

**STATE'S  
EXHIBIT NO. 79**

# Report on *Indiana Democratic Party et al v. Todd Rokita et al.*

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I was asked by legal counsel in this case to evaluate the reports of Dr. Marjorie Randon Hershey and Mr. Kimball W. Brace on the impact of Indiana's new requirement that voters present proof of identification before being allowed to vote (Senate Enrolled Act 483).

A summary of my basic findings is as follows:

- Dr. Hershey's report is pure speculation without any quantitative evidence on the likely magnitude and distribution across Indiana's citizens of the law's likely impact.
- Mr. Brace's analysis, while more quantitative than Dr. Hershey's, suffers from several serious statistical flaws that prevent any scientifically valid conclusions to be drawn from it on the likely impact of SEA 483 on voter turnout.

In the next section of the report I review my qualifications. I then examine the reports of Dr. Hershey and Mr. Brace in turn.

## 1 Qualifications

I am currently Professor of Political Science at the California Institute of Technology. I was also formerly on the faculty at the University of Chicago and a visiting professor at the University of Konstanz (Germany). A complete copy of my curriculum vitae is in Appendix A.

I received my Bachelor of Science degree from the Massachusetts Institute of Technology and my Masters of Arts and Doctor of Philosophy degrees, both in political science, from the University of California, San Diego. I have also done post-doctoral work at Harvard University and the Harvard-MIT Data Center.

I have done extensive research on American elections and on statistical methods for political science data. I am a member of the Caltech/MIT Voting Technology Project, serving as co-director since October 1, 2005. I have written numerous articles published in the leading journals as set forth in my curriculum vitae. I currently sit on the editorial board of three leading journals — *Political Analysis*, *Electoral Studies* and *Political Research Quarterly* — and have served as a referee of manuscripts for most of the major journals in my fields of research.

As part of my work with the Caltech/MIT Voting Project, I have a number of current research projects related to the evaluation of elections. For example, I have examined data with my colleague R. Michael Alvarez on manual recounts of elections from Los Angeles County.<sup>1</sup> I am also working a project jointly with the Election Science Institute (formerly Votewatch) examining audit data from the 2004 U.S. Presidential election in Ohio.

Over the past decade, I have testified or consulted in numerous elections cases involving the Federal Voting Rights Act, the evaluation of voting systems, or the statistical evaluation of electoral data. I have testified or consulted in court cases in the states of Arizona, California, Georgia, Illinois, Maryland, Michigan, Missouri, New Mexico, Oklahoma, Texas, and Washington.

## 2 Report of Dr. Hershey

Dr. Hershey's report in this case is essentially a literature review of the rather voluminous scholarship in political science, and some allied social sciences, on voters' decisions to turnout in an election that presents no original analysis as to the likely quantitative impact of implementing Senate Enrolled Act 483 (SEA 483) in Indiana. Her overall characterization of the literature, however, is fairly accurate. There is general agreement that increasing costs of voting decreases turnout.

Most of this literature, as noted in her report, examines the impact on changes in registration requirements, for example, moving the close of registration date closer to the election day. The typical data used in these studies are either survey data, such as from the American National Election Study or the Current Population Study, or aggregate state level returns that are compared over time or across localities. Since there is both temporal and cross-sectional variation in registration laws, the quantitative impact of different implementations of registration laws on voter turnout can be scientifically assessed much in the same way that

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<sup>1</sup>California law mandates that all jurisdictions randomly select one percent of their precincts to be manually recounted before certifying the vote tallies in any election. I have also personally witnessed two of these recounts.

the effect of a drug can be examined by comparing treated and control groups.<sup>2</sup>

There are no states or localities that have implemented an identification requirement as described in SEA 483 to the best of my knowledge.<sup>3</sup> In fact, even if there were such a jurisdiction, an argument would have to be made as to why both its implementation as well as its underlying demographic and political make-up was similar enough to be informative about the likely impact of the voter identification requirements adopted in Indiana. Instead, Dr. Hershey is left to purely speculate by analogy to the findings about voter registration in the literature. These speculations are not quantitative, therefore there is no real way to assess the substantive impact on voter turnout of the new law. I also note that there is not any attempt to measure the uncertainty in this “forecasted” impact as is generally accepted scientific practice. There must be at least some uncertainty since Dr. Hershey (as well as Mr. Brace) are attempting to forecast the law’s impact on future elections.

Further it is not clear to me that voter registration is a particularly good proxy for understanding the likely impact of the voter identification law, since all voters must register in order to vote, but a good number of registered voters likely already have acceptable identification.<sup>4</sup> This is noted by Dr. Hershey in her report where she goes on to say that “[t]herefore the impact of the new law on voter turnout would be considerably smaller [than a change in the voter registration system].” (p.12). But the real question is how much smaller would it be? Dr. Hershey’s report presents no evidence to this crucial question.

Dr. Hershey then goes on to opine that Indiana’s new identification requirements will have differential impact on certain subgroups of voters. In particular, she argues that voters with lower socio-economic status (SES) — i.e., low education and/or income — will more likely be deterred from voting under the new law. Again she is arguing by analogy — without any direct evidence — from the findings on changes in registration laws on turnout. She cites the studies by Wolfinger and Rosenstone (1980) and Leighley and Nagler (1984) as supporting her case for a differential impact. However, in a more recent study by Dr. Jonathan Nagler (the same author that she cited in her report) published in the *American Political Science Review*, the leading journal in political science, casts doubt on this claim in the registration literature. In the conclusion to his newer study Dr. Nagler states “[t]he modest contribution of the empirical research presented here is to show that what was thought to be a fact, namely, that poorly educated persons are more deterred from voting by registration laws

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<sup>2</sup>Although some care must be taken because unlike clinical drug trials, the choice of registration law is not random. There are appropriate statistical models that can account for this selection effect, however.

<sup>3</sup>There are a number of other states, for example, Georgia, that have enacted similar legislation, but I do not know of any scientific studies that have examined the impact of these new laws yet.

<sup>4</sup>In fact, the change in the law will likely increase the number of citizens of Indiana who will have state or federally issued identification. See my discussion of Mr. Brace’s report below.

than well-educated persons, is not a fact.” (Nagler 1991:1402). Therefore, any suggested differential impact by SES is not even a finding with regard to registration laws and cannot, therefore, form the basis of her claims about the likely differential impact of the new voter identification law.

### 3 Report of Mr. Brace

The report of Mr. Kimball Brace in this case details his efforts to match records from the Indiana’s Bureau of Motor Vehicles (BMV) on residents of Indiana with either a valid drivers license or identification card to a list of registered voters in Marion county. He additionally aggregated this data to use Federal Census data in an attempt to determine the impact of the new voter identification law by socio-economic status. Unfortunately, Mr. Brace’s analysis is seriously flawed on a number of grounds and is not, therefore, informative on the likely impact of the SEA 483.

The central question in this case is what will be the impact of the law on the turnout of Indiana voters in *future* elections — in the language of statistics this is the “quantity of interest”. Mr. Brace’s analysis instead examines what fraction of *current* Marion county registered voters have a valid state identification, either driver’s license or identification card. He finds that he is unable to match 8.42% of them even using the loosest of match criteria to the BMV list of individuals with valid state identification (Table C of Mr. Brace’s report). Mr. Brace then claims that these potential voters allegedly without identification will be challenged when they go to vote, or in other words, they will be effectively disenfranchised. The implicit assumption is that the new law will have no effect on potential voters future behavior. As we know since the pioneering work of Dr. Robert Lucas on the statistical forecasting of the consequences of changes in economic policy, it is difficult to make such forecasts because individual behavior is not static. Dr. Lucas noted that changes in policy will in general change the incentives of individuals and thus their observed behavior (Lucas 1976). In fact, this problem is now known as the “Lucas critique” in literature on quantitative policy analysis.<sup>5</sup>

In order to see this more clearly, consider older voters, those 65 and older. In a study from Wisconsin cited by Dr. Hershey, it was found that 23 percent of this group did not have a driver’s license or photo identification. Similarly, a survey done by AARP found that 10 percent of registered voters over age 65 in their sample did not have a valid state

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<sup>5</sup>Dr. Robert Lucas won the 1995 Nobel prize in economics in part for this observation of the dynamic nature of individuals’ response to changes in government policy.

driver's license or identification card.<sup>6</sup> This does not come as a surprise, since presumably a good number of these older individuals are either unable or unwilling to drive, so there is no reason for them to pay the cost, actual money and time, to maintain their license. However, once the new voter photo identification law takes effect in Indiana a license or identification is now more valuable to these older individuals since it will allow them to vote. It may, therefore, be worthwhile for them to obtain and maintain either a valid driver's license or identification card in the future. In fact, not only does the new law in essence make a license or identification card more valuable, the law also lowers the cost since it allows for the BMV to issue acceptable identification free of charge. In fact, this likely change in behavior is born out in the AARP survey where 58 percent of the respondents without a license or identification said it was at least somewhat likely they would get one in order to vote.<sup>7</sup>

In fact, as we consider older voters, we see another problem with Mr. Brace's analysis, the new voter identification law only applies to voters who are voting in a polling station on election day. Presumably at least some fraction of registered voters over age 65 without a driver's license will vote via an absentee ballot.<sup>8</sup> Absentee voters are unaffected by the new law. Thus, Mr. Brace's study is over estimating the impact of the new law even if there were no other problems with it.

The design of Mr. Brace's study is also likely to over-estimate the likely impact of the new voter identification law for two further reasons. First, he considers only Indiana issued identification. The law does allow Federally issued identification, such as a passport or military identification, as proper proof of identity for the purpose of voting. At least some fraction of registered voters he was unable to match to the BMV list will have Federal identification.<sup>9</sup> Second, Mr. Brace's analysis covers only registered voters in Marion county, which even he recognizes is likely to have the highest number of non-drivers since it is the most urban of the counties and has a metro bus system (Brace Report, p. 5). The quantity of interest in this case is the impact of the new law of turnout on all Indiana voters, not just

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<sup>6</sup>Presumably the difference between the two studies, besides they are about different states is that one of the samples is all individuals whereas the other is only registered voters.

<sup>7</sup>We should be careful how we generalize this to the entire population of registered voters age 65 or older without currently valid identification because the subsample of respondents who answered this question is only 29. This standard error of this estimate is very large, much larger than the 3.38 percentage points stated for the entire sample based on 843 respondents. However, there is not enough information in the survey for me to calculate an appropriate sampling error for the response to this question.

<sup>8</sup>It is my understanding that under Indiana law any voter over the age of 65 is entitled to vote absentee if they so desire.

<sup>9</sup>In fact, some proportion of Indiana's registered voters will be in the active military service or be a family member of an individual on active duty military and covered by the Uniformed and Overseas Citizens Absentee Voting Act (UOCAVA), who vote by absentee ballot and are not affected by the new law but are counted in Mr. Brace's analysis.

Marion County voters. Since his analysis is based on a non-representative sample, Indiana voters as a whole, in the language of statistics, his analysis suffers from a sample selection problem, which occurs when we do not draw a representative sample for our population of interest. In general, no valid statistical claims can be made from a study with a non-representative sample unless some further, rather sophisticated, statistical corrections are made. Mr. Brace has made no such corrections.

Turning to Mr. Brace's demographic analysis, it is even more problematic. Since neither the BMV nor the voter registration data contains any demographic information, Mr. Brace was forced to aggregate his data to the level of census block groups in order to estimate the impact of the law on different socio-economic groups. This analysis suffers from all of the problems I have previously pointed out and also suffers from what statisticians and quantitative social scientists call aggregation bias (see King 1997 for a general discussion of the problem and possible solutions). Aggregation bias occurs when we try to make inferences about *individual* behavior, in this case being registered and having a matched BMV record, from data only about *groups* of individuals, such as census data.<sup>10</sup>

The problem can probably best be seen from an example where we know the true answer. A recent study led by Dr. Andrew Gelman showed that aggregate Republican vote share appears strongly inversely related to average state income (Gelman, et al. 2005). An untrained analyst might, therefore, conclude that lower-income individuals are more likely to vote Republican. This, however, would be incorrect. As we know from survey data, the relationship is actually reversed at the true individual level. What causes the finding to reverse with the aggregate data? It turns out that the average voter in relatively poor Mississippi was more likely to vote for President Bush than the average voter in relatively wealthy Connecticut, thus reversing the correlation. In other words, the aggregate data masked this clear and strong individual level finding.

Instead of aggregate vote share, Mr. Brace attempts to correlate the aggregate fraction of registered voters with matched BMV listings to aggregate income or education levels. The fundamental statistical problem is identical to the Gelman, et al. (2005) study. Thus, even though Mr. Brace finds some correlation between socio-economic status and having a state issued identification at the aggregate level, this relationship may be non-existent or reversed at the true individual level. Much like with sample selection problem mentioned above, it is not possible to make any scientifically valid inferences unless fairly sophisticated statistical techniques are used to correct for the potential aggregation bias. These corrections were not done by Mr. Brace.

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<sup>10</sup>This is known as ecological fallacy in the statistical literature (King 1997).

Finally, Mr. Brace seems to not treat his analysis as a statistical estimation problem even though he is trying to forecast the impact of the SEA 483. However, because this is a statistical estimation problem, Mr. Brace's analysis must include generally accepted estimates of uncertainty since he does not (nor does anyone) know what the actual effect of the new law will be. Without any measure of estimation uncertainty, no scientifically valid inferences can be drawn from his study.

In conclusion, Mr. Brace's report presents no scientifically valid analysis of the impact of SEA 483. Thus, for example, Mr. Brace's concluding claim that 989,000 registered voters, or any for that matter, in the state could be challenged when they try to go vote in November, 2006 is not supported with his flawed analysis and is pure speculation at best.

## 4 References

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## A Curriculum Vitae

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### Education

- Ph.D. University of California, San Diego. Political Science, June, 1995.
- M.A. University of California, San Diego. Political Science, June, 1992.
- S.B. Massachusetts Institute of Technology. Applied Mathematics  
June, 1990.

### Academic Experience

Professor of Political Science, California Institute of Technology,  
November, 2003 – Present.

Gastprofessur in der Rechts-, Wirtschafts- und Verwaltungswissenschaftliche Secktion,  
Universität Konstanz  
May, 2003 – June, 2003.

Associate Professor of Political Science (with tenure), California Institute of Technology,  
April, 2001 – October, 2003.

Associate Professor of Political Science, California Institute of Technology,  
July, 2000 – March, 2001.

Assistant Professor of Political Science, University of Chicago,  
September, 1998 – June, 2000.

Associate Professor of Political Science, California Institute of Technology,  
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Assistant Professor of Political Science, California Institute of Technology,  
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Post-Doctoral Fellow in Positive Political Economy, Harvard University,  
July, 1994 – June, 1995.

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**Publications***Books*

*Elbridge Gerry's Salamander: The Electoral Consequences of the Reapportionment Revolution.* (with G. Cox). New York: Cambridge University Press. 2002.

*Articles in Refereed Journals*

Government Partisanship, Labor Organization and Macroeconomic Performance: A Corrigendum (with N. Beck, R.M. Alvarez, G. Garrett, and P. Lange). *American Political Science Review.* 87(4):945–949. 1993.

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Throwing Out the Baby With the Bath Water: A Comment on Green, Yoon and Kim (with N. Beck). *International Organization.* 55(2):487–498. 2001.

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The Mathematics and Statistics of Voting Power (with A. Gelman and F. Tuerlinckx).  
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Standard Voting Power Indexes Don't Work: An Empirical Analysis (with A. Gelman and J. Bafumi). *British Journal of Political Science*. 34: 657–674. 2004.

Random Coefficient Models for Time-Series-Cross-Section Data (with N. Beck). *Political Analysis*. Forthcoming. (Available as Social Science Working Paper #1205)

*Other Articles*

Empirically Evaluating the Electoral College (with A. Gelman and G. King) in A. Crigler, et al (editors), *Rethinking the Vote: The Politics and Prospects of American Election Reform*. New York: Oxford University Press. 2004.

Asymptotics in A. Bryman, et al (editors), *Encyclopedia of Science Research Methods*. Thousand Oaks, CA: Sage Publications. Forthcoming.

**Work in Progress and Conference Papers**

The Analysis of Time-Series–Cross Sectional Data (with N. Beck). A book manuscript under contract with the Cambridge University Press. Portions of the book have been presented at the Thirteenth Political Methodology Conference, Fourteenth Political Methodology, and 1997 Annual Meeting of the American Political Science Association.

Indecision Theory: Quality of Information and Voting Behavior (with P. Ghirardato). Caltech Social Science Working Paper No. 1106R.

Aggregation and Dynamics of Survey Responses: The Case of Presidential Approval (with R.M. Alvarez). Caltech Social Science Working Paper No. 1103.

How Much Does a Vote Count? Voting Power, Coalitions, and the Electoral College (with A. Gelman). Caltech Social Science Working Paper No. 1121.

Legislative Analogs of Gerrymandering: Partisan Bias in Congress, 1877-2000 (with G. Cox). Caltech Social Science Working Paper No. 1158.

A New Approach to Measuring the Racial Impact of Redistricting? (with A. Gelman and G. King)

Correcting for Survey Misreports using Auxiliary Information. Presented at the 1998 Annual Meeting of the American Political Science Association and the 1999 Midwest Political Science Association Meetings.

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Ambiguous Candidates and Disillusioned Voters: An Alternative Model of Voting Behavior with Incomplete Information (with P. Ghirardato).

Bill Scheduling and Legislative Control (with J. Copic).

Moderation in the Pursuit of Moderation is No Vice: The Clear but Limited Advantages of Being a Moderate for Congressional Elections (with A. Gelman)

The Impact of Majority-Minority Districts in Congressional Elections (with D. Grigg).

Machines Versus Humans: The Counting and Recounting of Pre-scored Punchcard Ballots (with R.M. Alvarez and S. Hill).

### **Awards and Fellowships**

Center for the Advanced Study in the Behavioral Sciences Fellowship. Tentatively scheduled for 2005–2006.

John Randolph Haynes and Dora Haynes Foundation Faculty Fellow, 2005–2006 (\$10,000).

National Science Foundation Grant (SES-0213549), 2002-2004.. Co-Principal investigator. Project title: “ Modeling Issues with Time-Series–Cross-Section Data” (\$112,000).

John M. Olin Foundation Faculty Fellow, 1999–2000 (\$110,000).

DAAD (German Academic Exchange Service) *Learn German in Germany* fellowship, Summer, 1998.

National Science Foundation Grant (SBR-9729899), 1998–1999. Co-Principal investigator. Project title: “ Strategic Redistricting and Its Political Consequences” (\$48,000).

Pi Sigma Alpha award for Best Paper Presented at the 1998 Midwest Political Science Association Meetings.

CQ Press Award for Best Paper in Legislative Politics Presented at the 1996 Annual Meeting of the American Political Science Association.

IBM University Equipment Grants Program, 1996–1997. Co-principal investigator. Project title: ‘Individuals and Aggregates: New Computational Techniques for Testing Models of Politics’ (\$134,00).

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National Science Foundation Graduate Research Fellow, 1991–1994.

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Member, Editorial Board of *Electoral Studies*  
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Director of Graduate Studies, Division of the Humanities and Social Sciences, California  
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Member, Editorial Board of *Political Analysis*  
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Member, Editorial Board of *Political Research Quarterly*  
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Member, Steering Committee of the USC-Caltech Center for the Study of Law & Politics.  
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Member of 2000 Miller Award Committee. Methodology section of the American Political  
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Manuscript Reviewing for *American Journal of Political Science*; *American Political  
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Book Manuscript Reviewing for University of Chicago Press, Cambridge University Press,  
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