (12% to 13%). The high proportion of non-disclosers is partly due to the fact that the pollsters do not use a "leaner" question that would reduce the proportion of declared undecideds. These trends, starting at the beginning of September, are presented in Figure 2, with a solid colored line representing each candidate's average support calculated from the individual poll estimates at that time; an individual poll result is represented by a colored circle.
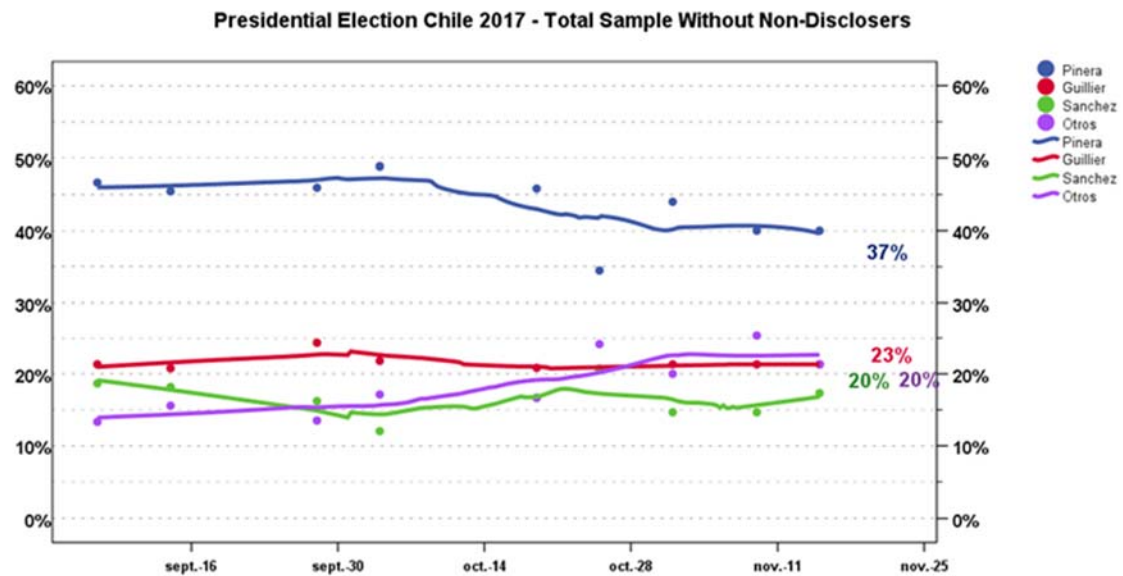
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Presidential Election Chile 2017 - Total Sample Without Non-Disclosers

The graph uses the estimates of the polls conducted until November 16, 2017. Each dot represents the estimate of one poll positioned at mid-field date. The curves represent the trends estimated using local regression (Loess) with an Epanechnikov .65. function.

Figure 2

Figure 2. Trends in support for the candidates in the total samples

Estimates from the Likely Voter Samples

Similar data are provided in Table 5 for the reduced Likely Voter samples from each poll. Piñera remained the preferred candidate in all of the polls when the samples were reduced. While Guillier´s average support put him in second place throughout the campaign, there were individual poll readings early in the campaign when he was virtually tied with Sánchez.

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Table 5. Estimates of Candidate Preference in the First Round in Likely Voter Samples across the Full Polling Period, by Pollster

| | | | | Likely voters without undecideds/refusals | | | | | | | | Undecideds/ |
DateDEB	DateEND	Pollster	Muestra	Piñera	Guillier	Sánchez	Kast	Goic	Enríquez	Others	Total	refusals
26.07.2017	28.07.2017	Cadem	331	43.8	22.9	19.8	5.2	3.1	4.2	1.0	100	4.0
03.08.2017	04.08.2017	Cadem	289	43.5	21.7	21.7	3.3	6.5	2.2	1.1	100	8.0
09.08.2017	11.08.2017	Cadem	298	43.5	22.8	20.7	5.4	5.4	2.2	0.0	100	8.0
21.07.2017	17.08.2017	CEP	455	44.6	20.3	20.1	3.8	6.1	2.0	3.3	100	10.8
11.08.2017	17.08.2017	Criteria	357	39.2	18.6	22.7	9.3	8.2	2.1	0.0	100	3.0
17.08.2017	18.08.2017	Cadem	294	47.8	21.7	17.4	5.4	5.4	2.2	0.0	100	8.0
23.08.2017	25.08.2017	Cadem	297	47.3	19.8	19.8	4.4	5.5	3.3	0.0	100	9.0
03.08.2017	29.08.2017	Adimark	464	44.4	23.3	17.8	2.2	7.8	1.1	3.3	100	10.0
30.08.2017	01.09.2017	Cadem	296	48.3	21.3	15.7	4.5	5.6	4.5	0.0	100	11.0
01.09.2017	12.09.2017	MORI	0	44.0	30.0	11.0	2.0	8.0	4.0	1.0	100	
06.09.2017	08.09.2017	Cadem	324	47.7	20.5	19.3	4.5	4.5	1.1	2.3	100	12.0
13.09.2017	15.09.2017	Cadem	304	46.1	24.7	16.9	3.4	6.7	2.2	0.0	100	11.0
20.09.2017	22.09.2017	Cadem	326	48.3	21.3	18.0	4.5	4.5	3.4	0.0	100	11.0
27.09.2017	29.09.2017	Cadem	343	47.8	25.0	14.1	4.3	4.3	3.3	1.1	100	8.0
04.10.2017	06.10.2017	Cadem	657	50.6	23.6	13.5	5.6	3.4	3.4	0.0	100	11.0
11.10.2017	13.10.2017	Cadem	645	48.3	22.5	14.6	5.6	4.5	4.5	0.0	100	11.0
22.09.2017	16.10.2017	CEP	528	52.6	23.3	10.1	3.2	4.6	5.5	0.7	100	15.6
18.10.2017	20.10.2017	Cadem	660	46.7	23.3	14.4	5.6	5.6	3.3	1.1	100	10.0
24.10.2017	26.10.2017	Cadem	691	46.7	23.3	15.6	5.6	4.4	4.4	0.0	100	10.0
20.10.2017	30.10.2017	Criteria	695	40.6	25.0	15.6	6.3	6.3	5.2	1.0	100	4.0
31.10.2017	02.11.2017	Cadem	740	45.2	21.5	14.0	6.5	5.4	6.5	1.1	100	7.0
08.11.2017	10.11.2017	Cadem	629	41.9	21.5	14.0	7.5	7.5	6.5	1.1	100	7.0
14.11.2017	16.11.2017	Cadem	604	43.5	22.8	14.1	6.5	6.5	5.4	1.1	100	8.0
Results Elections November 19, 2017				36.6	22.7	20.3	7.9	5.9	5.7	0.9	100	NA

In general, the average support for Piñera and Guillier was relatively stable throughout the campaign, but support for Sánchez declined in favor of candidates with less support. These trends are shown in Figure 3, again with a solid colored line representing each candidate's average support calculated from the individual poll estimates at that time, and an individual poll result represented by a colored circle.
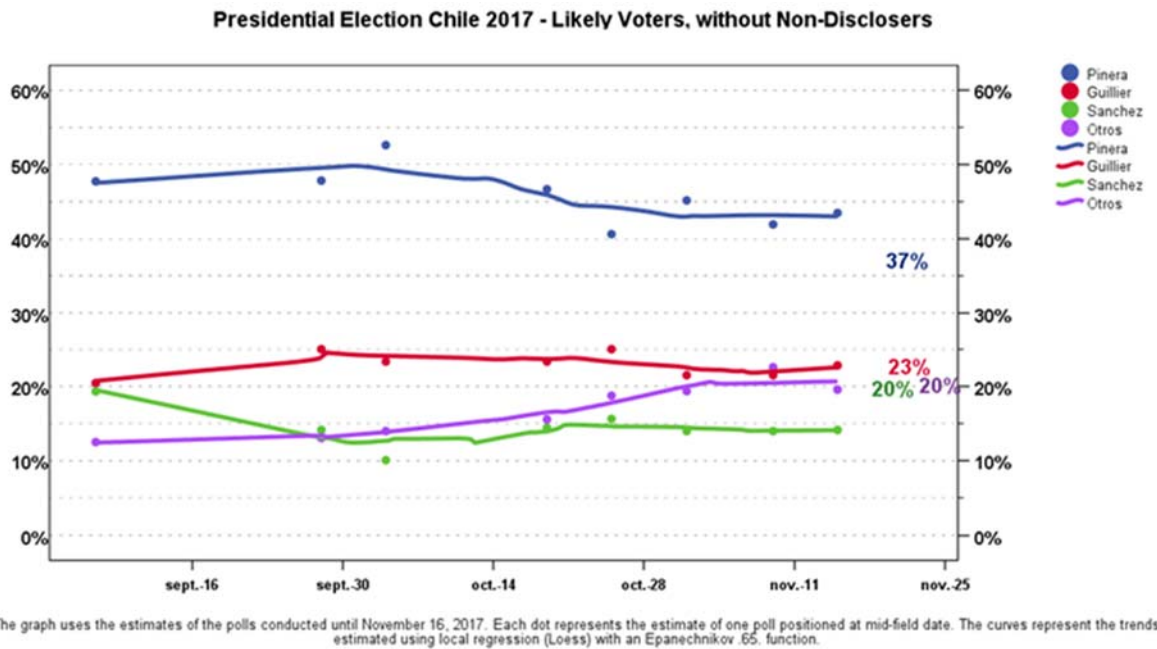
Presidential Election Chile 2017 - Likely Voters, without Non-Disclosers

The graph uses the estimates of the polls conducted until November 16, 2017. Each dot represents the estimate of one poll positioned at mid-field date. The curves represent the trends estimated using local regression (Loess) with an Epanechnikov .65. function.

Figure 3

Figure 3. Trends in support for the candidates – Likely voter sample

Measures of Error for the Polls Conducted during the Last Month

The accuracy of pre-election polls is generally assessed on the basis of their final estimates produced close to Election Day. For the purpose of our analysis, we focus only on the polls that were conducted after mid-October. Those include five CADEM polls – two of them conducted during the embargo period but published after the election -- and one poll from Criteria Research. The CEP poll is excluded because it started on September 22, had a field period that lasted close to one month, and was completed 45 days before the election.

Different measures of poll error have been developed over time. The two "classical measures" are the M3 and M5 Mosteller measures (Mosteller, 1948). M3 is the average absolute difference between the polls' estimates for each of the major candidates and their vote. We calculated this measure for the six major candidates excluding the "others" (less than 1% of the vote). M5 measures the discrepancy between the difference between the two main candidates in the polls and in the election. In addition, we present the difference between the estimates and the vote for Piñera and for Sánchez, since they are the ones whose estimates were less accurate. Finally, we present the A' measure (Martin, Traugott & Kennedy 2004; Arzheimer & Evans, 2014; Durand, 2008), which is the log odds of the ratio of Piñera vs the others in a poll compared to their relative vote share, a measure which captures the directional bias in the estimates and that can be used to compare errors from one election to another.

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Estimates from the Total Samples

The values of these different measures of accuracy for the total samples in the last six polls are presented in Table 6. For the four published polls from late in the campaign, the Criteria Research estimates were the most accurate as shown by the values of these three measures of accuracy as well as by the difference between their estimates for the two main candidates and the actual vote share. This was also the case when the two unpublished CADEM polls were included in the averages. For the six polls, the average estimate for Piñera was 4.9 percentage points too high, and the estimate for Sanchez 3.5 points too low. The estimate of Guillier's support was very accurate. The total average error (Mosteller 3) was 2.4 points. The advantage error (M5) considering the first and second place finishers averaged 6.18 points. The average of the A' for Piñera is .2055. Since the confidence interval is .1207, all the estimates are significantly biased toward Piñera except Criteria Research's estimate.

Table 6. Errors in the Estimates of Candidate Preference in the Total Samples for Final Estimates by CADEM and Criteria Research

					Total sample without undecideds						
Start date	pollster	Sample*	Piñera	Guillier	Sánchez	Mosteller M3	Mosteller M5	Piñera (est-vote)	Sánchez (est-vote)	A' Pinera vs the others	sig.
October 18-20 2017	Cadem	1038	45.8	20.8	16.7	3.15	11.06	9.19	-3.60	0.3806	*
October 24-26 2017	Cadem	1039	45.2	23.3	16.4	2.91	7.98	8.57	-3.83	0.3553	*
October 20-30 2017	Criteria	1365	34.5	20.7	20.7	1.34	-0.15	-2.16	0.42	-0.0942	
October 31 - November 2	Cadem	1067	44.0	21.3	14.7	2.85	8.73	7.36	-5.60	0.3065	*
November 8-10 2017	Cadem	1058	40.0	21.3	14.7	2.37	4.73	3.36	-5.60	0.1422	*
November 14-16 2017	Cadem	1071	40.0	21.3	17.3	1.96	4.73	3.36	-2.94	0.1422	*
	Mean		41.6	21.5	16.7	2.43	6.18	4.95	-3.53	0.2055	mean:.1207
Results Election November 19, 2017			36.6	22.7	20.3						

* estimated using the reported sample minus the non-disclosers

The formulas for calculating the Mosteller measures are as follows:

$$M3 = \frac{\sum_{i=1}^{m}|poll_m - result_m|}{m} \quad \text{and} \quad M5 = |(poll_{cand1} - result_{cand1}) - (poll_{cand2} - result_{cand2})|$$

Estimates from the Likely Voter Samples

Data are presented in Table 7 for the final estimates of candidate preference based upon the reduced likely voter samples. The relative ranking of the individual polls remains the same for the three measures of accuracy but the values are higher, suggesting that the estimates from the likely voter samples were less accurate than those generated from the full samples. For the four published polls from late in the campaign, the Criteria estimates were the most accurate as shown by the values of these three measures of accuracy as well as by the difference between their estimates for the two main candidates and the actual vote share. This was also the case when the two unpublished CADEM polls were included in the averages. For the

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six polls, the average estimate for Piñera was 7.4 percentage points too high, and the estimate for Sánchez 5.6 points too low. The total average error (Mosteller 3) was 2.9 percentage points. The advantage error (M5) considering the first and second place finishers averaged 7.2 percentage points. The average of the A' for Piñera is .3096. Since the confidence interval is .1567, all the estimates remain significantly biased toward Piñera including Criteria Research's estimate.

Table 7. Errors in the Estimates of Candidate Preference in the Likely Voter Samples for Final Estimates by Cadem and Criteria Research

						Mosteller M3	Mosteller M5	Piñera (est-vote)	Sánchez (est-vote)	A' Piñera vs the others	
Start date	**pollster**	**Sample***	**Piñera**	**Guillier**	**Sánchez**						**sig.**
				Likely voter sample without undecideds							
October 18-20 2017	Cadem	660	46.7	23.3	14.4	3.59	9.39	10.03	-5.83	0.4142	*
October 24-26 2017	Cadem	691	46.7	23.3	15.6	3.41	9.39	10.03	-4.71	0.4142	*
October 20-30 2017	Criteria	695	40.6	25.0	15.6	2.25	1.69	3.99	-4.65	0.1682	*
October 31 - November :	Cadem	740	45.2	21.5	14.0	3.12	9.72	8.52	-6.29	0.3535	*
November 8-10 2017	Cadem	629	41.9	21.5	14.0	2.60	6.49	5.30	-6.29	0.2223	*
November 14-16 2017	Cadem	604	43.5	22.8	14.1	2.57	6.71	6.84	-6.14	0.2853	*
	Mean		44.1	22.9	14.6	2.92	7.23	7.45	-5.65	0.3096	mean: .1567
Results Election November 19, 2017			36.6	22.7	20.3						
* estimated using the reported sample minus the non-disclosers											

The formulas for calculating the Mosteller measures are as follows:

$$M3 = \frac{\sum_{i=1}^{m}|poll_m - result_m|}{m} \text{ and } M5 = |(poll_{cand1} - result_{cand1}) - (poll_{cand2} - result_{cand2})|$$

The magnitude of these errors is large but it is comparable to equivalent measures of errors registered in other presidential elections in Latin America. In recent Mexican elections, the average value of Mosteller 3 for the final public polls was 2.7 in 2012, 2.4 in 2006, 2.8 in 2000 and 3.5 in 1994, mainly as a product of overestimation of the first place finisher, especially in 1994 and 2012 (Moreno, Aguilar & Romero 2015). On the other hand, the advantage errors (Mosteller 5) in the Mexican election of 2012 were unusually high, 7.7, slightly higher than that observed in Chile in 2017 (7.2 for the likely voters). In Mexico, the polling average estimated a win by 14 percentage points, but it ultimately was only seven percentage points. In Chile, the estimated lead was 21.2 percentage points and it was ultimately 13.9 percentage points. We may also compare these results with elections outside of Latin America. In the UK, the Mosteller M3 measure was 1.5 in 2005 but 3.5 in 2015, considered a polling miss (Moreno, Aguilar & Romero 2015).

The average of the A' measure for the total sample in Chile (.2055) is larger than Sarkozy's underestimation in the French Presidential election of 2007 (-0.151) but lower than Le Pen's overestimation (0.345). In 2002, a much publicized polling miss in France, Le Pen's underestimation was -0.347. It is also lower than for the US election of 1948 at 0.2783 (Martin et al. 2005). In short, Chile's polling error is not among the worst.

The use of likely voter estimations worsened the estimates from the pre-election polls in the 2017 Chilean presidential election, possibly because the likely voter

models predicted more turnout for Piñera and less for Sanchez. This failure of likely voter modelling may reflect a lack of experience with the new electorate that resulted from the recent changes in election laws and the associated decline in turnout in the Chilean electorate, together with the difficulty of accounting for the specific composition of the electorate in that election.

Chilean pollsters will have to develop more reliable likely voter model estimation. While the AAPOR Report on the US 2016 election[33] and the Report on the British 2015[34] election polling miss concluded that the likely voter models did not make any difference, in the Chilean case, they did.

Secondary Analyses of Available Polling Data

Two polling firms made data available to the committee for secondary analysis: MORI and CADEM. In addition, the CEP data are publicly available. Trying to determine what might have happened with the pre-election polls after the election is over is a complicated and tortuous task. First and foremost, there are "house effects" to deal with when data from different polling firms are used (Smith 1982; Silver 2010; Blumenthal 2017). In order to understand what the effect of different methods would be on estimation, it would be best to have data from a single firm with embedded experiments in its polls to eliminate the possibility of house effects contaminating the analysis and conclusions drawn from it. However, it is possible to look at the potential effects of design and methods in individual polls to obtain answers to some questions and provide suggestions for further research. The committee analyzed the three available polls to look at questions surrounding likely voter models, timing of the surveys, and weighting issues.

Tests of Likely Voter Models

Based upon the availability of a small subset of polls, it is not possible to determine which type of likely voter questions might be more appropriate for Chile. However, we were able to conduct an exercise using a MORI, a CEP and a CADEM poll to look at the difference that alternative likely voter models might make.[35] MORI included the following two questions: "On a scale of 0 to 10, where 0 means you will not vote and 10 that you will vote, how likely is it that you vote on the next presidential elections of November 19th?" and "Could you tell me how your electoral life has been? Would you say that you have voted in all elections, in almost all elections, in some elections or you have never voted?"

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[33] The report can be found here https://www.aapor.org/Education-Resources/Reports/An-Evaluation-of-2016-Election-Polls-in-the-U-S.aspx and an article in POQ following the report here: https://academic.oup.com/poq/article/82/1/1/4837043:

[34] The report can be found here: http://eprints.ncrm.ac.uk/3789/1/Report_final_revised.pdf

[35] We are thankful to Marta Lagos (MORI) and to Roberto Izikson (CADEM) for giving the Committee access to their polls. The data from CEP were available on their web site.

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As shown in Table 8, using a recoded form of the top four categories of the ten-point scale provides no better estimates of candidate preference relative to the total sample, as it increased slightly the overestimation for Piñera. The question about the past voting record seems to work slightly better in adjusting the frontrunner's share of the vote, but it also increases the vote share for Guillier while having no significant effect on Sánchez. A combined likely voter model using both questions helps even better to reduce the Piñera overestimation but degrades the estimates for the other two main candidates. Since this is a very early poll, it obviously does not capture campaign effects.

Table 8

Table 8.   An Evaluation of the Impact of Various Likely Voter Assessments in MORI's September 1-12 poll

Candidate	Weighted Total Sample Result	10-pt scale (7-10)	Past vote (all, almost all)	Combined
	%	%	%	%
Sebastián Piñera	44.2	46.2	42.2	40.9
Alejandro Guillier	31.7	32.7	34.0	37.2
Beatriz Sánchez	13.8	12.3	13.2	12.1
Marco Enríquez Ominami	3.9	3.6	4.2	4.3
Carolina Goic	3.3	3.4	3.6	3.9
José Antonio Kast	1.6	1.0	1.9	1.1
Alejandro Navarro	1.0	0.7	0.8	0.2
Eduardo Artés	0.4	0.2	0.2	0.2
% of subsample	100	53	52	40

CADEM had four questions that allow for an assessment of likely voting. One question asked the likelihood to vote in the current election with four response categories ranging from "sure to vote" to "sure not to vote." There were also two questions that asked about previous voting behavior in the 2016 and 2013 elections and one about interest in the election with five response categories ranging from "not at all" to "much." We do not know how CADEM combined these variables to build their likely voter electorate. In Table 9, we present the estimates of candidate preference using these different variables separately as indicators of likelihood of voting. The data show that all estimates of candidate preference in these reduced samples are less accurate than the estimates from the total sample. Keeping all those who say that they will probably or surely vote gives the best likely voter estimate. It uses 89% of the sample. This leads to the conclusion that individuals who were generally less sure they would vote, less likely to have voted in previous elections or less likely to state that they were interested in the current election were more likely

to prefer Sánchez. This also raises the general question whether nonvoters were more likely to be non-respondents. We don't know anything about the response rates to these surveys and how it could be taken into account.

Table 9. An Evaluation of the Impact of Various Likely Voter Assessments in CADEM's November 14-16 poll

	Total Sample Weighted	Probably or Sure to Vote	Sure to Vote	Voted in 2016	Voted in 2013	Interest: Much or Somewhat
Sebastián Piñera	40.0	40.6	43.4	42.2	43.1	42.4
Alejandro Guillier	21.0	21.2	21.2	22.1	22.2	19.9
Beatriz Sánchez	17.7	17.3	15.8	15.3	14.7	17.8
Marco Enríquez Ominami	7.4	6.8	5.8	6.4	5.8	5.3
Carolina Goic	5.9	6.0	5.8	6.3	7.2	6.0
José Antonio Kast	6.6	6.8	6.7	6.4	6.2	7.1
Alejandro Navarro	0.8	0.8	0.7	0.6	0.4	0.8
Eduardo Artés	0.6	0.6	0.6	0.7	0.6	0.7
total	**1077**	**965**	**680**	**645**	**727**	**676**
%	100%	89.6%	63.1%	59.9%	67.5%	62.8%
% non-disclosers	24.2	14.2	10.6	17.6	18.1	7.7

The CEP poll also had four questions that could allow for an assessment of likely voting, one about certainty to vote, another one about voting behavior in the last municipal election, one about the usual participation in elections in the last six years and finally, one about interest in the electoral campaign. Again, we present our own computation, not the one performed by the CEP. Table 10 shows the results of analyses that are similar to the one we presented for CADEM. The results are the same. None of the likely voter reduced samples improves the estimates. In the case of the CEP, all the models give slightly less accurate estimates for Piñera and all but one (based on interest) for Sánchez. However, that latter poll tends to provide a less accurate estimate for Guillier.

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Table 10

Table 10. An Evaluation of the Impact of Various Likely Voter Assessments in CEP's September 22 - October 16 poll

	Total Sample Weighted	Probably or Sure to Vote	Sure to Vote	Voted in 2016	Usually Votes - 6 Years	Interest: Much or Somewhat
Sebastián Piñera	49.0	50.1	49.1	49.7	50.7	51.6
Alejandro Guillier	21.9	23.4	24.8	24.6	24.0	20.3
Beatriz Sánchez	12.0	11.5	10.9	10.7	10.6	12.6
Marco Enríquez Ominami	8.7	6.8	4.8	7.0	6.5	7.2
Carolina Goic	4.2	4.4	5.4	4.1	4.5	4.8
José Antonio Kast	3.2	3.1	4.3	2.8	2.8	3.0
Alejandro Navarro	0.7	0.5	0.6	0.5	0.8	0.4
Eduardo Artés	0.4	0.1	0.0	0.5	90.1	0.1
total	**1005**	806	**530**	**539**	**678**	**533**
%	100%	80.2%	52.7%	53.6%	67.5%	53.0%
% non-disclosers	29.4	17.3	13.8	19.1	22.6	14.9

These analyses use data from three different polls conducted with different methodologies and at different points in time. They lead to two different conclusions. The MORI data, from a poll conducted very early in the campaign, show that some likely voter models reduce Piñera's overestimation but also increase Guillier's overestimation and Sánchez's underestimation. However, using different variables that could point to likely voters in the CADEM and the CEP polls – notice that this is not the likely voter model used by the firms – all tend to produce less accurate estimates for both Piñera's and Sánchez's vote share. This could mean that Sánchez likely attracted people who were less likely to have voted in preceding elections or were sure to vote in 2017. Using interest in the election, the CADEM and CEP polls do not lead to the same conclusion.

Generally pollsters use likely voter models that have been developed over time and worked well in the most recent past election. They often make adjustments for the current campaign, in terms of specific candidates or issues; but they may not anticipate or may be at a disadvantage when there are significant shifts in the voting population or the administrative procedures used for an election. They also have to anticipate significant surges or declines in participation.

It is interesting to note that analysts attributed the UK polling miss in 2017 to a similar problem.[36] It seems that pollsters used likely voter models based on the 2015 electorate. However, more people under 50 years old voted in 2017 than in the previous election. Since the pollsters had underweighted these people, they overestimated the vote share for the Conservatives.

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[36] The Politics of Polling. Report of the House of Lords Select Committee on Political Polling and Digital Media, April, 17, 2018: retrieved June 19, 2018. Available at https://publications.parliament.uk/pa/ld201719/ldselect/ldppdm/106/106.pdf

Looking at Survey Field Periods

The pre-election polls in Chile were conducted over a four-month period. The general belief is that estimates made closer to the election will be more accurate than those made earlier in the campaign since change in support for the different candidates may occur during electoral campaigns right up until the end. Trends in accuracy can be best addressed with panel studies of the same individuals which measure change at the individual level rather than with repeated cross-section polls with different samples interviewed each time which can only measure change at the aggregate level. There were no panel studies in Chile, but the CEP poll had an extended field period covering almost four weeks, and the CADEM polls were conducted weekly through the final week of the campaign. The data presented in Table 7 show that from mid-October to mid-November, CADEM showed a difference between the maximum and minimum measured support for Piñera of 4.8 percentage points without any clear directional trend. For Guilllier, the difference between his maximum and minimum measured support was 3.5 percentage points, while for Sánchez it was 1.6 percentage points, also without a clear directional trend.

Using the data from the CEP poll from September-October, it was possible to divide the field period into three roughly equal parts.[37] This analysis showed no significant difference in support for each of the three main candidates by time period in the earliest part of the campaign. In three successive time periods with equivalent samples sizes, support for Piñera was measured at 48.4%, 48.7% and 50.0% respectively. For Guillier, the equivalent measurements were 21.1%, 22.0%, and 22.2%, while for Sánchez they were 12.6%, 13.9%, and 9.4%. Although the support for each of the candidates was higher in polls conducted at the end of the campaign, the estimates produced by different polling firms using slightly different methodologies did not show significant shifts in support during the relevant field periods.

Looking at Other Sample Adjustments (Weighting)

A final analysis involved an investigation of the weighting used in some of the polls. While most of the polling firms indicated that they did weight their data and described the factors that they used for weighting, they did not describe in detail how their weights were calculated. Weighting can be applied in a number of different ways, i.e., as post-stratification or nonresponse adjustments, to adjust for probability of selection within a household, or as a means to combine data from different strata to estimate a parameter for the entire population.

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[37] This was actually accomplished two slightly different ways: by creating approximately equal parts by number of consecutive days and by cumulatively equal sample sizes (number of respondents) over time.

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Descriptive statistics derived from available datasets are provided in Table 11 for the weights used in the CEP poll and the final CADEM poll. The data suggest that CEP employed a weighting algorithm to produce an average weight of 1.0, and the relatively large maximum weight value of 8.612 suggests that they did not trim the weights. CADEM used two strata in their poll, one based upon a main sample of CATI phone interviews and the other for the face-to-face intercept interviews aimed at complementing the main sample. The descriptive data suggest that CADEM employed a weighting algorithm that produced an average weight of 1.0, within each stratum. The size of their weights may reflect the fact that they use quotas. While we do not know from the descriptions supplied how they combined the information from the two strata, the estimates presented in Table 11 show that the added intercept sample helped improve the estimates.

Table 11. Descriptive Statistics for the Weights Used in the CEP and CADEM Final Polls.

Polling Firm	Mean	Median	Minimum	Maximum
CADEM (11/3)				
Combined sample	0.9957	1.0199	0.3887	1.7512
CATI sample	0.9769	0.9585	0.3887	1.7512
Intercept sample	1.0417	1.1173	0.4693	1.4006
CEP Encuesta 81	1	0.847	0.1557	8.612

Analysis of the weighted candidate preference distributions in each stratum shown in Table 12 indicate that support for Piñera was 4.4 percentage points higher for those expressing a preference in the CATI stratum than among the intercept sample, while it was 3.5 percentage points lower for Guillier and 6.3 percentage points lower for Sánchez. This translated to a 20.4 percentage point lead for Piñera over Guillier in the CATI sample compared to a 15.7 percentage point lead in the intercept sample. Piñera had a 25.5 percentage point lead over Sánchez in the CATI sample compared to a 16.3 percentage point lead in the intercept sample. In order to understand these differences better, one would need more information about the geographical locations of the intercept interviewing sites, and more details about how the information from the two strata were combined.

Table 12

Table 12. Estimates of Candidate Support in the Final CADEM Poll, by Mode with and without Weights

CANDIDATE	UNWEIGHTED			WEIGHTED			(CATI – INTERCEPT)	
	CATI	INTERCEPT	COMBINED	CATI	INTERCEPT	COMBINED	WEIGHTED	UNWEIGHTED
Piñera	41.1	38.3	40.4	41	36.6	39.9	4.4	2.8
Kast	7.9	2.8	6.6	7.9	3.4	6.7	4.5	5.1
Guillier	20.7	22.6	21.2	20.1	23.6	21	-3.5	-1.9
Goic	6.8	4.5	6.2	6.6	3.8	5.8	2.8	2.3
Sánchez	15.6	22	17.3	16	22.3	17.7	-6.3	-6.4
Enríquez	6.2	8.4	6.8	6.9	8.9	7.4	-2	-2.2
Navarro	0.9	1	0.9	0.8	1	0.8	-0.2	-0.1
Arias	0.7	0.3	0.6	0.8	0.3	0.6	0.5	0.4
Differences between Candidate support in the Final CADEM Poll, by sample with and without Weights								
CANDIDATE	UNWEIGHTED			WEIGHTED				
PAIR	CATI	INTERCEPT	COMBINED	CATI	INTERCEPT	COMBINED		
Piñera – Guillier	20.4	15.7	19.2	20.9	13	18.9		
Piñera – Sánchez	25.5	16.3	23.1	25	14.3	22.2		

Conclusion

When viewed in terms of the problems pre-election pollsters have faced in other countries and circumstances, the pollsters in Chile encountered common difficulties that merit additional research, given the different administrative procedures for elections in Chile. Common problems can be worked out with common solutions, allowing for the distinctive nature of the Chilean political and social system. The development of solutions will require collaboration between academics and commercial pollsters, not just in Chile but from those who study survey methods and pre-election polling around the world. In order to work on effective solutions there will have to be extensive information sharing. Such an effort will be worth it if it results in an improvement in pre-election polling methods and hence the image of the industry in Chile.

In one sense, what happened in Chile was a somewhat unique event because of the changes in its election laws regarding compulsory and voluntary registration and voting that were implemented prior to the 2013 election.[38] The data necessary to determine the effects of these changes on the behavior of survey respondents, and the usefulness of previously developed likely voter models, unfortunately does not exist. As we have seen, the likely voter models generally degraded the estimates for Piñera and Sánchez. In the experience of the committee, this is not a situation unique to Chile. Some elections – because of the issues or candidates involved -- tend to bring in new voters, and it is an endeavor for all pollsters to examine ways to adjust their models in order to produce better estimates in these situations.

More specifically, a significant research effort should be mounted to improve the quality of likely voter models appropriate to the electoral system in Chile and the changes it has undergone in the last five years. These models should be sophisticated and flexible enough to take into account not only the regular voters but also the occasional voters who will show up in one particular election but not in others. This would improve the quality of the polling conducted in Chile while at the same time contributing to improvements in similar work being done elsewhere.

The ban on the publication of poll results within the 15-day period leading up to Election Day may contribute to inaccurate polling results, and it prevents citizens from accessing valuable information about how their fellow citizens are evaluating the candidates and issues they are discussing. However, in this election, one firm – CADEM –collected data across the entire campaign, including during the silent period, and their results in the aggregate suggest that a late campaign swing cannot explain

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[38] For more information on the impact of these changes, see "Métodos alternativos para la estimación de resultados electorales." 2015. "Alternative Methods for Estimating Election Outcomes." *Estudios Públicos* 137: 7-42, and "Problemas relacionados con las encuestas preelectorales desde una perspectiva comparada." 2015. "Problems with Pre-Election Polls in Comparative Perspective. *Estudios Públicos* 138: 7-46.

Chile's polling miss since there was stability in candidate preference across that period.

Recommendations

- It is important to have complete transparency about polling methods to improve understanding of the work that is being done and to suggest ways it might be improved. Guidelines about this can be found in the AAPOR Transparency Initiative https://www.aapor.org/Transparency_Initiative.htm), an initiative supported by WAPOR.
- Specifically in that regard, pre-election polling firms in Chile should always publish both the estimates from their total samples and from their likely voter model(s), including more information about how likely voter models are computed.
- In addition, information on the questionnaire and its length, and more specifically on the question order, on response choices and order of the voting intention question should be provided in methodological reports.
- Continuing education of the public and journalists should be provided, emphasizing that it is not possible to judge the accuracy of polls which produce estimates of the outcome of an election several weeks before it takes place. WAPOR, in conjunction with AAPOR and ESOMAR, has prepared online materials for journalists to help them understand how to report on poll results, for example.
- In view of the results presented here and the fact that many commentators attributed the polling miss to the absence of public polls during the last two weeks before the election, the committee recommends that the ban on publication of poll results be shortened if not eliminated. In addition to giving equal access to information for all, this would help ensure a studied assessment of the performance of polls and the likely improvement in the methodology of polls for the following elections.

From a scientific perspective, given the changes in the electoral system, it would be important to have a validation survey to improve likely voter models. Survey researchers from the government, academic institutions, and the private sector could design and implement such a study to put in the field before the next elections in Chile. Such an effort would not be conducted for publication purposes, and no results would be released before the election. Analysis of the resulting data would be used to improve subsequent likely voter models in Chile and elsewhere. WAPOR has members who would be glad to participate in such an effort, including those from its regional chapter, WAPOR Latin America.

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