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Exit Polling in an Emergent Democracy: The Complex Case of Ukraine

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This report considers the methodological specifics of conducting exit polls to verify election returns, mainly using an example of election campaigns in Ukraine from 2002-2007. The deepest public resonance was aroused by exit polls conducted after the second round of Ukrainian presidential elections in 2004. These polls were one of the factors, which led to massive demonstrations (the so-called "Orange Revolution") and the revocation of election results. The authors show that in the environment of administrative pressure on voters, governmental control of mass media, and severe political struggle, inaccuracy increases. Thus, to acquire reliable and valid information, the polling methods used must be modified. The recommendations given for the methodology of conducting exit polls may be useful for emergent democratic countries.
Keywords: exit-poll, elections

Introduction

Using examples from multiple Ukrainian elections conducted during 2002-2007, this report considers the methodological specificities of conducting exit polls to verify election results. Exit polls conducted after the second round of presidential elections in 2004 gained widespread public resonance, both in Ukraine and internationally. The extent of discrepancies between exit poll results and election returns announced by the Central Election Commission (CEC)[1] was so large that the difference became a major argument challenging the validity of the official election returns,[2] and became one of the catalysts of the massive demonstrations (the so-called "Orange Revolution") that contributed to the eventual cancelation of the second round election results. The authors analyze what methodological peculiarities could lead to differences between exit poll findings and election returns and discuss some points at issue connected with the functions of exit polls in the electoral system.

Background

Ukraine is not a country with established electoral traditions. Prior to 1991 Ukraine was not a sovereign state, belonging instead to the Soviet Union which essentially did not hold free elections, but rather staged the illusion of elections. Until 2005 state control over the media was pervasive, and enterprise managers regularly pressured their employees to vote 'as required'. Among elderly people who survived Soviet repression, fear that the government might apply sanctions if an 'incorrect' result was achieved was widespread.

The formal system of electoral cycles in Ukraine foresees parliamentary elections every four years, presidential elections every five years. The winner of presidential elections is the candidate who receives 50% of the votes cast plus one vote, but if no candidate receives more than 50% of votes cast in the first round, a second round is held two weeks after the first with the two leaders of the first round participating. Voting is allowed on election day only, meaning that no advance voting is permitted. All electors are to cast their ballots at polling stations except for the infirm and handicapped (such voters may request that election committee representatives come to their homes or hospital rooms with a special mobile ballot box).

Exit polls have been conducted in Ukraine since 1998 using methodologies that generally approximated those used by colleagues in developed democracies. In these countries, where traditions of free and fair electoral conduct are well established, the principal function of exit polls is to provide early election returns for publication in the media, and to supply data for deep analysis of voterl preferences by region, gender, age, etc. (Mitofsky et al., 2002). Most scholarly articles devoted to differences between exit poll results and election returns do not consider the effect of deliberate prejudice, but instead discuss what methodological specifics may cause errors in exit poll results (Mitofsky, 2003; Biemer et al., 2003; Lindeman and Brady, 2006). Even in those rare cases where electoral fraud is considered to have been a possible source of differences between exit poll results and official election returns (see, Barone, 2004, McCoy, 2006 regarding elections in Venezuela), it is difficult to establish that election returns are in fact false.[3] During the 2004 US presidential election, exit polls initially appeared to overestimate the proportion of votes cast for John Kerry, helping to spread suspicion that the inaccuracy had arisen not from errors in the exit polls, but from errors in vote counting. That exit poll

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[1] CEC – Central Electoral Commission – official organization that organizes elections in Ukraine.

[2] The authors developed the methodology and took part in project management of the exit poll under consideration.

[3] The Associated Press published information about the doubtfulness of exit polls (see, for example, http://www.sptimes.com/2004/08/20/Worldandnation/American_backs_his_Ve.shtml).

was discussed in January 2005 when the polling companies, Edison Media Research and Mitofsky International, issued a report which concluded that the errors arose from differential response rates in the two groups of voters (Evaluation, 2005; see also the discussion by R. Brady with S. Freeman in Brady, 2005). In any case, "In the United States, major exit polls have never been designed to verify vote counts" (Lindeman and Brady, 2006). In the case of Ukraine, virtually all exit polls were organized with the express purpose of verifying election returns.

Over nine years of conducting exit polls in Ukraine, there have been at least two precedents of possible mass falsifications, namely the pan-Ukrainian referendum on 16 April 2000 (Paniotto and Kharchenko, 2003) and the mayoral elections in Mukachevo on 18 April 2004 (Mukachevo, 2004). However, the elections of 2004 were far more complicated than these other two cases. The severely aggravated nature of political competition of the 2004 presidential elections destabilized the political situation in Ukraine, thus complicating the work of exit poll organizers.

Exit Poll Methodologies

Procedural peculiarities associated with exit polls are similar to those encountered in intercept surveys. On the one hand, the format of questioning makes it easier for a respondent to refuse to participate, but on the other hand, anonymity is increased compared to other survey methods. To encourage respondents to provide truthful answers, in each of the exit polls conducted in Ukraine by our firm during 2002-2007 we used a secret ballot methodology – one which has been used by our US and EU colleagues for exit polls since the early 1990s (Bishop and Fisher, 1995; Hoek and Gendall, 1997). According to the findings of several methodological experiments, the secret ballot methodology yields data that is closer to official results than that received from personal interviews (Perry 1979, Mcdonald and Glynn, 2001, Bautista et al., 2005). Unfortunately, until 2009, Ukraine did not have a single register of electors, and therefore a part of the information necessary for random sampling was missing. In 2004 parts of the electoral register were deliberately made secret by state authorities, and were therefore unavailable to researchers.

Ukraine is divided into 26 administrative units – regions (oblasts). For elections, Ukraine is divided into 225 constituencies, and every constituency is divided into electoral precincts (almost 34 thousand precincts or "local districts" in total). Every precinct includes not more than 3000 registered voters (the total number of voters in Ukraine is approximately 37 600 000, and the average number of voters per precinct is about 1100).

During the 2004 elections, the Central Election Commission provided information on the official count only for the oblast and constituency level, so within precinct error (WPE) calculations were not possible. Precinct-level voter turn-out information from previous elections was not available in 2004 either – a fact that changed for 2006 and 2007 elections (and thereafter), and made verification of our sample possible.

As in any exit poll project, survey organizers must decide on a number of issues concerning the survey procedure, including the interviewers' working time during the day, the number of interviewers per polling station (usually one or two), problems arising from two polling stations sharing one territory (e.g. two stations/precincts being located in one building), the interviewers' work safety[4] and so on. During the 2004 presidential election in Ukraine, data transmission via internet was not possible due to insufficient Internet availability (under 20% national coverage). Therefore, survey data was transferred to a central collection point via telephone, with interviewers summing up the data from their polling station and dictating by phone to the central office. Within 1-2 days of the vote, we received questionnaires filled in by respondents from all regions, which improved the accuracy of results (i.e. telephone dictation errors were corrected. Thus, preliminary results were available on election day, and final exit poll findings were tabulated in several days' time.

The Ukrainian exit poll experience

Exit polls have been conducted in Ukraine since 1998 with the last parliamentary election (30 September 2007) constituting the 9^{th} time that exit polls were used in our country (not counting some local exit polls in separate cities). Our firm (The Kiev International Institute of Sociology – KIIS), a member of a consortium formed by several research organizations,[5] has participated in conducting exit polls since 1999. The authors of this paper were responsible for methodology development and management of all exit polls conducted by KIIS independently, and by the Consortium in the case of the last two exit-polls. Other Ukrainian exit-polls have been conducted by SOCIS, "Social Monitoring" Center (SMC) and the Razumkov Center (RC). A comparison of exit poll results and methodologies is shown in Table 1.

Until 2004, differences between our exit poll findings and election returns were not more than 3.5%. Specifically, this discrepancy occurred in the second round of the presidential elections of 1999 when votes for the communist leader were underestimated – possibly due to transportation problems, as one candidate was more popular with villagers. In the next election (the parliamentary elections of 2002), the maximum difference between our exit poll findings and the election returns was 1.4% for 2 parties, and it was under 1% for the other remaining 31 parties. High congruence

[4] It should be mentioned that pollsters also face problems of poor transportation (for instance, some villages can be reached by bus only once a day) and telephone line availability (about 35% of countryside inhabitants have neither a stationary nor a mobile phone, and many settlements lack mobile coverage). Additionally, interviewers in Ukraine do not have private cars, so survey schemes such as the Valu exit poll in Sweden (Hernborn et al., 2002), where one interviewer attends several polling stations, are practically impossible to realize in Ukraine.

[5] Members of the "National Exit Poll" consortium varied from year to year, including the "Democratic Initiatives" center (which initiated the conducting of exit polls), KIIS, Razumkov Center, SOCIS and Social Monitoring.

Table 1: Characteristics of national exit polls in Ukraine

Elections	Parliamentary 1998	Presidential 1999		Parliamentary 2002	Presidential 2004			Parliamentary 2006	Parliamentary 2007
Round	1	1	2	1	1	2	3[a]	1	1
Pollsters	Socis	KIIS Socis SMC	KIIS Socis SMC	KIIS Socis SMC	KIIS Socis SMC RC	KIIS RC	KIIS RC	KIIS RC	KIIS RC
Number of questionnaires	10,000	6,000	6,000	18,240	50,000	30,000	28,746	16,796	16,710
Number of poll. stations	400	300	300	757	1,500	460	460	300	300
Sample	0,5 quota/ 0,5 random	Random	Random	Random	Random	Random	Random	Random	Random
Fieldwork method	Face-to-face interview	Face-to-face interview	Face-to-face interview	Face-to-face interview	0,5 Face-to-face interview/ 0,5 Secret ballot	Secret ballot	Secret ballot	Secret ballot	Secret ballot
Maximum divergence from the election data	4%	2,6%	3.5%	1.4%	4.7%	6.3%	3.6%	1.7%	0.7%

[a] (2^{nd} voting)

between our findings and election returns was also seen in the parliamentary elections of 2006 with a maximum difference of 1.7%. During the pre-term parliamentary elections of 2007 the KIIS-RC Consortium exit poll diverged from the CEC result with a maximum difference of 0.7%. The most dramatic discrepancies were seen in the exit polls of the 2004 presidential elections.

The 2004 Ukrainian presidential elections

On 31 October and 21 November 2004 Ukraine, held the first and second rounds of its presidential elections. This election was seen as immensely important because the two principal candidates represented radically divergent visions of the future development of the country. One prioritized European integration and democracy, while the other called for a closer union with Russia. The number of registered candidates was 26, but only two of them were principal candidates. The opposition candidate, Viktor Yushchenko, represented the European (Western) direction of development, while the candidate of the ruling regime, Prime Minister Viktor Yanukovych, represented the Russian (Eastern) direction. During the course of the campaign, the opposition accused the government of blatantly mobilizing state resources in support of Mr. Yanukovych. Critics noted that pensions had been doubled just a month before the election, and that billboards and mass media presentations (television, radio, printed press) tended to favor the Prime Minister. The main opposition candidate had only limited access to the media, and some candidates were completely prevented from getting any coverage. In this environment, exit poll and pre-election electoral survey respondents experienced considerable psychological pressure: openly sympathizing with the opposition candidate was risky (Bandera, 2006; Natsionalnyi, 2005; Paniotto, 2005).

Urged by the "Democratic Initiatives" Fund, four polling organizations (KIIS, RC, SOCIS and SMC) formed a consortium to conduct a survey called the 'National Exit Poll' (sponsored by four international funds and eight foreign embassies in Ukraine). In addition to the National Exit Poll, several alternative exit polls were conducted during the 2004 votes by various other organizations using a variety of methods. In the end, the total number of exit polls conducted in the three election rounds reached fifteen. All the organizations sponsoring those exit polls proclaimed vote count verification (not early result estimation or deep voter preference analysis) to be their ultimate goal.

To encourage respondents to provide truthful answers, KIIS and RC decided to conduct their exit poll by secret ballot, while SOCIS and SMC insisted on interviewing respondents personally. As a result, although participating in a single consortium, each company conducted its version of the exit poll using its own method – either interview or secret ballot.

The samples of each of the four companies participating in the consortium contained 370 polling stations (12,500 respondents), and were deemed representative of Ukraine as a whole. Thus, a total sample of nearly 1,500 polling stations (50,000 respondents) was achieved. The pooled data was meant to represent each of the 26 regions of Ukraine.

The first election round resulted in two candidates going on to the second round, just as predicted. According to official CEC returns, Viktor Yuschenko received 39.9% of all votes cast while Viktor Yanukovych polled 39.3%.

Before the second round, SOCIS and SMC accused international donors who financed the exit poll (4 funds and 8 embassies[6]), of pressuring them to use the secret ballot method instead of face-to-face interviews. They further stated that they had other financiers and would conduct their own exit poll separately from our consortium. As a result, during the November 2004 runoff vote, SOCIS and SMC conducted their exit polls through face-to-face interviews, while our company (KIIS) and the Razumkov Center (supported by the "Democratic Initiatives" fund) conducted the second round of the 2004 National Exit Poll by secret ballot. Preparing and conducting our exit poll, we consulted with experts and observers from Russia (A. Andreenkova from the Institute for Comparative Social Research, U. Levada, A. Grazhdankin, K. Kozyrenko, N. Zorkaya and E. Duke from Levada-Center) and from Poland (M. Kochanowicz and R. Pieñkowski from PBS DGA – Pracownia Badań Spolecznych). During the initial stages of exit poll preparation, we also received useful advice from Warren Mitofsky.

Prior to the November 2004 second round, sampling was done by KIIS to be representative for each of the two companies for Ukraine overall, and to remain representative for the 5 macroregions of Ukraine (West, Central, Northeast, East, South) when the companies aggregated their data sets (regional classification of Ukrainian oblasts was derived from first-round voting similarity data). In our usual surveys, with 110 primary sampling points (110 settlements, where a settlement is a city, town or village) and 200 sampling points, the design effect for most variables does not exceed 1.5. Thus, we assumed that taking 230 sampling points (precincts or "local election districts") for each company would ensure the design effect remained within the 1.5 value limit. Distribution of the 230 sampling points in settlements with probability proportional to their size gives 180 settlements, which is significantly more than our usual 110 settlements. The sample size for each company was 15,000 respondents which, accounting for the 1.5 design effect, leads to 1.2% sample error (95% confidence interval). When the two companies aggregated their data sets (to a total of 30,000 respondents), each of the 5 regions of Ukraine would be repre-

[6] This exit poll was supported by the Swiss Agency for Development and Cooperation (SDC), Royal Norwegian Embassy in Ukraine, Democracy Grants Program of the U.S. Embassy in Ukraine, Canadian International Development Agency, The Embassy of Canada in Ukraine, The Embassy of the Kingdom of the Netherlands in Ukraine, The Embassy of the United Kingdom of Great Britain and Northern Ireland in Ukraine, the Swedish International Development Cooperation Agency (Sida), The Royal Danish Embassy in Ukraine, the Charles Stewart Mott Foundation (USA), National Endowment for Democracy (USA), the International Renaissance Foundation and Eurasia Foundation.

sented by 6,000 respondents, giving a probability error under 2.1%. Thus, the total sample size for the two companies was 30,000 respondents (15,000 for each company) in 460 precincts, with an average of 65 interviewees at each polling station.

The most appropriate way of choosing a sample seems to be that of stratified sampling of polling stations (according to the number of polling stations in each of the 26 oblasts) with further respondent selection using the "same step" procedure for every polling station. This procedure is very sensitive to interviewers following the time-step interval, as an increase or decrease in this interval will skew the proportional representation of the polling station within the sample. Unsure of the accuracy of our interviewers' performance, we chose our proven practical standard research approach of stratifying the population aged 18 and older by oblasts and town-village proportion (52 strata) with the following PPS (PPS – probability proportional to the size) selection of settlements in the first stage. Polling stations were then used to select within these settlements in the second stage, and these were used to select respondents at each polling station in the third stage. In this way, we were able to give interviewers the number of respondents for polling stations in every strata.

As Andreenkova (Andreenkova, 2005) has noted, in the second stage of selection the sample is often based on the assumption of equally sized electoral districts – an assumption which is not entirely accurate and may contribute to sample error. Using PPS in the settlement selection and giving the interviewers the exact number of respondents for every polling station may compensate for this type of sample error.

Accordingly, 180 settlements were selected at the initial stage. During the second stage, 230 electoral districts were stratified (by oblasts and town/village residents) in proportion to strata size. Since the Ukrainian CEC does not provide information on the total number of voters registered in each electoral district (precinct), polling stations were selected by random equiprobable sampling within the settlements chosen in the preceding sampling stage.

On voting day, interviewers questioned the assigned number of respondents with the predetermined step at each polling station in the sample. Given the sampling strategy, receiving responses from the assigned number of respondents was deemed more important than keeping to the step precisely, and procedures were different for town and village residents. To calculate sample size, we used information on the size of the town and village electoral districts that we had obtained either from preceding elections, from the CEC data on the average size of electoral districts in each oblast (though, unfortunately, the CEC does not provide separate information on towns/cities and villages), and from turnout data for each oblast.

For the time distribution (i.e. time-of-day voting patterns), we used information on voting time recorded in previous surveys, basing ourselves on what time period voters voted in previous elections. Data in Table 2 were derived from several surveys:

Polling stations were closed at 20:00. We stopped polling at 18:00 in towns and cities (by which time, in the first round, nearly 97% of the urban population had already cast their ballots) and at 16:00 in villages (at which time 89% of the rural population had already voted).

A total of 28,178 questionnaires were collected on 21 November 2004 by 920 interviewers. Each precinct was assigned two interviewers, with one tasked with counting people leaving the polling station while the other conducted the exit poll. The survey results were dictated to the central office via telephone and then entered into a database.

After the survey, findings were weighted according to the CEC information on the proportion of people who cast their ballots in each region of Ukraine. When planning the sample, stratification of the 26 regions included overall population figures, but was not weighted according to the proportion of people actually voting, so turn-out weighting was deemed to be an important element of accuracy verification. It should be mentioned, however, that the turnout figures announced by the CEC made the opposition suspect some vote-rigging: unprecedentedly high voter turn-out was reported in Donetsk oblast, where CEC data showed nearly 97% of voters casting a ballot. Nevertheless, we used the CEC data on the proportion of actual voters casting a ballot by 20:00 (when the election was over) since the sample we developed required these numbers, and because unfortunately, no alternative information on the turnout was available.[7]

Exit Poll Results vs. CEC Returns

When tabulated, the maximum difference between data collected by the two companies participating in the National Exit Poll consortium during the 21 November 2004 second round (KIIS and RC) was 0.7%. We therefore pooled the KIIS and RC data into a single database. Table 3 shows the results of pooled exit poll findings compared to the official CEC election returns.[8]

The differences between the exit poll data and the CEC official count was 6.3% for Yuschenko and 5.3% for Yanukovych. According to National Exit Poll data, Yuschenko won, receiving 8.7% more than Yanukovych. The CEC count indicated that Yuschenko lost, receiving 2.9% less than Yanukovych. Such a big difference between our exit poll findings and the CEC results may indicate a huge error in exit polling, or it may be evidence of vote-rigging.

The total error in the exit poll results may depend on the following components: statistical sample error, frame error,

[7] It should be mentioned that later on (in the exit polls of 2006 and 2007) we stopped using CEC data and turned to equi-probable precinct sampling and a fixed respondent selection step at each polling station. Fortunately, our fears concerning interviewers being imprecise about the selection procedure proved to be unfounded. We paid particular attention to the importance of the precise selection step at the interviewers' briefing, and the exit poll results in the 2006 and 2007 elections concurred well with the official election outcomes (see Table 2).

[8] As we already mentioned, the CEC only gives voting information on Ukraine overall and its 25 major regions (oblasts), so WPE calculation is not possible.

Table 2: Selection time period (KIIS, RC)

Selection time period	Towns	Villages	Population overall, %	Cum. %
From 8 to 10 a.m.	25.9%	28.7%	26.8%	26.8%
From 10 to 12	31.2%	28.7%	30.4%	57.2%
From 12 to 14	18.7%	20.7%	19.4%	76.6%
From 14 to 16	11.4%	14.1%	12.3%	88.9%
From 16 to 18	8.4%	4.6%	7.1%	96.0%
From 18 to 20	4.4%	3.2%	4.0%	100.0%

Table 3: The 2004 Presidential Election second round: Exit poll findings (KIIS+RC) compared to official CEC election returns

	Yuschenko			Yanukovych		
	Exit poll	CEC	Dif.	Exit poll	CEC	Dif.
Ukraine	52,9	46,6	6,3	44,2	49,5	-5,3

measurement error, error due to refusals, and election day factors.

Sampling error: For a more precise evaluation statistical sampling error, we calculated the design-effect for Ukraine overall and for each of the marked regions. The design-effect was calculated with the help of WesVarPC 2.12 using the Balanced Repeated Replication method.[9] Townvillage groups were taken as strata in each oblast (25*2=50 plus Kyiv, 51 strata in total, as there is no village population in Kyiv). For sample units, we took corresponding strata from the sample made by KIIS and RC. The design-effect was calculated for univariate distribution tables by asking the question "Who did you vote for?" (table 4). The sampling error did not exceed 2.1%.

Frame error: The difference between the exit poll findings and the official count may be linked to the following: a) we stopped polling before the election was over; b) we did not survey any polling stations abroad, in hospitals, prisons, or military bases; and c) we did not question those who voted without going to the polling station (voting-by-mail was not allowed in Ukraine, but polling station representatives visited the infirm at home). Each of these possible sources of error and the magnitude of their effect will be considered in the following sections.

a) Finishing the survey before polling stations were closed

When conducting an exit poll in the first round of presidential elections, a question was added to query the respondent's voting intentions in the case of V. Yuschenko and V. Yanukovych going on to a second round. Those findings are given in Table 5, using only KIIS and RC data since SOCIS and CMC data (collected face-to-face) are to be regarded as dubious.

As was seen earlier in Table 2, since we stopped polling at 18:00 in towns/cities and 16:00 in villages, we 'lost' ≈3% of urban votes and ≈11% of rural voters. To what extent could this have influenced our results which showed a dramatic Yuschenko advantage? We attempted linear and nonlinear regression models (with the polling time as the independent variable and the proportion of answers "I will vote for Yuschenko" and "I will vote for Yanukovych" as dependent variables) to predict the responses favoring Yuschenko or Yanukovych at 19:00 and 20:00. However, goodness of fit for these models was low; the R^2 of the linear models was close to 0.005 and those of the nonlinear models were close to 0.300. If we assume that people voting after 18:00 voted like those who cast their ballots prior to 18:00 (meaning that among the 3% of urban voters, those voting for Yanukovych are 14% more numerous), this would increase Yanukovych's lead in our survey by only 0.4% (14% of 3%). If we consider rural residents, Yuschenko's lead increases closer to the evening, so 'losing' the last 11% of voters would only decrease the gap between Yuschenko and Yanukovych, but it would by no means erase it. As the urban population constitutes less than three-quarters of the entire population of Ukraine, stopping the survey before the polling stations closed would not add more than 0.3% to Yuschenko's 8.7% lead calculated with our results.

It is also worth noting that the data for a Yuschenko/Yanukovych decision from the first round exit poll (table 6) correlates closely with the one we calculated in the exit poll of the 2nd round of elections.

b) Polling stations abroad, in hospitals, in prisons, and on military bases were lacking in the sample. Table 7 contains a rough estimate of the size of these population categories and their proportion relative to the total number of people who voted on 21 November 2004 (according to official CEC data this figure constituted 30,511,289).

At polling stations abroad, 0.3% of those eligible to vote actually voted, but even the official count showed Yuschenko winning with 54.7% against Yanukovych with 43.4%. Thus, the fact that polling stations abroad were not included reduced Yuschenko's advantage, approximately by 0.03% (11% of 0.3%).

c) Home, hospital, prison and military base voting.

Unfortunately, only the number of people who voted from home is definitely known (this data can be found on the CEC website), but we do not know what number of convicts, military men, and hospital patients actually voted. With regard to convicts and military men, the proportion of

[9] See for example http://www.westat.com/wesvar/index.html

Table 4: Sampling errors (95% confidence interval), 2nd round of elections in 2004. (KIIS+RC) data

		Sampling errors		
	n	Design-effect	Without design-effect	Design-effect considered
Ukraine overall	28363		0.6	
Yuschenko		3.5		2.1
Yanukovych		2.7		1.6

Table 5: What will you do if V. Yuschenko and V. Yanukovych go to a second round? Data from 1st round of 2004 elections, KIIS+RC data

	Towns			Villages		
Polling time	I will vote for Yuschenko	I will vote for Yanukovych	Other[a]	I will vote for Yuschenko	I will vote for Yanukovych	Other[a]
8 a.m.	39.2	47.3	13.5	51.9	33.6	14.5
9 a.m.	42.5	45.5	12.0	51.1	32.7	16.2
10 a.m.	42.6	45.1	12.3	51.8	33.0	15.2
11 a.m.	41.3	46.8	11.9	52.0	33.0	15.0
12 p.m.	44.2	43.6	12.2	55.6	30.7	13.7
1 p.m.	39.3	48.2	12.5	51.3	32.2	16.5
2 p.m.	44.9	43.7	11.4	53.4	33.5	13.1
3 p.m.	44.3	42.2	13.5	50.0	35.7	14.3
4 p.m.	44.5	44.5	10.9	77.8	22.2	0.0
5 p.m.	41.3	47.1	11.6			
6 p.m.	36.4	50.0	13.6			
Total	42.3	45.4	12.3	52.4	32.5	15.1

[a] will not vote, will not support any candidate, difficult to say

people who actually voted should not be less than that of other population categories, as it is easier to manage turnout for these two groups. We may assume that about 75% of people in these categories took part in the elections, making up about 1.2% of the total turnout. However, even if we suppose that the majority voted for Yanukovych (maybe 60%), contributing about 0.7% for Yanukovych and about 0.5% for Yuschenko, this would introduce only a 0.2% error into the advantage that we estimated for Yuschenko. With regard to hospital voters, we have no basis for assuming that they would vote differently compared to people casting their ballots at polling stations.

We may assume that the majority of home voters are impaired and/or have mobility difficulties. These are most likely to be elderly people who voted for Yanukovych more actively than other age group. If the same proportional division is applied to home voters as was applied to convicts and military men, this 1.8% will become 1% for Yanukovych and 0.8% for Yuschenko, and will add 0.2% more to the overall difference in ranking.

Therefore, for Yuschenko's 8.7% advantage derived from our poll, only 0.2% + 0.2% = 0.4% may be explained by the polling stations that we did not survey. 0.2% can be accounted for from estimates of hospital, prison and military base voting patterns, and an additional 0.2% is accounted for by home voting.

Measurement error: Measurement error includes errors due to refusals, missed voters, interviewers' influence, and inadequacies of the research instrument. Practically all respondents were eligible (interviewers screened them). Missed voters were considered to be a negligible source of error since we had 2 interviewers at each polling station – one marking off the step (19 on average) and the other surveying voters. Even during peak periods at polling stations, the time needed for 19 people to vote was enough for the interviewer to contact a respondent, ask him/her to give answers to 3 questions, and place the questionnaire in the box. Thus, all non-answers were refusals.

The error due to refusals depends on the proportion of people who refused to answer and the different trends in those who responded and those who refused. Studies of non-response in Mexican exit-polls showed, that there is no significant relationship between response rates and exit poll level of error (Bautista et al., 2007). This is possible when differences of opinion between those who answer and those who refuse is not significant.

A more accurate calculation of the sample error caused by the fact that not all the respondents were questioned is calculated according to the following formula:[10]

$$E = |p_2 - p_1| * (1 - RR), \tag{1}$$

with E being error; p_1 represents the proportion of some characteristic P (for instance, a candidate's rating) among the respondents; p_2 represents the proportion of characteristic P among those who were not questioned; RR represents

[10] As a reminder, we were not able to calculate WPE because information on the official count for precincts was not available to us.

Table 6: If only V. Yuschenko and V. Yanukovych go on to a second round, what will you do? (1^{st} round of elections 2004, KIIS+RC data)

I will vote for Yuschenko	I will vote fore Yanukovych	I will not vote	I will vote against both	Difficult to say	Total
45.6%	41.2%	1.0%	4.2%	8.0%	100.0%

Table 7: Rough estimates of the number of people voting at "closed polling stations" or at home (2^{nd} round of 2004 elections)

Population categories	Numbers	Proportion in the total number of people who voted, %
Polling stations abroad	93,000	0.3
Convicts	200,000	0.7
Military	250,000	0.8
Home voters	537,000	1.8
Hospital berths (maximum)	458,000	1.5
Total	1,538,000	5.0

response rate (the proportion of people who answered the questions).

As was mentioned previously, RR = 0.78. To estimate the difference ($p_2 - p_1$), we consider differences in socio-demographic characteristics of those who responded and those who refused to respond (we recorded their gender and age). No differences in response rates based on gender were found, but as shown in table 8 some age differences were identified.

We take the sum total of responses and refusals as an indicator of the age distribution of voters and recalculate the final results according to age group proportions in the entire sample, and receive practically the same result: Yuschenko's score becomes 0.1% lower, Yanukovych's rating becomes 0.1% higher.

However, it is possible that the difference in the candidates' ratings among those who responded and those who did not is directly related to their willingness to participate in the survey, but is not linked to their socio-demographic characteristics. Since we found a considerable lead for Yuschenko, we were interested first in whether there were noticeably more Yanukovych supporters among those who refused to answer than among those who agreed to respond. The refusal motivation did not provide an answer to this question. Over 70% did not actually state the reason (stating, for instance, "I do not want to reveal my choice"), 17% said they were too busy, and 13% said they do not believe that elections are fair and that they do not trust pollsters ("sociologists").

Experiments that use both interviewing and secret ballots are a productive means of inquiry into reasons for non-response. Using data from the preceding survey (1^{st} round vote), comparing secret ballots to interviews, we found that Yuschenko's rating was higher among those who responded by secret ballot, meaning that evasion was more typical of Yuschenko's supporters (see also Paniotto, 2004). Thus, it is highly unlikely that during the second round of voting there were more Yanukovych supporters among those who refused in this instance. But even if we suppose that among the refusals there were 10% more Yanukovych supporters than Yuschenko supporters, the error rate calculated from the formula above is still only 2.2%.

Interviewers can influence exit poll results in different ways. For example, interviewers' may consist express their own opinion on candidate preference, thus causing respondents to be insincere in their answers. Concerning the insincerity of those who responded, this error is not likely to be large. First, in an exit poll it is easier to refuse to answer than in usual surveys when an interviewer comes to one's home. Why give a false, though perhaps socially desirable response, when it is so easy to refuse? Second, we used the secret ballot method, so respondents themselves marked their papers and placed them in a sealed cardboard box. Finally, the social pressure was on Yuschenko supporters to falsely report support for Yanukovych, so this effect would not have led to an inaccurately high result for Yuschenko.

Another possible source of interviewers' influence when a secret ballot method is used may be in affecting refusal rate, thus increasing the likelihood of a non-representative voter sample. However, the refusal rate in the 2004 exit poll was rather high – not lower than in other exit polls. As for interviewers' influence on respondent selection, the procedure of selecting every 19^{th} voter was strictly controlled; controllers appeared unnoticed at polling stations and watched interviewers follow the procedure documenting everything for a certain period of time.

The influence of the research instrument seems to have been minimized by adding only 2 questions (about the respondent's sex and age) to the main question ("Who have you just voted for?"). In addition (as in our other surveys) interviewers asked respondents to select the language of the questionnaire (Ukrainian or Russian).

Election day factors. Interviewers identified 11 non-typical election situations, including drunk respondents, obstacles caused by candidates' supporters, militia, election observers obstructing exit poll surveyors. A total of 298 cases of such polling station difficulties were documented (affecting about 1% of respondents), and these were spread more or less evenly over the 26 oblasts of Ukraine. We therefore conclude that error due to this factor was negligible.

Combining the above analyses, the exit poll error in total should not have exceeded:

Table 8: Differences between those respondents who agreed and those who refused to answer, 2^{nd} round of 2004 elections.

	Responded	Refused	Difference	Yuschenko	Yanukovych
Sex					
Male	46.7	46.7	0	59,4	37,8
Female	53.3	53.3	0	50,7	47,1
	100.0	100.0			
Age					
18-29	22.1	15.3	6.8	57,5	39,1
30-39	18.5	17.5	1.0	58,9	38,0
40-49	21.2	23.4	-2.2	56,7	41,0
50-59	18.8	20.6	-1.8	51,2	46,4
60+	19.4	23.2	-3.8	49,3	49,3
	100.0	100.0			

- 2.1% due to statistical error of the sample (95% confidence interval);
- 0.7% due to frame error (0.3% due to the survey being stopped before polling stations were closed and 0.4% due to the absence of exit polling at home, hospitals, military bases, etc.);
- 2.2% due to non-answers (evaluation of sex and age structure shows that error due to nonanswers must not exceed 0.7%).

These errors add up to 5%, and the ratings differences that we calculated showed Yuschenko to have an 8.7% lead, while the official count showed Yanukovych leading by 2.9%. Of course some measurement errors cannot really be fully measured, and using current methods, it is difficult to disentangle where sampling errors were responsible for discrepancies in results, and where fraudulent actions took place. Indeed this fact led to significant political problems when the National Exit Poll results were announced, and subsequently interpreted. However, the existence of very significant differences between Yuschenko's and Yanukovych's results according to exit polls vs. their results according to official election returns, raise suspicions of vote-rigging.

Exit Polls and the "Orange revolution"

It is difficult to say whether the exit poll was the deciding factor that led to mass public protests in Ukraine in late 2004, but it was certainly one of the factors. On 21 November 2004, on the day of the second round of voting, immediately after polling stations were closed at 20:00, several TV channels showed the National Exit Poll representatives announcing the findings with about 54% of the votes going to Viktor Yuschenko. This put him 11%[11] ahead of the government candidate, Viktor Yanukovych (43%). In addition to these exit poll results, during and after the elections, the media and representatives of various parties reported massive violations of the voting procedures. When the CEC announced preliminary information (during the early hours of November 22, when less than one-third of votes had been counted), according to which Yanukovych was shown as leading by 3%, the opposition called for people to stage protest demonstrations against vote-rigging. On 22 November, 200-300 thousand people gathered in the center of the Ukrainian capital, Kyiv, beginning a massive protest demonstration that lasted 16 days, and became known as the "Orange Revolution"[12] (Paniotto, 2005; Wilson, 2005).

On the very first day, leaflets showing the exit poll findings were distributed among the demonstrators, and on the following day more copies were printed. The total number of leaflets presenting the exit poll results reached nearly 500,000 copies. Urged by unceasing protests, the Verkhovna Rada of Ukraine (Parliament) held hearings to consider opposition complaints, and revealed massive violations of the voting procedure (McFaul, 2007; OSCE, 2004). Some of these violations tested the validity of the methodological decisions that we had taken when planning the exit poll. In particular, the following violations were detected:

1. *Adding ballot papers after polling stations were closed.* Extra ballot papers were printed secretly. After polling stations were closed, additional ballot papers marked for Yanukovych were cast into ballot boxes. As a result, some oblasts of Ukraine showed an unprecedented 'turnout' in the second round. The most prominent was Yanukovych's homeland, Donetsk Oblast. In the first round, this oblast had a turnout of 78%, and in the third round (held as a result of the Supreme Court decision that cancelled the CEC results of the 2^{nd} round) it registered 84% turnout. During the second round, turnout reached nearly 97%.

2. *Absentee voter forms* – Buses and special trains filled with people carrying packs of absentee voter forms were sent all over Ukraine. These forms gave the bearer the right to vote in any electoral district, not only in his/her place of residence – a measure that was deemed necessary by the authorities given Ukraine's lack of a single registry of voters. According to international observer reports (and evidence presented in Ukraine's Supreme Court), many of these voters re-

[11] On the following day, the turnout figures for each of the 26 regions were published. The exit poll findings were re-weighted using this data and Yuschenko's lead decreased to 9% (53% to 44%), but this did not change the situation, as the data still showed a definite victory for the opposition candidate.

[12] Orange was adopted by the Yushchenko team as the signifying colour of his election campaign.

peatedly cast ballots at various polling stations, constituting an abuse of the electoral process.

3. *Electoral register spoilage.* One of the main vote-rigging instruments was intentional spoiling of electoral registers in regions where a vast majority of people were expected to vote for Yuschenko. The lists contained intentional errors in voter surnames or patronymics. In such cases, when people came to cast their ballots on election day, they were not allowed to vote.

4. *Home voting.* Such a democratic measure as home voting was also used for vote-rigging. Specifically, prior to election day, people who were not going to vote were identified in advance, and then ballots were cast in their names during the period when the ballot boxes were taken out of polling stations – supposedly to service the elderly and infirm. According to Supreme Court testimony, these ballot papers were almost universally marked for Yanukovych.

On 3 December 2004, the Supreme Court of Ukraine concluded that massive vote-rigging had occurred during the second round of Ukraine's Presidential election, and declared this vote void. A 're-balloting' of the second round (effectively a third election round) was set for 26 December 2004.

During the third round of voting, the difference between exit poll findings and the CEC results decreased to 3.6%, but more importantly, both the CEC and our data illustrated Yuschenko's sound victory, as shown in Table 9.

Apart from the public upset, the presidential elections of 2004 also led to a split in the Ukrainian sociological community. These elections were the first time that different pollsters' exit poll findings showed such considerable discrepancies. Suspicions were raised that some exit polls were not carried out at all, and that the publication of such results was only meant to justify voterigging. The journalist community dubbed the publication of widely divergent exit poll findings as "the exit poll war". Table 10 shows results announced by four exit polls immediately after polling stations were closed after the first round of voting in October 2004. All exit polls except for ours (KIIS+RC) showed Yanukovych leading.

However, it should be noted that FOM ("Public Opinion" Fund) later disavowed their own results. They announced that, because of the low response rate, their survey was not complete, and therefore their exit poll was cancelled. Information on Yanukovych's lead was not confirmed by CEC data in the first round or the third rounds, so some within the pollster community concluded that SOCIS, SMC, and UISR (Ukraine Institute for Social Research) had committed exit poll fraud. The only logical explanation is that this was done to support individuals within the state apparatus who were committing electoral fraud.

Similar suspicions were voiced prior to the second election round, and a group of sociologists lodged a complaint with the Ethics Committee of the Sociological Association of Ukraine (SAU), but the head of the committee resigned after refusing to investigate the case. Reciprocal accusations lead to both the SAU Chairman and Secretary resigning. The Sociological Association of Ukraine virtually ceased to exist, and its activity was renewed only in April 2007, though the main office was moved from Kyiv to Kharkiv.

Conclusions and implications

Exit polls in Ukraine differ significantly from those conducted in mature democracies in that they are generally not financed or organized by the mass media. Their clients' ultimate goal is not necessarily to obtain preliminary results early, but rather to make sure that election returns have not been falsified. Paul J. Lavrakas, answering the question of "Why Our Democracy Needs Accurate National Exit Polls", writes that exit polls shed light on the so-called "mandate" of the election, explaining *why* the various electorates voted as they did. Such information makes the gathering of accurate data by exit polls truly critical to American democracy. But in Ukraine, the democratic process needs accurate national exit polls for different reasons: one of the primary functions of exit polls in emerging democracies is to verify official election returns; to ensure that authorities do not falsify vote counts. In cases when exit poll findings coincide with official vote counting results, exit polls serve to validate election returns in the public mind.

When discussing our article draft, we pointed out that there is a danger in using exit polls as an instrument of official vote counting validation. Such a practice puts a great deal of pressure, and perhaps too much responsibility, on academics. But what can pollsters do if clients order exit polls with the express purpose of verifying official election returns? Does our professional code of ethics allow us to conduct such research? If it does, what can we promise our client? We think our article can evoke such a discussion.

In our view, pollsters cannot confidently maintain that an election has been falsified however big the difference between their exit poll findings and the official vote count is: such a conclusion can only be come to by a court of law. However, if the difference between exit poll findings and electoral returns cannot be explained methodologically, pollsters have a right to express their doubt as to the correctness of such election returns, and to urge their clients to look for violations in the election procedure that can serve as grounds for legal action.

The experience of conducting exit polls in Ukraine allowed us to make the following conclusions regarding the most adequate exit poll methodology for such conditions.

1. If the function of election verification is considered primary, pollsters should do everything in their power to increase public confidence levels in their honesty and objectivity. This includes:
   - Involving several competitive organizations in the fieldwork
   - Strictly following the code of authoritative professional pollster unions. Especially useful are the WAPOR guidelines for exit polls, including information for minimal disclosure (http://www.unl.edu/wapor/social_science.html);
   - Involving international and national experts as independent observers.

2. Infrastructure weakness forces pollsters to finish interviewing much earlier in the countryside and somewhat earlier in ordinary towns compared to oblast centers. This in-

Table 9: The third election round (re-voting of second round). Exit poll findings compared to the CEC results

	Viktor Yuschenko, (%)	Viktor Yanukovych (%)
Official results	51,99	44,20
Exit poll (KIIS+Razumkov Center)	55,28	40,58
Divergence	-3,29	3,62

Table 10: Exit poll findings presented immediately after polling stations were closed (1st round in 2004)

Candidate	KIIS+RC	SOCIS+SMC	Ukrainian Institute of Social Research	FOM ("Public Opinion Fund"
Viktor Yuschenko (in opposition)	44.1	39.3	39.3	38.0
Viktor Yanukovych (in power)	38.8	42.7	43.0	43.5

Note. Table 10 data differs slightly from data presented in Table 3. Table 3 data showed final exit poll results (i.e. calculated after paper questionnaires from every polling station were received in Kyiv) whereas Table 10 shows results as announced on election night.

creases the importance of including voting time questions in exit polls and post-electoral surveys, and it also increases the importance of developing weightings based on this information for use in later polls. It would be appropriate to provide for three stages of exit poll finding announcements: immediately after polling stations are closed, then a few hours later (to announce more accurate data), and in a few days (after paper copies of questionnaires from each region are received).

3. Lack of necessary information causes difficulties in sampling and in data analysis. If there is no information on electoral districts at all (we, for example, faced the problem of a lack of information on many addresses of territorial electoral commissions and of specific polling stations), one can select settlements as PSU (primary sampling units). Then, interviewers may select election districts by the route method in every settlement, and subsequently select respondents at a polling station. If no data on the size of stations is available, we cannot use PPS (probability proportional to the size) for selecting stations, so we apply equi-probable sampling of election districts with equal steps in respondent selection at each polling station. Our experience also shows that weighting our findings using the CEC turnout data is not always effective, as this information is often unreliable. This underscores the importance of using a procedure that allows election returns to be evaluated without using the CEC turnout data. In this sense, the procedure of equi-probable sampling of polling stations with equal steps in respondent selection at each polling station is preferred.

4. Administrative pressure, threats, and unilateral rhetoric in the mass media (originating from either candidates' campaign camps) can increase respondent insincerity, and lower response rates. To overcome this, it is advisable to use the "secret ballot" methodology, where respondents themselves mark questionnaires and cast them in a special box resembling a ballot box. When possible, pollsters should lead a campaign in the media to provide a positive attitude toward the exit poll. Our experience shows that the exit poll response rate can reach 80%, even under heavy administrative pressure.

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