

# ELECTION MONITORING AND PUBLIC OPINION AROUND THE WORLD: DO ELECTION MONITORS CHANGE HOW THE PUBLIC VIEWS THE ELECTION?

Using Information Theory for a Social Science Question

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## Abstract

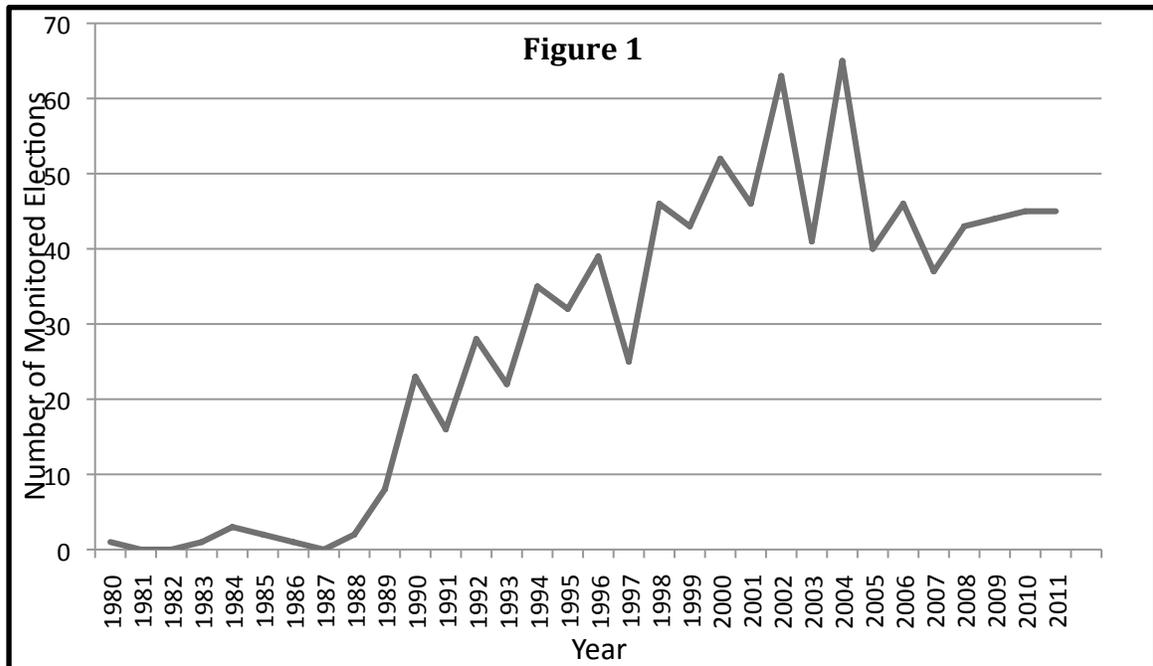
Election monitoring organizations have long claimed that their missions to developing countries and new democracies help improve the electoral environment and prevent fraud in the host country. This paper uses the information theory concepts of mutual information to estimate the dependence between public opinion about the fairness of the election and the presence of monitors in 50 countries in Africa, Latin America, and Asia. The presence of monitors explains a small part of opinion responses about the elections, but is overshadowed by the importance of other variables such as the GDP of the host country. GDP is a better indicator of how strongly respondents will feel about the most recent democratic election in their country than variables describing the political environment, the presence of monitoring, or satisfaction with democracy.

## Introduction

When election monitoring, also referred to as election observation, first began in the 1960s some states protested that monitoring was an infringement on state sovereignty. A series of conflicting United Nations resolutions from 1991 to 2006 alternately encouraged election monitoring and stressed the principles of sovereignty. As can be seen in Figure 1, election monitoring grew dramatically in the 1990s to become an internationally accepted norm. The Organization of American States (OAS) was the first international organization to monitor an election (Santa-Cruz 2005), but later organizations such as the Carter Center and the National Democratic Institute, as well as The United Nations and the European Union, became leaders of election monitoring activity.

Election monitoring is defined in the United Nations Declaration as “the systematic, comprehensive and accurate gathering of information concerning the laws, processes and institutions related to the conduct of elections and other factors concerning the overall electoral environment; the impartial and professional analysis of such information; and the drawing of conclusions about the character of electoral processes based on the highest standards for accuracy of information and impartiality of analysis” (United Nations

2005). In this paper election monitoring missions refer only to missions where delegations assessed pre-election, election-day and post-election conditions, without including limited or technical missions or missions for assistance. We also limit the definition to include international election observation of national elections, not including monitoring of constituent assembly elections or elections of referendums, since not all countries have these types of processes to compare.



Many international election monitoring organizations claim to do more than just observe. Their presence is meant to prevent electoral fraud and help create a freer and fairer election. Past literature has argued that the presence of election monitoring organizations does in fact have an effect on the confidence of opposition parties. Opposition parties sometimes choose to boycott an election in order to delegitimize it in the eyes of the international community. Hyde and Beaulieu (2009) argued that the presence of international monitors could increase boycotts by endorsing unfair elections knowingly or because governments simply hide their corruption and cheating more carefully in their presence. Kelley (2011) demonstrated that the presence of international monitors that are known to be more reputable or strict is associated with a lower likelihood of boycotts. Depending on the opposition parties' perceptions of the election monitoring organizations that have been invited by the incumbent government, they may decide not to boycott the election because they feel more confident in the quality of the upcoming election. This paper investigates the possible effect election monitoring organizations may have on the

confidence of the general public and not just opposition parties.

## Methodology

The phenomenon of election monitoring has been interpreted in terms of international interactions and incentives for countries to invite monitors in order to appear more legitimate and dedicated to democracy. Little (2011) referred to elections as vehicles for public information, allowing citizens to evaluate the popularity or effectiveness of the candidates. Fraud is then a distortion of this information. The information provided by an election can also be applied to the international level, where an election conveys information to the international community not just about the candidate's popularity but also about the legitimacy of the ruling government and its dedication to democracy. In order to describe what happens once monitors are already in a country, this paper examines the situation at the individual respondent level after the decision to invite monitors has been made and the election has happened.

Data about opinions of individuals in each of 50 countries was taken from two questions asked in surveys conducted by Afrobarometer, Latinobarometro, and the Asian Barometer. The first question, the one used to evaluate people's perceptions of the most recent election in their country, asks "How free and fair were the last elections?" and the second question asks "How satisfied are you with the way democracy works in this country?" In addition, data on elections was expanded from Judith Kelley's (2012) dataset on international monitoring, which included internationally monitored elections up to 2004, to include internationally monitored elections up to 2012. Education level, age and gender of respondents were included along with country-level variables such as the Gross Domestic Product of the nation in the year prior to the election and the region (Africa, Latin America, or Asia) that the respondent's country is located in. The Freedom House's indicators of the Political Rights and Civil Liberties of each country were included in order to assess the status of human rights prior to the election (Freedom House). Finally, the World Bank's corruption and political stability governance indicators were used to expand our understanding of the political environment in which the election took place (World Bank).

In order to analyze the dependence of survey responses about the election on the various variables, we chose an information theoretical approach. Information theory has the potential to investigate various problems in the social sciences, and this project is an example of one such possibility. One useful property is that dependence can be calculated between variables that are correlated with other variables of interest (Bettencourt 2009). The dependence of one variable on two other correlated variables can also be quantified. Information is a quantity used to measure knowledge and uncertainty. Specifically,

information here represents a reduction in the uncertainty of survey responses given knowledge of one of our other variables. The uncertainty then can be expressed in terms of the odds for each of the states of our discrete variable  $X$ , in this case representing the survey responses. The uncertainty can be written mathematically using the Shannon entropy of  $X$

$$S(X) = -\sum p(x) \log_2 p(x)$$

Where  $p(x)$  is the probability for each possible response,  $x$ , to our survey question. A positive response to the election survey question is represented by state  $x = 1$ , and a negative response to the election survey question is state  $x = 0$ . Entropy is at its maximum when there is complete uncertainty about the state of the survey responses. There would be no uncertainty if  $S(X) = 0$ . We use logarithm based two because our uncertainty is measured in terms of the bits needed to describe  $X$ . If survey responses are completely random, entropy is equal to one bit. We can investigate how dependent the state of  $X$  is on each of our other variables, denoted by  $Y_1$  through  $Y_9$ . These are our respondent-level demographics and country-level variables. The information gain in  $X$ , given observation of one of the variables  $Y_i$ , is the mutual information between  $X$  and  $Y_i$ . The notation for mutual information notation  $I(X, Y_i)$  is as follows:

$$I(X, Y_i) = S(X) - S(X|Y_i) = -\sum p(x, y) \log_2 p(x, y) + \sum p(x) \log_2 p(x)$$

This equation describes the mutual information as the conditional entropy  $S(X|Y_i)$  subtracted from the entropy of  $X$ . The conditional entropy value expressed the uncertainty on  $X$  which remains once  $Y_i$  is known. In this equation,  $p(x, y)$  is the probability of  $x$  and  $y$  occurring simultaneously, and  $p(x)$  and  $p(y)$  are the probability of  $x$  and  $y$  occurring, respectively. It is important to note that the mutual information will always be greater than zero, but smaller than  $S(X)$ . When the mutual information is equal to 0, the variables  $X$  and  $Y_i$  are not dependent on each other at all, and when mutual information is equal to  $S(X)$ , then the amount of uncertainty of  $X$  is explained fully by  $Y_i$ . When interpreting mutual information, the values that are obtained from our analysis are relative, in that information is the reduction in uncertainty of a given target variable relative to the knowledge of the state of another.

## Results

We found that the entropy  $S(X)$  for the election survey response variable  $X$  was equal to 0.96. We calculated the mutual information  $I(X|Y_i)$  for every  $Y_i$ . The results can be seen in Table 1, where the column of numbers represents the mutual information values normalized so that they are the percentage of the maximum, 0.96. The highest value corresponds to the GDP of the respondent's country for the year prior to the election. Therefore survey responses representing public opinion were most dependent on GDP. Region also had a high mutual information value relative to the other results, suggesting that the political history of each region influences how people view the election. Variable  $Y_6$ , representing whether the most recent election was monitored or not, had a mutual information value corresponding to 0.99% of the total possible entropy that could be explained by knowledge of this variable.

15.88	$Y_1$ GDP year prior to election
6.41	$Y_2$ Region
4.99	$Y_3$ Survey Response Satisfaction with Democracy
3.86	$Y_4$ Freedom House Indicator year prior to election
2.35	$Y_5$ World Bank Governance Indicator year prior to election
0.99	$Y_6$ Election Monitored yes/no
0.56	$Y_7$ Age of respondent
0.54	$Y_8$ Education of respondent
0.04	$Y_9$ Gender of respondent

### Next Steps

The preliminary have many limitations in their interpretation. The analysis of the mutual information in this context does not take into account the invitation of the monitors to begin with. As shown by Kelley (2011) the reputation of the election monitoring organization may have an effect on how the opposition party, and perhaps the general public as well, evaluates the probable result of the monitoring activity. It may be that if the organization is viewed as likely to endorse an unfair election, the public will be less likely to trust that organization to change the quality of the election for the better. Other factors, which may also tie in with the importance of region in this analysis, may include whether or not the country has experienced monitoring for many years and sees it as the

norm, or whether the election in question is the first to be monitored in that country. Another possibility is that certain countries have a history of electoral fraud, influencing their citizens to distrust the elections. A second limitation is that the figures do not tell us whether or not the dependence between survey responses and GDP, for example, correspond to a positive or negative effect. In other words, do respondents in countries with higher GDP answer questions about the election more positively or more negatively? These are important questions to answer in the future, as well as a more advanced use of information theory to control for certain variables. This could be done using conditional mutual information, where we can investigate whether mutual information increases or decreases when knowledge of the state of a third variable is included.

## Conclusion

Information theory provides a useful and exciting new way to address social science questions. In this project, the responses of more than 150,000 respondents in Africa, Latin America, and Asia about the fairness of the most recent elections in their country were analyzed. Their responses were found to be most dependent on the GDP of the country they live in, with the region of their country also an important variable. Although the presence of monitors did explain a percentage of the uncertainty of survey responses, therefore showing a small dependence between survey responses and monitoring, it did not explain much, suggesting that controlling for other variables or taking other factors, such as how much experience with monitoring each country has, into account could inform a more detailed future analysis.

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