7198700012687 Published online by Cambridge University Press

POLITICAL ANALYSIS

www.pan.oxfordjournals.org

Volume 19 Number 1 Winter 2011

Estimation of Heterogeneous Treatment Effects from Randomized Experiments, with Application to the Optimal Planning of the Get-Out-the-Vote Campaign

Kosuke Imai and Aaron Strauss

An Empirical Bayes Approach to Estimating Ordinal Treatment Effects R. Michael Alvarez, Delia Bailey, and Jonathan N. Katz

An Introduction to Bayesian Inference via Variational Approximations

Justin Grimmer

The Measurement of Cross-cutting Cleavages and Other Multidimensional Cleavage Structures

Joel Sawat Selway

Inferential Network Analysis with Exponential Random Graph Models **Skyler J. Cranmer and Bruce A. Desmarais**

Theory Driven Bias in Ideal Point Estimates—A Monte Carlo Study **Alexander V. Hirsch**

Stochastic Process Methods with an Application to Budgetary Data Christian Breunig and Bryan D. Jones



https://doi.org/10.1017/S1047198700012687 Published online by Cambridge University Press

Political Analysis

Editors-in-Chief:

Jonathan N. Katz (California Institute of Technology, USA)

R. Michael Alvarez (California Institute of Technology, USA)

Associate Editors:

Andrew Gelman (Columbia University, USA)

Simon Jackman (Stanford University, USA)

Vera Troeger (University of Essex, UK)

Editorial Board

Fred Boehmke (University of Iowa, USA)

Jeffrey Lewis

Janet Box-Steffensmeier (Ohio State University,

USA)

Henry Brady (University of California,

Berkeley, USA)

John Brehm (University of Chicago, USA)

Elisabeth Gerber (University of Michigan, Ann Arbor, USA)

Jeff Gill (Washington University, St. Louis, USA)

Kristian Gleditsch (University of Essex, UK)

Donald Green (Yale University, USA)

Michael Herron (Dartmouth College, USA)

Simon Hix (London School of Economics, UK)

Simon Hug (Université de Genève,

Switzerland)

Kosuke Imai (Princeton University, USA)

William Jacoby (Michigan State University, USA)

Brad Jones (University of California, Davis, USA)

Orit Kedar, (Massachusetts Institute of Technology, USA)

Gary King (Harvard University, USA)

Thomas Koenig (University of Mannheim,

Germany)

Jeffrey Lewis (University of California, Los Angeles, USA)

Suzanna Linn (Pennsylvania State University, USA)

John Londregan (Princeton University, USA)

Samantha Luks (YouGovPolimetrix, USA)

Walter Mebane (University of Michigan,

Ann Arbor, USA)

Adam Meirowitz (Princeton University, USA)

Sara Mitchell (University of Iowa, USA)

Jonathan Nagler (New York University, USA)

Thomas Palfrey (California Institute of Technology, USA)

John Patty (Washington University, St. Louis,

Thomas Plümper (University of Essex, UK)

Kevin Quinn (University of California,

Berkeley, USA)

Philip Schrodt (Pennsylvania State University, USA)

Jasjeet Sekhon (University of California, Berkeley, USA)

James Stimson (University of North Carolina,

Chapel Hill, USA)

Langche Zeng (University of California, San Diego, USA)

Political Analysis (ISSN 1047-1987) is published quarterly in January, April, July, and October as the official journal of the Society for Political Methodology and the Political Methodology Section of the American Political Science Association. The journal is published by Oxford University Press. Postmaster: send address changes to Political Analysis, Journals Customer Service Department, Oxford University Press, 2001 Evans Road, Cary, NC 27513, USA.

Instructions for Authors

Authors interested in submitting to *Political Analysis* should consult the instructions to authors available on the *Political Analysis* Web site (www.pan.oxfordjournals.org).

Subscriptions

A subscription to *Political Analysis* comprises 4 issues. Prices include postage; for subscribers outside the Americas, issues are sent air freight. Annual Subscription Rate (Volume 19, 4 issues, 2011)

Institutional

Print edition and site-wide online access: US\$446/£299/€446

Print edition only: US\$409/£274/€409

Site-wide online access only: US\$372/£249/€372

Parsonal

Print edition only: US\$88/£59/€88

Please note: UK£ rate applies to UK and Rest of World, except US and Canada (\$) and Europe (€).

There may be other subscription rates available; for a complete listing, please visit

http://www.oxfordjournals.org/our_journals/polana/access_purchase/price_list.html.

Full pre-payment in the correct currency is required for all orders. Payment should be in US dollars for orders being delivered to the USA or Canada; Euros for orders being delivered within Europe (excluding the UK); GBP sterling for orders being delivered elsewhere (i.e., not being delivered to USA, Canada, or Europe). All orders should be accompanied by full payment and sent to your nearest Oxford Journals office. Subscriptions are accepted for complete volumes only. Orders are regarded as firm, and payments are not refundable. Our prices include Standard Air as postage outside of the UK. Claims must be notified within four months of despatch/order date (whichever is later). Orders from the UK will be subject to a VAT charge. For orders from elsewhere in the EU you or your institution should account for VAT by way of a reverse charge. Please provide us with your or your institution's VAT number. If registered, please supply details to avoid unnecessary charges. For subscriptions that include online versions, a proportion of the subscription price may be subject to UK VAT. Subscribers in Canada, please add GST to the prices quoted. Personal rate subscriptions are only available if payment is made by personal cheque or credit card, delivery is to a private address, and is for personal use only.

or credit card, delivery is to a private address, and is for personal use only.

The current year and two previous years' issues are available online at www.periodicals.com/oxford.html or from Oxford University Press. Previous volumes from the Periodicals Service Company, 11 Main Street, Germantown, NY 12526, USA. E-mail: psc@periodicals.com. Tel: (518) 537-4700. Fax: (518) 537-5899.

Contact information: Journals Customer Service Department, Oxford University Press, Great Clarendon Street, Oxford OX2 6DP, UK. E-mail: jnls.cust.serv@oup.com. Tel: +44 (0)1865 353907. Fax: +44 (0)1865 353485. In the Americas, please contact: Journals Customer Service Department, Oxford University Press, 2001 Evans Road, Cary, NC 27513, USA. E-mail: jnlorders@oup.com. Tel: (800) 852-7323 (toll-free in USA/Canada) or (919) 677-0977. Fax: (919) 677-1714. In Japan, please contact: Journals Customer Service Department, Oxford University Press, 4-5-10-8F Shiba, Minato-ku, Tokyo, 108-8386, Japan. E-mail: custserv.jp@oup.com. Tel: (81) 3 5444 5858. Fax: (81) 3 3454 2929.

Methods of payment: (i) Check (payable to Oxford University Press, to Oxford University Press, Cashiers Office, Great Clarendon Street, Oxford OX2 6DP, UK) in GB£ Sterling (drawn on a UK bank), US\$ Dollars (drawn on a US bank), or EU€ Euros. (ii) Bank transfer to Barclays Bank Plc, Oxford Group Office, Oxford (bank sort code 20-65-18) (UK), overseas only Swift code BARC GB 22 (GB£ Sterling to account no. 70299332, IBAN GB89BARC20651870299332; US\$ Dollars to account no. 66014600, IBAN GB27BARC20651866014600; EU€ Euros to account no. 78923655, IBAN GB16BARC20651878923655). (iii) Credit card (Mastercard, Visa, Switch or American Express).

Oxford Journals Environmental and Ethical Policies

Oxford Journals, a division of Oxford University Press, is committed to working with the global community to bring the highest quality research to the widest possible audience. Oxford Journals will protect the environment by implementing environmentally friendly policies and practices wherever possible. Please see http://www.oxfordjournals.org/ethicalpolicies.html for further information on environmental and ethical policies.

Digital object identifiers

For information on dois and to resolve them, please visit www.doi.org.

Permissions

For information on how to request permissions to reproduce articles or information from this journal, please visit www.oxfordjournals.org/jnls/permissions.

Indexing and abstracting

The journal is included in the Social Science Citation Index, Current Contents/Social & Behavioral Sciences, and Statistical Theory & Method Abstracts.

Advertising

Inquiries about advertising should be sent to Advertising and Special Sales, Oxford Journals, Oxford University Press, Great Clarendon Street, Oxford, OX2 6DP, UK. Tel: +44 (0)1865 354767; Fax: +44 (0)1865 353774; E-mail: jnlsadvertising@oup.com.

Disclaimer

Statements of fact and opinion in the articles in *Political Analysis* are those of the respective authors and contributors and not of the Society for Political Methodology or Oxford University Press. Neither Oxford University Press nor the Society for Political Methodology make any representation, express or implied, in respect of the accuracy of the material in this journal and cannot accept any legal responsibility or liability for any errors or omissions that may be made. The reader should make her or his own evaluation as to the appropriateness or otherwise of any experimental technique described.

© 2011 The Society for Political Methodology

All rights reserved; no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without prior written permission of the publisher or a license permitting restricted copying issued in the UK by the Copyright Licensing Agency Ltd, 90 Tottenham Court Road, London W1P 9HE, or in the USA by the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

https://doi.org/10.1017/S1047198700012687 Published online by Cambridge University Press

Political Analysis

www.pan.oxfordjournals.org

Volume 19 Number 1

Winter 2011

Contents

Estimation of Heterogeneous Treatment Effects from Randomized Experiments, with Application to the Optimal Planning of the Get-Out-the-Vote Campaign Kosuke Imai and Aaron Strauss	1
An Empirical Bayes Approach to Estimating Ordinal Treatment Effects R. Michael Alvarez, Delia Bailey, and Jonathan N. Katz	20
An Introduction to Bayesian Inference via Variational Approximations Justin Grimmer	32
The Measurement of Cross-cutting Cleavages and Other Multidimensional Cleavage Structures Joel Sawat Selway	48
Inferential Network Analysis with Exponential Random Graph Models Skyler J. Cranmer and Bruce A. Desmarais	66
Theory Driven Bias in Ideal Point Estimates—A Monte Carlo Study Alexander V. Hirsch	87
Stochastic Process Methods with an Application to Budgetary Data Christian Breunig and Bryan D. Jones	103