IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN

WILLIAM WHITFORD, ROGER ANCLAM, EMILY BUNTING, MARY LYNNE DONOHUE, HELEN HARRIS, WAYNE JENSEN, WENDY SUE JOHNSON, JANET MITCHELL, ALLISON SEATON, JAMES SEATON, JEROME WALLACE, and DONALD WINTER, Plaintiffs, v. GERALD C. NICHOL, THOMAS BARLAND, JOHN FRANKE, HAROLD V. FROEHLICH, KEVIN J. KENNEDY, ELSA LAMELAS, and TIMOTHY VOCKE, Defendants.	)	No. 15-cv-421-bbc

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DECLARATION OF KENNETH MAYER

I, Kenneth Mayer, pursuant to 28 U.S.C. § 1746, hereby declare as follows:

1. I am one of Plaintiffs' expert witnesses in the above captioned action. I make this declaration based on my personal knowledge and in support of the Plaintiffs' Opposition to the Defendants' Motion for Summary Judgment.

2. Docket Number 54 in this case is a true and correct copy of my Expert Report. This report is a true and correct statement of my opinions and conclusions, applying the principles of my academic discipline and scholarship in the field to a reasonable degree of scientific certainty.

3. Attached as Exhibit A is a true and correct copy of my curriculum vitae.

4. Attached as Exhibit B is a true and correct copy of the Rebuttal Report I submitted in this case. This report is a true and correct statement of my opinions and conclusions, applying the principles of my academic discipline and scholarship in the field to a reasonable degree of scientific certainty.

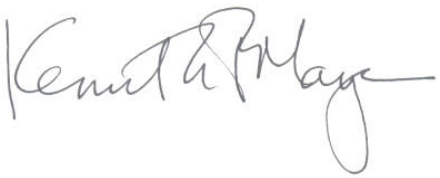
5. Attached as Exhibit C is a true and correct copy of an article I relied on in drafting my Rebuttal Report: Edward L. Glaeser & Bryce A. Ward, *Myths and Realities of American Political Geography,* Harvard Institute of Economic Research Discussion Paper No. 2100; Harvard University, John F. Kennedy School of Government Research Paper No. RWP06-007 (2005).

5. Attached as Exhibit D is a true and correct copy of an article I relied on in drafting my Rebuttal Report: Edward L. Glaeser & Jacob Vigdor, *The End of the Segregated Century: Racial Separation in America's Neighborhoods, 1890-2010*, Manhattan Institute Civic Report No. 66, (Jan. 2012).

6. Attached as Exhibit E is a true and correct copy of a report I relied on in drafting my Rebuttal Report: Su-Yuel Chung & Lawrence A. Brown, *Racial/Ethnic Residential Sorting in Spatial Context: Testing the Explanatory Frameworks*, 28 Urb. Geo. 312 (2007).

I declare under penalty of perjury that the foregoing is true and correct.

Dated this 22nd day of January, 2016.



KENNETH MAYER

Kenneth R. Mayer
Curriculum Vitae

Professor of Political Science
Department of Political Science
Affiliate Faculty, La Follette School of Public Affairs
110 North Hall / 1050 Bascom Mall
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Education

Ph.D. Yale University, 1988 (Political Science)
M.A., M.Phil. Yale University, 1987 (Political Science)
B.A. University of California, San Diego 1982 (Political Science)

Positions Held

Education and Social and Behavioral Sciences Institutional Review Board. 2009-2014. Acting Chair, Summer 2011. Chair, May 2012- June 2014

Fulbright-ANU Distinguished Chair in Political Science, Australian National University (Canberra, ACT), July – December 2006.

Professor, Department of Political Science, University of Wisconsin-Madison, July 2000 – present

Director, Data and Computation Center, College of Letters and Science, University of Wisconsin-Madison, June 1996-September 2003

Associate Professor, Department of Political Science, University of Wisconsin-Madison, June 1996-June 2000.

Assistant Professor, Department of Political Science, University of Wisconsin-Madison, August 1989-June 1996.

Consultant, The RAND Corporation, Washington DC, 1988-1994. Conducted study of acquisition reform, and the effects of acquisition policy on the defense industrial base. Also performed computer simulations of U.S. strategic force posture and capabilities.

Contract Specialist, Naval Air Systems Command, Washington D.C., 1985-1986. Responsible for cost and price analysis, contract negotiation, and contract administration for aerial target missile programs in the $5 million - $100 million range.

Honors and Awards

American Political Science Association, State Politics and Policy Section, best journal article published in the American Journal of Political Science in 2014. Awarded for Burden, Canon, Mayer, and Moynihan, "Election Laws, Mobilization, and Turnout."

Robert H. Durr Award, from the Midwest Political Science Association, for best paper applying quantitative methods to a substantive problem presented at the 2013 meeting. Awarded for Burden, Canon, Mayer, and Moynihan, "Election Laws and Partisan Gains."

Leon Epstein Faculty Fellow, College of Letters and Science, 2012-2015

Recipient, Jerry J. and Mary M. Cotter Award, College of Letters and Science, 2011-2012

Alliant Underkofler Excellence in Teaching Award, University of Wisconsin System, 2006
Pi Sigma Alpha Teaching Award, Fall 2006
Vilas Associate, 2003-2004, University of Wisconsin-Madison Graduate School.
2002 Neustadt Award (awarded by the Presidency Research Group of the American Political Science Association, for best book published on the American presidency in 2001). Awarded for *With the Stroke of a Pen*.
Lilly Teaching Fellow, University of Wisconsin-Madison, 1993-1994.
Interfraternity Council award for Outstanding Teaching, University of Wisconsin-Madison, 1993.
Selected as one of the 100 best professors at University of Wisconsin-Madison, Wisconsin Student Association, March 1992.
Olin Dissertation Fellow, Center for International Affairs, Harvard University, 1987-1988

Professional and Public Service

Expert Witness, *One Wisconsin Institute, Inc., et al. v. Nichol, et al*., No. 3:15-CV-324 (Western District of Wisconsin), voting rights litigation (2015-2016)
Expert Witness, *Whitford et al. v. Nichol et al.*, No. 15-CV-421-bbc (Western District of Wisconsin), redistricting litigation (2015-2016)
Participant, U.S. Public Speaker Grant Program. United States Department of State (nationwide speaking tour in Australia, May 11-June 2, 2012)
Expert Witness, *Milwaukee NAACP et al. v. Scott Walker et. al*, Dane County District Court (constitutional challenge to photo-ID requirements for voting, 2011-2012)
Expert Witness, *Baldus et al. v. Brennan et al.,* case 11-CV-562 (Eastern District of Wisconsin), redistricting litigation (2011-2012)
Expert Consultant and Witness, *County of Kenosha v. City of Kenosha* (redistricting dispute in the city of Kenosha, 2011)
Expert Consultant, *Voces de la Frontera* (Milwaukee Aldermanic Redistricting, 2011)
Expert Consultant, Prosser for Supreme Court (Wisconsin Supreme Court recount, 2011)
Consultant and Expert Witness, *McComish et al. v Brewer et al.* (D. Ariz; campaign finance case, 2008-2009)
Chair, Blue Ribbon Commission on Clean Elections (Madison), August 2007-April 2011
Consultant, Consulate of the Government of Japan (Chicago) on state politics in Illinois, Indiana, Minnesota, and Wisconsin, 2006-2011.
Section head, Presidency Studies, 2006 Annual Meeting of the American Political Science Association.
Co-Chair, Committee on Redistricting, Supreme Court of Wisconsin, November 2003-December 2009
Section Head, Presidency and Executive Politics, 2004 Annual Meeting of the Midwest Political Science Association, Chicago, IL.
Presidency Research Group (organized section of the American Political Science Association) Board, September 2002-present
Consultant and Expert Witness, *Baumgart et al. v. Wendelberger et al.* (Wisconsin state legislative redistricting case, 2001-2002)
Book Review Editor, *Congress and the Presidency*, 2001-2006
Editorial Board, *American Political Science Review*, September 2001-September 2007

Books and Monographs

Mayer, Kenneth R., ed. 2014. *The 2012 Presidential Election: Forecasts, Outcomes, and*

Consequences. Lanham, MD: Rowman and Littlefield, 2014. With Amnon Cavari and Richard J. Powell.

-----, ed. 2013. *The Enduring Debate: Classic and Contemporary Readings in American Government.* 7th ed. New York: W.W. Norton & Co. (with David T. Canon and John Coleman). Previous editions 1st (1997), 2nd (2000), 3rd (2002), 4th (2006) 5th (2009) 6th (2011).

-----, ed. 2013. *Faultlines: Readings in American Government*, 4th ed. New York: W.W. Norton & Co. (with David T. Canon and John Coleman). Previous editions 1st (2004), 2nd (2007), 3rd (2011)

-----. 2009. *2008 Election Data Collection Grant Program: Wisconsin Evaluation Report*. Report to the Wisconsin Government Accountability Board, September 2009. With Barry C. Burden, David T. Canon, Stéphane Lavertu, and Donald P. Moynihan.

-----, ed. 2002. *Readings in American Government*, 7th edition. New York: W.W. Norton & Co. (with Theodore J. Lowi, Benjamin Ginsberg, David T. Canon, and John Coleman). Previous editions 4th (1996), 5th (1998), 6th (2000).

-----. 2001. *With the Stroke of a Pen: Executive Orders and Presidential Power*. Princeton, NJ: Princeton University Press. Winner of the 2002 Neustadt Award.

-----. 1999. *The Dysfunctional Congress? The Individual Roots of an Institutional Dilemma*. Boulder, CO: Westview Press. (with David T. Canon). 2nd edition in process, expected publication date 2014.

-----. 1999. *Issue Advocacy in Wisconsin: Analysis of the 1998 Elections and A Proposal for Enhanced Disclosure*. September.

-----. 1998. *Public Financing and Electoral Competition in Minnesota and Wisconsin*. Citizens' Research Foundation. April.

-----. 1993. *The Development of the Advanced Medium Range Air-to-Air Missile: A Case Study of Risk and Reward in Weapon System Acquisition*. N-3620-AF. Santa Monica: RAND Corporation.

-----. 1992. *Barriers to Managing Risk in Large Scale Weapons System Development Programs*. N-4624-AF. Santa Monica: RAND Corporation (with Thomas K. Glennan, Jr., Susan J. Bodilly, Frank Camm, and Timothy J. Webb).

-----. 1991. *The Political Economy of Defense Contracting*. New Haven: Yale University Press.

Articles and Other Scholarly Papers

Mayer, Kenneth R. 2014. "Lessons of Defeat: Republican Party Responses to the 2012 Presidential Election. In Amnon Cavari, Richard J. Powell, and Kenneth R. Mayer, eds. *The 2012 Presidential Election: Forecasts, Outcomes, and Consequences*. Lanham, MD: Rowman and Littlefield.

-----. 2014. "Alien Abduction, and Voter Impersonation in the 2012 U.S. General Election: Evidence from a Survey List Experiment." *Election Law Journal* 13:460-475 (No.4, December 2014). With John S. Ahlquist and Simon Jackman.

-----. 2014. "Election Laws, Mobilization, and Turnout: The Unanticipated Consequences of Election Reform." *American Journal of Political Science*,58:95-109 (No. 1, January). With Barry C. Burden, David T. Canon, and Donald P. Moynihan. Winner of the State Politics and Politics section of the American Political Science Association, for the best article published in the *AJPS* in 2014.

-----. 2013. "Public Election Funding: An Assessment of What We Would Like to Know." *The Forum* 11:365-485 (No. 3).

-----. 2013. "Selection Method, Partisanship, and the Administration of Elections." *American*

Politics Research 41:1-34. With Barry C. Burden, David T. Canon, Stéphane Lavertu, and Donald Moynihan.

-----. 2012. "The Effect of Administrative Burden on Bureaucratic Perception of Policies: Evidence from Election Administration." *Public Administration Review* 72:741-451 (No. 5, September/October 2012). With Barry C. Burden, David T. Canon, and Donald Moynihan.

-----. 2011. "Early Voting and Election Day Registration in the Trenches: Local Officials' Perceptions of Election Reform." *Election Law Journal* 10:89-102 (No. 2). With Barry C. Burden, David T. Canon, and Donald Moynihan.

-----. 2010. "Is Political Science Relevant? Ask an Expert Witness," *The Forum*: Vol. 8 : Iss. 3, Article 6. **DOI:** 10.2202/1540-8884.1391 **Available at:** http://www.bepress.com/forum/vol8/iss3/art6

-----. 2009. "Thoughts on the Revolution in Presidency Studies," *Presidential Studies Quarterly* 39 (no. 4, December)

-----. 2009. "Unilateral Action." George C. Edwards, III, and William G. Howell, *Oxford Handbook of the American Presidency* (New York: Oxford University Press, 2009)

-----. 2009. "Executive Orders," in Joseph Bessette and Jeffrey Tulis, *The Constitutional Presidency*. (Baltimore: Johns Hopkins University Press, 2009)

-----. 2008. "Does Australia Have a Constitution? Part I – Powers: A Constitution Without Constitutionalism." *UCLA Pacific Basin Law Journal* 25:228-264 (No. 2, Spring). With Howard Schweber.

-----. 2008. "Does Australia Have a Constitution? Part II: The Rights Constitution." *UCLA Pacific Basin Law Journal* 25:265-355 (No. 2, Spring). With Howard Schweber.

-----. 2007. "The Base Realignment and Closure Process: Is It Possible to Make Rational Policy?" Brademas Center for the Study of Congress, New York University.

-----. 2007 "Controlling Executive Authority in a Constitutional System" (comparative analysis of executive power in the U.S. and Australia), manuscript, February 2007**.**

-----. 2007. "Public Election Funding, Competition, and Candidate Gender." *PS: Political Science and Politics* XL:661-667 (No. 4,October). With Timothy Werner

-----. 2006. "Do Public Funding Programs Enhance Electoral Competition?" In Michael P. McDonald and John Samples, eds., *The Marketplace of Democracy: Electoral Competition and American Politics* (Washington, DC: Brookings Institution Press, 2006). With Timothy Werner and Amanda Williams. Excerpted in Daniel H. Lowenstein, Richard L. Hasen, and Daniel P. Tokaji, *Election Law: Cases and Materials* (Durham, NC: Carolina Academic Press, 2008).

-----. 2005. "The Last 100 Days." *Presidential Studies Quarterly* 35:533-553 (No. 3, September). With William Howell.

-----. 2004. "The Return of the King? Presidential Power and the Law," *PRG Report* XXVI, No. 2 (Spring).

-----. 2003. "Political Reality and Unforeseen Consequences: Why Campaign Finance Reform is Too Important To Be Left To The Lawyers," *University of Richmond Law Review* 37:1069-1110 (No. 4, May).

-----. 2002. "Unilateral Presidential Powers: Significant Executive Orders, 1949-1999." *Presidential Studies Quarterly* 32:367-386 (No. 2, June). With Kevin Price.

-----. 2002. "Review Essay: Assessing The 2000 Presidential Election – Judicial and Social Science Perspectives." *Congress and the Presidency* 29: 91-98 (No. 1, Spring)

-----. 2001. "Answering Ayres: Requiring Campaign Contributors to Remain Anonymous Would Not Resolve Corruption Concerns." *Regulation* 24 (No. 4, Winter):24-29.

-----. 2001. "Presidential Emergency Powers." *Oxford Analytica Daily Brief*, December 18.
-----. 2001. "Hey, Wait a Minute: The Assumptions Behind the Case for Campaign Finance Reform." Gerald C. Lubenow, ed., *A User's Guide to Campaign Finance Reform* (Lanham, MD: Rowman & Littlefield).
-----. 2001. "Everything You Thought You Knew About Impeachment Was Wrong." Leonard V. Kaplan and Beverly I. Moran, ed., *Aftermath: The Clinton Impeachment and the Presidency in the Age of Political Spectacle* (New York: New York University Press). With David T. Canon.
-----. 2000. "Student Attitudes Toward Instructional Technology in the Large Introductory US Government Course." *PS: Political Science and Politics* 33: no. 3 (September). With John Coleman.
-----. 2000. "The Institutionalization of Power." Robert Y. Shapiro, Martha Joynt Kumar, and Lawrence R. Jacobs, ed. *Presidential Power: Forging the Presidency for the 21st Century* (New York: Columbia University Press). With Thomas J. Weko.
-----. 1999. "The Limits of Delegation – the Rise and Fall of BRAC." *Regulation* 22:32-38 (No. 3, October)
-----. 1999. "Executive Orders and Presidential Power." *The Journal of Politics* 61:445-466 (No. 2, May).
-----. 1997. *Campaign Finance Reform in the States*. Report prepared for and presented to the Governor's Blue Ribbon Commission on Campaign Finance Reform (State of Wisconsin). February. Portions reprinted in Anthony Corrado, Thomas E. Mann, Daniel R. Ortiz, Trevor Potter, and Frank J. Sorauf, ed. 1997. *Campaign Finance Reform: A Sourcebook* (Washington, D.C.: Brookings Institution)
----- 1996. "Bringing Politics Back In: Defense Policy and the Theoretical Study of Institutions and Processes." *Public Administration Review* 56:180-190 (with Anne Khademian).
-----. 1996. "Does Public Financing of Campaigns Work?" *Trends in Campaign Financing*, no. 3. Occasional Paper Series, Citizens' Research Foundation, Los Angeles, CA (with John M. Wood).
-----. 1995. "Closing Military Bases (Finally): Solving Collective Dilemmas Through Delegation." *Legislative Studies Quarterly*, 20:393-414.
-----. 1995. "Electoral Cycles in Federal Government Prime Contract Awards: State-Level Evidence from the 1988 and 1992 Presidential Elections." *American Journal of Political Science* 40:162-185.
-----. 1995. "The Impact of Public Financing on Electoral Competitiveness: Evidence from Wisconsin, 1964-1990." *Legislative Studies Quarterly* 20:69-88 (with John M. Wood).
-----. 1993. "Policy Disputes as a Source of Administrative Controls: Congressional Micromanagement of the Department of Defense," *Public Administration Review* 53:293-302.
-----. 1993. "Congressional-DoD Relations After the Cold War: The Politics of Uncertainty," in *Downsizing Defense*, Ethan Kapstein ed. Washington DC: Congressional Quarterly Press.
-----. 1993. "Combat Aircraft Production in the United States, 1950-2000: Maintaining Industry Capability in an Era of Shrinking Budgets." *Defense Analysis* 9:159-169.
-----. 1991. "Elections, Business Cycles, and the Timing of Defense Contract Awards in the United States," in *The Political Economy of Military Spending*, Alex Mintz ed. London: Routledge.
-----. 1990. "Patterns of Congressional Influence In Defense Contracting," in *Arms, Politics, and the Economy: Contemporary and Historical Perspectives*, Robert Higgs ed. New York:

Holmes and Meier.

Other Publications and Book Reviews

Kenneth R. Mayer. 2011. Review of Jason K. Dempsey, *Our Army: Soldiers, Politicians, and American Civil-Military Relations*. *The Forum* 9 (No. 3). Available at**:** http://www.bepress.com/forum/vol9/iss3/art10

------. 2010. "Voting Early, but Not Often." *New York Times*, October 25. With Barry C. Burden

------. 2008. Review of John Samples, *The Fallacy of Campaign Finance Reform* and Raymond J. La Raja, *Small Change: Money, Political Parties, and Campaign Finance Reform* , in *The Forum* 6 (No. 1). Available at http://www.bepress.com/forum/vol6/iss1/art18/

-----. 2007. Review Essay, *Executing the Constitution: Putting the President Back Into the Constitution*, Christopher S, Kelley, ed.; *Presidents in Culture: The Meaning of Presidential Communication*, David Michael Ryfe; *Executive Orders and the Modern Presidency: Legislating from the Oval Office*, Adam L. Warber. In *Perspective on Politics* 5:635-637 (No. 3, September)

-----. 2006. "Campaigns, Elections, and Campaign Finance Reform." *Focus on Law Studies*, XXI, No. 2 (Spring 2006). American Bar Association, Division for Public Education.

-----. 2006. Issue Briefs (Midterm Elections, Homeland Security; Foreign Affairs and Defense Policy; Education; Budget and Economy; Entitlement Reform) *2006 Reporter's Source Book*. Project Vote Smart. With Meghan Condon.

-----. 2006. , "Sunlight as the Best Disinfectant: Campaign Finance in Australia." Democratic Audit of Australia, Australian National University, October.

-----. 2006. "Return to the Norm," *Brisbane Courier-Mail*, November 10.

-----. 2004. Issue Briefs (Campaign Finance Reform, Homeland Security; Foreign Affairs and Defense Policy; Education; Budget and Economy; Entitlement Reform), *2004 Reporter's Source Book*. Project Vote Smart. With Patricia Strach and Arnold Shober.

-----. 2004. "Where's That Crystal Ball When You Need It? Finicky Voters and Creaky Campaigns Made for a Surprise Electoral Season. And the Fun's Just Begun." *Madison Magazine*. April.

-----. 2002. "Capitol Overkill." *Madison Magazine*, July.

-----. 2002. Issue Briefs (Homeland Security; Foreign Affairs and Defense Policy; Education; Economy, Budget and Taxes; Social Welfare Policy), *2002 Reporter's Source Book*. Project Vote Smart. With Patricia Strach and Paul Manna.

-----. 1999. "An Analysis of the Issue of Issue Ads." Guest Column Op-ed. *Wisconsin State Journal*, November 7.

-----. 1999. "Background of Issue Ad Controversy." Guest Column Op-ed. *Wisconsin State Journal*, November 7.

-----. 1999. "Eliminating Public Funding Reduces Election Competition." Guest Column Op-ed. *Wisconsin State Journal*, June 27.

-----. 1998. Review of *Executive Privilege: The Dilemma of Secrecy and Democratic Accountability*, by Mark J. Rozell. *Congress and the Presidency*, 25.

-----. 1996. "Like Marriage, New Presidency Starts In Hope." *Wisconsin State Journal*. March 31.

-----. 1994. Review of *The Tyranny of the Majority: Fundamental Fairness in Representative Democracy*, by Lani Guinier. *Congress and the Presidency* 21: 149-151.

-----. 1994. Review of *The Best Defense: Policy Alternatives for U.S. Nuclear Security From*

the 1950s to the 1990s, by David Goldfischer. *Science, Technology, and Environmental Politics Newsletter* 6.

-----. 1993. Review of *The Strategic Defense Initiative*, by Edward Reiss. *American Political Science Review* 87: 1061-1062

-----. 1993. Review of *The Political Economy of Defense: Issues and Perspectives*, Andrew L. Ross ed. *Armed Forces and Society* 19:460-462.

-----. 1993. Review of *Space Weapons and the Strategic Defense Initiative*, by Crockett Grabbe. *Annals of the American Academy of Political and Social Science* 527: 193-194.

-----. 1992. "Limits Wouldn't Solve the Problem." Guest Column Op-ed. *Wisconsin State Journal*, November 5 (with David T. Canon).

-----. 1992. "Convention Ceded Middle Ground." Guest Column Op-ed. *Wisconsin State Journal*, August 23.

-----. 1992. "CBS Economy Poll Meaningless." Guest Column Op-ed. *Wisconsin State Journal*, February 3.

-----. 1988. "It's a Matter of Character: Pentagon Doesn't Need New Laws, it Needs Good People." Op-ed. *Los Angeles Times*, July 8.

Convention and Conference Papers

Mayer, Kenneth. 2015. "What Happens at the Polling Place: Using Administrative Data to Understand Irregularities at the Polls." Presented at Conference on New Research on Election Administration and Reform, Massachusetts Institute of Technology, Cambridge, MA, June 8. With Barry C. Burden, David T. Canon, Donald P. Moynihan, and Jake R Neiheisel.

-----. 2013. "Election Laws and Partisan Gains: What are the Effects of Early Voting and Same Day Registration on the Parties' Vote Shares". Presented at the 2013 Annual Meeting of the Midwest Political Science Association, Chicago, IL, April 11-14. Winner of the Robert H. Durr Award.

-----. 2011. "The Effect of Public Funding on Electoral Competition: Evidence from the 2008 and 2010 Cycles." Presented at the 2011 Annual Meeting of the American Political Science Association, Seattle, WA, September 1-4. With Amnon Cavari.

-----.2011. "What Happens at the Polling Place: A Preliminary Analysis in the November 2008 General Election." Presented at the 2011 Annual Meeting of the American Political Science Association, Seattle, WA, September 1-4. With Barry C. Burden, David T. Canon, Donald P. Moynihan, and Jake R. Neiheisel.

-----. 2010. "Election Laws, Mobilization, and Turnout: The Unanticipated Consequences of Election Reform." With Barry C. Burden, David T. Canon, Stéphane Lavertu and Donald P. Moynihan. Presented at the 2010 Annual Meeting of the American Political Science Association, Washington, DC, September 2-5.

-----. 2010. "Selection Methods, Partisanship, and the Administration of Elections." With Barry C. Burden, David T. Canon, Stéphane Lavertu and Donald P. Moynihan. Paper presented at the 2010 Annual Meeting of the Midwest Political Science Association, Chicago, IL, April 22-25. Revised version presented at the 2011 Annual Meeting of the European Political Science Association, June 16-19, Dublin, Ireland.

-----. 2009. "The Effects and Costs of Early Voting, Election Day Registration, and Same Day Registration in the 2008 Elections." With Barry C. Burden, David T. Canon, and Donald P. Moynihan. Paper presented at the 2009 Annual Meeting of the American Political Science Association, Toronto, Canada, September 3-5.

-----. 2007. "Comparative Election Administration: Can We Learn Anything From the

Australian Electoral Commission?" Paper presented at the 2007 Annual Meeting of the American Political Science Association, Chicago, IL, August 29-September 1.

-----. 2007. "Electoral Transitions in Connecticut: Implementation of Public Funding for State Legislative Elections." Paper presented at the 2007 Annual Meeting of the American Political Science Association, Chicago, IL, August 29-September 1. With Timothy Werner.

-----. 2005. "Candidate Gender and Participation in Public Campaign Finance Programs." Paper delivered at the 2005 Annual Meeting of the Midwest Political Science Association, Chicago IL, April 7-10, 2005. With Timothy Werner.

-----. 2004. "Do Public Funding Programs Enhance Electoral Competition?" Paper delivered at the 4th Annual State Politics and Policy Conference," April 30-May 1, Akron, OH. With Timothy Werner and Amanda Williams. Updated April 2005.

-----. 2003. "The Last 100 Days." Presented at the 2003 Annual Meeting of the American Political Science Association, August 28-31, Philadelphia PA.

-----. 2000. "Hey, Wait a Minute: The Assumptions Behind the Case for Campaign Finance Reform." Paper presented at the Citizens' Research Foundation Forum on Campaign Finance Reform, Institute for Governmental Studies, University of California Berkeley. August.

-----. 1996. "The Importance of Moving First: Presidential Initiative and Executive Orders." Presented at the 1996 Annual Meeting of the American Political Science Association, San Francisco, CA, August 28-September 1

-----. 1993. "Department of Defense Contracts, Presidential Elections, and the Political-Business Cycle." Presented at the 1993 Annual Meeting of the American Political Science Association, Washington, DC, September 2-5.

-----. 1993. " Informational vs. Distributive Theories of Legislative Organization: Committee Membership and Defense Policy in the House." Presented at the 1993 Annual Meeting of the American Political Science Association, Washington, DC, September 2-5.

-----. 1991. "Problem? What Problem? Congressional Micromanagement of the Department of Defense." Presented at the 1991 Annual Meeting of the American Political Science Association, Washington DC, August 29 - September 2.

Grants and Research Activities

"How do You Know? The Structure of Presidential Advising and Error Correction in the White House." Graduate School Research Committee, University of Wisconsin, $18,941. July 1, 2015-June 30,2016.

"Study and Recommendations for the Government Accountability Board Chief Inspectors' Statements and Election Incident Report Logs." $43,234. Co-PI. With Barry C. Burden (PI), David T. Canon (co-PI), and Donald Moynihan (co-PI). October 2011-May 2012.

"Public Funding in Connecticut Legislative Elections." Open Society Institute. September 2009- December 2010. $55,000.

"Early Voting and Same Day Registration in Wisconsin and Beyond." Co-PI. October 2008-September 2009. Pew Charitable Trusts. $49,400. With Barry C. Burden (PI), David T. Canon (Co-PI), Kevin J. Kennedy (Co-PI), and Donald P. Moynihan (Co-PI).

City of Madison, Blue Ribbon Commission on Clean Elections. Joyce Foundation, Chicago, IL. $16,188. January-July 2008.

"Wisconsin Campaign Finance Project: Public Funding in Connecticut State Legislative Elections." JEHT Foundation, New York, NY $84,735. November 2006-November 2007.

"Does Public Election Funding Change Public Policy? Evaluating the State of Knowledge." JEHT Foundation, New York, NY. $42,291. October 2005-April 2006.

"The Wisconsin Campaign Finance Project: Disseminating Data to the Academic, Reform, and Policy Communities." Joyce Foundation, Chicago, IL. $20,900. September 2005-August 2006.

"Enhancing Electoral Competition: Do Public Funding Programs for State and Local Elections Work?" Smith Richardson Foundation, Westport, CT. $129,611. December 2002-June 2005

WebWorks Grant (implementation of web-based instructional technologies), Division of Information Technology, UW-Madison, $1,000. November 1999.

"Issue Advocacy in Wisconsin during the 1998 Election." Joyce Foundation, Chicago, IL. $15,499. April 1999.

Instructional Technology in the Multimedia Environment (IN-TIME) grant, Learning Support Services, University of Wisconsin. $5,000. March 1997.

"Public Financing and Electoral Competitiveness in the Minnesota State Legislature." Citizens' Research Foundation, Los Angeles, CA, $2,000. May-November 1996.

"The Reach of Presidential Power: Policy Making Through Executive Orders." Graduate School Research Committee, University of Wisconsin, $21,965. July 1, 1995-August 31,1995. National Science Foundation (SBR-9511444), $60,004. September 1, 1995 - August 31, 1998. Additional support provided by the Gerald R. Ford Library Foundation, the Eisenhower World Affairs Institute, and the Harry S. Truman Library Foundation.

"The Future of the Combat Aircraft Industrial Base." Changing Security Environment Project, John M. Olin Institute for Strategic Studies, Harvard University (with Ethan B. Kapstein). June 1993-January 1995. $15,000.

Hilldale Student Faculty Research Grant, College of Letters and Sciences, University of Wisconsin (with John M. Wood). 1992. Amount: $1,000 ($3,000 award to student)

"Electoral Cycles in Federal Government Prime Contract Awards," March 1992 - February 1995. National Science Foundation (SES-9121931), the Graduate School Research Committee at the University of Wisconsin, and the MacArthur Foundation. Amounts: National Science Foundation, $74,216; Graduate School Research Committee: $2,600; MacArthur Foundation, $2,500

C-SPAN In the Classroom Faculty Development Grant, 1991. $500

Professional Activities

Discussant, "The Use of Unilateral Powers." 2014 American Political Science Association Annual Meeting, August 28-31, Washington, DC.

Presenter, "Roundtable on Money and Politics: What do Scholars Know and What Do We Need to Know?" 2013 American Political Science Association Annual Meeting, August 28-September 1, 2013, Chicago, IL.

Presenter, "Roundtable: Evaluating the Obama Presidency." 2012 Midwest Political Science Association Meeting, April 11-14, 2012, Chicago, IL.

Panel Participant, "Redistricting in the 2010 Cycle," Midwest Democracy Network,

Speaker, "Redistricting and Election Administration," Dane County League of Women Voters, March 4, 2010

Keynote Speaker, "Engaging the Electorate: The Dynamics of Politics and Participation in 2008." Foreign Fulbright Enrichment Seminar, Chicago, IL, March 2008.

Participant, Election Visitor Program, Australian Electoral Commission, Canberra, ACT.

November 2007.

Invited Talk, "Public Funding in State and Local Elections." Reed College Public Policy Lecture Series. Portland, Oregon, March 19, 2007.

Fulbright Distinguished Chair Lecture Tour, 2006. Public lectures on election administration and executive power. University of Tasmania, Hobart (TAS); Flinders University and University of South Australia, Adelaide (SA); University of Melbourne, Melbourne (VIC); University of Western Australia, Perth (WA); Griffith University and University of Queensland, Brisbane (QLD); Institute for Public Affairs, Sydney (NSW); The Australian National University, Canberra (ACT)

Discussant, "Both Ends of the Avenue: Congress and the President Revisited," 2004 American Political Science Association Meeting, September 2-5, 2004, Chicago, IL.

Presenter, "Researching the Presidency," Short Course, 2004 American Political Science Association Meeting, September 2-5, 2004, Chicago, IL.

Discussant, Conference on Presidential Rhetoric, Texas A&M University, February 2004, College Station, TX

Presenter, "Author Meets Author: New Research on the Presidency," 2004 Southern Political Science Association Meeting, January 8-11, New Orleans, LA.

Chair, "Presidential Secrecy," 2003 American Political Science Association Meeting, August 28-31, Philadelphia, PA

Discussant, "New Looks at Public Approval of Presidents." 2003 Midwest Political Science Association Meeting, April 3-6, 2003, Chicago, IL

Discussant, "Presidential Use of Strategic Tools." 2002 American Political Science Association Meeting, August 28-September 1, 2002, Boston, MA

Chair and Discussant, "Branching Out: Congress and the President." 2001 Midwest Political Science Association Meeting, April 19-22, 2001, Chicago, IL

Invited witness, Committee on the Judiciary, Subcommittee on Commercial and Administrative Law, U.S. House of Representatives. *Hearing on Executive Orders and Presidential Power*, Washington, DC. March 22, 2001

Invited Presenter, "The History of the Executive Order," Miller Center for Public Affairs, University of Virginia (with Griffin Bell and Will Howell), January 26, 2001

Presenter and Discussant, Future Voting Technologies Symposium (meeting organized by Dane County Clerk's Office), Madison, WI May 2, 2000

Moderator, Panel on Electric Utility Reliability. Assembly Staff Leadership Development Seminar, Madison, WI. August 11, 1999

Chair, Panel on "Legal Aspects of the Presidency: Clinton and Beyond." 1999 Midwest Political Science Association Annual Meeting, April 15-17, Chicago, IL

Consultant, Governor's Blue Ribbon Commission on Campaign Finance Reform. State of Wisconsin. 1997

Session Moderator, National Performance Review Acquisition Working Summit, Milwaukee, WI, June 1995

Invited Speaker, American Politics Seminar, The George Washington University, Washington D.C., April 1995.

Invited speaker, Defense and Arms Control Studies Program, Massachusetts Institute of Technology, Cambridge, MA, March 1994.

Discussant, International Studies Association (Midwest Chapter) Annual Meeting, Chicago IL, October 29-30, 1993

Invited speaker, Seminar on American Politics, Princeton University, January 16-17,1992

Participant, Conference on Defense Downsizing and Economic Conversion, October 4, 1991, Harvard University.
Participant, Conference on Congress and New Foreign and Defense Policy Challenges, The Ohio State University, Columbus OH, September 21-22, 1990, and September 19-21, 1991.
Presenter, "A New Look at Short Term Change in Party Identification," 1990 Meeting of the American Political Science Association, San Francisco, CA.
Journal Manuscript Reviewer: *American Political Science Review, American Journal of Political Science, Journal of Politics, Political Research Quarterly, Legislative Studies Quarterly, International Studies Quarterly, Public Administration Review, Journal of Policy History*
Peer Reviewer, National Science Foundation; Carnegie Corporation

Department and University Service

Athletic Board, September 2014-present
General Education Requirements Committee (Letters and Science), C ommunications-B Implementation Committee(Letters and Science) Curriculum Committee (Letters and Science)
Verbal Assessment Committee (University)
College of Letters & Science Faculty Appeals Committee (for students dismissed for academic reasons), ongoing.
Committee on Information Technology, Distance Education and Outreach, 1997-98.
Hilldale Faculty-Student Research Grants, Evaluation Committee, 1997, 1998 Department Computer Committee, 1996-1997; 1997-1998, 2005-2006. Chair, 2013-present.
FacultySenate Delegate, 2000-2001, 2001-2002, 2002-2005. Alternate Delegate, Department of Political Science, 1994-1995; 1996-1997; 1997-1998, 1998-1999
Preliminary Exam Appeals Committee, Department of Political Science, 1994-1995
Faculty Advisor, Pi Sigma Alpha (Political Science Honors Society), 1993-1994 Department Honors Advisor, 1991-1992; 1992-1993
Brown-bag Seminar Series on Job Talks (for graduate students), 1992
Keynote speaker, Undergraduate Honors Symposium, April 13 1991
Brown Bag Seminar on the Persian Gulf War, Medical Scholars Program, February 15 1991
Undergraduate Curriculum Committee, Department of Political Science, 1990-1991; 1991-1992; 1993-1994
Individual Majors Committee, College of Letters and Sciences, 1990-1991
Dean Reading Room Committee, Department of Political Science, 1989-1990; 1994-1995

Teaching

Undergraduate: Introduction to American Government; Honors Introduction to American Government; Legislative Process; The American Presidency; Theories of Legislative Organization; Defense and Foreign Policy; Classics of American Politics; Senior Honors Thesis Seminar; Campaign Finance; Election Law; Presidential Debates; Comparative Electoral Systems
Graduate: Contemporary Presidency; Legislative Process; American National Institutions; Classics of American Politics

Rebuttal Report: Response to Expert Reports of Sean Trende and Nicholas Goedert

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December 21, 2015

This report presents my responses to the criticisms that Sean Trende and Professor Nicholas Goedert make of my report.[1]

I. Summary

A. Both Trende and Goedert erroneously argue that Democrats are more geographically concentrated than Republicans in Wisconsin, which creates a natural pro-Republican bias even under a neutrally-drawn district plan. Both arguments are based on unreliable methodologies, flawed measures, and lead to inaccurate conclusions. Trende's methodology for measuring partisan concentration relies on an unorthodox method (the PVI) far more common among political commentators than academics who study spatial patterns of concentration and isolation. Moreover, as he applies it here, Trende relies on fundamentally inaccurate measures of geography that are guaranteed to demonstrate that Democratic wards are closer to one another than are Republican wards.

Goedert's arguments about geographic concentration are analogous to Trende's, and suffer from the same flaws in that they are based on superficial claims that do not rely on actual measures of spatial concentration or isolation. Moreover, Goedert's claims here contradict his own research, in which he finds that even after controlling for urbanization (a proxy for concentration), Republican control of the redistricting process has a large and statistically significant impact on a plan's bias. A model in one of his papers (Goedert 2015) also shows that a court-drawn or bipartisan map in Wisconsin would be expected to produce a *pro-Democratic bias*. The model generates the same expectation for a court-drawn or bipartisan map in a state that resembles the country as a whole. Accordingly, based on Goedert's own analysis, there is no natural pro-Republican tilt in either Wisconsin or the typical U.S. state.

In contrast to Trende's and Goedert's unorthodox techniques, widely (even universally) accepted measures of spatial distributions, such as Global Moran's I (Cho 2003) and the Isolation Index (Reardon 2004), show that Wisconsin's Republicans and Democrats are equally spatially concentrated and equally spatially isolated from each other, and that in some election years *Republicans are more concentrated* than Democrats.

B. Trende criticizes my method of estimating the partisanship of uncontested Assembly districts as biased. But his criticism stems from a superficial and erroneous discussion of a single figure in my report (Figure 2), and he erroneously believes that I set the Assembly votes in uncontested districts to the presidential vote in those districts. He does not take notice of the fact that my analysis was based on a comprehensive multiple regression model that controlled for the very factors that he claims create bias, nor that my model produces extraordinarily accurate forecasts of the actual data, using multiple methods.

[1] "Analysis of the Efficiency Gaps of Wisconsin's Current Legislative District Plan and Plaintiff's Demonstration Plan," July 3, 2015.

C. Trende criticizes my baseline measure of partisanship for not taking into account factors such as incumbency, candidate quality, and spending. This is an inaccurate criticism, because estimating baseline partisanship is *designed* to control for incumbency, campaign spending, and candidate quality. This is the method preferred in the academic literature on redistricting, which seeks to understand the consequences of hypothetical plans (in which candidate quality, spending, and incumbency are unknown). My approach is *identical* to the method used by Professor Gaddie, who produced the baseline partisan estimates used by Wisconsin's map drawers in 2011.

D. Goedert challenges my model for estimating baseline partisanship in 2012, contending that I took into account information that the authors of Act 43 did not have (the 2012 election results). However, my baseline estimates of partisanship are nearly identical to those generated by Gaddie in 2011, indicating the same conclusions follow whether 2012 or pre-2012 data are used in the analysis. In addition, pre-2012 election results are highly correlated with 2012 election results, indicating that it would make no difference if I had used earlier election results. Goedert dismisses the convergence between my estimates and Gaddie's estimates as "mostly coincidental," but offers no evidence or data to support his assertion.

E. Geodert also challenges my efficiency gap calculations for ignoring the effects of incumbency, which he asserts that any author of a redistricting plan would incorporate. His criticism fails to acknowledge that controlling for incumbency is the standard methodology for estimating the partisan consequences of a hypothetical district plan. Nevertheless, I recalculated efficiency gap estimates for both Act 43 and my Demonstration Plan, taking incumbency into account. The substantive conclusions are identical: the efficiency gap for my plan increases slightly (but is still well within acceptable limits), as does the efficiency gap for Act 43. The *difference* between the two plans' efficiency gaps remains enormous.

F. Goedert criticizes my efficiency gap calculations for not including any sensitivity testing to determine whether my results are robust to changes in the statewide electoral environment. I conducted a uniform swing analysis over the range of plausible election results, based on the maximum and minimum statewide Democratic Assembly vote since 1992. This analysis shows that the efficiency gaps of both Act 43 and the Demonstration Plan are robust: Act 43's efficiency gap remains very high across this range, always significantly above the plaintiffs' suggested 7% threshold, and the Demonstration Plan's efficiency gap remains very low, and is always well below the threshold. Goedert is simply incorrect in asserting that the plans' respective efficiency gaps are not robust, and, again, offers no data or evidence to support his claim.

G. Throughout their reports, neither Trende nor Goedert has actually done any analysis that identifies problems with my analysis, or that specifically shows where my analysis is

incorrect. Trende and Goedert merely offer speculative and unsubstantiated criticism, but never offer any substantive data or evidence that supports their arguments. And, as I will show, when they attempt to analyze Wisconsin's political geography, their conclusions are utterly wrong.

II. The Claim that Wisconsin's Political Geography Has a Pro Republican Bias

While I will go into more detail on the specific points each report makes, I focus first on a central argument both Trende and Goedert make: that Wisconsin has a natural distribution of Republicans and Democrats that produces an intrinsic pro-Republican bias in a neutrally-drawn redistricting plan. They claim that because Democrats in Wisconsin happen to be (allegedly) naturally concentrated in small pockets of overwhelming Democratic strength, even a neutrally-drawn map would produce a large pro-Republican efficiency gap. As a result, they conclude, it is not possible to consider a large pro-Republican efficiency gap as evidence of gerrymandering.

I begin by noting that both Trende and Goedert ignore the role that political geography already plays in plaintiffs' proposed test. Under the test's first prong, if the state's motive in enacting its plan was simply to follow the contours of the state's geography, then partisan intent would not be present and plaintiffs would proceed no further in their claim. Similarly, under the test's third prong, if the state can show that its plan's large efficiency gap was necessitated by the geographic distribution of the state's voters, then the plan would be upheld. These points mean that geography is already properly incorporated into plaintiffs' proposal.

There are, additionally, two points that fundamentally negate the utility of this line of attack. First, the geographic concentration argument is predicated on the foundational assumption that a *neutrally-drawn map* would have produced a pro-Republican bias. Even if Trende and Goedert are correct in this assumption (which they are not), they take no position on whether the process in Wisconsin was, in fact, neutral. The record of the federal redistricting trial clearly shows that Act 43 was designed with the predominant purpose of benefiting Republicans and disadvantaging Democrats, and neither Trende nor Goedert contradicts the findings in my report of examples of blatant packing and cracking that are the very DNA of a partisan gerrymander.

And second, even if the state's experts are correct that political geography has produced the pro-Republican bias in Wisconsin's state legislative district plan (which they are not), it is impossible for them to quantify *how much* of an effect geography has had: is it 5%? 10%? 90%? 100%? Neither Trende nor Goedert have actually done any analysis that *demonstrates* that the alleged concentration of Democrats *in Wisconsin* will produce a pro-Republican efficiency gap, or any work that quantifies how concentration is related to efficiency gap calculations. They simply assert (incorrectly) that Democrats are more concentrated than Republicans, and therefore that even a neutral map will produce a pro-Republican bias.

But they are also wrong on the facts. Their argument about geographic concentration is based on flawed data and measures, and has no basis in accepted methods of measuring geographic concentration and isolation. Trende, in particular, uses an unorthodox method with

no support in the peer-reviewed literature, and one that is guaranteed to produce a biased result that shows Democrats far more concentrated than they actually are. Goedert's argument contradicts his own published work, which shows that partisan control of redistricting generates a substantial bias even after partisan concentration is taken into account. His argument, further, falls victim to the Modified Areal Unit Problem, in that it is based entirely on the analysis of wards, ignoring the fact that wards are aggregated into districts. As I demonstrate, this aggregation process completely changes the applicability of Goedert's conclusions.

When I analyze the geographic distribution of Wisconsin's Democrats and Republicans using widely accepted measures of spatial concentration and isolation (Global Moran's I and the Isolation Index), I find that there is very little evidence of significant disparities in how the parties' voters have been distributed in recent election cycles. Republicans are in fact *more concentrated* than Democrats when measured by the 2012 Assembly vote.

A. Trende

Trende spends nearly half of his report (paragraphs 62-105) arguing that Democrats are naturally more concentrated ("clustered") than Republicans in Wisconsin, which creates a natural packing effect. Much of this discussion is entirely irrelevant to Wisconsin (Trende's discussion of patterns in the southern United States, Virginia, and differences between the 1996 and 2008 Democratic coalitions; see paragraphs 62-77). Trende also simply asserts that "there is little doubt that the Democratic vote in Wisconsin is also increasingly concentrated in fewer counties" (paragraph 71). He neither explains the relevance of the *county* vote to the issue of geographic distribution and legislative redistricting, nor why the county vote pattern in 1988 or 1996 is germane to the environment in 2012.

1. The PVI (partisan vote index) is the wrong quantity of interest

As applied to Wisconsin, Trende attempts to demonstrate that over the last 20 years Democrats have become more concentrated. His method relies on a quantity he calls the Partisan Lean Index, which is the party's county or ward vote share minus the party's statewide vote share, and appears to be analogous to the Cook PVI, which is the same quantity calculated using the congressional district vote and the national presidential vote. Trende argues that Democratic wards are closer together than Republican wards, which to him is evidence of geographic clustering that produces a natural pro-Republican redistricting bias.

The PVI (which is how Trende abbreviates the measure) is a quantity that is not commonly used in the academic literature, and when it is, it is used largely as a simple descriptive statistic. What this index does is simply redistribute the ward vote around the statewide average, and thus tells us which areas are more Democratic (or Republican) than the state as a whole, and which areas are less so.[2] It tells us little about overall partisan strength, and

[2] The Cook Political Report notes that it "introduced the Partisan Vote Index (PVI) as a means of providing a more accurate picture of the competitiveness of each of the 435 congressional districts." http://cookpolitical.com/story/5604

is useful only in comparing elections at one level (here, counties or wards) to elections at another (the state).

The PVI is used almost exclusively by political commentators to describe congressional districts (the most widely known is the Cook PVI, which compares the average congressional district vote split over two consecutive elections to the average national presidential vote over those same elections). It is used less frequently in academic research, and then largely as a basic descriptive statistic used to classify districts as competitive or not. It is not used in the context of state legislative redistricting (Trende did not cite any studies that support the use of his measure, and could not identify any in his deposition).

Moreover, Trende appears to have made two errors in his calculation of the PVI.[3] First, while he states that his PVI is based on the top-of-the-ticket race in each year, he uses the gubernatorial elections as his top-of-the-ticket race in 2002, 2010, and 2014, but the U.S. Senate race in 2006, even though there was a gubernatorial race that year. While scholars may differ on whether a gubernatorial or U.S. Senate election is the correct top-ticket race, there is no justification whatsoever for being inconsistent.[4]

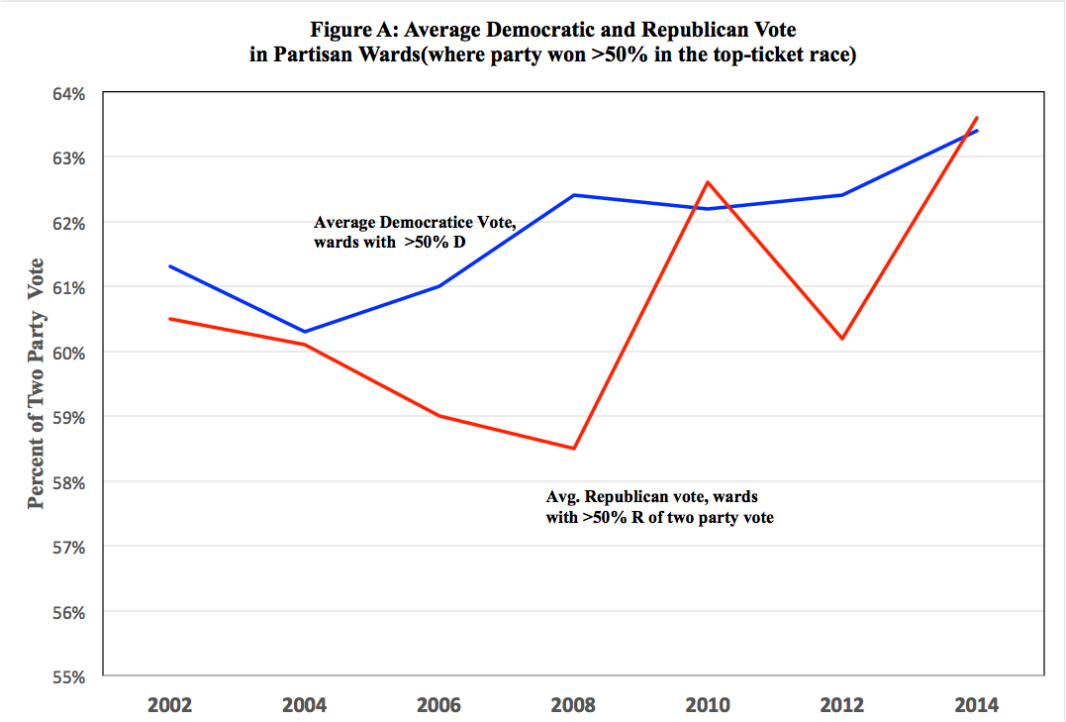
Second, in calculating his 2014 PVI, Trende mistakenly subtracted the *2014* statewide percentages from the *2012* ward totals (this is the code he used to generate the PVI for 2014; the error is highlighted, and "map_2012$r_share" is the ward vote for 2012):

```
map_2014=readOGR("Wards_Final_Geo_111312_2014_ED.shp",
"Wards_Final_Geo_111312_2014_ED")
map_2014=spTransform(map_2014, CRS("+proj=longlat +datum=WGS84"))
map_2014$r_share=map_2014$GOVREP14/(map_2014$GOVREP14 + map_2014$GOVDEM14)
map_2014$pvi=map_2012$r_share -
sum(map_2014$GOVREP14)/(sum(map_2014$GOVREP14) + sum(map_2014$GOVDEM14))
map_2014$pvi[which(is.nan(map_2014$pvi))]=0
```

Instead of the PVI, the actual ward level vote (or party vote share) is a much more direct measure of ward partisanship. I used LTSB ward level data from 2002 to 2014 to calculate the average Democratic percentage of the vote in a Democratic ward (all wards that were more than 50% Democratic in the top-ticket race), and the average Republican vote in wards where Republicans won more than 50% of the top-ticket vote. A graph of this data shows a very different pattern from what Trende claims (Republicans are in red; Democrats in blue):

[3] These occurred in the R file "Wisconsin_clustering_computation.R" that Trende disclosed.

[4] This inconsistency could well affect Trende's results, as the vote percentages were vastly different in the two races in Wisconsin. Democrats garnered 53.8% of the two-party vote in the gubernatorial election, but 60.5% in the Senate race (GAB data).



Here, we see that Democrats and Republicans have moved in almost identical fashion between 2002 and 2014. In 2002, Democrat wards were about 60.8% Democratic, and Republican wards were about 60.5% Republican in the top-ticket races. In 2014, similarly, both Democratic and Republican wards became more partisan: Democratic wards were 63.3% Democratic, and Republican wards 63.6% Republican.

Trende's claim that Democratic wards have become more Democratic, while Republican wards have not become more Republican (paragraphs 91-95), is simply false.

Trende offers no justification or support for why he is relying on the PVI measure rather than more direct indicators of ward partisanship; he merely asserts that it is a relevant quantity. Given that there are far more widely used and relevant measures of district level partisanship, his reliance on it in this context is unsupportable.

2. Trende's "Nearest Neighbor" Method is Inappropriate and Inaccurate

After introducing the PVI, Trende attempts to use it to demonstrate that Democrats have become more closely packed than Republicans (which, he asserts, produces a natural pro-Republican gerrymander). Apart from the irrelevance of the PVI, Trende's analysis uses a fundamentally flawed measure that is guaranteed to exaggerate the extent of Democratic concentrations. Instead of his measure, widely used and academically accepted metrics of concentration and isolation show that Democrats and Republicans are *both* highly segregated, and to about the same extent. Just as there are core areas of high Democratic strength in Milwaukee and Madison, there are similar Republican core areas in the "collar counties" of Waukesha, Ozaukee, and Washington.

The premise of Trende's argument is that pro-Democratic wards are closer to other pro-Democratic wards than are pro-Republican wards to other pro-Republican wards. His method, which I infer from his description, is to identify a pro-Democratic or pro-Republican ward of a certain percentage lean, and then to find the distance to the nearest ward with the *same* partisan lean. He determines the *median* distance between similar wards, and presents two graphs (about paragraph 98 in his report) showing that the median distance between similar Democratic wards is smaller than for Republican wards, and that as Democratic wards become more Democratic, they become closer to one another.

This is reminiscent of the nearest neighbor method used in the study of populations, but it bears little resemblance to how the concept is actually used in the literature, even in its earliest form (Clark and Evans (1954) used it to study the distribution of plant and animal populations).[5] His application of this method is highly unorthodox, unsuited to the study of redistricting, and not based on any accepted peer-reviewed academic work (he does not cite a single study in support of his method).

Trende's method is to start with a ward (call it *i*), calculate its PVI and assign it to a quantile, and then locate the closest ward that shares this PVI quantile (call it *j*). The geographic distance between wards *i and j* (presumably calculated using the ward centroids, although Trende fails to specify this key detail) is then recorded (paragraph 97). The process is repeated for every ward over every election from 2002 to 2014, producing for each election a matrix consisting of every ward and the distance to the nearest ward with the same PVI quantile. He then calculates median distances between wards of the same PVI quantiles, which he claims shows that Democratic wards are, and have been continuing to move, closer together than Republican wards.

There are several problems with this approach. First, and most fundamentally, the proximity of similar wards is simply not a measure of geographic concentration or clustering. Trende's method tells us nothing about which wards are actually *adjacent* to wards of a certain PVI. It only tells us how far these wards tend to be from other wards of the same partisan lean. It is entirely possible for wards of the same partisan makeup to be far apart but still easy to join in the same district (think of a sparsely populated but uniformly partisan area). Likewise, it is entirely possible that wards of the same partisan makeup are close together but quite difficult to combine in the same district (think of a densely populated but politically heterogeneous area). Trende's method cannot distinguish between these scenarios, and as a result it cannot tell us anything about the geographic patterns that actually matter for redistricting.

Second, Trende does not explicitly define in his report what a "similar partisan index" (paragraph 97) means. Clearly, Trende is classifying them in some way, defining "similar" as within some range, as his vague discussion of quantiles indicates (paragraph 98). But without specifying the range, it is impossible to know whether his measure has any meaning. Different

[5] Byers and Raferty (1998) use a near neighbor method to estimate the statistical relationship between points in space and how they differ from random distributions, or "clutter," in the context of distinguishing landmines from other objects during aerial reconnaissance. Neither their work nor Clark and Evans (1954) supports Trende's use of the method.

classification methods -- requiring a match of, say, within 0.1 percentage points, or classifying according to deciles or some other method -- are likely to yield very different results than requiring a match of within 0.5 or 1.0 percentage points or using a larger number of categories. His graphs suggest he is using some type of percentile distribution (the x axis label refers to "(.05% is the most Democratic [or Republican] Ward)," but he does not explicitly define why he chose this particular scheme or how he calculated the quantiles. On this point alone, his method lacks validity or replicability.

But there are two additional serious – fatal, in fact – flaws in this method. First, in treating the geographic distances between wards as his quantity of interest, Trende does not take into account the fact that wards in Wisconsin are not uniform in area. Ward areas actually vary widely: some are very small, others are moderate in size, and still others are very large (wards are drawn within specified population limits, but their geographic areas are not similarly constrained).

Table A shows the mean and median areas (in square miles) of Wisconsin wards. The average is 8.41 mi^2, but the range is huge: the smallest ward with a nontrivial population is in the City of Middleton: ward 19, with 690 people in an area of 0.0071 mi^2. The largest ward in the state is in the Town of Winter: ward 2 (in Sawyer County), with 565 people in an area of 227.7 mi^2.

Geographic distances between ward centroids will, obviously, depend on how large the wards are. Although centroid-to-centroid distances will not map perfectly onto area differences (because the distances will vary with the shape and orientation of wards), two large wards – even if they are adjacent – will show up as much farther apart than two smaller wards that might be separated by numerous other wards and municipal boundaries.

The problem is magnified when we observe that ward sizes are correlated with other relevant variables, particularly whether a ward is in a city, and most crucially, whether it is a Democratic or Republican ward:

Table A 2012 Ward Sizes (square miles)[6]	Mean	Median
Statewide Average	8.41	1.12
City of Milwaukee	0.29	0.20
Rest of State	8.83	1.27
Democratic Wards	5.91	0.56
Republican Wards	10.96	3.45

Wards in the city of Milwaukee have a mean area of only 0.29 mi^2, which is 3% of the size of the mean area statewide. Democratic wards (measured by whether the 2012 Democratic presidential vote was above 50%) are, on average, only about half the size of Republican wards (5.91 mi^2 vs. 10.96 mi^2).

In relying on the distance between wards, Trende is thus putting his thumb on the scale; all other things equal, this method will *always* show Democratic wards to be much closer than Republican wards, irrespective of whether this concentration is real or merely an artifact of ward area. To put it most simply, smaller Democratic wards will *always* appear closer than larger Republican wards.

But a second and equally serious problem lurks. Trende does not use the *mean* distance between wards as his quantity of interest, but rather the *median*. He justifies this choice "because outlying wards, such as Menominee County, exert an undue amount of leverage on averages" (paragraph 97).

This is the wrong measure, because the "nearest neighbor" approach is unlikely to pair, say, a ward in Milwaukee with a ward in northwest Wisconsin. Menominee County will not exercise "an undue amount of leverage" because it is an outlying ward. It will exercise an undue amount of leverage because it *has a very large area* (222.8 mi^2), which is something Trende should, but does not, correct for.

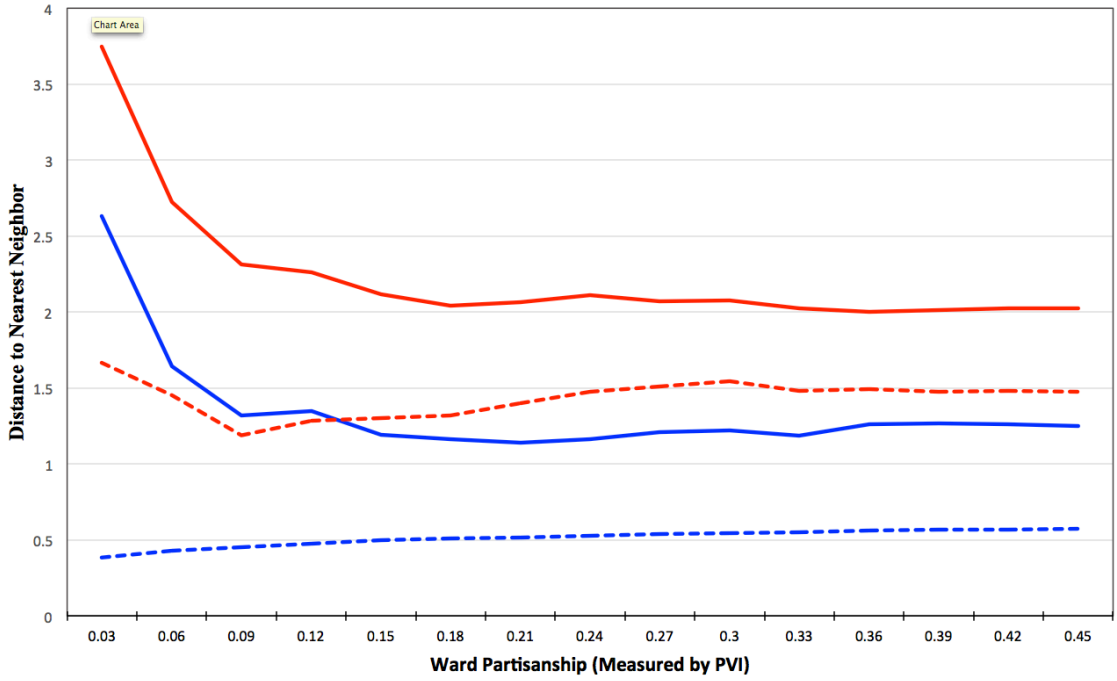
His use of the median rather than the mean further exaggerates the difference between Republican ward distances and Democratic ward distances. The average Republican ward area is 1.9 times larger than the average Democratic ward area (10.96 vs. 5.91 mi^2). But the *median* Republican ward is *6.2* times larger than the median Democratic ward (3.45 mi^2 vs. 0.56 mi^2).

[6] Calculated directly from the LTSB shape files of 2012 wards, obtained from http://legis.wisconsin.gov/gis/data.

Because the disparity is three times larger for the median versus the mean area, Trende is further stacking the deck in favor of his preferred hypothesis.

I was able to replicate Trende's analysis, using LTSB data and the R code he disclosed. When the mean distances between similar wards are included, Figure B is the result for the 2012 Election:[7]

Figure B
Nearest Neighbor Analysis: Mean vs. Median Distance



In this graph, the dotted lines are the median nearest neighbor distances for Democratic (blue) and Republican (red) wards, replicating what Trende did in his median distance graphs around paragraph 98 in his report. Wards become more partisan as we move from right to left.

The *mean* distances are shown with solid lines. While Republican wards remain farther apart than Democratic wards, the mean distances for both parties are much larger than the median distances. Proportionally, Republican and Democratic wards are much closer together in mean than in median distances (which is what one would expect, given the exaggerated difference between median Democratic and Republican ward sizes). Specifically, the mean distance between Republican wards is only about 70% larger than the mean distance between Democratic wards, compared to a 180% difference between the median Republican and Democratic distance.

[7] The pattern Trende identifies is largely constant across all elections; adding the additional cycles will not change the results.

More relevant is the shape of the mean distance lines. They show that Republican and Democratic distances move precisely in parallel, and that strongly Democratic wards are significantly *farther apart* than weaker Democratic wards (as are strongly Republican wards). This is the complete opposite of Trende's claim that stronger Democratic wards are closer together than weaker Democratic wards, and it obliterates the core of Trende's report: the assertion that the pro-Republican bias evident in Act 43 is the natural result of Democrats being more geographically concentrated.

To conclude, Trende's argument about Democratic concentration is based on an irrelevant measure of partisanship (PVI) that is incorrectly calculated, applies a methodology that bears no relationship to any scholarship or actual research on spatial distribution, ignores a key feature of Wisconsin's actual political geography (ward area), relies on an improper distance measure that is enormously biased in favor of his hypothesis, and produces a result that fundamentally misrepresents what the data actually shows. Because of his use of a questionable method and fundamentally flawed measures, Trende's opinions should be regarded as uninformative.

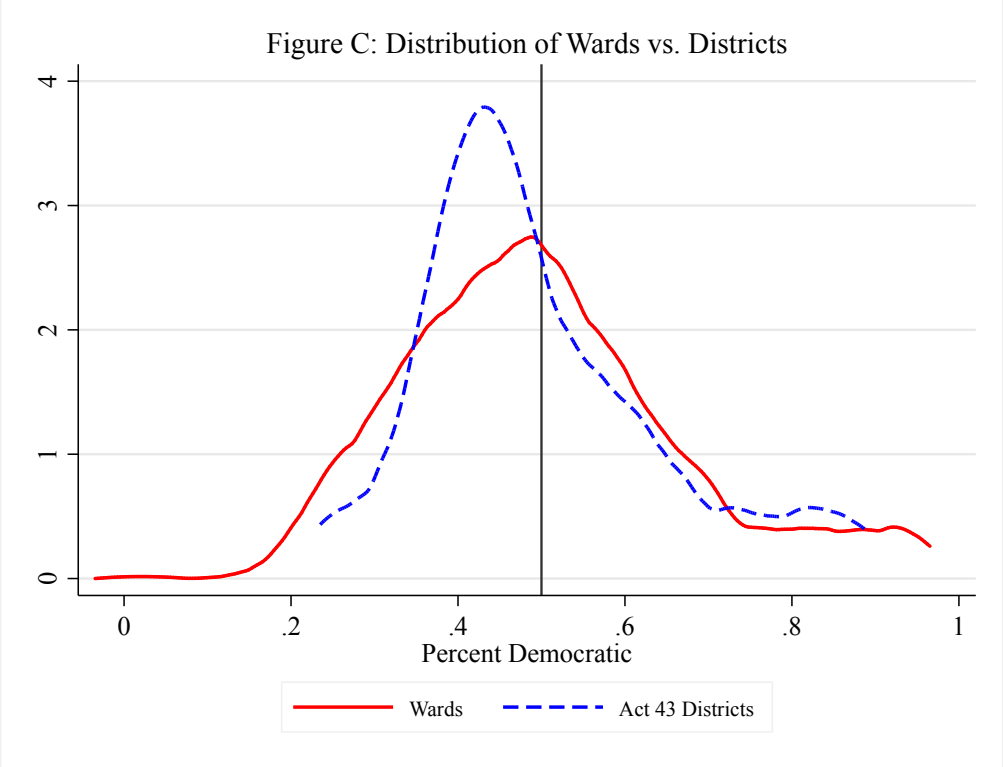
B. Goedert

Goedert, like Trende, asserts that Wisconsin's natural geography creates an intrinsic pro-Republican bias in redistricting (p. 17). He cites his own research that geography produced a pro-Republican bias in the 2012 congressional election (p. 19).

The only analysis Goedert conducts as to Wisconsin is an examination of wards, which he claims shows "the bias inherent in Wisconsin's geography" (p. 21). His analysis is a simple "uniform swing" study of wards in 2012, adjusting the Democratic presidential vote in each ward downward by 3.5% to determine the overall ward distribution in the event of a tied election (Figure 1, p. 22). He asserts that based on this analysis, "Republicans would win 60.2% of wards, comprising 54.4% of the voting population" in a tied election (p. 22). This is the extent of his analysis.

This analysis, however, is a non sequitur, because it fails to aggregate wards to the relevant geographic level, which is *districts*. Goedert's failure to take this into account is an example of the Modified Areal Unit Problem, in which inferences at one level of geography frequently do not hold at other levels of aggregation; see King (1996). In this example, the ward level vote is far less relevant than the district level vote, because it is entirely possible that wards will be aggregated in such a way that the pattern he observes either disappears (or even reverses).

When we examine the distribution of *districts*, which have a population deviation small enough that we can consider them equal (the deviation under Act 43 is 0.76%), we in fact see almost the reverse pattern. The following graph (Figure C) displays Goedert's adjusted ward level presidential vote in a simulated 50-50 election, along with an adjusted baseline forecast for Act 43 districts, using my baseline open seat model, in a simulated tied election. Both wards and districts are weighted based on the number of votes cast in each unit. This allows me to directly compare ward level results to district level results:



What this figure demonstrates is that as wards are aggregated into districts, the distribution substantially changes. The red line is a kernel density plot of the ward Democratic vote percentage in a simulated tied election; it is a continuous version of the histogram Goedert presents in his Figure 1. The dotted blue line shows the predicted Democratic vote in Act 43 districts in a simulated tied election – or, what occurs after the wards are aggregated into Assembly districts. The overall shape of the curves, the mode of each distribution, and even the mean vote percentage vary as we aggregate from wards up to districts. Knowing the ward distribution ultimately does not tell us much about what the distribution of districts will look like; the process of aggregation is crucial.

More significantly, the district distribution is much more tilted in a Republican direction than is the ward distribution. The ward distribution is nearly normal in shape, and has a peak very close to 50% Democratic. In contrast, the *district* distribution is skewed to the right, and has a much higher peak around 42% Democratic, meaning that there are many more districts that Republicans win by relatively small margins (indicating that Democrats are cracked), and many more districts where Democrats win by much larger margins (indicating packing). Accordingly, the district distribution does *not* mirror the underlying distribution of wards. Rather, it reveals that Act 43's designers were able to distort a fairly neutral ward distribution into a far more advantageous district distribution, through gerrymandering.

1. Goedert's Published Work Contradicts His Report

Goedert's own prior work indicates that unified party control of state government has an independent and significant effect on the bias of redistricting plans, even after controlling for

population concentration. This work also indicates that if Wisconsin, or a state resembling the country as a whole, had a court-drawn or bipartisan map in 2012, this map would have had a slight *pro-Democratic* bias. These findings further obliterate the claim that Act 43's extreme partisan tilt resulted from Wisconsin's natural political geography.

In a 2014 article, Goedert analyzes the consequences of different redistricting processes, looking for evidence that partisanship and geography each have an independent effect on the partisan bias of redistricting plans.[8] Using an unorthodox definition of gerrymandering – Goedert defines *any* redistricting plan created in a state with unified party control of state government as a partisan gerrymander – he finds that in states with more than six congressional districts, both urbanization (a proxy for Democratic concentration) and unified party control have a strong and statistically significant effect on the bias of a district plan (2014, 6). Goedert interprets his results as indicating that geography matters, and that higher urban concentration leads to more bias against Democrats (2014, 6). But what his results also show is that *even after taking urbanization into account*, the partisanship of the map drawers introduces a separate and significant bias: Republican-drawn maps are associated with an additional *13.6%* pro-Republican bias.

Geodert updated his 2014 article in a more recent manuscript, which incorporated the results of the 2014 midterm elections. Here, he finds that urbanization *no longer has a statistically significant effect* on the bias of district plans (2015, 6). Yet he stills finds evidence that the partisanship of map-drawers has a significant effect on district plans' bias (in 2014, a Republican-drawn plan adds 12.4% bias, or roughly the same as the 13.6% estimate for 2012).

So, on the one hand, Goedert's own work comes to different conclusions about the impact of urbanization (or Democratic concentration): sometimes it matters, other times it does not. But his work is consistent about the effect of partisan control: when partisans draw maps, they *always* do so in ways that dramatically bias plans in their favor. The clear inference is that geography matters much *less* than partisan control in explaining plans' electoral consequences.

Furthermore, we can use Goedert's regression model to generate a forecast of what would have occurred in 2012 in Wisconsin – as well as in a state resembling the country as a whole – under a neutral process (i.e., a court-drawn or bipartisan plan). His regression model includes the following variables (2015, 11):

1. Whether a district plan was drawn by Democrats or Republicans (court-drawn and bipartisan plans are the excluded category)
2. A state's African American population percentage
3. A state's Hispanic population percentage

[8] Goedert's definition of bias is essentially identical to the efficiency gap. He "compare[s] the mean vote share with the expected seat share under a 'fair' map with zero bias and a historically average seats-votes curve" (2014, 3). In the "historically average seats-votes curve," "a 1% increase in vote share will produce about a 2% increase in seat share," which is the same seat-vote relationship implied by a zero efficiency gap (2014, 3). Goedert's bias estimates are thus largely indistinguishable from the efficiency gap calculations of Stephanopoulos and McGhee (2015).

4. The percentage of a state that is urbanized (according to the Census)
5. The statewide Democratic vote
6. The number of congressional seats.

With the coefficients of this model, and the appropriate data for Wisconsin (or any other state), we can calculate what the expected bias would be for a plan in 2012.[9] The dependent variable here is a measure of bias almost identical to the efficiency gap, with positive values indicating a pro-Democratic bias, and negative values a pro-Republican bias. Because this is a linear regression, we can multiply each coefficient by the value of the independent variable, and then sum the results to generate a forecast from any set of data values. In Table B, I set both Democratic and Republic Gerrymanders to 0, simulating a neutrally-drawn plan:

[9] Goedert generated two models, one for states with fewer than 6 congressional districts, and another for states with more than six. As Wisconsin has 8 districts, I use the latter.

Table B **Goedert's Regression Model for 2012** **Dependent Variable:** **Pro-Democratic Bias in a District Plan**			
Variable Name	**(a)** **Coefficient Value**	**(b)** **Variable value for Wisconsin**	**Value** **(a) x (b)**
Democratic Gerrymander	16.6	0	0
Republican Gerrymander	-13.6	0	0
% Black	-0..29	6.6	-1.914
% Hispanic	0.77	6.5	5.005
% Urbanized	-0.72	70.2	-50.544
Statewide Democratic Congressional Vote	0.11	50.8 (2012)	5.588
Number of Seats	-0.16	8	-1.28
Constant	45.0	1	45
Total	**(sum of all values)**		**1.855**

Goedert's regression model thus predicts that if Wisconsin had a neutrally drawn plan in 2012, the resulting map would have had a *pro-Democratic* bias of 1.855%. In other words, in the absence of unified Republican control over the redistricting process, Wisconsin's demographic, geographic, and political characteristics would have resulted in a small natural *Democratic* advantage. And this is no fluke of the state or the election year. We can also use Goedert's model to predict what would happen in a state resembling the United States as a whole (i.e., a state that is 13.2% black, 17.4% Hispanic, 80.7% urbanized, 51% Democratic, and with

8.7 congressional seats[10]). Substituting these values into the regression model shows that in an "average" state, a neutrally-drawn map would have had a *pro-Democratic bias* of 0.684% in 2012.

Goedert's 2014 variant of the model (2015, 13) further predicts that Wisconsin would have had a *pro-Democratic bias* of 4.392% in 2014, and that the average state would have had a *pro-Democratic bias* of 1.589%. At this point, it is hard to see what is left of the thesis that political geography inherently favors Republicans. If anything, Goedert's own published analysis shows that Wisconsin's political geography slightly favors *Democrats*.

C. Accepted Measures of Geographic Concentration and Isolation Show that Democrats and Republicans are Equally Dispersed

In arguing that Republicans in Wisconsin enjoy a natural geographic advantage, both Trende and Geodert use ad hoc, unorthodox measures of concentration that are neither relevant nor accepted by the academic literature. In fact, there exist widely accepted metrics of geographic concentration and dispersion, used by geographers and demographers to study spatial patterns. Two of the most common are Global Moran's I (Anseln 1995; Cho 2003), and the Isolation Index (Glaeser and Vigdor 2012; Reardon 2004). I use these metrics to determine how Democrats and Republicans in Wisconsin are actually distributed.

Moran's I is a measure of spatial autocorrelation, or how values of a variable in space correlate with values in nearby space. It can be calculated for an entire geographic system (Global Moran's I), or for any specific point in space (Local Moran's I). The Isolation Index indicates, for the average member of a group residing in a certain geographic unit (such as a ward), what share of the member's neighbors in the unit belong to the same group (Iceland and Weinberg 2002, 120). It measures how geographically isolated a group is (Reardon 2004, 153), and it can easily be adjusted, by deducting a group's share of the statewide population, to show how much *more* isolated a group is than we would expect given its statewide size (Glaeser and Vigdor 2012, 2). Both Moran's I and the Isolation Index are widely used in studies of residential segregation and sorting (Chung and Brown 2007; Massey and Denton 1989; Glaeser and Vigdor 2012; Dawkins 2007; Reardon 2004; Iceland and Weinberg 2002), epidemiology (Moore and Carpenter 1999), network effects (Cho 2003), and political geography (Glaeser and Ward 2005). The measures are also used by the U.S. Census Bureau itself (Iceland and Weinberg 2002).

Both Moran's I and the Isolation Index are directly applicable to the issue of measuring the geographic distribution of Democrats and Republicans in Wisconsin. In this context, Global Moran's I tells us how likely Democrats are to live clustered next to other Democrats (and Republicans to Republicans), and the Isolation Index, adjusted as noted above, tells us to what extent the average Democrat (or Republican) lives in a ward that is more heavily Democratic (or Republican) than the state as a whole. I use these indices to directly assess the geographic distribution of Democrats, and, more importantly, to compare it to the geographic distribution of Republicans.

[10] Calculated as 435/50.

Global Moran's I is analogous to a correlation coefficient, and ranges from -1 to 1; scores close to 1 indicate a very high spatial correlation (i.e., clustering) of Democrats (or Republicans). The Isolation Index ranges from 0 to 1, and, adjusted as noted above, indicates to what extent the average Democrat or Republican lives in a ward that is more heavily Democratic or Republican than Wisconsin as a whole. In calculating both measures, I use the ward as the basic unit of geography and actual Assembly votes.[11] Because I only have geodata for the current wards, I only estimate Global Moran's I for 2012 and 2014. For the Isolation Index, I compute scores dating back to 2004. Both Global Moran's I and the Isolation Index are asymmetrical, and so must be calculated separately for Democrats and Republicans.

Table C shows the values of the Isolation Index, adjusted as noted above, for Democrats and Republicans in Wisconsin from 2004 to 2014:

	Table C Isolation Index	
	Dem-Rep	**Rep-Dem**
2014	0.23	0.20
2012	0.14	0.12
2010	0.15	0.17
2008	0.15	0.14
2006	0.16	0.17
2004	0.20	0.21

As is evident from Table C, Democrats were slightly less isolated than Republicans in 2004, 2006, and 2010, and slightly more so in 2008, 2012, and 2014. In all cases, the differences in isolation were very small, amounting to only one to three percentage points (out of a scale extending from 0% to 100%). In the 2012 election, for instance, the average Democrat lived in a ward whose Democratic vote share was 14% more Democratic than the state as a whole; analogously, the average Republican lived in a ward whose Republican vote share was 12% more Republican than the entire state. In the previous election, it was Republican voters who were more isolated than Democratic voters (17% versus 15%). This analysis in no way supports the claim that Republicans are more advantageously distributed than Democrats; on the contrary, both parties' supporters are almost identical in their geographic isolation over the last decade, and there is no clear temporal pattern. In some years, Democrats are marginally more isolated than Republicans, and in other years Republicans are marginally more isolated than Democrats.

[11] I calculated Global Moran's I using the method in Bivand and Piras (2015) and the R module spdep available at https://cran.r-project.org/web/packages/spdep/index.html. I calculated the isolation index using a Stata module (seg), available at http://econpapers.repec.org/software/bocbocode/s375001.htm.

The results are very similar with the Global Moran's I, again calculated for Democrats and Republicans in Wisconsin, although only for the two elections (2012 and 2014) for which the geodata is readily available:

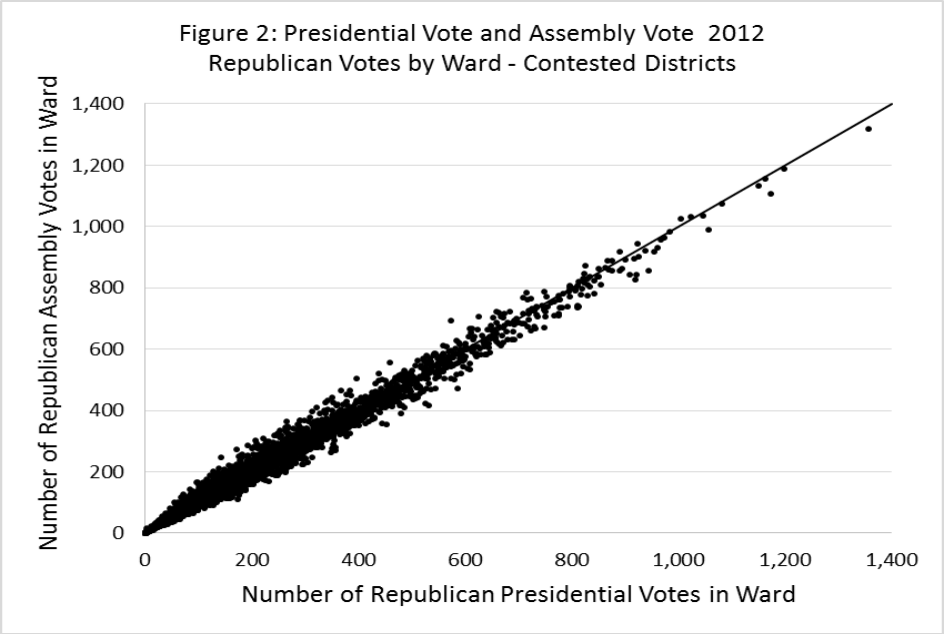
	Table D Global Moran's I	
	Democrats	**Republicans**
2014	0.75	0.68
2012	0.68	0.69

Here, we see that Democrats were slightly less spatially concentrated than Republicans in 2012, but slightly more spatially concentrated in 2014. The differences in both cases are tiny: 0.01 in 2012 and 0.07 in 2014, on a scale that stretches from -1 to 1. The message is quite clear: *both* Democrats and Republicans in Wisconsin tend to live near one another in distinct clusters, but there is no evidence that Democrats are *more* geographically clustered than Republicans.

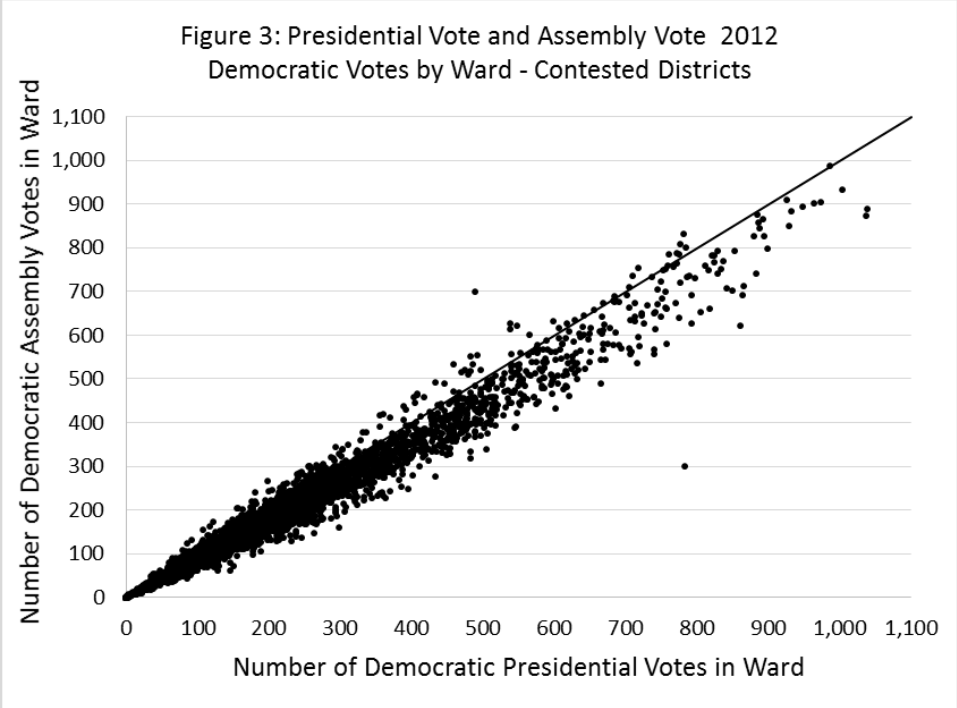
Accordingly, two widely used and accepted measures of geographic distribution show no consistent pattern, and no material difference in how Wisconsin's Democrats and Republicans are dispersed spatially. In no sense, therefore, is it an accurate statement that Democrats are much more concentrated than Republicans – the unsubstantiated claim that comprised the core of both Trende's and Geodert's arguments about natural gerrymanders.

III. Trende's Claim That My Vote Model Is Biased Is Incorrect

Trende claims that there may be "a systematic bias involved in imputing presidential results to state House results" (paragraph 135). As evidence he points to Figures 2 and 3 in my original report, which display the relationship between the ward level presidential vote and the ward level Assembly vote. Trende notes that Figure 2 shows that there is close to a 1:1 relationship between Republican presidential and Assembly votes, as the dots on the graph are distributed around the 45-degree line:



However, Trende claims that the relationship is different for Democratic votes (Figure 3 in my original report):

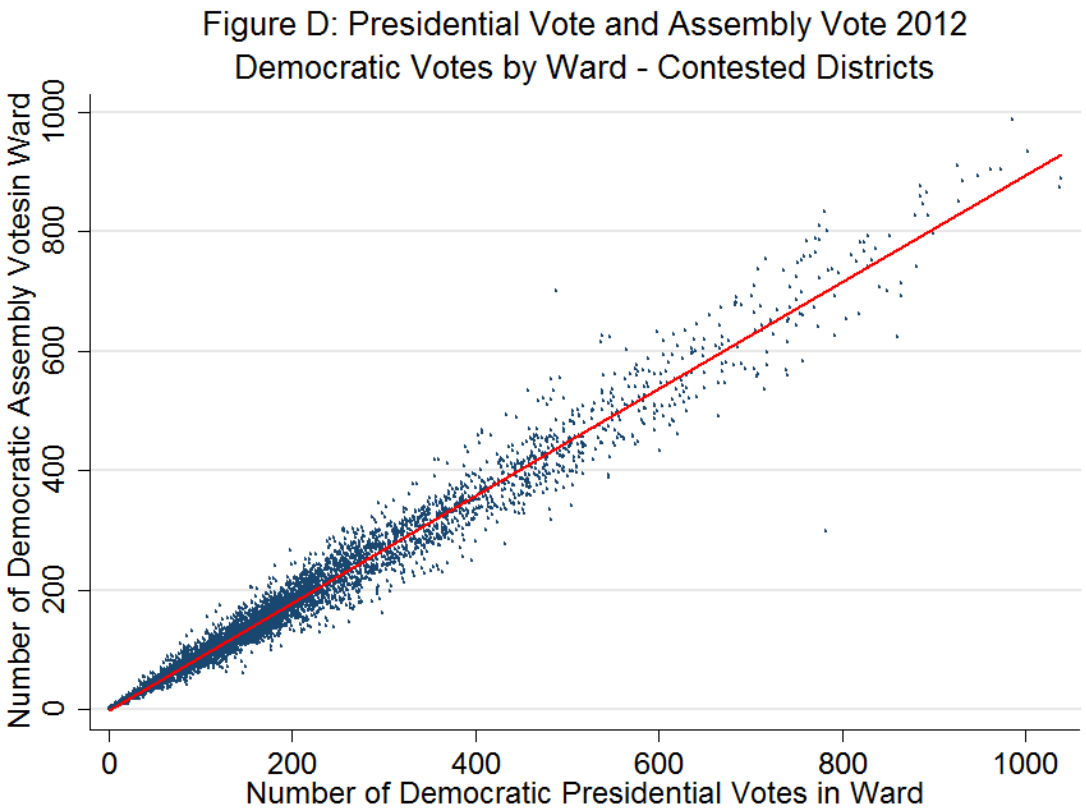


Here, Trende argues, the "dots systematically fall below the line, often creating differences on the order of 10 percent" (paragraph 138). This pattern, he asserts, will "skew the imputation" of votes, resulting in "too many votes [being] imputed in wards reporting a high number of Democratic votes" (paragraph 139).

Trende is completely and unambiguously wrong in this claim, which belies a fundamental lack of understanding of multiple regression and the causes of bias in statistical models. Trende appears to believe that I simply assumed that ward level Democratic Assembly votes are actually *equal* to ward level Democratic presidential votes, or that in estimating the Assembly vote in uncontested wards I merely used the value of the presidential vote (presumably because that is how he imputes the vote in uncontested districts in his own analysis; deposition page 83).

That is wrong. I displayed this graph merely to show that there is in fact a strong relationship between the two variables. The fact that the Democratic Assembly vote tends to fall below the presidential vote is completely irrelevant to any possible bias. In fact, regression analysis estimates the relationship between the two quantities by identifying the *slope* of the line that relates them, not how the relationship varies across a 45-degree line.

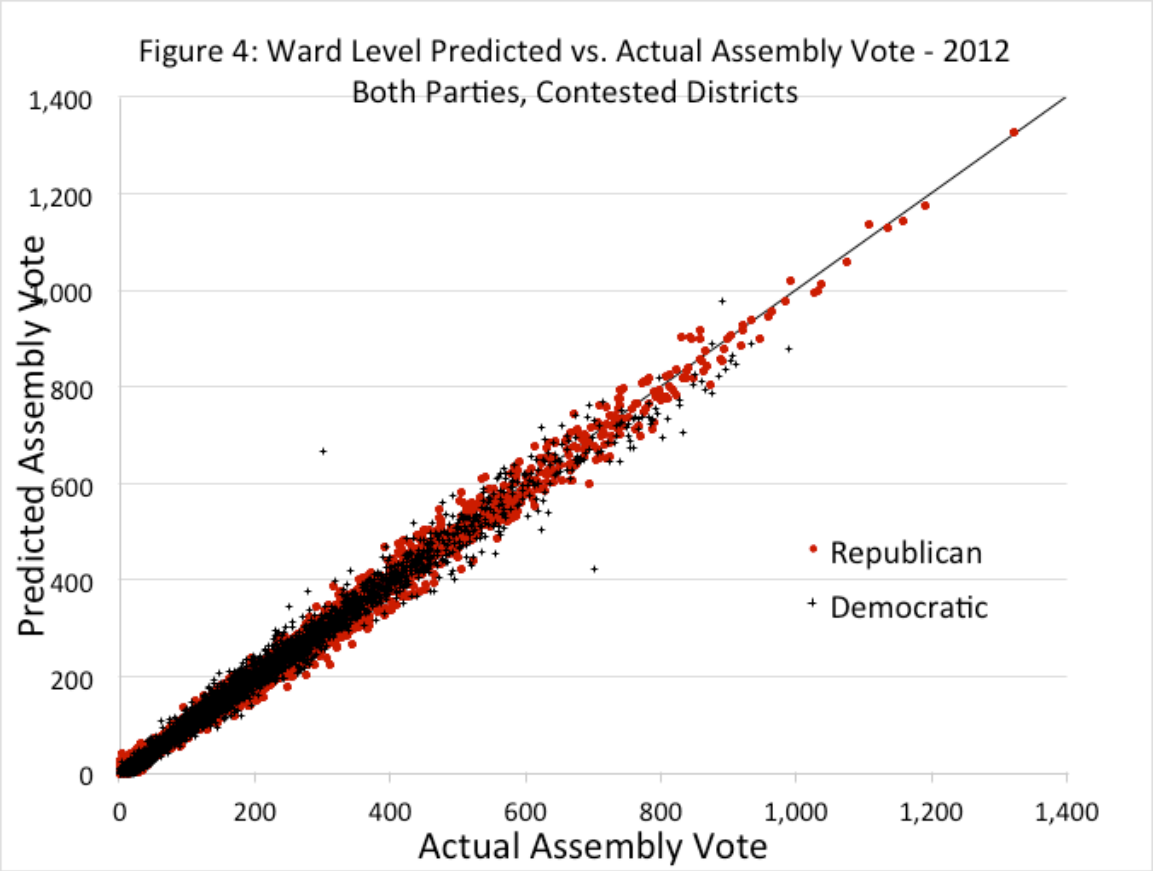
Below (Figure D) is a graph that plots the data in Figure 3 of my original report along with a fitted line of predicted values from a bivariate regression of the Democratic Assembly vote on the Democratic presidential vote. The red line consists of the predicted values of the Democratic Assembly vote in each ward:



Here, we see that the fitted line runs *exactly* down the middle of the plotted points. My regression analysis of the Democratic Assembly vote (Table 1 in my original report) shows that the coefficient for the Democratic presidential vote is 0.931 ($p<0.0001$), which is precisely the pattern than we see in the bivariate relationship above. In a linear model, this coefficient is the

slope of the line that relates the presidential vote to the assembly vote. It is less than 1 (a 45-degree line), indicating that the Assembly vote rises more slowly than the presidential vote; i.e., the predicted Assembly vote will lie below the 45-degree line in Figure 2.

And, as is immediately apparent from the actual results of my regression (Figure 4 in my original report, which plots the actual vs. predicted ward level votes), there is no bias in the results. In this graph, the 45-degree line is where the *predicted* Assembly vote would fall if it were exactly equal to the actual Assembly vote:



Trende's criticism on this point is utterly misinformed. No one with a solid understanding of quantitative methods or regression analysis would have made it.

IV. Trende's Claim That My Efficiency Gap Calculations Ignore Incumbency, Candidate Quality, and Campaign Spending

In paragraphs 140-143, Trende criticizes my efficiency gap calculations for failing to take into account factors that can affect election results, such as get-out-the vote drives, candidate quality, recruitment, and campaign spending.

Trende offers no evidence that these factors would actually have a material effect on my estimates if I had more directly taken them into account. And he ignores the fact that any

estimation of the results of a hypothetical district plan utilizes baseline estimates that, in effect, average out the effects of these factors (Gelman and King 1990; 1994). That is to say, my regression model *does* implicitly incorporate these factors, in its analysis of the relationship between the presidential vote (where none of these variables will affect the vote) and the Assembly vote (where they are all incorporated into the estimates).

Moreover, Trende's criticism overlooks the point that my model is based on precisely the same information that the authors of Act 43 considered in estimating the likely partisan effects of the new districts. In particular, Gaddie's analysis of the partisan effects in the new Act 43 districts was functionally equivalent to mine and based on exactly the same considerations.

Like his complaints about alleged bias in the regression analysis that I discuss above, Trende's criticism is uninformed and betrays a lack of knowledge of how hypothetical district plans are evaluated.

V. Goedert's Claim That My Efficiency Gap Calculations Incorporate Information Not Available to Act 43's Designers, and Ignore the Effects of Incumbency

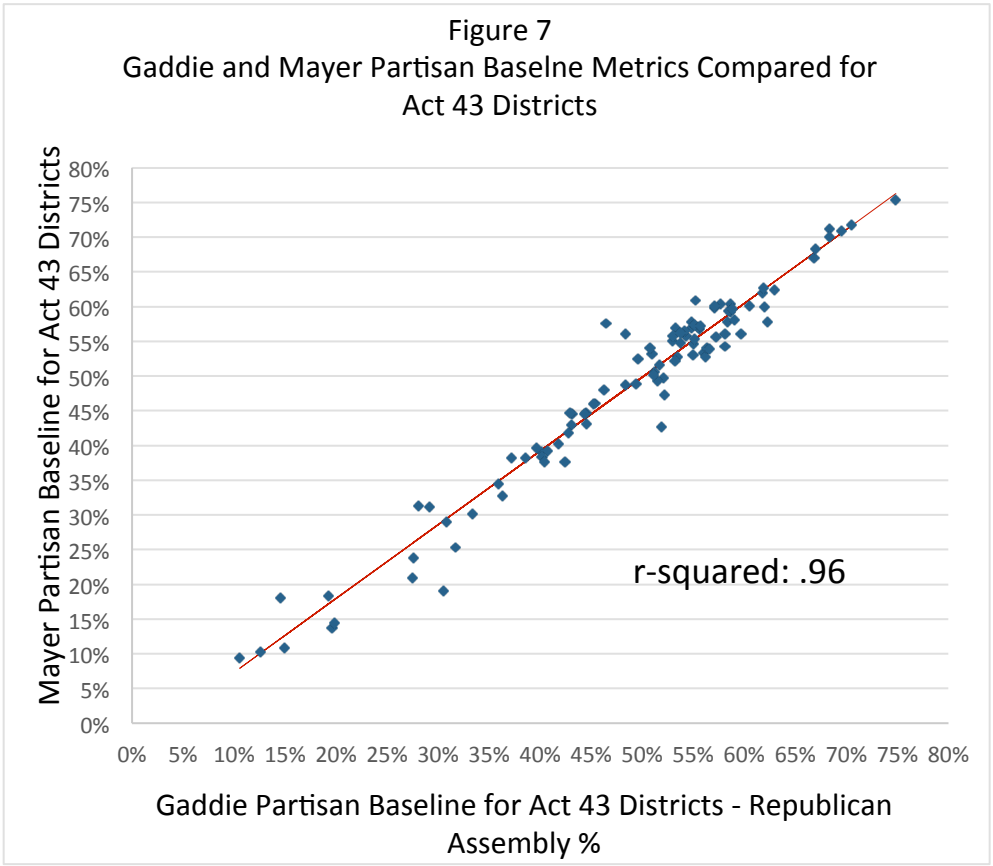
Goedert criticizes my analysis for incorporating information that map drawers did not have (2012 election results), and for ignoring information that map drawers would have taken into account (incumbency in particular).

The first criticism is incorrect, as Act 43's designers in fact had information functionally equivalent to the 2012 election results in their possession, in the form of Gaddie's Act 43 district level estimates. These estimates, like my own, are baseline measures of partisanship, and they correlate almost perfectly with my results (r^2=0.96). In his deposition, Gaddie described in detail his method, which like mine assumed that all seats would be contested and that no incumbents would run (Gaddie Deposition, pp. 197, 198, 201, 202, 204):

> Let's suppose we have a seat with an incumbent and a seat without an incumbent and each one has an Assembly election. The party of the incumbent is presumably going to do a little stronger in the district where they have an incumbent than in an open seat. So I can't really take -- Let's suppose I move precincts from the open seat into that incumbent seat. I can't really take those open seat Assembly votes, add them, compare them to the percentage for the incumbent running for the same party, get an accurate estimation of the partisanship and the competitiveness of the district. So we attempt to create a substitute measure. Statewide elections are held in all precincts, they're held in all constituencies, so one thing that we often do is we do what we call reconstituted elections, or proxy elections, where we'll take one election or a composite of elections, like I described previously, and attempt to create some measure of partisan competitiveness, an expected vote or what we call a normal vote, what the vote would usually do without an incumbent in the district." (Gaddie Deposition, pp. 204-5)

To highlight the similarity between Gaddie's pre-2012 estimates and my own estimates using 2012 election results, below is a graph plotting the two sets of data (Figure 7 in my original report, p. 30):

Figure 7
Gaddie and Mayer Partisan Baselne Metrics Compared for Act 43 Districts



This graph shows that the information the Act 43 authors relied on when drawing their map (the Gaddie estimates) and my estimates, are nearly identical. This is largely because they are both estimates of the same underlying quantity – the baseline partisanship of a hypothetical Assembly district. Goedert dismisses the nearly perfect correlation as "mostly coincidental" (p. 17), but offers no analysis or data to support this conclusion. It is simply an assertion offered without evidence.

And it is an entirely unpersuasive assertion for the additional reason that election results in Wisconsin (and in most states) are extremely highly correlated from one election to the next. For example, Wisconsin's counties remained geographically constant between 2008 and 2012, and Trende supplied information about the presidential vote in each county in each of these years. The 2008 county level presidential vote and the 2012 county level presidential vote are almost perfectly correlated (r^2=0.96), indicating that it would make no difference whether Act 43 was assessed using the former or the latter.[12] Either way, the same conclusion would follow: that

[12] Ward level 2008 and 2012 results cannot easily be compared because ward boundaries were redrawn after the 2010 Census.

the map is an extreme Republican gerrymander, and that the authors of Act 43 had information in their possession that predicted it.

Second, Goedert claims that map drawers do not ignore incumbency when drawing maps. That will generally be true when map drawers are trying to figure out which incumbent should be included in which district. But when it comes to estimating the likely partisanship of the new districts, ignoring incumbency (that is, controlling for it) is precisely what the drawers of Act 43 did, as Gaddie noted in his description of his methods. This approach is sensible since incumbents can be defeated, retire, run for higher office, or switch parties over a plan's decade-long lifespan. A map's authors will typically want to ensure that their projections do not depend on particular incumbents continuing to run in particular districts.

In any event, *including* incumbency in no way changes my substantive conclusions about Act 43 or the Demonstration Plan. I recalculated the efficiency gap for both maps, using my baseline partisan estimate and then incorporating incumbency into the model. For Act 43, I used the actual incumbents who ran in the plan's districts, with the adjustments noted in my report to account for paired incumbents and those who lost in primaries (p. 18, footnote 14).[13] For my plan, I geocoded incumbents' home addresses[14] and then identified which districts had incumbents residing in them using Maptitude for Redistricting. Table E shows the resulting efficiency gap calculations, and compares them to the open seat baseline I generated in my report:

Table E

Efficiency Gap Calculations

with Incumbents

	Demonstration Plan	**Act 43**
Baseline Efficiency Gap	2.20%	11.69%
Efficiency Gap with Incumbency	3.71%	13.04%

The efficiency gap increases marginally for both plans (by 1.5% for the Demonstration Plan and 1.4% for Act 43), in large part because there were more Republican (50) than

[13] I recalculated vote estimates using predicted values of Democratic and Republican Assembly votes when one of the parties had an incumbent running.
[14] This information was provided to me by counsel.

Democratic (24) incumbents running in 2012. With twice as many incumbents, Republicans will win more seats than in the open seat baseline even though the Republican vote percentage remains below 50% in both cases. It is thus apparent that taking incumbency into account has no effect on my conclusion that Act 43 was an egregious partisan gerrymander; the substantive inferences are identical, with or without incumbency.[15]

VI. Goedert's Claim That I Did Not Perform Sensitivity Testing for Act 43's or the Demonstration Plan's Efficiency Gaps

Goedert criticizes the efficiency gap calculations for both Act 43 and the Demonstration Plan, arguing that I "provide no estimates for the efficiency gap of the demonstration plan under the range of plausible election outcomes facing legislators at the time they were drawing the map" (p. 16), and that I conduct no "sensitivity testing" of my calculations of Act 43's efficiency gap.

I note that Goedert has not provided any actual analysis showing that this sensitivity testing would have materially altered my conclusions, or even any citations showing that such testing is necessary to evaluate the adequacy of my calculations.

Still, it is possible to show that my calculations are robust to significant changes in the electoral environment. Using Jackman's historical estimates of the statewide Assembly vote in Wisconsin, I can determine the plausible variation of the overall vote over the course of a decade. Since 1992, the statewide Democratic percentage of the Assembly vote has ranged from a high of 54.6% (in 2006) to a low of 46.4% (in 2010). The Democratic share of the statewide vote in 2012 was 51.2% in my baseline calculations, which suggests a plausible range of -5% to +3% in conducting a sensitivity analysis. In effect, this approach asks whether Act 43's and the Demonstration Plan's efficiency gaps would be durable in the face of massive Democratic *or* Republican waves – an extremely rigorous test that exceeds what is normally found in the literature.

Following Goedert's method of applying a uniform swing (p.21), I can estimate the effects that these swings will have on the efficiency gap, both for Act 43 and for the Demonstration Plan. To maintain consistency and to address his concern that I did not incorporate incumbency in my baseline, I estimate the effects using the incumbent baseline (that is, including the incumbents who ran in 2012).

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[15] We can use these calculations to determine how many more Democratic legislators would have been elected in 2012 if either the Demonstration Plan, or a plan with an efficiency gap of exactly zero, had been in place. Under the open-seat baseline, 9.49% more Democrats would have been elected under the Demonstration Plan (11.69% - 2.20%), and 11.69% more under a plan with an efficiency gap of exactly zero. Similarly, under the incumbent baseline, 9.33% more Democrats would have been elected under the Demonstration Plan (13.04% - 3.71%), and 13.04% more under a plan with an efficiency gap of exactly zero. In all cases, these are very large differences, amounting to anywhere from nine to thirteen Assembly seats.

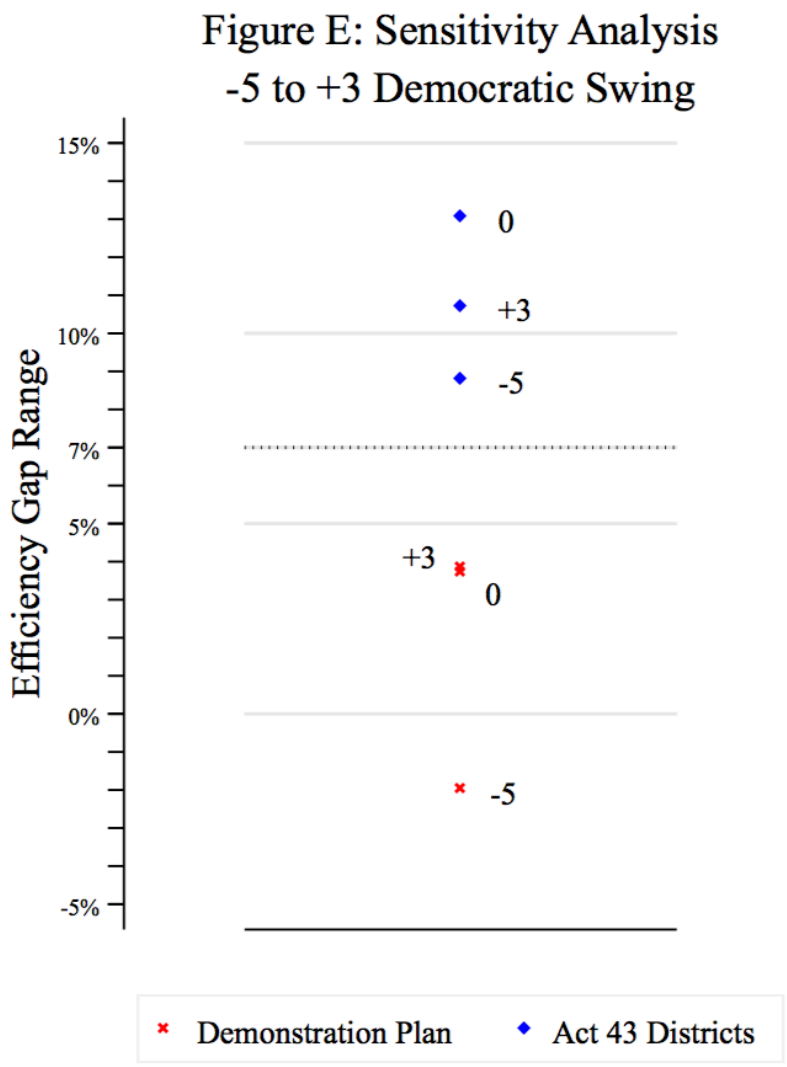
The results are shown in the following two tables, the first for the Demonstration Plan (Table F), and the second for Act 43 (Table G). For the Demonstration Plan, the efficiency gap remains well below the plaintiffs' suggested 7% threshold, even when the statewide vote reaches the most extreme values either party has seen over the last three decades. Specifically, the efficiency gap goes to 3.9% in the event of a Democratic wave akin to that of 2006, and to -2.0% if a Republican wave like that of 2010 occurs. For Act 43, however, the efficiency gap remains extremely large and above the threshold at all times, ranging from 10.7% in a Democratic wave to 8.8% in a Republican wave. Moreover, the sensitivity testing shows that even if the Democrats obtained over *54%* of the statewide Assembly vote – equal to their best performance in a generation – they *still* would not capture a majority of the Assembly, gaining only 48 seats. Act 43's gerrymandering thus effectively insulates the Republican Assembly majority from all plausible shifts in voter sentiment.

Table F
Efficiency Gap Estimates, Uniform Swing
Demonstration Plan

	D Minus 5	**My Plan Incumbent Baseline**	**D Plus 3**
party split (R-D)	51-48	48-51	43-56
Rep share of Seats	52%	48%	43%
Wasted Republican Votes	737,557	659,821	659,390
Wasted Democratic Votes	681,900	765,561	769,546
Gap	(55,657)	105,740	110,156
Total Democratic Votes	1,336,168	1,484,631	1,573,709
Total Republican Votes	1,502,745	1,366,132	1,284,164
Total Votes	2,838,913	2,850,763	2,857,873
Efficiency Gap (gap/total votes)	**-1.96%**	**3.71%**	**3.85%**

	Table G Efficiency Gap Estimates, Uniform Swing Act 43 Districts		
	D Minus 5	**Act 43 Actual**	**D Plus 3**
Party Split (R-D)	64-35	60-39	51-48
Rep share of Seats	65%	61%	52%
Wasted Republican Votes	585,668	504,553	560,840
Wasted Democratic Votes	835,968	876,153	866,725
Gap	250,300	371,600	305,885
Total Democratic Votes	1,316,158	1,462,397	1,550,141
Total Republican Votes	1,527,115	1,388,286	1,304,989
Total Votes	2,843,273	2,850,684	2,855,130
Efficiency Gap (gap/total votes)	**8.80%**	**13.04%**	**10.71%**

Figure E below shows these results graphically: the red x's are the efficiency gap estimates for the Demonstration Plan, and the blue diamonds the estimates for Act 43. The dotted line is at plaintiffs' suggested threshold of 7%. The figure clearly demonstrates that even across huge partisan swings, the efficiency gap under Act 43 remains very large, and the efficiency gap for the Demonstration Plan remains very small. This is further powerful confirmation of the durability of Act 43's bias – and the durable *lack* of bias of the Demonstration Plan.



VII. **Conclusion**

In their criticism of my report, both Trende and Goedert offer nothing but supposition, speculation, irrelevant discourse about Wisconsin political history, extraneous discussion of congressional redistricting in other parts of the United States, wildly inapposite and inaccurate conjecture about the geographic concentration of Democrats as a possible source of the pro-Republican bias of Act 43, unreliable methodologies, and minor quibbles that have no consequences for my conclusions. Neither Trende nor Goedert has conducted any valid analysis of either Act 43 or the Demonstration Plan – in fact, they make no mention at all of the specifics of the Demonstration plan.

Most significantly, nothing in their reports undercuts my fundamental conclusion that Act 43 constituted an egregious and durable gerrymander, and that it was entirely possible to draw a neutral map that met or exceeded Act 43 on all legal dimensions. If anything, the sensitivity

testing substantially bolsters this conclusion, since it shows that Act 43's large efficiency gap and the Demonstration Plan's small one are durable in the face of enormous changes in Wisconsin's electoral environment.

Dated: December 21, 2015

/s/ Kenneth R. Mayer

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MYTHS AND REALITIES OF AMERICAN POLITICAL GEOGRAPHY

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November 23, 2005

Abstract

The division of America into red states and blue states misleadingly suggests that states are split into two camps, but along most dimensions, like political orientation, states are on a continuum. By historical standards, the number of swing states is not particularly low, and America's cultural divisions are not increasing. But despite the flaws of the red state/blue state framework, it does contain two profound truths. First, the heterogeneity of beliefs and attitudes across the United States is enormous and has always been so. Second, political divisions are becoming increasingly religious and cultural. The rise of religious politics is not without precedent, but rather returns us to the pre-New Deal norm. Religious political divisions are so common because religious groups provide politicians the opportunity to send targeted messages that excite their base.

* Glaeser thanks the Taubman Center for State and Local Government. We are grateful to Alice Chen and Nate Rosenberg, Jr. for outstanding research assistance.

In the aftermath of the 2000 election, David Brooks wrote in the *Atlantic Monthly* that America was split into red states and blue states. In red states, people believed in God, watched NASCAR and voted for George W. Bush. In blue states, people ate Thai food, cared about the environment and voted for Albert Gore. The 2004 election, which seemed geographically to be a replay of 2000, only reinforced the perceived value of this framework. Only three states (Iowa, New Hampshire and New Mexico) switched parties between the elections.

In this essay, we revisit America's political geography and ask what is true and false about the "red state/blue state" framework. We begin by identifying five myths associated with this framework: 1) American is divided into two politically homogenous regions; 2) The two parties are more spatially segregated than in the past; 3) America's political geography is more stable than in the past; 4) America's cultural divisions are increasing and 5) America is becoming more politically polarized.

But despite the myths surrounding the red state/blue state paradigm, there are two important truths captured by this framework. America is a country with remarkable geographic diversity in its habits and beliefs. People in different states have wildly different views about religion, homosexuality, AIDS, military policy and wildly different consumption patterns. The distribution of states along all dimensions is continuous, not bimodal, but this continuum should never be confused with homogeneity. Moreover, America's ideological diversity is not particularly new. In the 1930s, New England was much more socially liberal than the South. The extent and permanence of cultural divisions across space is one of America's most remarkable features. While spatial sorting on the basis of income or tastes may seem natural to most economists, the remarkable spatial heterogeneity of beliefs – political and otherwise – presents more of a challenge to the standard Bayesian models of belief formation. For example, in the April 2004, CBS/New York Times poll, twenty-three percent of respondents in Oregon, Washington and California thought that Saddam Hussein was personally involved in the September 11, 2001, attacks. Forty-seven percent of respondents in Texas, Oklahoma and Arkansas had that view. In the 1987-2003 PEW Values surveys, 56 percent of

Mississippi residents think that AIDS is God's punishment for immoral sexual behavior. Only 16 percent of Rhode Island residents share that view.

Using state and county level regressions, we explore a number of different hypotheses about the long run historical causes of differences in beliefs over space. We find little support these cultural differences represent long-standing differences in religiosity or the legacy of slavery.

Instead, our regressions support the idea that Blue State culture reflects primarily the legacy of different ethnicities working together at high densities: the most important historical explanatory variables are the share of the labor force in manufacturing in 1920 and the share of the population that was foreign born in 1920 strongly predict liberal beliefs and voting for John Kerry. We interpret these results as suggesting that the liberal views that reduced traditional social divisions came about because there were gains to reducing economic and religious conflicts that could derail interactions in the marketplace.

The second important truth captured by the red state/blue state framework is that political parties and politicians have had an increasing tendency to divide on cultural and religious issues rather than on economic differences. Again, in historical perspective, cultural politics is not unusual. In the late 19th century, "Rum, Romanism and rebellion" were the core issues that determined the Republican Party. The true aberration was the mid-twentieth century era of economic politics.

Why has culture dominated politics so much more effectively than economics during much of American history? Glaeser, Ponzetto and Shapiro (2005), following Downs (1957), present a model where extremism occurs because political divisions are needed to mobilize infra-marginal voters, but going to extremes is only rational when political messages are heard disproportionately by your own supporters. Political divisions therefore follow social cleavages because social organizations allow politicians to send targeted messages. .This models helps us to understand why economic divisions between

the parties only became entrenched in the middle 20th century, with the rise of the labor movement and its growing connection to the Democratic Party, and why as unions have lost their importance, religion has again come to dominate political debate.

Myths of American Political Geography

We now discuss five myths of American political geography.

Myth # 1: America is divided into two politically homogeneous areas

Does the red state/blue state paradigm that describes the remarkable spatial configuration of Democrats on the coast and Republicans in the heartland mean that Americans are increasingly living in politically homogenous states, so that a smaller number of people live in swing states? Is it true, as E. J. Dionne (2003) asserted, that "the red states get redder, the blue states get bluer," and as a result elections are being decided by a smaller and smaller number of battleground states?

Figure 1 shows the time series of the share of electoral votes in "battleground" states, where we define battlegrounds as those states with margin of victory that was less than ten percent. Alternative definitions from five to twenty percent margins of victory show similar results. The dotted line shows the share of electoral votes in battleground states in every election from 1840 until today. The black line shows the average of the past five elections. The gray line at the bottom of the figure shows the popular vote "margin of victory" in the last election.

The election-by-election results show that there is a great deal of volatility in the share of electoral votes, or population, connected with battleground states. In close elections, such as 1960, 1968 and 1976, more than 70 percent of the electoral votes were cast in battlegrounds. In blowout elections, like 1964 or 1972, less than fifteen percent of the votes are in such states. In the last three elections, between 40 and 50 percent of the

electoral votes were in swing states. These numbers lie between the high and low extremes of the last 40 years.

To show any trends that underlie this volatility, the black line in Figure 1 displays the twenty year moving average of the share of electoral votes in battleground states. The moving average shows no evidence of a general downward trend in the number of swing states. Instead, the time series suggests three periods in post-1840 U.S. electoral history. Between 1840 and 1900, on average, around 55 percent of the electoral votes lived in swing states. Between 1904 and 1948, around 30 percent of electoral votes were in swing states. After 1952, the U.S. has reverted to pre-1900 patterns. The first half of the 20th century, not today, had an unusual abundance of landslide states.

Myth # 2: The two parties are more spatially segregated than in the past

Even though the number of states that can by considered "safe" for either party has not been rising over time, there could be more political segregation at the local level. However, the county-level evidence shows that segregation by party is not significantly increasing, and it is in fact much lower than many other forms of segregation.

There are two usual indices of racial segregation that can also be used to measure political segregation: dissimilarity and isolation. The dissimilarity index measures the share of the total population of either group 1 or group 2 that would need to be moved across areas for there to be an equal proportion of group 1 in every area. [1] A high dissimilarity index indicates a large degree of segregation; if a large share of the population must move in order to be evenly distributed, then the population must currently be highly segregated. The isolation index measures the share of the population belonging to group 1 where the average member of group 1 lives. A high isolation index

1. The dissimilarity index between group 1 and group 2 is defined as:

$$Dissimilarity = \frac{1}{2} \sum_{All\ Areas} \left| \frac{Population_{1,Area}}{Population_{1,Total}} - \frac{Population_{2,Area}}{Population_{2,Total}} \right|$$

where refers to the population of group i for i=1 or 2 in a geographic area and refers to the total population of group i.

also indicates a large degree of segregation; if the typical member of group 1 lives in an area where the proportion of group1 greatly exceeds the proportion of group 1 in the total population, then the population is highly segregated.[2]

Following Klinkner (2004), we calculate dissimilarity indices and isolation indices for Republicans and Democrats based on voting in the last presidential election between 1840 and today.[3] In all cases, we have eliminated individuals who voted for neither Republican nor Democratic candidates. We use counties as the units of observation. Figure 2 shows the time patterns of these indices.

The dissimilarity index shows that there have been two time periods where the U.S. was unusually divided spatially: the elections of 1856 and 1860, when dissimilarity topped 40 percent and the geographically based Civil War ensued, and 1924, when dissimilarity was greater than 30 percent. Over the last 60 years, dissimilarity has generally been below 20 percent. The past four elections do show a slight upward trend, but this is nothing like the remarkable rise seen between 1916 and 1924. Moreover, this level of dissimilarity is much less than the dissimilarity of college and non-college educated adults across counties (.25) or blacks and non-blacks (.46).

The isolation measures show even less of a trend. Both Republicans and Democrats live in counties where about fifty percent of the voters share their own party. The isolation index in 2004 was 53.4 percent for Republicans and 52.6 percent for Democrats. These numbers are far lower than the Republican 1920s, when the average Republican lived in a county where 70 percent of the voters also voted for Coolidge or Hoover, or the Democratic 1930s where the average Democrat lived in a county where 60 percent of the voters supported F.D.R. There is just no sense that people are generally living in politically highly segregated counties.

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[2] The isolation index of group 1 is defined as:

$$Isolation = \sum_{All\ \ Areas} \frac{Population_{1,Area}}{Population_{1,Total}} \frac{Population_{1,Area}}{Population_{1,Area} + Population_{2,Area}}$$

[3] For years prior to 1856, the segregation indices represent the segregation between Whigs and Democrats.

Myth # 3: America's political geography is more stable than in the past

While the segregation of the political parties hasn't increased significantly, it may still be true that American political divisions are hardening, and that political patterns are becoming more permanent. As Harold Meyerson (2004) wrote in the Washington Post, "the battle lines of the cultural civil war that emerged in the 2000 contest have shown themselves to be all but permeable to even the most earthshaking events." If anything, the stability predicted by Meyerson and many others was vindicated in the 2004 election where only three states (Iowa, New Hampshire and New Mexico) changed parties. Perhaps, American politics is becoming increasingly geographically stable over time.

Indeed, the myth in this case is not the stability of political geography— political geography is quite stable— but rather that this stability is new or unusual. Figure 3 shows two measures of electoral stability over the last 150 years. The top line shows the correlation coefficient across counties between the percent supporting the Republican Party in the current election and the percent supporting the Republican Party in the previous election. The bottom line shows the share of electoral votes that changed parties since the last election.[4]

The top line shows just how stable political geography has been over the last 130 years. Between 1880 and today there has only been one period where the correlation between current and lagged percentage of Republican voters dropped significantly below 80 percent. In 1964, 1968 and 1972, the coefficient dropped wildly as the South left the Democratic Party. In historical context, this period is unusual, not the 24 years since.

[4]In both cases, as in Figure 7 & 8 below, we deviate slightly from our usual methodology in our treatment of the 1912 election. In that year, we treat Theodore Roosevelt's progressive supporters as Republicans. Since Roosevelt was a former Republican president, albeit running for election on the Progressive ticket, his supporters do not reflect any real change in support for the Republican party, but rather a temporary deviation to supporting a Republican political idol. Without this correction, the 1912 election would display a particularly unusual degree of political fluidity as Republicans flocked to Roosevelt in 1912 and then flocked back to the Republican fold in 1916.

The correlation between the percentage of voters supporting George W. Bush in 2004 and the percentage of voters supporting Bush in 2000 at the county level is over 95 percent. This is high, but not unlike the degree of electoral stability engendered in the re-election campaigns of Eisenhower or Franklin Roosevelt. In these cases, the correlation coefficients were also in the mid-90s. Over the past 20 years, smoothing out election-by-election variation, the correlation has been lower than during 1932-1960 or 1868-1908. Stability has been the norm, not the exception, in American electoral history, and recent trends have brought us back to this norm.

Myth # 4: America's cultural divisions are increasing

A steady stream of rhetoric proclaims that "there is a religious war going on in this country, a cultural war as critical to the kind of nation we shall be as the Cold War itself, for this war is for the soul of America" (this example is from Davis and Robinson, 1997). Fiorina, Abrams, and Pope (2004) provide a rich set of examples showing that across a wide range of issues, the distribution of preferences is single-peaked: most people are in the middle of the distribution and not at the extreme. We will later disagree with Fiorina, Abrams, and Pope (2004) in our interpretation of American political geography, as we believe that there are significant cultural divisions across space and people: Mississippi is not Massachusetts. But we do not disagree with their evidence that divisions across people and space have not been increasing over time.

For example, consider polling evidence on extreme views about abortion. From 1972 to 2004, the share of the population taking the position that abortion should never be permitted has varied in a narrow band between 10-13 percent, according to data from the National Election Surveys. Conversely, the fraction of the population taking the position that abortion should never be forbidden or that a women should always be able to obtain an abortion (the precise wording of the question varied over time) rose from 25 percent in the 1970s to roughly 35 percent in the 1980s, before peaking at about 45 percent in 1992 and declining back to the 1980s levels since then. Overall, any purported increase in abortion extremism amounts to essentially no change in the share of the population who

is extremely opposed to abortion and the share of those who believe abortion should never be forbidden fluctuating somewhat, but currently standing at the same level as the 1980s. Similarly, while many Americans are opposed to homosexuality, on the whole, Americans have become significantly more tolerant of homosexuality now then they were 20 years ago. We are not living in an era of increasing cultural divisions between people, even if politicians are increasingly dividing on these issues.

Myth # 5: America's political divisions are increasing

A final myth is that we live in an era of increasingly polarized politics, where individuals from different parties increasingly despise one another, or as Lawrence (2002) writes, "when George W. Bush took office, half the country cheered and the other half seethed." Certainly, the heat of the last election, where Democrats accused the President of trading blood for oil, and the Swift Boat Veterans for Truth attacked John Kerry's war record, does suggest rising tempers and mutual distaste.

One usual political science measure of inter-party dislike is the group "thermometer." In "thermometer" questions, respondents are asked to give their feelings towards a group on a 0 to 100 scale with 100 indicating the most positive and 0 indicating the most negative. The National Election Survey offers thermometer ratings towards the Democratic Party and the Republican Party bi-annually since 1978 (with the exception of the 2002 survey, which did not include this question). For the whole period, Democrats' thermometer rating of the Democratic Party averages 73, and their average rating of the Republican Party averages 42. Republicans, on the other hand, rate the Republican Party at an average of 70 and the Democratic Party at an average of 44.

Since these ratings may be influenced both by general attitudes towards politics and by partisanship, we compute each individual's relative taste for the Democratic Party by subtracting the thermometer rating towards the Republican Party from the thermometer rating for the Democratic Party. We then average this relative preference for the Democratic Party among Democrats and Republicans separately.

Figure 4 shows the average relative preference for the Democratic Party among Democrats and Republicans since 1978. The difference between these two lines should be seen as widening partisan hostility. Throughout most of the past 30 years partisanship has been essentially stable, albeit with a slight upwards trend. There was a slight increase in hostility in the early Reagan years and some swings during George H.W. Bush's presidency, but from 1982-1998 partisanship is essentially flat. Moreover, between 1978 and 1998 any rise in partisanship is statistically insignificant.

After 1998 (and particularly between 2000 and 2004), there have been sharp increases in both Republican and Democratic partisanship. Republican enthusiasm for the Republican Party is higher than it has ever been. Democratic hostility for the Republican Party is higher than it has ever been. As such, there is certainly some truth to the view that we are currently experiencing a strongly partisan period, but this does not appear to represent any sort of a secular trend. This division really began in 2000 and seems to be more of a George W. Bush effect than any ongoing move towards greater partisan hostility. Of course, it remains to be seen if partisanship declines in the post-Bush era.

The First Reality of American Political Geography: Cultural Heterogeneity

These myths have led some observers to suggest that there is no truth to the "Culture War" metaphor or that the red state/blue state division is just plain false. While there are misleading elements of these frameworks, amidst all myths, these ideas also contain two great, essential truths. First, America is a nation of enormous cultural and economic diversity. This diversity is not new and it shouldn't be news, but it is still the central fact of American cultural geography. We earn, consume and believe wildly different things in different parts of this country. To an economist, perhaps the most striking thing is that beliefs can differ so much over space.

Second, American political parties have increasingly become organized around cultural and religious fissures. 30 years ago, income was a better predictor of party than religious

attendance. Today, religion rather than earnings predicts Republicanism. The rise of religious politics is not without precedent. Prior to 1930, the correlation between religion and party affiliation across states seems to have been at least as strong as it is today. Nonetheless, this cultural division is a central political fact of the last 25 years.

Heterogeneity of Economics and Society

Using the Pew Research Center's 1987-2003 Values Survey (combined dataset), we have calculated state average responses for a number of questions about values and beliefs. Even pooling over this 16 year time period, sample sizes are often modest, so we include only those states with more than 50 observations over the entire time period. In Table 1, we report the ten most extreme states (including the District of Columbia) for six of these questions. We also include the ten most extreme states in terms of median household income and wine sales per capita.[5] Since correlations across variables are far less than one, if we followed Ansolabehere, Rodden and Snyder (2006) and look at an average variable to classify states views as unidimensional, we would miss significant amounts of the striking variation that exists across states.

The first panel shows the state average response rate to the question "Should schools fire homosexual teachers?" Across the entire sample, 42 percent answered yes to this question. There is striking geographic variation to this question. In the five most liberal states (with respect to this statement): New Jersey, Maryland, Connecticut, the District of Columbia and Massachusetts, less than 30 percent of respondents thought that teachers should be fired for being gay. In the five most conservative states: West Virginia, Oklahoma, Tennessee, Arkansas and Mississippi, a healthy majority favored firing homosexual teachers. Indeed, almost two-thirds of Mississippi respondents favored

[5] One potential issue with a table of this nature is that these samples are not huge and we should expect to see significant variation. However, the variation across states is much higher than we would expect from random sampling error. On average, each state has 440 respondents, and if the true response probabilities were the same across states, we would expect the standard deviation of state level averages to be .023. The standard deviation of the state means is more than four times this amount. We can soundly reject the view that differences across states just reflect sampling error.

firing such teachers. The standard deviation of state mean is more than four times the standard deviation of state means that would be expected from random sampling error.

The second and third panels show similar geographic heterogeneity in the responses to the statements "It is okay for blacks and whites to date" and "AIDS is God's punishment for immoral sexual behavior." While the extreme left and ring wing states as defined by these first three questions are not the same, the correlations among them are quite high. e.g., the correlation between the belief that schools should fire homosexual teachers and approval of black-white dating is -77 percent.

Figure 5 shows that responses to these cultural statements are highly correlated across states with voting Democratic in the last election. In no state that went for Kerry did the share of respondents agreeing with the statement "AIDS is God's punishment for immoral sexual behavior" exceed 38 percent. In no state that went for Bush did the share of respondents answering no to this question fall below 28 percent. The overall correlation coefficient across states between this variable and voting is -70 percent. The figure also illustrates that there is a continuous distribution of beliefs over space, not two nations. The variation is striking, but the distribution is not bi-modal.

The fourth and fifth panels show that geographic heterogeneity in political beliefs is not limited to cultural issues, but it extends into foreign and economic policies as well. These panels indicate the share of respondents that agree with the statements "the best way to ensure peace is through military strength" and "when something is run by the government, it is usually inefficient and wasteful." The differences in the fraction who agree with these statements between the most liberal and conservatives states are 30-40 percent. Again, America is not two nations, but it does have a lot of geographic heterogeneity in its beliefs.

The heterogeneity of political beliefs is accompanied by striking geographic heterogeneity in religious beliefs. The Pew data have only a limited number of questions

on religious beliefs, such as "I never doubt the existence of God," and "Prayer is an important part of my daily life." There is geographic variation in the former question: 30 percent of Delaware respondents admit to doubt, while only four percent of South Carolina respondents admit to doubt. There is even more geographic variation in the question on prayer. In this case the range is from 58 percent in Rhode Island to 95 percent in Mississippi.

Other data sets, such as the National Election Survey and the General Social Survey, provide other, perhaps more interesting questions. For example, the National Election Survey provides us with variation in belief about the literal truth of the Bible. In this case, the most believing states were Louisiana and Alabama, where 75 and 69 percent of respondents respectively believed in the literal truth of the bible. The least two believing states were Massachusetts and Connecticut, where only 17 and 20 percent of respondents respectively believed in the literal truth of the bible. The General Social Survey provides us with belief in the existence of the devil. The General Social Survey sample is too small to make comparisons across states, but across regions the variation is significant. In the Pacific region, 49 percent of respondents say that they believe in the devil; in the East South Central region, 82 percent of respondents say that they believe in the devil.[6]

Panel 6 of Table 1, reports the extreme states measured in terms of responses to the statement, "We will all be called before God on Judgment Day to answer for our sins." The five states with the smallest fractions believing in Judgment Day are Vermont, Rhode Island, Oregon, New Hampshire and Nevada. The five states with the highest fractions are Tennessee, South Carolina, Oklahoma, Alabama and Mississippi. These numbers make it clear why a New England agnostic intellectual might indeed feel that the Deep South is another planet. After all nearly 95 percent of respondents from that state will have a fundamentally different view of God and the after-life from this New England agnostic.

[6] The Pacific region consists of Washington, Oregon, California, Alaska, and Hawaii. The East South Central region consists of Kentucky, Tennessee, Alabama, and Mississippi.

The regional patterns on moral issues appear to be remarkably durable. Today, the New England and Mid-Atlantic regions are today America's most liberal regions (along with the Pacific Coast). These regions appear to have had liberal views as early as the 1930s. In 1936-37 Gallup polls, across the U.S., 67 percent of respondents said that they would vote for a qualified Catholic for President and 49 percent of respondents said that they would vote for a quality Jew for President. In New England and the Mid-Atlantic region, 74 and 79 percent of respondents said that they would support a qualified Catholic and 62 and 59 percent of respondents said that they would support a qualified Jew, which made these two regions the most tolerant in the county along these dimensions. They were also the most liberal regions in favoring support for federal funding of venereal disease, supporting a free press and opposing the sterilization of criminals. Importantly, in those days, New England had the most conservative views on economic policy.

One of the peculiarities of American geography is that ardent Christianity and belief in the military tend to go together. Across states, the correlation between the share of respondents who say that prayer is an important part of my daily life and the share of respondents who say that the best way to ensure peace is through military strength is 73 percent. One can certainly interpret the Gospels as having an anti-military message, but this doesn't seem to be the interpretation favored by America's most active Christians.

The country doesn't just display remarkable difference in beliefs about religious things like the devil; beliefs about foreign policy related facts also differ significantly across space. For example, a CBS/New York Times poll of April 2004 asked respondents, "Do you think Sadam Hussein was personally involved in the September 11, 2001, terrorist attacks on the World Trade Center?" 45 percent of the South Central region respondents said yes to this question, but only 25 percent of the Pacific Southwest respondents shared this belief. In the same poll, 60 percent of the South Central region respondents and 62 percent of the Mountains and Plains respondents said that they think that "Iraq probably does have weapons of mass destruction that the United States has not found yet?" Only

forty-three percent of the Pacific Southwest and forty percent of the Pacific Northwest respondents shared this view.[7]

These differences in beliefs within the U.S. drive home one central point about human cognition: the Bayesian approach to learning offers little hope for understanding the remarkable heterogeneity in beliefs across individuals and space (Glaeser 2004). In these rational models, disagreement is difficult, let alone the wild level of dispersion of beliefs that we see. After all, there is no real difference in the evidence that these different states have been exposed to, yet they have come to radically different conclusions, and continue to hold these conclusions despite being aware that others disagree. Despite Aumann (1976), Americans wholeheartedly agree-to-disagree. One natural alternative model is that people base opinions mostly on the views of those around them. As such, local interactions are critical, and these provide plenty of possibility for wide geographic variation (as in Glaeser, Sacerdote and Scheinkman, 1996).

Of course, the nation is different in many other ways as well. According to 2003 Census Bureau figures, the five wealthiest states (Minnesota, Virginia, Connecticut, New Hampshire and New Jersey) had median family incomes around $55,000. Mississippi, Arkansas, West Virginia and Louisiana all have median family incomes that are $20,000 less than this amount. Of course, these are nominal income levels, uncorrected for state cost of living, but certainly the ability to buy traded goods is far lower in these poorer states. Unsurprisingly, there is a healthy correlation between attitudes and income. The correlation between mean income and acceptance of black-white dating is 58 percent. The correlation between income and the belief that homosexual teachers should be fired is -68 percent. A particularly surprising relationship is the fact that the correlation between state median income and share of respondents that say that poor people have become too dependent on government assistance is -38 percent. As we will discuss later,

[7] The Pacific Southwest includes California, Nevada, Arizona, and Hawaii. The Pacific Northwest includes Alaska, Washington, Oregon, and Idaho. The South Central includes Texas, Oklahoma, Arkansas, Louisiana, and New Mexico. The Mountains and Plains include Colorado, Utah, Wyoming, Montana, North Dakota, and South Dakota.

the fact that respondents in poorer states are more likely to have anti-redistribution opinions makes us doubt whether these opinions should be seen as being exogenous variables that reflect true economic interests. Another quite plausible view is that these opinions are the result of political affiliation and the desire to be consistent with the party line.

While there is a positive correlation between voting Republican and the share of respondents that say that poor people have become too dependent on government, the correlation between state income and Republicanism is -43 percent. Since individual level income still positively predicts voting Republican (albeit weakly), the negative correlation between income and Republicanism at the state level represents one of those interesting instances in which aggregate relationships are the reverse of individual relationships (as in Glaeser and Sacerdote, 2001). This relationship, however, disappears if we control for state level cultural variables or even urbanization, and one explanation for this phenomenon is that the correlation between income and culture is much stronger at the state level than at the individual level.

Differences in consumption patterns are even greater than differences in income. The five states with the least wine sales (West Virginia, Mississippi, Oklahoma, Arkansas and Iowa) sold around 1 gallon of wine per capita in 2002. The five areas with the most wine sales (Massachusetts, Nevada, Idaho, New Hampshire and the District of Columbia) consumed nearly five times as much wine per capita. Even wine consumption is correlated with political and social beliefs, often in surprising ways. For example, the correlation between wine consumption and the share of respondents who think that black-white dating is okay is 61 percent.

While the geographic differences within America are large, they are not new and they do not seem to be growing. There is little evidence to back up E. J. Dionne's assertion that red states are getting redder and blue states are getting bluer. We compared the variance of state averages during the 1987-1993 period and the 1994-2004 period. The variance across states in the opinion that schools should fire homosexual teachers has risen

slightly. The variance of the state average view that it is okay for blacks and whites to date has fallen more. The variance of the view that AIDS is God's punishment has risen. The variance in the share of the population that takes the Bible to be the literal word of God has fallen. The variance of the share that thinks that the government is often inefficient and wasteful has risen. Overall, it is hard to see a general trend. The nation is different and it has been so for many years.

The Causes of American Cultural Diversity

While the differences in political and social beliefs across space are striking and while many of these correlations are provocative, these correlations give us little idea about what factors explain differences in beliefs across the United States. In this section, we consider three possible explanations: long-standing differences in religious adherence across states, the legacy of slavery, and diversity in the marketplace. The first hypothesis suggests that the fundamental difference between areas within the U.S. is simply the degree of religiosity. The second hypothesis is that regional differences fundamentally reflect the legacy of slavery and the Civil War.

The third hypothesis – diversity in marketplace-- suggests that areas where diverse populations interacted in market settings developed beliefs that reduced ethnic and religious conflict. According to this view, if ethnic groups interact at high densities, they either destroy each other or eventually develop ideologies that minimize conflict.[8] While many of the "liberal" responses to survey questions suggest tolerance towards minorities or people who violate traditional religious norms, this hypothesis does not imply that blue state America is tolerant and Red State America is not. Blue State America is more intolerant of some groups like the religious and Southerners. Instead, this hypothesis suggests that Blue State ideology is tolerant in ways that reduced the ethnic and religious conflicts that could have hurt an economy depending on ethnically diverse populations working together at high densities.

[8] Alternatively, the hypothesis can be interpreted as suggesting a reverse causality where diverse ethnic groups economically interact only in places that have managed to reduce conflict.

To measure the historical religious environment, we use the 1926 Census of Religious Bodies which provides a count of members of different churches at both the county and state level. Because some denominations (Catholics, Lutherans, Episcopalians) include children in their membership, but most other Protestant denominations do not (or do not do so consistently), we follow Johnson, et al (1974) and multiply membership in churches which substantially underreport child participation by the total county population divided by the population over 14. Then, using the classification groupings of the American Religion Data Archive (www.thearda.com) based on the research of Steensland, et al (2000), Melton (1999) and Mead (1995), we calculate the number of church members who are evangelical.[9] The county-level correlation between adherents per capita in 1926 and adherents per capita in 1990 is .44.[10] We present the results for evangelicalism because it is both more correlated over time and more correlated with modern religious behavior

.

To test whether current political divisions reflect the enduring legacy of slavery and the Civil War, we use the number of slaves per capita in the state in 1850. For places that weren't states, this variable takes on a value of zero. Because this variable is highly skewed, we use the logarithm of one plus this variable (none of our results change if we use the linear specification). Our results are also unchanged if we replace this continuous variable with a discrete variable that takes on a value of one if the state was a member of the Confederacy.

The diversity hypothesis is tested using three different measures of diverse social environments. First, using Census data we use the share of the population that is foreign born in 1920. We have reproduced our results using a fractionalization index of ethnic heterogeneity based on country of birth in the 1920 Census.[11] Second, we use the share

[9] For a complete description of how the modern list was matched to historical denominations, see the data appendix posted at http://www.people.fas.harvard.edu/~bward

[10] We exclude 5 counties with adherents per capita well above 1 in 1926 from this correlation.

[11] The results with ethnic-fractionalization indicies which include race as well as foreign-born ancestry change the results discussed below slightly. Specifically, the significance the slavery measure increases slightly for several of the outcomes, and the significance of the log of density decreases slightly.

of the population that worked in manufacturing in 1920. This variable is highly correlated with the density and urbanization of an area, and we see it as a proxy for high density economic interactions. We have obtained similar results using the share of the population in 1920 that lives in cities with more than 25,000 people.

Regressions (1)-(6) show our results for states and regression (7) shows the connection between these explanatory variables and the share voting for Kerry at the county level. In the state level regressions, the explanatory power is quite high and r-squareds run from 48 percent to 70 percent. In the county level regressions, the r-squared is 14 percent.

The first row shows the impact of evangelism in 1926. Evangelicalism in 1926 is statistically significant in four out of seven specifications. For example, it significantly predicts approval of black-white dating and belief in peace through strength, and it weakly predicts the belief that AIDS is a punishment from God and the importance of prayer. In most cases, the coefficients are reasonably large, but due to the high correlation of the independent variables, this variable is not highly significant. In univariate regressions, the evangelicalism variable is almost always significant.

In the second row, we see the coefficients on the slave population in 1850. In this case, the coefficients are typically small and quite insignificant. The same is true of the categorical variable depicting membership in the confederacy. There are two variables which this variable (or the confederacy variable) is correlated with – the belief in peace through strength and, somewhat surprisingly, a belief in the efficiency of government. These effects, while significant, are still quite small. While it is not impossible that the legacy of slavery matters, there is no sense that support for Republicanism is determined by the borders of the old slave states, and despite E. J. Dionne's views, there is little evidence to suggest that current political and social divisions reflect the ongoing legacy of the Civil War.

In the third row, we look at the importance of percent foreign born in 1920. In this case, the coefficients are generally significant economically and statistically. As the share of

the state that is foreign born in 1920 increases by one percentage point, the share of respondents who say that AIDS is God's punishment declines by .271 percent point and the share of respondents who say that homosexual teachers should be fired declines by .504 percentage points. Foreign born is also negatively associated with the importance of prayer and positively correlated with acceptance of interracial dating. Finally, this variable is strongly positively associated with support for the Democratic Party. As the county share foreign born in 1920 increases by one percentage point, the share supporting Kerry increases by almost one-half of a percentage point.

The fourth row examines the impact of the share of the workforce in manufacturing in 1920. In this case, the coefficients are significant in every regression except on black-white dating. Industrialization 85 years ago is an astonishingly good predictor of social and cultural attitudes today across states and a good predictor of support for the Democratic Party at both the state and county levels. As the share of the workforce in 1920 in manufacturing increases by one percentage point, the share of respondents today believing that AIDS is punishment declines by .28 percentage points, the share believing that military strength is the best way to peace declines by .16 percentage points, and the share supporting John Kerry at the state level increased by .42 percentage points.

Religious and political attitudes are better predicted by industrialization and immigration 100 years ago, then by the history of slavery and religion. Traditional religious views and voting Republican is strongly associated with places where Anglo-Americans lived with fewer immigrants. Likewise, late industrialization is also strongly associated with Republican ballots and views that are now Republican. History does matter, but it seems that cultural and political divides have at least as much to do with industrialization and immigration than with religious history or slavery.

While there are many possible explanations for the connection between immigration, industrialization and culture, one hypothesis is that diverse populations working together at high densities, eventually develop ideologies that minimize conflict. Alternatively, areas that were more productive and that sought new immigrant labor encouraged views

that minimized religious strife and encouraged financially profitable immigrants. New York City has a remarkable history of religious tolerance dating from its founding as a commercial colony. Its Dutch commercial leaders tolerated Jews and heterodox Christians because their presence would increase the economic welfare of the colony. Through the early 20th century, industrialists generally opposed the intolerant, nativist strain that would eventually shut off the supply of cheap immigrant labor.

New England's path to religious tolerance also shows the importance of commerce and heterogeneity. . Early seventeenth century Massachusetts is usually put forward as a model of intolerance, not openness, and Protestants of differing views were exiled (like Anne Hutchison) or killed (like Quakers). However, by the 19th century, tolerant Unitarianism had replaced strict Congregationalism, and as we have already discussed in the first decades of the 20th century, New England was remarkably socially liberal.

The change appears to have begun even at the end of the eighteenth century, as "merchants increasingly were dependent on their commerce with the outside world and believed in seeking an accommodation with that world" (Bremer, 1995, p. 173). Between 1690 and 1710, traditional Puritanism declined. The state legislature pushed Increase Mather, a champion of traditional Puritanism, out as President of Harvard. Merchants, like Thomas Brattle, endowed more liberal churches, and, in 1699, the "Brattle Street Manifesto" affirmed a far more tolerant form of Congregationalism. The decline of strict Puritanism appears to have been primarily the result of actions by merchants like Brattle and Elisha Cooke who followed the merchant led community in New York towards a more religiously tolerant and less religious community (the stricter Congregationalists of course founded a competing college in New Haven).

This hypothesis does not mean to suggest that diversity always leads to tolerance. Indeed, in many cases, diversity leads at least initially to hatred and ethnic conflict (Glaeser, 2005). However, if different religious or ethnic groups are prevented from using the power of the state to disenfranchise, enslave or kill each other, and if there

exists a powerful group that benefits from eliminating conflict, then diversity can eventually lead to a watering down of core religious tenets or ethnic animosities.

The Second Reality of American Political Geography: Politics follows Culture

Around the 2004 election, many authors commented on the remarkable correlation between the tendency to go to church and the tendency to vote Republican. The overall correlation between income and Republicanism among white males is essentially zero outside of the extremes of the income distribution (Glaeser, Ponzetto and Shapiro, 2005). However, the relationship between Religion and Republicanism is extremely strong throughout the distribution. Individuals who go to church once a month vote Republican 66 percent of the time; individuals who go to church once per week vote Republican 75 percent of the time. The correlation between the church attendance variable and Republicanism is 20 percent.

This increasing importance of religion does represent a shift over the past 50 years. Figure 7 shows the impact of income and religion over the past 50 years. The vertical axis depicts the OLS coefficients from estimation of the following equation for each election year:

$$(1) \quad \Pr(\text{Republican})_i = \beta \bullet \ln(\text{Income}_i) + \delta \bullet \text{church attendence}_i + X_i'\varphi + \varepsilon_i,,$$

where $\Pr(\text{Republican})$ is a categorical variable taking on a value of one if the individual votes republican, $\ln(\text{Income}_i)$ is the logarithm of family income, church attendance is a categorical variable taking on a value of one if the individual attends church once per month or more. The X vector includes controls for gender, race, education and age. As before, we have excluded voters who chose neither Republicans nor Democrats. The black line shows the effect of log of income, and the grey line the effect of attending church once a month or more. The coding of religion in the National Election Survey changed in 1972, so it is inappropriate to compare the magnitude of effects before that

date with the magnitudes after then.[12] The figure suggests that in the 1970s and before, the coefficients on income and church attendance were comparable. Since 1980, religion has become much more important.

To analyze longer historical patterns in the relationship between income and Republicanism, we turn to county level election returns and during each election from 1864 until today we regress:

$$(2)\ \frac{\text{Republican Votes}}{\text{Total Votes}} = \alpha + \beta \bullet \text{Log(Median Income in 1950)} + \varepsilon$$

where α is a constant and β captures the relationship between Republicanism and income. We use income in 1950 because income is not available before 1947 and we wanted to be able to use a consistent measure of county wealth. Results look similar if we use the logarithm of contemporary income for the post-1950 period. Because of the correlation between income and the South, we also present estimates of β in regressions that include a dummy variable indicating that the state was a member of the Confederacy and in regressions excluding all of those states.

The top line shows the estimates from a regression with no Confederacy control and that regression shows a straightforward rise and decline in the connection between income and Republicanism. The most basic fact is that from the 1870s to the 1950s, richer states were reliably more Republican and this is no longer true today. On average, a one log point increase in 1950 median income (roughly a doubling) generally increased the share of the population that voted Republican by 4 percent between 1868 and 1956. The bottom line excludes the south, and in this case, there is a very long term pattern (1870-2004) and a recent pattern (1976-2004) of declining correlations between income and Republicanism, but over in the middle part of the 20th century, there is extreme volatility

[12] Prior to 1972, the church dummy is equal to one if the respondent attends church often or regularly. The fraction of respondents in these categories in 1968 (the last year it was phrased in this way) is basically the same as the fraction attending church at least once a month in 1970 (the first year of the new version).

in the income-Republicanism relationship mostly associated with the ability of Democrats to attract high income urban counties. Finally, the middle line shows an even more complex pattern, but one that still supports a declining relationship between income and voting Republican at the county level.

Our results contrast with those presented by Ansolabehere, Rodden and Snyder (2006) who argue that economics remains a more important predictor of political orientation than morals. Our results differ because they use opinions on issues to predict voting and we use actual income and religious attendance. Income doesn't strongly predict voting Republican but their economic issues index does. On moral issues both opinions and harder variables like church attendance predict Republicanism.

To believe Ansolabehere, Rodden and Snyder's (2006) view that economic issues continue to trump moral issues, you must believe that the importance of economic voting should be measured by using opinion surveys about economics rather than actual income. If these survey opinions are the result of political affiliation rather than the cause (either because of social persuasion as in Murphy and Shleifer, 2004, or because of a desire for internal consistency), then it would make little sense to regress voting on opinions. The first reason to question the use of these surveys is that responses are weakly correlated with individual economic status and correlations at the state level generally go in the wrong direction. Economic opinions don't appear to respond to economic interests.

A second issue with the Ansolabehere, Rodden and Snyder (2006) economic issues index is that this index is the result of factor analysis designed to find opinions that tend to go together. The opinions that go together and are labeled "economic issues" are an odd mix including enthusiasm for government spending, environmentalism, health insurance and labor unions. These views have little in common other than being major parts of the Democratic platform, and one plausible interpretation of the factor analysis is that instead of finding exogenous preferences for economic policy, they have identified the common factor that is ideological loyalty to the Democratic Party.

A third reason to be suspicious of economic opinions is the pattern of regional change, especially relative to the persistence of moral opinions (New England was liberal on religious issues in the 1930s and remains so today). In the 1930s, Republican New England was anti-government and pro-free market and the Democratic South was strongly pro-redistribution. These opinions have completely flipped as party affiliations have flipped. There is no sense that the changing patterns reflect changing economic fortunes, because after all, these opinions remain negatively correlated with economic realities. As such, we think that it is more sensible to look at hard variables that capture economics and religion, like income and church attendance, and these variables show a steady increase in the correlation between religiosity and Republicanism relative to the constant correlation or declining correlation between Republicanism and income.

If the correlations between economics and Republicanism are open to debate, there is little doubt the religiosity increasingly predicts voting Republican. This voting pattern is is mirrored by changes in party policies and party platforms. Glaeser, Ponzetto and Shapiro (2005) compare the party platforms of Republicans and Democrats in 1976 and 2004. During the earlier time period, the Democratic platform took a truly moderate stance, recognizing the differing views of many Americans, but finding it "undesirable to attempt to amend the U.S. constitution to overturn the Supreme Court decision in this area." In that platform, the Democratic platform supported "the Congressional efforts to restrict the use of taxpayers' dollars for abortion." In 2004, far from considering a pro-life Amendment, the Democratic Party stood "proudly for a women's right to choose, consistent with Roe v. Wade, and regardless of her ability to pay." The Republican platform similarly trended right and in 2004 stated that "the unborn child has a fundamental individual right to life that cannot be infringed." Interestingly, political rhetoric was matched with little visible action; there is no difference in the number of abortions per capita under Democratic and Republican presidencies (Glaeser, Ponzetto and Shapiro, 2005).

The abortion gap between the parties is mirrored by gaps in many religious or cultural policies. The Republican platform also opposes gay marriage and embryonic stem cell

research. Democrats have clearly taken opposing positions on these and similar issues. By contrast, in the debate over the Iraq war, John Kerry claimed to differ primarily in his competence and ability to bring in allies, not in his commitment to fighting America's enemies. In the economic sphere, both party platforms trumpet their commitment to reducing taxes (Glaeser, Ponzetto and Shapiro, 2005). The starkest differences in both public statements of candidates and in the wording of the platforms occur along moral dimensions. Given the statements of party platforms, it is no surprise then that religion predicts party preference better than income.

The recent rise in the connection between politics and religion hardly represents something new in American politics. In the pre-modern era, religion was also a central part of party politics. . Party platforms during the nineteenth century also often contained significant religious or cultural statements. For example in 1880, the Republican Party platform attacked Catholic education by endorsing a constitutional amendment "to forbid the appropriation of public funds to the support of sectarian schools." In 1884, the platform resolved "that it is the duty of Congress to enact such laws as shall promptly and effectually suppress the system of polygamy within our Territories; and divorce the political from the ecclesiastical power of the so-called Mormon Church." In 1888, the platform contained a moderate pro-prohibition plank supporting "all wise and well-directed efforts for the promotion of temperance and morality." Fifty years later, the Democratic platform called for a repeal of prohibition.

The relatively mild language of the platforms was coupled with stump speeches which emphasized cultural or religious divisions. Following Samuel Burchard in 1884, Republicans accused Democrats of standing for "Rum, Romanism and Rebellion." By contrast, the Democrats relied upon their urban support from Catholic immigrants from Ireland and Germany. Indeed, the roots of the Republican Party are in the religion-inspired battle against slavery. Protestant ministers like Henry Ward Beecher (whose sister wrote *Uncle Tom's Cabin*) fervently supported the Republican Party before the Civil War.

However, while these anecdotes certainly suggest that it was possible that religion mattered as much in the past as it does today, it provides us with no quantitative evidence on this topic. To analyze historical patterns, we turn to county level election returns and during each election from 1864 until today we regress:

$$(3)\ \frac{\text{Republican Votes}}{\text{Total Votes}} = \alpha + \beta \bullet \frac{\text{Adherents in a Set of Denominations}}{\text{Total Church Adherents}} + \varepsilon$$

where α is a constant and β now captures the relationship between Republicanism and religious affiliation. In this case, we present results with and without the variable capturing membership in the Confederacy. We use two different religion variables: the share of church members that are evangelicals and the share of church members that are mainline Protestants. Catholics represent the main excluded category. We use religious censuses from 1890, 1926, 1952 and 1990, and in all cases, we used the data from the chronologically closest religious census. Given the extremely high persistence of denomination over time (the 80+ percent correlation between evangelicalism in 1926 and 1990), these results are not particularly sensitive to using religion measures from other years. Mainline Protestants primarily include Presbyterians, Episcopalians, Lutherans, and Methodists, while evangelicals are more conservative and include a wide array of groups like Southern Baptists and Pentecostals.[13] Again, we use the American Religion Data Archive (www.thearda.com) classification.

Figure 8 shows our results where the data is smoothed by averaging the estimates of β over three elections and graphing the results. We again treat votes for Theodore Roosevelt in 1912 as votes for the Republican Party in that year. There are obviously many different ways of performing this exercise, but this provides a simple sense of the

[13] Steensland, et al (2000) provide a basic description of the major differences between Mainlines and Evangelicals: "Mainline denominations have typically emphasized an accommodating stance toward modernity, a proactive view on issues of social and economic justice, and pluralism in their tolerance of varied individual beliefs. Evangelical denominations have typically sought more separation from the broader culture, emphasized missionary activity and individual conversion, and taught strict adherence to particular religious doctrines."

correlates of Republicanism, at least at the county level, in the time period before opinion polling.

The bottom line charts the changing relationship between the Republican Party and evangelicals. During the early time period, even controlling for being a Southern county, evangelical counties were much more likely to be Democratic than to be Republican. Over the last 25 years that has changed, and today there is a significant positive relationship between the share of the religious population that is evangelical and the share of the population that voted for George Bush. As the share of the population that is evangelical increases by one percentage point, the share voting Republican increases by .13 percentage points.

But the graph makes it clear that while the connection between Republicanism and evangelicalism may be new, the connection between religion and politics is not. The connection between mainline Protestantism and Republicanism during the late 19th century was much stronger than the correlation between evangelicalism and Republicanism today. Even as late as the Eisenhower era, this connection remained strong. Of course, this correlation is partly a reflection of the strong ties between the Republican Party and the mainstream churches, but it is also a reflection of the equally strong ties between the Democrats and the Catholic Church.

The conclusion from this graph is that religion has usually played a role in party divisions. The patterns have changed. Today attendance is a bigger predictor of voting Republican. In the past, mainline Protestantism predicted Republicanism. In the next section, we turn to explanations of the connection between religion and political divisions.

Explaining Party Divisions

The traditional problem with explaining why parties divide on some issues rather than others is that the prevailing paradigm in political science has been the median voter

theorem. This result pushes strongly towards the implication that parties will rush to the center, and if all parties are at the center then there is little possibility of explaining why Republicans and Democrats split on religion rather than economics.

To the extent that there has been an alternative paradigm, it is that the preferences of leaders or elites pull parties away from the median voter. In this case, party leaders sacrifice votes to achieve their own goals, and the implication is that parties will divide on issues that party elites really care about. This theory can potentially explain the division on religion. It wouldn't be surprising if party leaders had stronger preferences for religion-related issues than for tax policy, especially if they interact in social organizations that emphasize religion (Murphy and Shleifer, 2004). Indeed, it is quite possible that this does explain part of the tendency of parties to split on these cultural issues: this is what party leaders do seem to care most about.

Unfortunately, this theory gives us little guidance about why the connection between religion and party affiliation has changed over time, or why the connection between religion and party affiliation is different in different countries. Glaeser, Ponzetto and Shapiro (2005) show that in some countries (like India) religion correlates strongly with political affiliation but income does not. In other countries (like Sweden), income correlates strongly with political affiliation but religion does not. And in some places (like Spain) both income and religion correlate quite strongly with political affiliation. These differences can't be explained by a general tendency of leaders to care more about social issues.

To explain these differences over space and time, Glaeser, Ponzetto and Shapiro (2005) present a model of strategic extremism where parties divide on issues not to appease the tastes of the leaders but rather to increase their chances of electoral success. As Downs (1957) intuited and Riker and Ordeshook (1973) proved, extremism (defined as party policies that differ from those of the marginal voter) hinge on a turnout margin. If everyone always votes, then moving away from the center is always costly for politicians trying to get elected. Extremism can become strategic, i.e. vote enhancing, only when

there is a turnout margin so that by moving from the center, you excite your base and get them to come to the voting booths.[14]

However, a turnout margin is not enough to ensure extremism. Even with a turnout margin, going to extremes has, in principle, equal likelihood of exciting your base and exciting your opponent's base in the opposite direction. As a result, a voting margin is not enough. There must also be an asymmetry so that extremism excites your supporters more than it enrages your opponent's supporters. Glaeser, Ponzetto and Shapiro (2005) suggest a natural source of this asymmetry: the ability to target messages towards one's own supporters. If your supporters hear your messages (speeches, platforms, etc.) more than your opponents, then going to extremes will increase support more than it increases opposition. In the model, the opposition support is not fooled: they correctly anticipate what you will be saying. Nonetheless, there is still an asymmetry, because if you don't take an extreme position then your own supporters will know that you are centrist and will fail to vote.

This model suggests that policy divisions will be closely tied to the ability to send coded messages (this was called Dog Whistle Politics in the latest British parliamentary race). Large social organizations, like churches or unions, can provide politicians with just this ability. Inside a religious services or a labor meeting, outsiders are absent, and there is an ability to send targeted messages. There are of course abundant examples from Henry Ward Beecher to Pat Robertson of Churches being used to send political messages. It is also certainly true that labor unions have historically provided a key venue for dissemination of political positions.

The model suggests, somewhat surprisingly, that the influence of a social group is non-monotonic and it peaks when the group represents slightly less than one-half of the population. The intuition of this is that when the group represents the entire population, it no longer provides an opportunity to target messages, and when the group represents no

[14] A contribution margin can work just as well. The key is that there is some margin where intensity of support matters.

one, it is no longer an important political force. When the group is slightly less than one-half of the population, then its key issues (economics in the case of unions and social issues in the case of churches) will come to dominate political division and debate.

One particularly clear example of how social groups determine policy divisions is the role of the Grand Army of the Republic (GAR) in the rise of the Grand Old Party. The GAR, a vast veteran's group from the Civil War, provided the Republican Party with a natural means of sending targeted messages reminding voters of Democrat's activities in the civil war ("not every Democrat was a rebel, but every rebel was a Democrat") and pledging future Republican policies towards veterans and freed slaves. This access ensured that Democrats and Republicans would continue to divide on Civil War related issues for 50 years after the war.

This theory then provides us with two hypotheses for the changing importance of economic and social issues in American politics and for the realignments throughout the 20th century. One candidate is the rise and fall of unionization in America. At the beginning of the century, unions were a small part of the population. Only in small areas of the population did they provide an opportunity for targeting a significant fraction of the population. In mid-century, they rose to over 30 percent of all workers and today they are back down to 12 percent (Troy 1965, www.laborresearch.org).

The rise and fall of unionization corresponds reasonably with the connection between income and Republicanism shown in Figure 10. The middle decades of the 20th century were the high point of unionism and they were also the high point of the correlation between income and Republicanism. During this time period, the Democratic Party had access to the labor unions and this created an incentive for Democrats to move to the left on economic issues to get support in this important base. The rise and decline of unions provides at least one possible reason why economic issues rose and then fell in importance.

A second hypothesis explaining the rise and fall of religion is the changes in the religious market. Over the past 80 years, there has been a decline in the numbers of mainline Protestants and a rise in the number of evangelicals. According to this hypothesis, as the mainline Protestants declined in importance, the Republican Party stopped catering to their interests, and gradually switched to issues that were more significant to the growing numbers of evangelicals. Democrats have been more successful at connecting with the rise in non-Christian religious groups (Fogel, 2001).

While this story makes perfect sense from a Republican stand point, it makes less sense for Democrats. Why didn't Democrats move to capture the votes of evangelicals? Certainly, the presidency of Jimmy Carter suggests that this was far from impossible. There are several hypotheses. First, Democratic policies towards civil rights had alienated a huge part of the evangelical population. Second, liberal elites in the Democratic Party were uncomfortable with moving to the right on social issues. Third, the Democrats were dominant during a period of rapid social change and had difficulty running against socially liberal policies that had been enacted and popular during their time in power.

This discussion has emphasized the role of religion as if churches were just another form of social group and as if religious views were no different than views over fiscal policy. But in fact, many people take their religious views far more seriously than views on other topics, and this may also help us to understand why religion is so often an important part of politics. It may be far easier to motivate voters by appealing to core religious values than to topics like tax policy, and this may be the key reason why religion is so appealing to politicians.

Whatever the cause, the trends are clear. While Republicanism used to represent mainline Protestantism, it now represents evangelicalism. The ability to send targeted messages helps us understand why social groups, such as churches or unions, end up driving the key differences between parties. As such, we should neither be surprised at today's religious politics, nor at the politics of religion in the past. As long as churches

provide politicians with an ability to send targeted messages to supporters, religious issues will be important in elections and parties will divide over religion.

Conclusion

There are many myths about America's political geography. There has not been any decrease in the number of swing states over time. Democrats and Republicans are no more geographically segregated than they have been in the past. Voting patterns may have become mildly more persistent than in the past, but persistence has usually been quite high, except for the 12 year period when the South left the Democratic fold. Cultural heterogeneity is not increasing and most people are in the middle, not at the extremes (as in Fiorina et al., 2004). Political hostility between the party members is relatively constant, although there has been an uptick in hostility over the last four years.

But all of these myths should not obscure two primary truths about American political geography. First, America is a nation with an astonishing degree of cultural diversity. The Red State/Blue State framework makes it appear that regions fall into one of two groups and this is false. There is a continuum of states ranging from the poor conservative places of the south and west to the rich, liberal places of the coasts. These places are quite different and they have been so for many years. At the state or county level, these differences line up well with political affiliation.

The roots of these geographic differences seem to come from two primary sources: industrialization and immigration. Places that industrialized earlier and that attracted more immigrants at the start of the century are much more likely to have socially liberal attitudes, much less likely to take prayer seriously, and less likely to vote Republican. These forces appear to be much more important in predicting attitudes and politics than the legacy of the Civil War, or long-standing religious differences. One theory that can explain the power of immigration and early industrialization is that the cultural attitudes associated with the Democratic party (downplaying Religion and emphasizing some

forms of tolerance) reflect the long run effect of ethnically and religiously heterogeneous populations interacting over many decades in the marketplace

The second great truth is that American parties are increasing oriented around religion and culture rather than economics. This change has occurred since the 1970s, but in broader historical perspective it is the 1932-1976 period that is exceptional, not the current epoch. Prior to 1932, religion also predicted voting, but during that era the key correlation was between Republicanism and mainline Protestantism.

Why has religion or culture played such an important role in American party divisions? We offer two explanations. Glaeser, Ponzetto and Shapiro (2005) show that parties divide along issues where they have the ability to send targeted messages to their supporters. Religious groups provide just this ability. Second, voting is innately irrational, and emotional cultural topics may be much more effective in getting people into the voting booth than naked self-interest.

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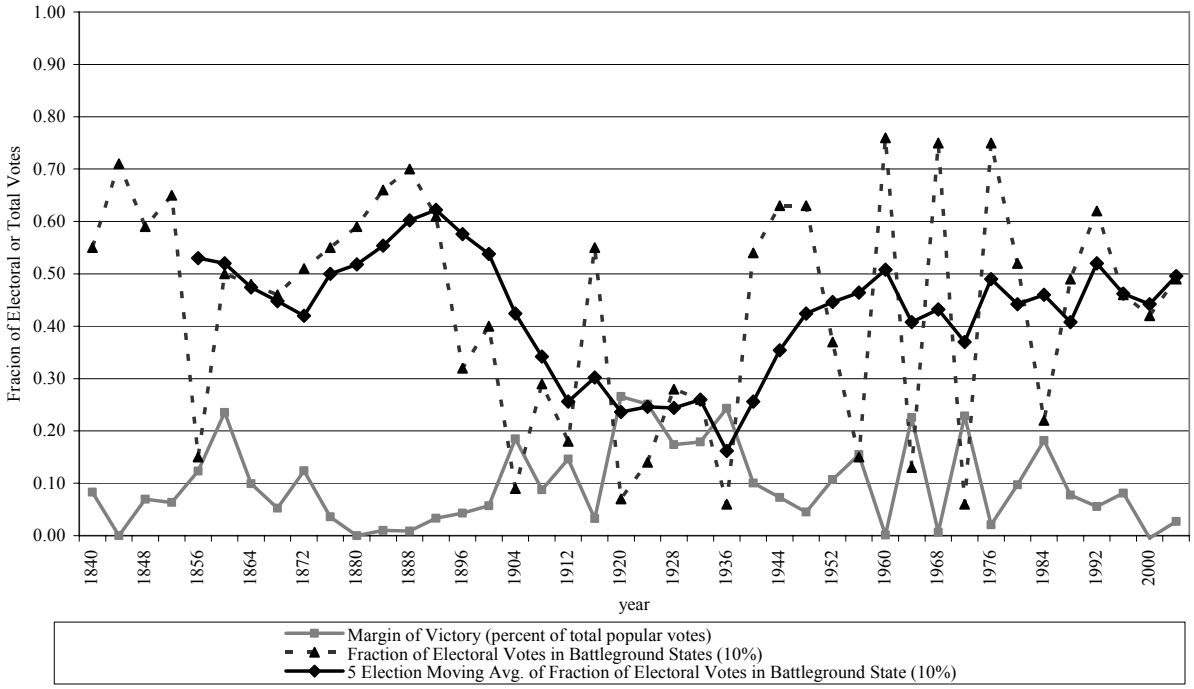
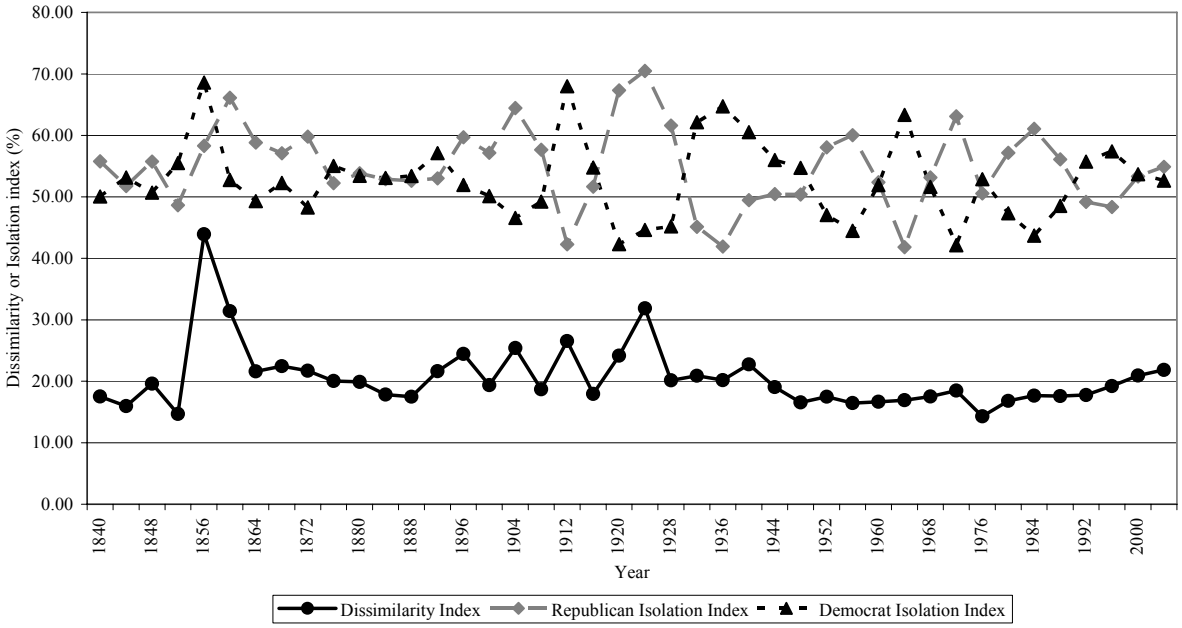
Figure 1 -- Popular Vote Margin of Victory and Share of Electoral Votes in Battleground States (10%) in US Presidential Elections, 1840-2004



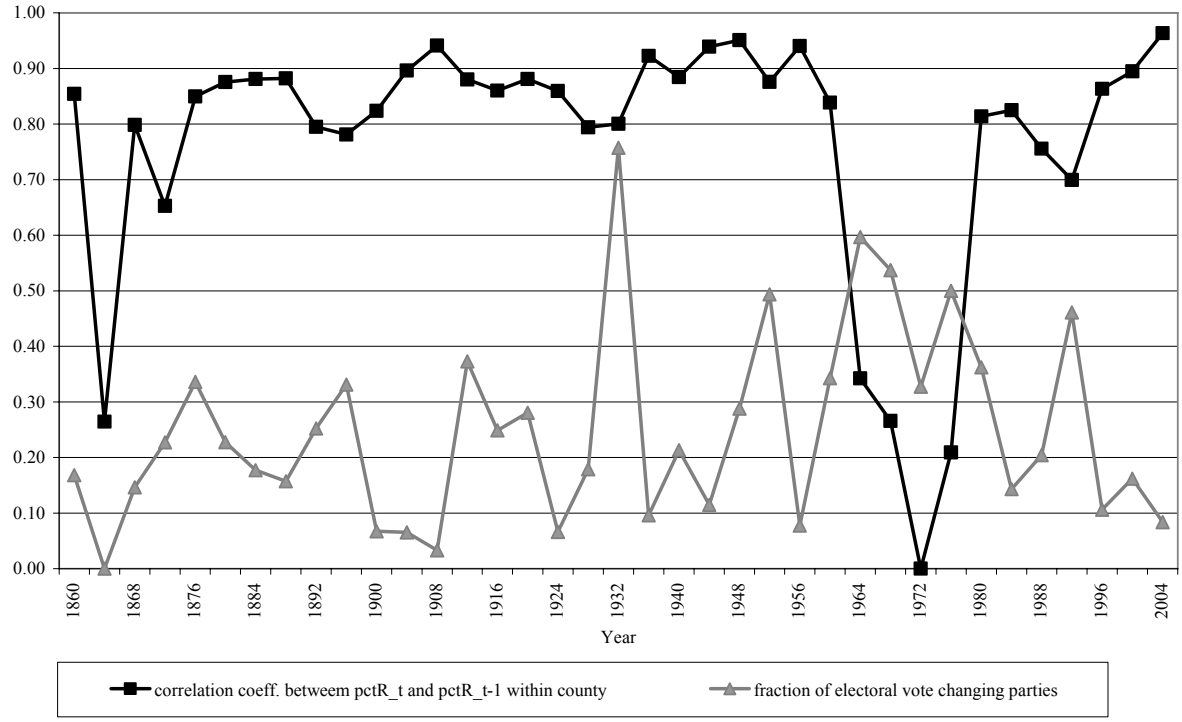
Note: Margin of Victory calculated as |(number of Democratic votes/total votes) - (number of Republican votes/total votes)|, Battleground calculated as (Margin of Victory) ≤ 10%.
Sources: Clubb, et al (2005) 1840-1972; ICPSR (1995) 1972-1988; Dave Leip's Atlas of US Presidential Elections, 1992-2004.

Figure 2 -- County Level Dissimilarity and Isolation Indices for Whig/Republican and Democratic Presidential Votes, 1840-2004



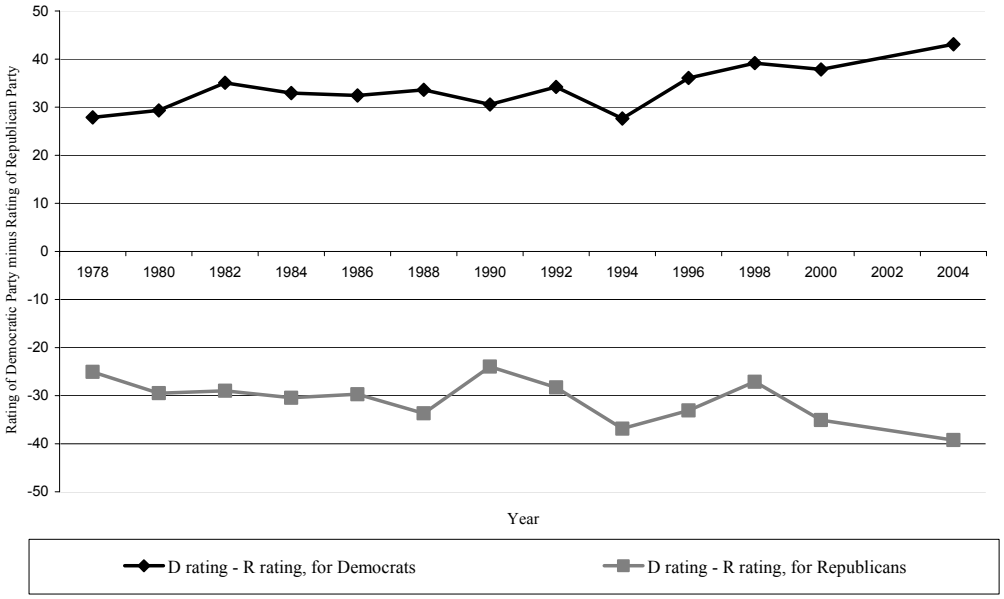
Notes: Dissmilarity index calculated by using: dissmilarity index = (100%)*(1/2) Σ |(total vote Republican in a county/total vote Republican in US) - (total vote Democrat in a county/total vote vote Democrat in US)|, and the summation was over all counties within the United States.
Isolation index calculated by using: isolation index for republicans = (100%) * Σ |(total vote Republican in a county/total vote Republican in US) - (total vote Republican in a county/total vote vote Democrat or republican in a county)|, and the summation was over all counties within the United States. A similar calculation is used for the Democrat isolation index.
Sources: Clubb, et al (2005) 1840-1972; ICPSR (1995) 1972-1988; Dave Leip's Atlas of US Presidential Elections, 1992-2004.

Figure 3 -- Persistence in Presidential Voting, 1860-2004



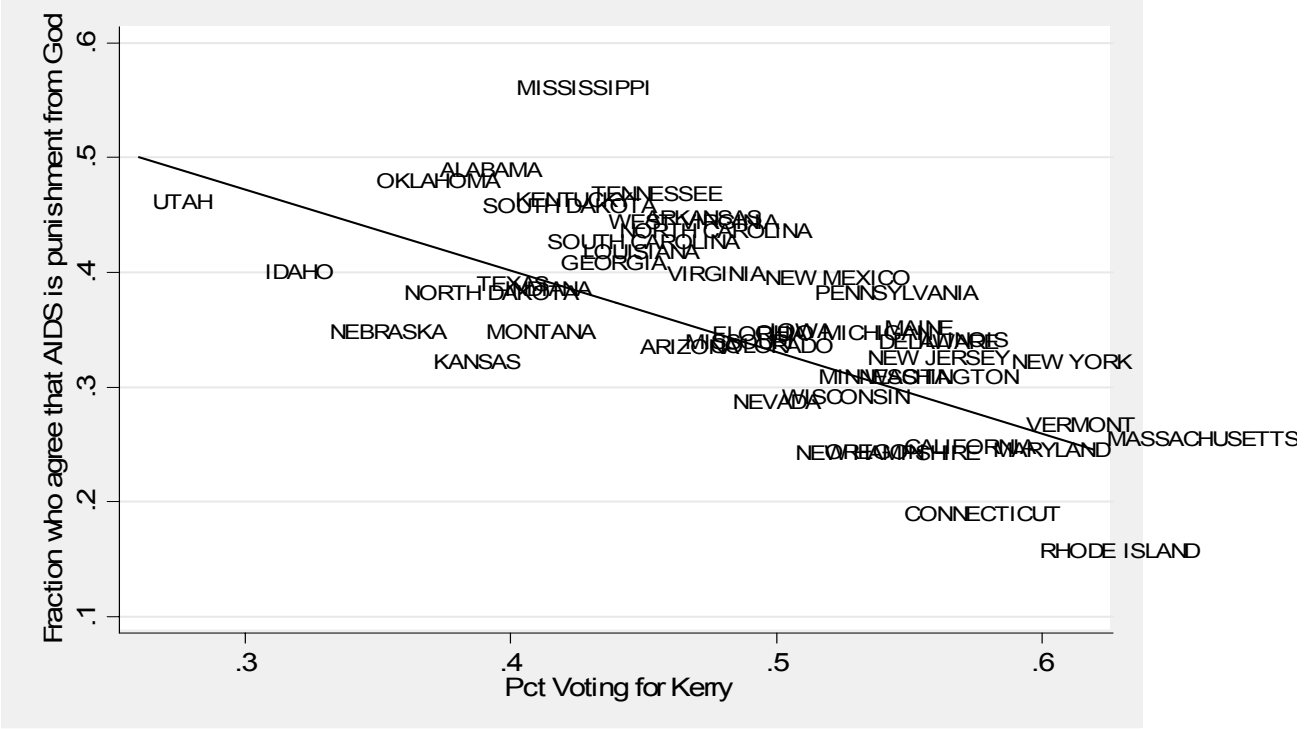
Note: Calculations take into account the change of state electoral votes for each election year.
Sources: Clubb, et al (2005) 1840-1972; ICPSR (1995) 1972-1988; Dave Leip's Atlas of US Presidential Elections, 1992-2004.

Figure 4 -- Political Partisanship, 1978-2004



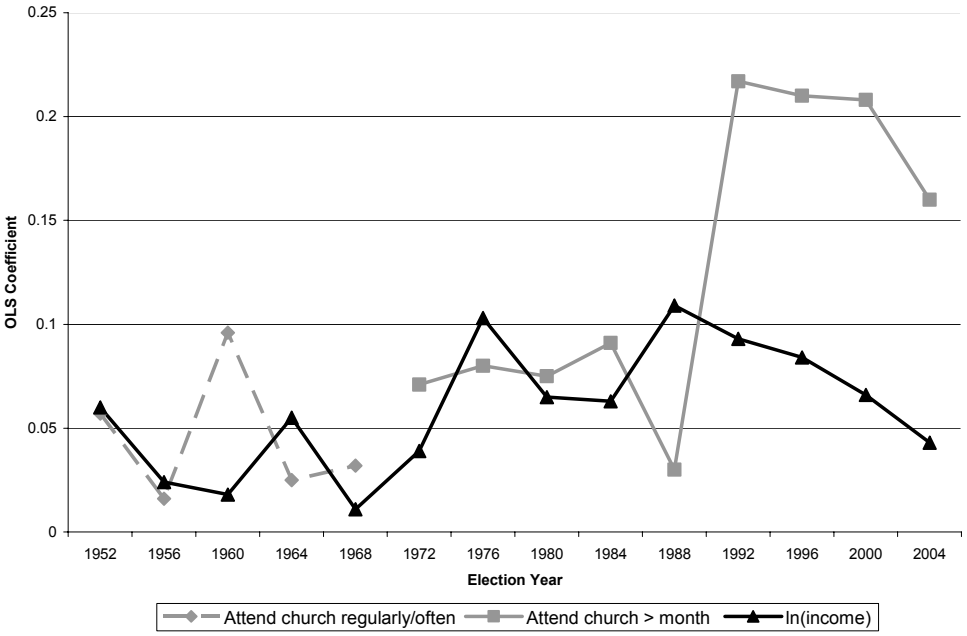
Notes: The party trend lines represent the individuals' thermometer rating of the Democratic Party minus their thermometer rating of the Republican Party averaged by their self-identifed party status.
Sources: American National Election Studies Cumulative Data File, 1948-2002 and 2004 National Election Study

Figure 5 – Correlation between Share Voting for Kerry and Belief that AIDS is Punishment from God.



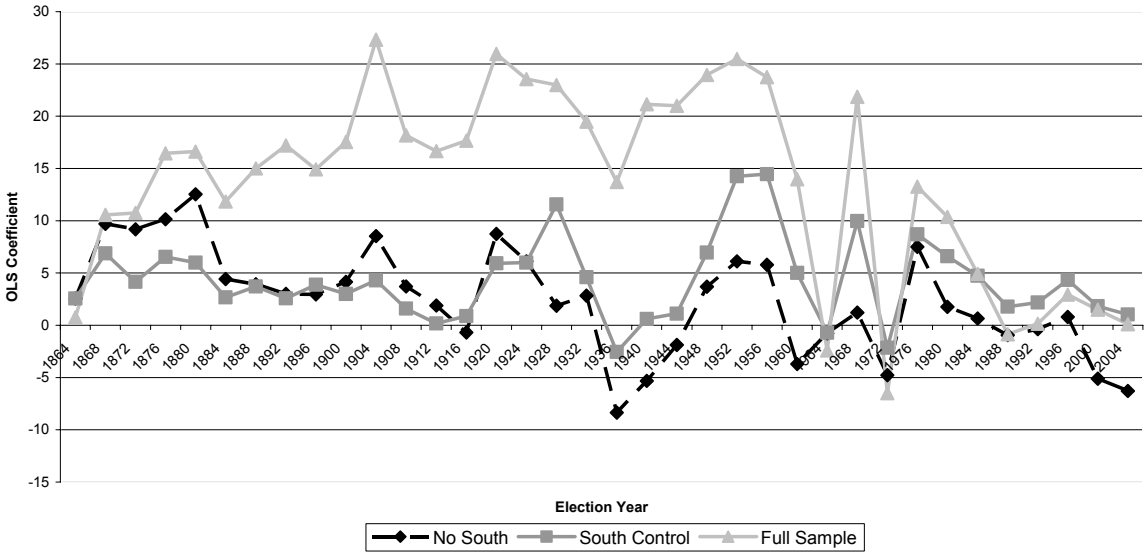
Sources: PEW 1987-2003 Values Survey (combined dataset); Dave Leip's Atlas of Presidential Elections

Figure 6 -- Trends in the Determinants of Voting Republican, 1952-2004



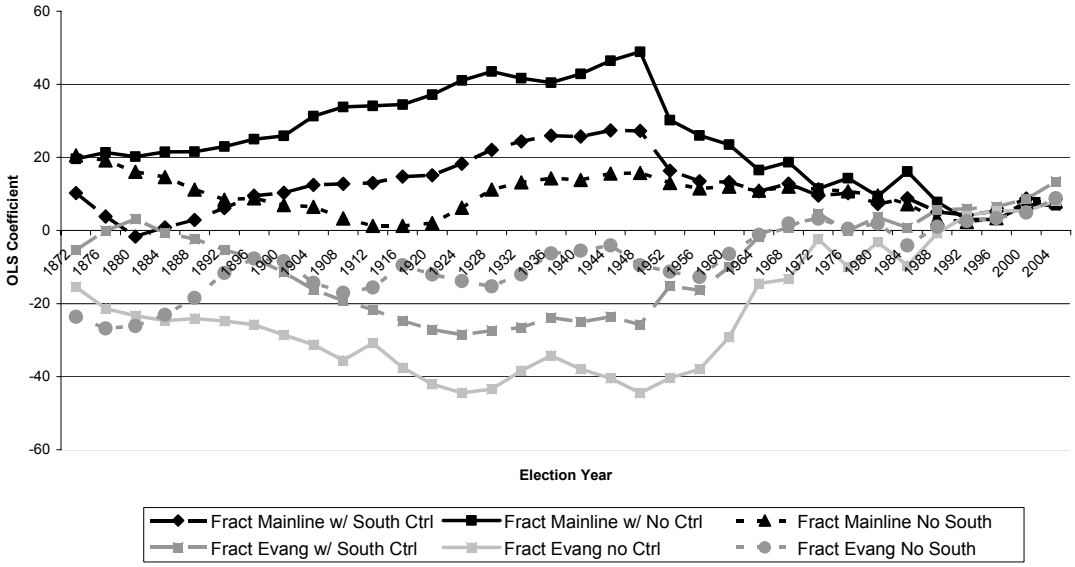
Notes – ANES 1952-2004. Coefficents are from OLS regression of probability of voting R on ln of family income, dummy if attend church more than once a month (or regularly or often for years before 1970), age, age2, race, and a dummy for completing college.

Figure 7 -- Relationship between ln(Median County Income 1950) and Voting Republican



Notes -- Lines represent coefficients from univariate regressions of ln(median county income 1950) on the share voting Republican. For 1912, we use the combined Republican and Progressive percentage.
Sources: Clubb, et al (2005) 1840-1972; ICPSR (1995) 1972-1988; Dave Leip's Atlas of US Presidential Elections, 1992-2004; Haines and ICPSR (2005); Bradley, et al (1992)

Figure 8 -- Relationship between Religion and Voting Republican at the County Level, 1864-2004



Notes -- Lines represent 3-election moving averages of coefficients from univariate regressions on the share voting Republican. Fraction of religious adherents computed for 1890, 1926, 1952, and 1990. Coefficients are computed using the closest year. For 1912, we use the combined Republican and Progressive percentage.
Sources: Clubb, et al (2005) 1840-1972; ICPSR (1995) 1972-1988; Dave Leip's Atlas of US Presidential Elections, 1992-2004; Haines and ICPSR (2005); Bradley, et al (1992)

Table 1 -- Heterogeneity in Beliefs, Behaviors, and Economic Conditions Across States

A: Beliefs -- Fraction of state's respondents who agree with the given statement:

1. State	N	Schools should fire homosexual teachers.
Massachusetts	430	0.23
District of Columbia	74	0.26
Connecticut	272	0.26
Maryland	449	0.27
New Jersey	588	0.29
West Virginia	230	0.54
Oklahoma	261	0.56
Tennessee	514	0.60
Arkansas	226	0.61
Mississippi	283	0.65

2. State	N	It is okay for blacks and whites to date.
Kentucky	339	0.35
West Virginia	230	0.40
Tennessee	497	0.41
South Carolina	322	0.43
Alabama	382	0.46
Oregon	240	0.77
California	1860	0.77
Delaware	58	0.79
Maine	124	0.81
District of Columbia	74	0.88

3. State	N	AIDS is God's punishment for immoral sexual behavior.
Rhode Island	83	0.16
Connecticut	243	0.19
New Hampshire	74	0.24
Oregon	226	0.24
Maryland	375	0.25
Kentucky	309	0.46
Tennessee	438	0.47
Oklahoma	221	0.48
Alabama	364	0.49
Mississippi	232	0.56

4. State	N	The best way to ensure peace is through military strength.
District of Columbia	77	0.36
Vermont	52	0.40
Oregon	257	0.42
Delaware	62	0.42
Minnesota	418	0.47
Idaho	122	0.66
Oklahoma	265	0.68
Mississippi	281	0.69
Arkansas	230	0.70
South Carolina	330	0.73

5. State	N	When something is run by the government, it is usuall inefficient and wasteful.
District of Columbia	77	0.45
Mississippi	292	0.51
Delaware	63	0.57
Nevada	87	0.57
South Carolina	339	0.58
Montana	113	0.72
Nebraska	189	0.72
Arkansas	242	0.74
Oregon	262	0.74
South Dakota	71	0.77

6. State	N	We will all be called before God on Judgement Day to answer for our sins.
Vermont	51	0.53
Rhode Island	96	0.60
Oregon	250	0.63
New Hampshire	88	0.65
Nevada	79	0.67
Tennessee	492	0.92
South Carolina	299	0.93
Oklahoma	247	0.94
Alabama	377	0.94
Mississippi	266	0.95

B: Consumption and Conditions:

7. State	Gallons of wine sold per capita, 2002
West Virginia	0.79
Mississippi	0.89
Oklahoma	1.01
Arkansas	1.05
Iowa	1.07
Massachusetts	4.18
Nevada	4.70
Idaho	4.94
New Hampshire	5.34
District of Columbia	6.49

8. State	2003 Median Household Income
Arkansas	32,002
Mississippi	32,728
West Virginia	32,763
Louisiana	33,507
Montana	34,108
Minnesota	52,823
Virginia	54,783
Connecticut	54,965
New Hampshire	55,567
New Jersey	56,045

Notes: Data for beliefs are from the Pew Values Survey 1987-2003 Merged File. The fraction agreeing is computed by combining individuals who completely or mostly agree and dividing that number by the total number of respondents. Data on wine consumption per capita is from NIH Publication No. 04-5563 (2004). Median household income is from the census.
Sources: PEW 1987-2003 Values Survey (combined dataset); NIH Publication No. 04-5563 (2004); U.S. Census Bureau

Table 2 -- Historical Determinants of State Beliefs and State and County Voting Patterns

	(1)	(2)	(3)	(4)	(5)	(6)		(7)
	AIDS is punishment from God	Schools should fire homosexuals	It is ok for blacks and whites to date	Prayer is important for daily life	Ensure peace thru military strength	Pct Voting for Kerry		Pct Voting for Kerry
Percent of religious aderents evangelical, 1926	0.13	0.11	-0.26	0.13	0.18	-0.014		0.031
	(0.070)*	(0.110)	(0.118)**	(0.067)*	(0.070)**	-0.079		(0.033)
ln(1+percent of population slave in 1850)	-0.01	-0.01	0.02	-0.01	0.00	0.012		0.007
	(0.010)	(0.016)	(0.017)	(0.009)	(0.007)	(0.009)		(0.006)
Percent of population foreign born, 1920	-0.27	-0.50	0.45	-0.34	0.06	0.242		0.413
	(0.118)**	(0.148)***	(0.207)**	(0.147)**	(0.157)	(0.139)*		(.079)***
Share of pop >10 yrs working in Mfg, 1920	-0.28	-0.26	0.04	-0.23	-0.16	0.417		0.42
	(0.060)***	(0.080)***	(0.100)	(0.092)**	(0.068)**	(0.073)***		(.096)***
Constant	0.452	0.535	0.59	0.86	0.574	0.309		0.32
	(0.031)***	(0.034)***	(0.051)***	(0.035)***	(0.040)***	(0.044)***		(.023)***
Observations	47	47	47	47	47	47		2822
R-squared	0.67	0.7	0.58	0.65	0.48	0.56		0.14

Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: All results are from OLS regresstions and exclude Alsaka, Hawaii, and Wyoming.
Sources: PEW 1987-2003 Values Survey (combined dataset) ; Dave Leip's Atlas of Presidential Election; Haines and ICPSR (2005);

Civic Report | No. 66 January 2012

THE END OF THE SEGREGATED CENTURY: Racial Separation in America's Neighborhoods, 1890–2010

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Published by Manhattan Institute

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CENTER FOR STATE AND LOCAL LEADERSHIP
AT THE MANHATTAN INSTITUTE

Executive Summary

Following every census enumeration since 1890, the Census Bureau has released neighborhood-level data on race. This report presents an analysis of the data from 13 consecutive census administrations on the long-run path of racial segregation across American cities. This report extends our previous work on segregation, by incorporating information from the 2010 census, made available to the public in early 2011 (Cutler, Glaeser, and Vigdor, 1999; and Glaeser and Vigdor, 2003). America's cities have been shaped over decades, and even the most recent data need historical perspective to be understood (Logan and Stults, 2011). The main findings follow:

- **The most standard segregation measure shows that American cities are now more integrated than they've been since 1910.** Segregation rose dramatically with black migration to cities in the mid-twentieth century. On average, this rise has been entirely erased by integration since the 1960s.
- **All-white neighborhoods are effectively extinct.** A half-century ago, one-fifth of America's urban neighborhoods had exactly zero black residents. Today, African-American residents can be found in 199 out of every 200 neighborhoods nationwide. The remaining neighborhoods are mostly in remote rural areas or in cities with very little black population.
- **Gentrification and immigration have made a dent in segregation.** While these phenomena are clearly important in some areas, the rise of black suburbanization explains much more of the decline in segregation.
- **Ghetto neighborhoods persist, but most are in decline.** For every diversifying ghetto neighborhood, many more house a dwindling population of black residents.

At its mid-century peak, segregation reflected the operation of both government and market forces. Beginning in the 1930s, federal regulations disfavored the extension of mortgage credit to homeowners in mixed-race neighborhoods. Restrictive covenants prohibited integration in some areas (until the Supreme Court ruled them unenforceable in 1948). Decisions by public housing authorities and other agencies often reinforced existing patterns of segregation.

The decline in segregation can be partly attributed to the reform of these government practices and partly to changes in racial attitudes that can be considered both cause and consequence of policy change. The extension of mortgage credit also appears to have encouraged suburban integration; the list of cities with the largest declines in segregation since 2000 includes several caught up in the subprime housing bubble during the same period.

The decline in segregation carries with it several lessons relevant to public policy debates:

- The end of segregation has not caused the end of racial inequality. Only a few decades ago, conventional wisdom held that segregation was the driving force behind socioeconomic inequality. The persistence of inequality, even as segregation has receded, suggests that inequality is a far more complex phenomenon.
- Access to credit has fostered mobility. At a time when proposed regulations threaten to eliminate the market for lending to marginal borrowers, it is important to recognize that there are costs and benefits associated with tightening credit standards.
- The freedom to choose one's location has helped reduce segregation. Segregation has declined in part because African-Americans left older, more segregated, cities and moved to less segregated Sun Belt cities and suburbs. This process occurred despite some public attempts to keep people in these older areas.

About the Authors

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CONTENTS

The End of the Segregated Century: Racial Separation in America's Neighborhoods, 1890–2010

Edward Glaeser & Jacob Vigdor

INTRODUCTION

Over the past century, residential segregation in the United States has undergone two radical transformations. The first occurred between 1910 and 1960, as African-American migration to cities met with white hostility and produced massive ghettos in almost every major city. The second transformation is still ongoing, according to recently released data from the 2010 census. Segregation has declined steadily from its mid-century peak, with significant drops in every decade since 1970. As of 2010, the separation of African-Americans from individuals of other races stood at its lowest level in nearly a century. Fifty years ago, nearly half the black population lived in what might be termed a "ghetto" neighborhood, with an African-American share above 80 percent. Today, that proportion has fallen to 20 percent.

This report focuses on the pervasive decline in segregation that occurred during the first decade of the twenty-first century. Using the most common segregation index, the dissimilarity index, the separation of blacks from individuals of other races declined in all 85 of the nation's 85 largest metropolitan areas. In 657 out of 658 housing markets tracked by the Census Bureau, segregation is now lower than the average level of segregation marked in 1970.[1] Segregation declined in 522 out of 658 housing markets overall between 2000 and 2010.

Using an alternate measure that focuses on the extent to which blacks are isolated in neighborhoods where few members of other groups live, declines occurred in the nation's 30 largest metropolitan areas. According to the isolation index, declines occurred in 516 out of 658 housing markets. No housing market in the United States today features an isolation level as high as the national average in 1970.

Several factors help to explain the 40-year decline in residential segregation. Federal housing policy has shifted over time, away from actions that promoted or perpetuated segregation and toward actions that diminish segregation. Restrictive covenants and "redlining" are things of the past, and the Fair Housing Act of 1968 made housing-market discrimination illegal. More recently, the demolition of large-scale housing projects in major cities has accelerated a long process of population decline in former ghetto neighborhoods.

Significant shifts in public attitudes toward integration have complemented these official policy changes. The number of American neighborhoods with exactly zero black residents has decreased by more than 90 percent over the past 50 years. The majority of remaining neighborhoods without African-American residents are either in rural areas or metropolitan regions where less than 1 percent of the population is black.

The integration of some ghetto neighborhoods—by immigrants or gentrifying whites—plays only a small role in the overall decline in segregation. The Hispanic population grew in almost every corner of the United States over the past decade, roughly equally in predominantly black and predominantly white neighborhoods. The typical African-American resides in a neighborhood that is 14 percent Hispanic, only slightly higher than the figure for the population as a whole. And for every prominent example of a black neighborhood undergoing gentrification—in Harlem, Roxbury, or Columbia Heights—there are countless more neighborhoods witnessing no such trend. Instead, the dominant trend in predominantly black neighborhoods nationwide has been population loss. Particularly in the formerly hyper-segregated cities of the Northeast and Midwest, ghetto neighborhoods have witnessed profound population declines, as former residents decamp for the suburbs or for the rapidly growing cities of the Sun Belt—where segregation is generally very low.

HOW SEGREGATION IS MEASURED

Residential segregation can be measured in a variety of ways. The most common method is to form an index that summarizes the level of segregation in a metropolitan area on a scale from zero, where every neighborhood is just as diverse as the entire region, to 100, where individuals of different races never share neighborhoods. Indices differ according to their coding of intermediate situations, where neighborhoods are at least somewhat diverse but can nonetheless be categorized by race. Some indices require more detailed geographical data than others, with the most sophisticated using census information collected on a block-by-block basis.

This report focuses on two measures—the dissimilarity index and the isolation index—both of which have a long history in social-scientific writing on segregation. The two measures together adequately summarize segregation, being highly correlated with more sophisticated indices, while being simple enough to calculate that even data from the late nineteenth century are sufficiently rich to permit their computation.

The *dissimilarity index* measures the extent to which two groups are found in equal proportion in all neighborhoods. It can be interpreted as the proportion of individuals of either group that would have to change neighborhoods in order to achieve perfect integration. It is the most commonly used segregation measure, first introduced into the sociology literature shortly after World War II.

Dissimilarity is not a perfect measure. Consider the following scenario. There are two equal-size neighborhoods in a city: one is 100 percent white; and the other is 98 percent white and 2 percent black. According to the dissimilarity index, this city is fairly segregated, since about half of the black residents

would need to move in order to achieve perfect integration. In an important sense, though, the black residents are not isolated—after all, they live in a neighborhood that is 98 percent white.

The *isolation index* is designed to distinguish this sort of scenario from one where neighborhoods have dramatically different racial character. It measures the tendency for members of one group to live in neighborhoods where their share of the population is above the citywide average. In this hypothetical example, black residents live in a neighborhood that is 2 percent black, which is just 1 percentage point higher than what would be expected under perfect integration. The isolation index would therefore be on the order of 1 percent, rather than 50 percent.

Both indices require us to define a couple of terms. We must define a neighborhood and define the relevant collection of neighborhoods that together form a common housing market. In practice, both definitions are based on basic census geography. For purposes of this report, a neighborhood is defined as a *census tract*. In 2010, there were 72,531 census tracts in the United States, containing an average of 4,256 people. Not all census tracts are of equal population: in 2010, the largest tract corresponded to the Marine Corps base at Camp Pendleton near San Diego, and counted more than 37,000 residents. About 90 percent of the time, the population of a census tract varies between 1,500 and 7,500.

A housing market in this study corresponds to a Core Based Statistical Area (CBSA), as defined by the Office of Management and Budget. A CBSA is a collection of counties corresponding to a metropolitan or "micropolitan" area. There are 942 CBSAs in the United States. The largest, corresponding to the New York metropolitan area, comprises one county in eastern Pennsylvania, 12 counties in northern New Jersey, the five boroughs, and five suburban counties in New York, and counts nearly 19 million residents. The smallest, covering the city of Tallulah and Madison Parish in northeast Louisiana, counts only 12,000 residents. Approximately 20 million Americans live in rural areas not included in any CBSA. This report presents information on segregation only in CBSAs that count at least 1,000 black residents, as segregation indices have little meaning when the black population is minute.

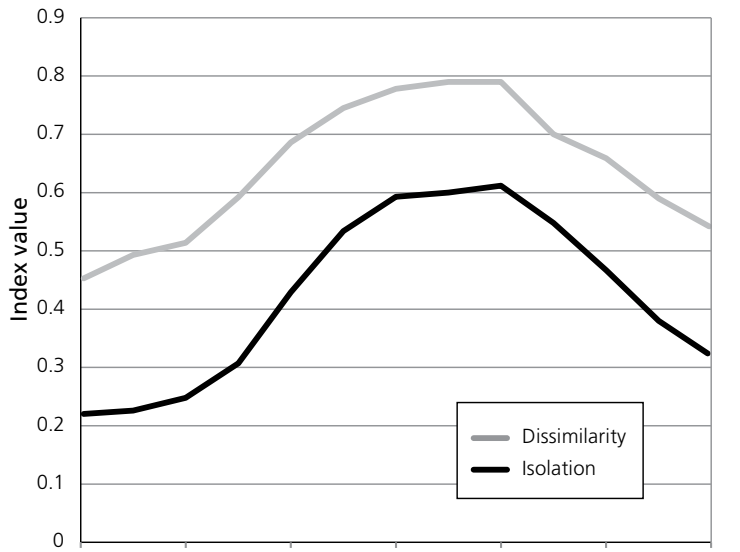
The concept of a CBSA did not exist as of 2000. This report includes information on segregation in both 2000 and 2010, using the CBSA definitions as amended by OMB on December 1, 2009.

Finally, segregation can be measured only after segmenting the population into two groups. In the case of racial segregation, this is not a trivial matter. Since 2000, the Census Bureau has permitted individuals to describe themselves as belonging to more than one racial category. As the overwhelming majority of respondents select exactly one category, this report will consider the segregation of African-Americans, counting only those individuals who identify themselves as African-American alone. Segregation indices computed using a more inclusive definition of African-American are nearly identical to the ones reported here (Glaeser and Vigdor, 2003). The indices reported here therefore describe the residential separation of blacks from both multiracial individuals and those of any other race.

THE DECLINE IN SEGREGATION, 2000–2010

The dissimilarity and isolation indices can be computed using data from every census since 1890. Figure 1 reports average segregation levels—as experienced by the "average" urban black resident—for the 120-year span between 1890 and 2010. In the late nineteenth and early twentieth centuries, prior to the Great Migration of blacks from the rural South to urban areas, segregation was comparatively modest. Between 1910 and 1960, blacks moved to urban areas in vast numbers. Upon arriving, they often encountered legal obstacles in their choice of neighborhood, ranging from restrictive deed covenants (enforced until the late 1940s), federally sponsored redlining in mortgage lending, and outright discrimination by landlords, real-estate agents, or local public housing authorities. As a consequence, segregation rose dramatically. By mid-century, the

Figure 1. Black/Nonblack Segregation 1890–2010



typical urban African-American lived in a city where 80 percent of the black population would have to move in order to achieve integration and in a neighborhood where the black share exceeded the citywide average by roughly 60 percentage points.

The decline in segregation since 1970 has been no less dramatic than the earlier rise. As of 2010, dissimilarity had declined to its lowest level in a century and isolation to its lowest level in 90 years. This shift does not mean that segregation has disappeared: the typical urban African-American lives in a housing market where more than half the black population would need to move in order to achieve complete integration. The average African-American lives in a neighborhood where the share of population that is black exceeds the metropolitan average by roughly 30 percentage points.

Table 1 shows the dissimilarity and isolation index values for the nation's ten largest metropolitan areas as of 2010. Using either index, segregation declined in all ten between 2000 and 2010. Chicago, long one of the nation's most segregated cities, posts the highest dissimilarity and isolation levels in the group. Yet these levels are still significantly below the mid-century peak: as recently as 1970, dissimilarity in the Chicago area topped 90 percent.

Over the last decade, Chicago had the second-largest declines in dissimilarity and isolation among this top-ten group (after Houston), which illustrates a more natural trend where more segregated areas had the sharpest declines in segregation. If an area's dissimilarity index was 10 percentage points higher in 2000, on average its dissimilarity index declined by 1.3 percentage points more between 2010 and 2000.

According to the dissimilarity index, Dallas and Houston are the least segregated large cities; Los Angeles boasts the lowest isolation index value. Houston experienced the largest declines in both isolation and dissimilarity. All three regions share common characteristics: they are Sun Belt metropolises that exhibited significant population growth in the fair-housing era; and they are centers of immigration, particularly from Mexico and other parts of Latin America.

Declines in segregation have long been stronger in metropolitan areas that were growing more quickly. Between 2000 and 2010, holding initial dissimilarity constant, we find that if a metropolitan

Table 1. Segregation in the Nation's 10 Largest Metropolitan Areas, 2000–2010				
	Dissimilarity		Isolation	
	2000	2010	2000	2010
New York	68.7	64.7	47.6	42.4
Los Angeles	58.4	54.5	26.8	22.0
Chicago	77.9	71.9	65.9	57.5
Dallas-Ft. Worth	53.7	47.5	30.4	23.4
Philadelphia	67.0	62.6	50.5	44.6
Houston	56.0	47.8	34.0	24.3
Washington	59.7	56.1	44.0	39.1
Miami	63.6	58.1	42.8	37.7
Atlanta	61.0	54.1	45.4	37.8
Boston	62.6	57.6	32.0	26.8

area's population grew by 20 percent more between 2000 and 2010, its dissimilarity index dropped by 1.2 percentage points more.

Declines in segregation were not confined to the nation's largest metropolitan areas. Of the 628 housing markets for which segregation can be calculated in both 2000 and 2010, dissimilarity and isolation increased in only 95. Table 2 identifies the ten largest areas with increases in segregation between 2000 and 2010. The list begins with Boise, Idaho, a rapidly growing metropolitan area with slightly more than 600,000 residents in 2010. While dissimilarity and isolation both increased in Boise over the decade, the indices remain at remarkably low levels—the isolation index, in particular, remains under 1 percent.

The list continues with cities drawn primarily from the northern part of the United States. In all ten, dissimilarity and isolation in 2010 lie significantly below the national average; isolation exceeds 10 percent in only one. It should also be noted that the black share of the population is under 4 percent in all but one of these cities. The Ann Arbor area is the only region on this list with more than 10,000 black residents.

While increases in segregation tended to be confined to small cities with insignificant black populations, large decreases can be found in some of the nation's largest metro areas. Table 3 lists the 15 regions with declines in dissimilarity exceeding 10 percentage points between 2000 and 2010. While the markets at the top of the list

Table 2. The Largest Cities with Increases in Segregation, 2000–2010					
City (CBSA)	2010 population	Dissimilarity		Isolation	
		2000	2010	2000	2010
Boise, ID	616,561	25.6	28.4	0.2	0.7
Portland, ME	514,098	41.5	50.7	1.7	5.1
Manchester, NH	400,721	37.6	39.1	1.2	2.2
Ann Arbor, MI	344,791	50.4	53.0	21.1	21.5
San Luis Obispo, CA	269,637	49.5	51.0	18.6	8.2
Greeley, CO	252,825	28.7	34.0	0.5	1.2
Binghamton, NY	251,725	49.4	49.7	5.0	6.2
Sioux Falls, SD	228,621	40.5	46.5	1.4	4.5
Burlington, VT	211,261	34.1	40.4	0.9	2.4
Lafayette, IN	201,789	32.8	33.3	1.4	2.8

Table 3. Cities with the Largest Declines in Dissimilarity, 2000–2010			
City (CBSA)	2000	2010	Change
York, PA	67.8	47.7	-20.1
Fort Pierce, FL	56.9	40.9	-15.9
Hagerstown, MD	54.4	39.7	-14.7
Fayetteville, AR	52.6	38.2	-14.4
Sarasota, FL	64.1	50.3	-13.8
Reading, PA	53.4	40.6	-12.9
Fort Wayne, IN	68.6	56.4	-12.2
Fort Myers, FL	65.6	54.5	-11.1
Kansas City, MO	68.6	57.7	-10.9
Asheville, NC	58.4	47.5	-10.9
Detroit, MI	84.2	73.5	-10.7
Naples, FL	54.8	44.1	-10.7
Lakeland, FL	50.1	39.7	-10.5
Tampa, FL	60.9	50.4	-10.5
Ogden, UT	38.8	28.4	-10.4

are modest in size, the list also contains Kansas City, Detroit, and Tampa. The presence of Detroit, long one of the nation's most segregated cities, foreshadows one important reason for the half-century decline in segregation: the depopulation of former ghetto neighborhoods.

Notably, the list of cities with significant drops in segregation includes five smaller metropolitan areas in Florida, including several that are often included in lists of regions heavily affected by the housing bubble of the past decade. This foreshadows yet another partial explanation for the decline in segregation over the past decade.

As a final exercise, Table 4 shows the long-run trajectory of the ten most segregated areas in 1970 still in existence in 2010.[2] Unsurprisingly, dissimilarity has declined in each of them. In some cases, segregation has declined dramatically. Los Angeles, Oklahoma City, and Wichita have all receded from dissimilarity levels of about 90 percent to levels at or below the national average. The greatest declines have occurred closer to the Sun Belt; segregation in the Rust Belt

Table 4. Long-run Segregation Trends in the Nation's Most Segregated Cities			
City	Dissimilarity		
	1970 (SMSA)	2010 (CBSA)	Change
Chicago, IL	91.1	71.9	-19.2
Cleveland, OH	90.5	71.5	-19.0
Oklahoma City, OK	90.3	48.7	-41.6
Milwaukee, WI	89.9	77.7	-12.2
Detroit, MI	89.0	73.5	-15.5
Los Angeles, CA	88.4	54.5	-33.9
Wichita, KS	88.2	52.8	-35.4
Dayton, OH	87.7	65.6	-22.1
Kansas City, MO	87.5	57.7	-29.8
Waterloo, IA	87.5	61.6	-25.9

cities of Chicago, Cleveland, Detroit, and Milwaukee has declined more slowly—and, as we have seen, much of the decline in Detroit occurred only in the last ten years.

WHY HAS SEGREGATION DECLINED?

The turning point in the history of American residential segregation occurred around 1970. In our past work, we presented evidence supporting the view that the rise in segregation between 1900 and 1960 reflected, in part, a maze of barriers, such as restrictive covenants, that limited African-American choices. We also presented evidence suggesting that the decline in segregation reflected the dismantling of these barriers to African-American freedom.

The successful fight for housing freedom began with the Supreme Court ruling against raced-based zoning in 1917 (*Buchanan* v. *Warley*) and against using public resources to enforce racial deed covenants in 1948 (*Shelley* v. *Kraemer*). New York City officially banned housing discrimination in its 1958 Fair Housing Practices Law, and the nation followed suit with the 1968 Fair Housing Act. The years since 1970 have seen the demolition of segregated high-rise housing projects.

In the era of legal housing discrimination, restrictions on the housing choices of African-Americans led to price premiums for ghetto housing. As the legal and social restrictions on these choices subsided, housing prices in ghettos collapsed as the neighborhoods depopulated. In some limited cases, former ghetto neighborhoods have enjoyed a population resurgence fueled by the introduction—or reintroduction—of other racial and ethnic groups.

African-American suburbanization and the near-eradication of the all-white neighborhood

In 1960, the Census Bureau divided the metropolitan portions of the United States into 22,688 census tracts. Of these, more than 20 percent—4,700—had exactly zero black residents. In the half-century since 1960, even as the number of census tracts has nearly tripled to 72,531, the number of tracts with zero black residents has declined to 424. Even as recently as 2000, there were 902 such neighborhoods nationwide. So even in the past decade alone, the number of tracts without black residents has been halved.

It is difficult to locate neighborhoods without black residents in metropolitan America. Of the 424 tracts with no black residents, more than half are either in rural areas or in CBSAs where less than 1 percent of the population is African-American. There are more neighborhoods without black residents in the Dakotas than in California, in spite of the fact that the former have less than 5 percent of the latter's population. Every single census tract in Connecticut, Maryland, and New Hampshire has at least one black resident. Excluding regions of the country that had virtually no African-Americans to start with, as well as the 25 neighborhoods that have no blacks but are simultaneously majority non-Anglo white, there are a total of 170 remaining all-white neighborhoods. In 50 years, the proportion of these neighborhoods has declined from one in five to one in 427. Over the same period, the proportion of African-Americans residing in majority-nonblack areas has nearly doubled, from 29.7 percent to 58.5 percent.

Many of the former all-white neighborhoods were in suburbs, and such areas now typically contain at least a small number of African-Americans. While it may be tempting to see the overwhelmingly white nature of many suburbs as evidence of stagnation or stasis, the presence of even modest numbers of African-Americans in suburbs demonstrates the remarkable change in American society. Indeed, measured by dissimilarity indices, suburbs are often among the most integrated parts of America.

The easing of credit standards in the early part of the decade permitted many moderate-income African-American families access to neighborhoods that would have otherwise been out of their financial reach. While some of these families would go on to become delinquent on their loans after the housing bubble burst, a larger share managed to keep up on their payments, thereby maintaining their foothold. Yet African-American suburbanization is a long-run trend that long predates the subprime lending boom (Cutler,

Glaeser, and Vigdor, 1999). While Table 3 documents that several of the metropolitan areas with the greatest declines in segregation are also areas associated with significant exposure to the subprime mortgage market, it is also true that several metro areas with significant subprime exposure—such as Miami and Las Vegas—appear to have followed fairly unremarkable segregation trajectories over the past decade.

As of this writing, turmoil in the American housing market had not yet fully subsided, so we cannot know the full extent of the bubble's impact on segregation. The data used for this report reflect the location of the population as of April 1, 2010, several years after the housing bubble burst, and the data are well in line with 30 years of segregation decline. The decline in segregation over the past decade spread broadly over areas with and without significant housing bubbles.

Depopulation of the ghetto

Figure 1 shows that dissimilarity declined by 25 percentage points between 1970 and 2010. Only a handful of individual cities experienced declines that large, however. Table 4 shows declines of that magnitude only in five of the ten most segregated cities of 1970. As of that year, the nation's largest black population belonged to New York; the dissimilarity index has declined by less than 10 points in that area between 1970 and the present. How could segregation decline so much nationwide if the decline in individual areas was so modest?

The answer lies in interregional migration. In addition to moving from cities to suburbs in large numbers, blacks—along with members of every other racial and ethnic group—relocated toward the Sun Belt and away from the more segregated areas of the Northeast and Midwest. On average, metropolitan-area population growth decline by 1.8 percent more if the area had a 10-percentage-point higher dissimilarity index as of 2000.

Table 5 shows the list of ten metropolitan areas with the largest black populations in 1970 and 2010. In 1970, only two true Sun Belt cities—Los Angeles and Houston—appear on the list. In 2010, fully half the cities on the list are in the Sun Belt. Atlanta, which would have placed 13th in terms of black population in 1970, had risen to number two on the list by 2010. Miami and Dallas have also joined the list. Notably, these cities were not particularly integrated as of 1970. Integration has accompanied growth, partly through the process of neighborhood change but largely by the establishment of new neighborhoods with an inherently integrated character.

Table 5. Segregation in the Largest Cities by African-American Population, 1970 & 2010

City	Rank in African-American Pop.		Dissimilarity		Isolation	
	1970	2010	1970	2010	1970	2010
New York, NY	1	1	73.7	64.7	52.0	42.4
Chicago, IL	2	3	91.1	71.9	82.6	57.5
Philadelphia, PA	3	5	78.0	62.6	61.5	44.6
Los Angeles, CA	4	10	88.4	54.5	68.5	22.0
Detroit, MI	5	8	89.0	73.5	75.3	61.0
Washington, D.C.	6	4	81.1	56.1	70.4	39.1
Baltimore, MD	7	11	81.1	62.2	71.7	47.1
Houston, TX	8	7	78.1	47.8	61.2	24.3
St. Louis, MO	9	14	85.1	71.0	72.6	53.8
Cleveland, OH	10	16	90.5	71.5	78.6	56.0
Atlanta, GA	13	2	82.1	54.1	72.4	37.8
Miami, FL	18	6	86.0	58.1	72.6	37.7
Dallas-Ft. Worth, TX	16	9	86.9	47.5	75.5	23.4

Holding segregation fixed at 2010 levels, redistributing the black population to its location in 1970 would add about five points to mean dissimilarity and six points to mean isolation. Thus, interregional migration alone—the depopulation of cities with the most significant ghettos at mid-century—can explain about a fifth of the decline in segregation since 1970.

The depopulation of ghettos has been driven not only by the "pull" factors of suburbanization and Sun Belt weather but also by the reversal of past public housing policy. Massive housing projects built at the peak of urban segregation, such as Chicago's Robert Taylor Homes, were demolished over the past decade—following on the earlier destruction of other notorious projects, including St. Louis's Pruitt-Igoe complex. The Robert Taylor Homes were constructed with an express purpose of perpetuating segregation, separated from traditionally white neighborhoods on Chicago's South Side by the massive Dan Ryan Expressway. The high-rise project occupied several census tracts; one of these tracts registered 1,532 residents in 2000—99.1 percent of them African-American—and exactly zero in 2010. More broadly, the set of census tracts with black shares of higher than 80 percent experienced an average population decline of 3.6 percent over the past decade—even as the nation's population grew by nearly 10 percent. The number of such tracts declined as well—for reasons to be discussed below.

The demolition of mid-century housing projects has not been without controversy. Removing these massive monuments to officially condoned segregation does seem to have accelerated the process of integration.

Inroads into the ghetto

At mid-century, during the peak decades of black migration, existing neighborhoods in numerous cities "tipped" rapidly from predominantly white to predominantly black. Migration to the Rust Belt slowed significantly after 1965, as manufacturing employment reached its historic peak. Through subsequent periods of decline and renewal, it has been very uncommon for black neighborhoods, once "tipped," to "un-tip." Depopulation, rather than subsequent ethnic or racial change, has been the dominant demographic change in the ghetto since 1970.

Nonetheless, in certain cities, integration has occurred in predominantly black neighborhoods. Washington, D.C.'s Navy Yard neighborhood has witnessed rapid change, from 95 percent black in 2000 to 31 percent black in 2010, as redevelopment led to a 50 percent increase in population.[3] A more gradual process of racial change is occurring in the city's northwest quadrant, where several neighborhoods have seen a 25 percent drop in the proportion of black residents over the past decade.[4] This area represents the forefront of a wave of gentrification that began in Georgetown some decades ago and has crept steadily eastward since.

The "untipping" of a handful of neighborhoods near the city center is accompanied by the more numerous regions of African-American Washington where no trace of gentrification exists. In 2000, the District of Columbia contained 17 census tracts—with 46,796 inhabitants among them—that were more than 98 percent black. As of 2010, every single one of them remained more than 95 percent black. Gentrification in Washington, as elsewhere, has occurred primarily at the fringe of the ghetto.

Since 1990, cities in regions with little previous history of immigration have witnessed substantial inflows of foreign-born residents—a majority of them from Latin America. These immigrants can be found in almost every type of neighborhood—99.8 percent of the populated census tracts in the country have at least one resident who claims Hispanic ethnicity. It is therefore not surprising that Hispanics have made inroads into predominantly black neighborhoods.

The forefront of integration between blacks and Hispanics can be found in cities such as Charlotte, North Carolina, which is located in Mecklenburg County, a county that contains 223 census tracts, with 20 of them at least one-quarter black and one-quarter Hispanic. One might be tempted to attribute any drop in segregation in the Charlotte region to the phenomenon of Hispanics moving into predominantly black neighborhoods.

Yet several pieces of information are inconsistent with this hypothesis. Segregation declined only modestly in Charlotte over the past decade—by three points on the dissimilarity index, and five on isolation.

Hispanics did not move into the most African-American neighborhoods. Eight of Mecklenburg County's census tracts were at least 80 percent black in 2000; all of them remained in that category as of 2010.

The Hispanic influx into Charlotte concentrated on areas that were already at least somewhat integrated; none of the neighborhoods counted among the 20 with black and Hispanic representation were more than 65 percent black in 2000. In fact, each of the 20 tracts was at least 13 percent Hispanic by 2000.

The story of integration in Charlotte thus does not hinge on the entry of Hispanics into areas that had been exclusively black. A more familiar story of black entry into suburban neighborhoods plays a stronger role. The proportion of Mecklenburg County census tracts with fewer than 5 percent black residents declined from 46 percent to 39 percent between 2000 and 2010.

In summary, gentrification and immigration have made some contribution to the decline in segregation over the past decade. They are relatively minor factors, however. The raw number of predominantly black neighborhoods, with at least 80 percent black residents, declined by only 7 percent between 2000 and 2010. The raw number of neighborhoods without any black residents, by contrast, declined 53 percent over the same period.

CONCLUSION

The 1960s were the heyday of racial segregation. During those years, segregation seemed a likely cause of many of the troubles afflicting African-Americans. Segregation was so enormous, and so unfair, that it seemed to create a separate and unequal experience for African-Americans everywhere. During those years, the fight against housing segregation seemed to offer the possibility that once the races mixed more readily, all would be well.

Forty years later, we know that this dream was a myth. There is every reason to relish the fact that there is more freedom in housing today than 50 years ago and to applaud those who fought to create that change. Yet we now know that eliminating segregation was not a magic bullet. Residential segregation has declined pervasively, as ghettos depopulate and the nation's population center shifts toward the less segregated Sun Belt. At the same time, there has been only limited progress in closing achievement and employment gaps between blacks and whites.

The difficult lesson of these decades is that society is complicated and single solutions rarely solve everything. While the decline in segregation remains good news, far too many Americans still lack the opportunity to achieve meaningful success.

Endnotes

1. The sole exception is the Sault Ste. Marie, Michigan, area, where the presence of a majority-black state correctional facility in what is otherwise a fairly homogeneous community skews the segregation measure significantly.

2. Excluded from the list are areas absorbed into other CBSAs: Fort Lauderdale, Florida; Gary, Indiana; and Fort Worth, Texas.

3. Census tract 72, District of Columbia.

4. Census tracts 46, 48.01, 48.02, and 49.01, District of Columbia.

Appendix. Segregation by Geographic Area, 2000–2010

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Abbeville LA Micropolitan Statistical Area	10020	0.449	0.462	0.209	0.212
Abilene TX Metropolitan Statistical Area	10180	0.371	0.407	0.078	0.074
Adrian MI Micropolitan Statistical Area	10300	0.539	0.588	0.054	0.049
Akron OH Metropolitan Statistical Area	10420	0.583	0.651	0.327	0.391
Alamogordo NM Micropolitan Statistical Area	10460	0.344	0.321	0.023	0.025
Albany GA Metropolitan Statistical Area	10500	0.504	0.535	0.328	0.366
Albany-Schenectady-Troy NY Metropolitan Statistical Area	10580	0.585	0.607	0.250	0.265
Albemarle NC Micropolitan Statistical Area	10620	0.446	0.453	0.129	0.138
Albertville AL Micropolitan Statistical Area	10700	0.402	0.488	0.042	0.066
Albuquerque NM Metropolitan Statistical Area	10740	0.243	0.268	0.011	0.014
Alexander City AL Micropolitan Statistical Area	10760	0.378	0.423	0.168	0.192
Alexandria LA Metropolitan Statistical Area	10780	0.592	0.616	0.397	0.424
Allegan MI Micropolitan Statistical Area	10880	0.452	0.473	0.016	0.021
Allentown-Bethlehem-Easton PA-NJ Metropolitan Statistical Area	10900	0.418	0.480	0.057	0.055
Alma MI Micropolitan Statistical Area	10940	0.775	0.797	0.363	0.358
Altoona PA Metropolitan Statistical Area	11020	0.425	0.492	0.021	0.025
Altus OK Micropolitan Statistical Area	11060	0.330	0.350	0.046	0.059
Amarillo TX Metropolitan Statistical Area	11100	0.485	0.575	0.156	0.240
Americus GA Micropolitan Statistical Area	11140	0.295	0.231	0.115	0.079
Ames IA Metropolitan Statistical Area	11180	0.322	0.325	0.014	0.013
Anchorage AK Metropolitan Statistical Area	11260	0.373	0.395	0.036	0.044
Anderson IN Metropolitan Statistical Area	11300	0.545	0.588	0.207	0.256
Anderson SC Metropolitan Statistical Area	11340	0.405	0.408	0.179	0.184
Ann Arbor MI Metropolitan Statistical Area	11460	0.530	0.504	0.215	0.211
Anniston-Oxford AL Metropolitan Statistical Area	11500	0.441	0.486	0.257	0.301
Appleton WI Metropolitan Statistical Area	11540	0.362	n/a	0.010	n/a
Arcadia FL Micropolitan Statistical Area	11580	0.509	0.266	0.230	0.055
Ardmore OK Micropolitan Statistical Area	11620	0.456	0.486	0.077	0.103
Arkadelphia AR Micropolitan Statistical Area	11660	0.280	0.218	0.068	0.043
Asheville NC Metropolitan Statistical Area	11700	0.475	0.584	0.120	0.221
Ashtabula OH Micropolitan Statistical Area	11780	0.495	0.458	0.074	0.075
Athens-Clarke County GA Metropolitan Statistical Area	12020	0.380	0.414	0.159	0.210
Athens OH Micropolitan Statistical Area	11900	0.289	0.270	0.022	0.016
Athens TN Micropolitan Statistical Area	11940	0.338	0.381	0.041	0.046
Athens TX Micropolitan Statistical Area	11980	0.454	0.470	0.076	0.090
Atlanta-Sandy Springs-Marietta GA Metropolitan Statistical Area	12060	0.541	0.610	0.378	0.454
Atlantic City-Hammonton NJ Metropolitan Statistical Area	12100	0.508	0.578	0.262	0.357
Auburn-Opelika AL Metropolitan Statistical Area	12220	0.330	0.376	0.153	0.202
Auburn NY Micropolitan Statistical Area	12180	0.581	0.628	0.123	0.206
Augusta-Richmond County GA-SC Metropolitan Statistical Area	12260	0.440	0.433	0.246	0.250

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Austin-Round Rock-San Marcos TX Metropolitan Statistical Area	12420	0.382	0.422	0.078	0.133
Bainbridge GA Micropolitan Statistical Area	12460	0.312	0.318	0.107	0.115
Bakersfield-Delano CA Metropolitan Statistical Area	12540	0.401	0.426	0.065	0.079
Baltimore-Towson MD Metropolitan Statistical Area	12580	0.622	0.666	0.471	0.529
Bangor ME Metropolitan Statistical Area	12620	0.337	n/a	0.006	n/a
Barnstable Town MA Metropolitan Statistical Area	12700	0.302	0.357	0.017	0.017
Bartlesville OK Micropolitan Statistical Area	12780	0.311	0.429	0.033	0.061
Bastrop LA Micropolitan Statistical Area	12820	0.444	0.448	0.261	0.271
Batavia NY Micropolitan Statistical Area	12860	0.415	0.441	0.023	0.030
Baton Rouge LA Metropolitan Statistical Area	12940	0.559	0.595	0.390	0.424
Battle Creek MI Metropolitan Statistical Area	12980	0.544	0.597	0.226	0.291
Bay City MI Metropolitan Statistical Area	13020	0.417	0.444	0.023	0.027
Bay City TX Micropolitan Statistical Area	13060	0.381	0.300	0.114	0.130
Beaumont-Port Arthur TX Metropolitan Statistical Area	13140	0.585	0.641	0.379	0.446
Beaver Dam WI Micropolitan Statistical Area	13180	0.711	0.794	0.117	0.168
Beckley WV Micropolitan Statistical Area	13220	0.523	0.485	0.126	0.134
Beeville TX Micropolitan Statistical Area	13300	0.617	0.483	0.153	0.087
Bellingham WA Metropolitan Statistical Area	13380	0.199	0.211	0.003	0.002
Bennettsville SC Micropolitan Statistical Area	13500	0.266	0.259	0.086	0.085
Niles-Benton Harbor MI Metropolitan Statistical Area	35660	0.702	0.734	0.497	0.542
Big Rapids MI Micropolitan Statistical Area	13660	0.397	0.474	0.044	0.039
Big Spring TX Micropolitan Statistical Area	13700	0.383	0.296	0.050	0.038
Binghamton NY Metropolitan Statistical Area	13780	0.497	0.494	0.062	0.050
Birmingham-Hoover AL Metropolitan Statistical Area	13820	0.643	0.683	0.480	0.548
Blacksburg-Christiansburg-Radford VA Metropolitan Statistical Area	13980	0.232	0.236	0.013	0.016
Bloomington-Normal IL Metropolitan Statistical Area	14060	0.348	0.340	0.053	0.043
Bloomington IN Metropolitan Statistical Area	14020	0.444	0.476	0.027	0.026
Bloomsburg-Berwick PA Micropolitan Statistical Area	14100	0.494	n/a	0.056	n/a
Bluefield WV-VA Micropolitan Statistical Area	14140	0.502	0.541	0.104	0.128
Blytheville AR Micropolitan Statistical Area	14180	0.508	0.569	0.309	0.342
Bogalusa LA Micropolitan Statistical Area	14220	0.431	0.433	0.218	0.235
Boise City-Nampa ID Metropolitan Statistical Area	14260	0.284	0.256	0.007	0.002
Bonham TX Micropolitan Statistical Area	14300	0.420	0.399	0.077	0.053
Boston-Cambridge-Quincy MA-NH Metropolitan Statistical Area	14460	0.576	0.626	0.268	0.320
Boulder CO Metropolitan Statistical Area	14500	0.156	0.225	0.001	0.003
Bowling Green KY Metropolitan Statistical Area	14540	0.362	0.394	0.082	0.102
Bradford PA Micropolitan Statistical Area	14620	0.737	n/a	0.232	n/a
Bremerton-Silverdale WA Metropolitan Statistical Area	14740	0.372	0.414	0.027	0.036
Brenham TX Micropolitan Statistical Area	14780	0.177	0.235	0.035	0.051
Brevard NC Micropolitan Statistical Area	14820	0.516	0.578	0.166	0.178
Bridgeport-Stamford-Norwalk CT Metropolitan Statistical Area	14860	0.562	0.607	0.197	0.227
Brookhaven MS Micropolitan Statistical Area	15020	0.405	0.390	0.159	0.142

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Brownsville TN Micropolitan Statistical Area	15140	0.227	0.169	0.074	0.047
Brownsville-Harlingen TX Metropolitan Statistical Area	15180	0.245	0.283	0.003	0.002
Brownwood TX Micropolitan Statistical Area	15220	0.267	0.320	0.017	0.033
Brunswick GA Metropolitan Statistical Area	15260	0.520	0.545	0.256	0.277
Buffalo-Niagara Falls NY Metropolitan Statistical Area	15380	0.699	0.756	0.487	0.547
Burlington IA-IL Micropolitan Statistical Area	15460	0.472	0.449	0.054	0.060
Burlington NC Metropolitan Statistical Area	15500	0.362	0.356	0.119	0.138
Burlington-South Burlington VT Metropolitan Statistical Area	15540	0.404	0.341	0.024	0.009
Calhoun GA Micropolitan Statistical Area	15660	0.256	0.308	0.034	0.085
Cambridge MD Micropolitan Statistical Area	15700	0.450	0.455	0.226	0.240
Camden AR Micropolitan Statistical Area	15780	0.307	0.235	0.114	0.085
Campbellsville KY Micropolitan Statistical Area	15820	0.181	0.194	0.022	0.026
CaÔon City CO Micropolitan Statistical Area	15860	0.775	0.766	0.179	0.167
Canton IL Micropolitan Statistical Area	15900	0.753	0.851	0.265	0.526
Canton-Massillon OH Metropolitan Statistical Area	15940	0.545	0.580	0.194	0.231
Cape Girardeau-Jackson MO-IL Metropolitan Statistical Area	16020	0.581	0.610	0.243	0.262
Carbondale IL Micropolitan Statistical Area	16060	0.400	0.434	0.125	0.156
Carson City NV Metropolitan Statistical Area	16180	0.529	n/a	0.034	n/a
Cedar Rapids IA Metropolitan Statistical Area	16300	0.405	0.457	0.043	0.047
Cedartown GA Micropolitan Statistical Area	16340	0.190	0.216	0.019	0.031
Centralia IL Micropolitan Statistical Area	16460	0.548	0.622	0.118	0.162
Central City KY Micropolitan Statistical Area	16420	0.285	0.377	0.019	0.028
Chambersburg PA Micropolitan Statistical Area	16540	0.290	0.361	0.027	0.039
Champaign-Urbana IL Metropolitan Statistical Area	16580	0.509	0.494	0.191	0.207
Charleston-Mattoon IL Micropolitan Statistical Area	16660	0.389	0.422	0.075	0.032
Charleston-North Charleston-Summerville SC Metropolitan Statistical Area	16700	0.390	0.434	0.198	0.238
Charleston WV Metropolitan Statistical Area	16620	0.588	0.595	0.175	0.178
Charlotte-Gastonia-Rock Hill NC-SC Metropolitan Statistical Area	16740	0.471	0.504	0.248	0.302
Charlottesville VA Metropolitan Statistical Area	16820	0.318	0.329	0.084	0.121
Chattanooga TN-GA Metropolitan Statistical Area	16860	0.628	0.686	0.405	0.463
Chester SC Micropolitan Statistical Area	16900	0.320	0.291	0.140	0.110
Cheyenne WY Metropolitan Statistical Area	16940	0.261	0.295	0.012	0.018
Chicago-Joliet-Naperville IL-IN-WI Metropolitan Statistical Area	16980	0.719	0.779	0.575	0.659
Chico CA Metropolitan Statistical Area	17020	0.334	0.357	0.017	0.014
Chillicothe OH Micropolitan Statistical Area	17060	0.499	0.498	0.181	0.182
Cincinnati-Middletown OH-KY-IN Metropolitan Statistical Area	17140	0.680	0.730	0.414	0.482
Clarksdale MS Micropolitan Statistical Area	17260	0.379	0.493	0.160	0.232
Clarksville TN-KY Metropolitan Statistical Area	17300	0.357	0.378	0.128	0.148
Clarksburg WV Micropolitan Statistical Area	17220	0.391	0.405	0.018	0.027
Clearlake CA Micropolitan Statistical Area	17340	0.274	0.386	0.019	0.044
Cleveland MS Micropolitan Statistical Area	17380	0.573	0.561	0.388	0.383
Cleveland-Elyria-Mentor OH Metropolitan Statistical Area	17460	0.715	0.767	0.561	0.640

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Cleveland TN Metropolitan Statistical Area	17420	0.391	0.425	0.039	0.050
Clewiston FL Micropolitan Statistical Area	17500	0.381	0.434	0.129	0.137
Clinton IA Micropolitan Statistical Area	17540	0.389	n/a	0.037	n/a
Clovis NM Micropolitan Statistical Area	17580	0.251	0.274	0.021	0.028
Coffeyville KS Micropolitan Statistical Area	17700	0.411	0.436	0.064	0.081
Coldwater MI Micropolitan Statistical Area	17740	0.737	0.762	0.214	0.262
College Station-Bryan TX Metropolitan Statistical Area	17780	0.348	0.409	0.097	0.135
Colorado Springs CO Metropolitan Statistical Area	17820	0.340	0.389	0.041	0.059
Columbus GA-AL Metropolitan Statistical Area	17980	0.523	0.559	0.337	0.374
Columbus IN Metropolitan Statistical Area	18020	0.262	0.287	0.019	0.025
Columbia MO Metropolitan Statistical Area	17860	0.349	0.382	0.072	0.098
Columbus MS Micropolitan Statistical Area	18060	0.438	0.388	0.251	0.208
Columbus OH Metropolitan Statistical Area	18140	0.603	0.621	0.336	0.380
Columbia SC Metropolitan Statistical Area	17900	0.464	0.468	0.280	0.299
Columbia TN Micropolitan Statistical Area	17940	0.369	0.350	0.131	0.140
Concord NH Micropolitan Statistical Area	18180	0.388	n/a	0.014	n/a
Cookeville TN Micropolitan Statistical Area	18260	0.405	0.419	0.020	0.024
Cordele GA Micropolitan Statistical Area	18380	0.210	0.212	0.062	0.066
Corinth MS Micropolitan Statistical Area	18420	0.457	0.459	0.113	0.123
Cornelia GA Micropolitan Statistical Area	18460	0.431	0.485	0.120	0.168
Corning NY Micropolitan Statistical Area	18500	0.373	0.358	0.012	0.011
Corpus Christi TX Metropolitan Statistical Area	18580	0.311	0.351	0.037	0.070
Corsicana TX Micropolitan Statistical Area	18620	0.262	0.289	0.044	0.067
Crowley LA Micropolitan Statistical Area	18940	0.492	0.493	0.225	0.214
Culpeper VA Micropolitan Statistical Area	19020	0.220	0.245	0.031	0.042
Cumberland MD-WV Metropolitan Statistical Area	19060	0.559	0.512	0.186	0.114
Dallas-Fort Worth-Arlington TX Metropolitan Statistical Area	19100	0.475	0.537	0.234	0.304
Dalton GA Metropolitan Statistical Area	19140	0.297	0.414	0.017	0.038
Danville IL Metropolitan Statistical Area	19180	0.678	0.691	0.287	0.254
Danville KY Micropolitan Statistical Area	19220	0.402	0.427	0.044	0.063
Danville VA Metropolitan Statistical Area	19260	0.366	0.336	0.174	0.167
Daphne-Fairhope-Foley AL Micropolitan Statistical Area	19300	0.388	0.395	0.100	0.113
Davenport-Moline-Rock Island IA-IL Metropolitan Statistical Area	19340	0.479	0.530	0.131	0.174
Deltona-Daytona Beach-Ormond Beach FL Metropolitan Statistical Area	19660	0.494	0.569	0.257	0.336
Dayton OH Metropolitan Statistical Area	19380	0.656	0.724	0.480	0.537
Decatur AL Metropolitan Statistical Area	19460	0.551	0.567	0.227	0.272
Decatur IL Metropolitan Statistical Area	19500	0.524	0.536	0.250	0.249
Denver-Aurora-Broomfield CO Metropolitan Statistical Area	19740	0.567	0.602	0.131	0.198
DeRidder LA Micropolitan Statistical Area	19760	0.462	0.507	0.139	0.174
Des Moines-West Des Moines IA Metropolitan Statistical Area	19780	0.478	0.561	0.105	0.166
Detroit-Warren-Livonia MI Metropolitan Statistical Area	19820	0.735	0.842	0.610	0.728
Dillon SC Micropolitan Statistical Area	19900	0.188	0.174	0.054	0.044

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Dixon IL Micropolitan Statistical Area	19940	0.596	0.610	0.117	0.131
Dothan AL Metropolitan Statistical Area	20020	0.451	0.448	0.236	0.248
Douglas GA Micropolitan Statistical Area	20060	0.281	0.272	0.087	0.076
Dover DE Metropolitan Statistical Area	20100	0.262	0.318	0.087	0.103
Dublin GA Micropolitan Statistical Area	20140	0.338	0.339	0.172	0.181
DuBois PA Micropolitan Statistical Area	20180	0.692	0.772	0.100	0.172
Dubuque IA Metropolitan Statistical Area	20220	0.502	n/a	0.055	n/a
Duluth MN-WI Metropolitan Statistical Area	20260	0.471	0.526	0.024	0.022
Dunn NC Micropolitan Statistical Area	20380	0.238	0.230	0.060	0.067
Durham-Chapel Hill NC Metropolitan Statistical Area	20500	0.417	0.431	0.220	0.256
Dyersburg TN Micropolitan Statistical Area	20540	0.406	0.460	0.139	0.159
East Liverpool-Salem OH Micropolitan Statistical Area	20620	0.595	0.584	0.077	0.071
Easton MD Micropolitan Statistical Area	20660	0.250	0.297	0.056	0.082
East Stroudsburg PA Micropolitan Statistical Area	20700	0.271	0.256	0.060	0.035
Eau Claire WI Metropolitan Statistical Area	20740	0.394	n/a	0.025	n/a
El Campo TX Micropolitan Statistical Area	20900	0.314	0.321	0.085	0.106
El Centro CA Metropolitan Statistical Area	20940	0.513	0.523	0.144	0.104
El Dorado AR Micropolitan Statistical Area	20980	0.394	0.391	0.213	0.189
Elizabethtown KY Metropolitan Statistical Area	21060	0.386	0.466	0.077	0.105
Elizabeth City NC Micropolitan Statistical Area	21020	0.285	0.274	0.134	0.123
Elkhart-Goshen IN Metropolitan Statistical Area	21140	0.470	0.541	0.104	0.148
Elmira NY Metropolitan Statistical Area	21300	0.490	0.516	0.140	0.156
El Paso TX Metropolitan Statistical Area	21340	0.385	0.430	0.042	0.063
Enid OK Micropolitan Statistical Area	21420	0.264	0.283	0.017	0.015
Enterprise-Ozark AL Micropolitan Statistical Area	21460	0.313	0.295	0.101	0.108
Erie PA Metropolitan Statistical Area	21500	0.631	0.641	0.207	0.227
Eufaula AL-GA Micropolitan Statistical Area	21640	0.187	0.177	0.058	0.055
Eugene-Springfield OR Metropolitan Statistical Area	21660	0.241	0.297	0.003	0.004
Eureka-Arcata-Fortuna CA Micropolitan Statistical Area	21700	0.259	0.306	0.005	0.009
Evansville IN-KY Metropolitan Statistical Area	21780	0.522	0.560	0.160	0.193
Fairbanks AK Metropolitan Statistical Area	21820	0.357	0.417	0.037	0.064
Fairmont WV Micropolitan Statistical Area	21900	0.518	0.548	0.122	0.172
Fargo ND-MN Metropolitan Statistical Area	22020	0.328	0.358	0.014	0.010
Faribault-Northfield MN Micropolitan Statistical Area	22060	0.500	n/a	0.082	n/a
Farmington MO Micropolitan Statistical Area	22100	0.626	0.673	0.091	0.206
Fayetteville-Springdale-Rogers AR-MO Metropolitan Statistical Area	22220	0.382	0.526	0.021	0.033
Fayetteville NC Metropolitan Statistical Area	22180	0.272	0.283	0.108	0.122
Findlay OH Micropolitan Statistical Area	22300	0.301	n/a	0.024	n/a
Fitzgerald GA Micropolitan Statistical Area	22340	0.256	0.255	0.088	0.092
Flagstaff AZ Metropolitan Statistical Area	22380	0.322	0.390	0.012	0.016
Flint MI Metropolitan Statistical Area	22420	0.676	0.765	0.512	0.616
Florence-Muscle Shoals AL Metropolitan Statistical Area	22520	0.415	0.428	0.168	0.192

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Florence SC Metropolitan Statistical Area	22500	0.358	0.392	0.205	0.241
Fond du Lac WI Metropolitan Statistical Area	22540	0.382	n/a	0.028	n/a
Forest City NC Micropolitan Statistical Area	22580	0.334	0.351	0.067	0.076
Forrest City AR Micropolitan Statistical Area	22620	0.339	0.310	0.159	0.111
Fort Collins-Loveland CO Metropolitan Statistical Area	22660	0.243	0.292	0.004	0.005
Fort Dodge IA Micropolitan Statistical Area	22700	0.446	0.463	0.043	0.049
Fort Leonard Wood MO Micropolitan Statistical Area	22780	0.281	0.363	0.042	0.078
Fort Madison-Keokuk IA-MO Micropolitan Statistical Area	22800	0.456	0.459	0.063	0.059
Cape Coral-Fort Myers FL Metropolitan Statistical Area	15980	0.545	0.656	0.230	0.384
Fort Payne AL Micropolitan Statistical Area	22840	0.562	0.628	0.060	0.079
Port St. Lucie FL Metropolitan Statistical Area	38940	0.409	0.569	0.218	0.378
Fort Polk South LA Micropolitan Statistical Area	22860	0.432	0.460	0.125	0.138
Fort Smith AR-OK Metropolitan Statistical Area	22900	0.505	0.507	0.068	0.090
Fort Valley GA Micropolitan Statistical Area	22980	0.520	0.605	0.357	0.444
Crestview-Fort Walton Beach-Destin FL Metropolitan Statistical Area	18880	0.303	0.285	0.045	0.051
Fort Wayne IN Metropolitan Statistical Area	23060	0.564	0.686	0.258	0.389
Frankfort KY Micropolitan Statistical Area	23180	0.428	0.458	0.112	0.125
Freeport IL Micropolitan Statistical Area	23300	0.517	0.540	0.140	0.174
Fremont OH Micropolitan Statistical Area	23380	0.527	0.569	0.068	0.085
Fresno CA Metropolitan Statistical Area	23420	0.391	0.421	0.059	0.089
Gadsden AL Metropolitan Statistical Area	23460	0.656	0.686	0.373	0.407
Gaffney SC Micropolitan Statistical Area	23500	0.496	0.399	0.206	0.129
Gainesville FL Metropolitan Statistical Area	23540	0.393	0.416	0.219	0.246
Gainesville GA Metropolitan Statistical Area	23580	0.339	0.443	0.084	0.140
Gainesville TX Micropolitan Statistical Area	23620	0.376	0.422	0.053	0.057
Galesburg IL Micropolitan Statistical Area	23660	0.509	0.529	0.104	0.115
Georgetown SC Micropolitan Statistical Area	23860	0.444	0.410	0.239	0.214
Gettysburg PA Micropolitan Statistical Area	23900	0.309	0.423	0.016	0.031
Glasgow KY Micropolitan Statistical Area	23980	0.371	0.378	0.045	0.047
Glens Falls NY Metropolitan Statistical Area	24020	0.586	0.681	0.136	0.159
Gloversville NY Micropolitan Statistical Area	24100	0.363	n/a	0.024	n/a
Goldsboro NC Metropolitan Statistical Area	24140	0.394	0.399	0.210	0.218
Grand Forks ND-MN Metropolitan Statistical Area	24220	0.362	0.411	0.019	0.037
Grand Island NE Micropolitan Statistical Area	24260	0.410	n/a	0.030	n/a
Grand Rapids-Wyoming MI Metropolitan Statistical Area	24340	0.591	0.632	0.221	0.300
Great Falls MT Metropolitan Statistical Area	24500	0.357	n/a	0.044	n/a
Greeley CO Metropolitan Statistical Area	24540	0.340	0.287	0.012	0.005
Green Bay WI Metropolitan Statistical Area	24580	0.478	0.462	0.074	0.085
Greeneville TN Micropolitan Statistical Area	24620	0.426	0.456	0.051	0.063
Greensboro-High Point NC Metropolitan Statistical Area	24660	0.498	0.512	0.298	0.338
Greenville MS Micropolitan Statistical Area	24740	0.470	0.513	0.266	0.315
Greenville NC Metropolitan Statistical Area	24780	0.275	0.297	0.120	0.144

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Greenville-Mauldin-Easley SC Metropolitan Statistical Area	24860	0.415	0.457	0.185	0.235
Greenwood MS Micropolitan Statistical Area	24900	0.585	0.494	0.397	0.344
Greenwood SC Micropolitan Statistical Area	24940	0.250	0.296	0.087	0.142
Grenada MS Micropolitan Statistical Area	24980	0.392	0.442	0.197	0.231
Gulfport-Biloxi MS Metropolitan Statistical Area	25060	0.399	0.442	0.196	0.220
Hagerstown-Martinsburg MD-WV Metropolitan Statistical Area	25180	0.397	0.544	0.166	0.297
Hammond LA Micropolitan Statistical Area	25220	0.350	0.370	0.163	0.176
Hanford-Corcoran CA Metropolitan Statistical Area	25260	0.368	0.347	0.078	0.060
Hannibal MO Micropolitan Statistical Area	25300	0.376	0.411	0.051	0.074
Harriman TN Micropolitan Statistical Area	25340	0.317	0.362	0.017	0.053
Harrisburg-Carlisle PA Metropolitan Statistical Area	25420	0.625	0.689	0.289	0.352
Harrisonburg VA Metropolitan Statistical Area	25500	0.351	0.386	0.031	0.026
Hartford-West Hartford-East Hartford CT Metropolitan Statistical Area	25540	0.563	0.595	0.287	0.321
Hattiesburg MS Metropolitan Statistical Area	25620	0.478	0.501	0.276	0.316
Helena-West Helena AR Micropolitan Statistical Area	25760	0.271	0.235	0.094	0.081
Henderson NC Micropolitan Statistical Area	25780	0.271	0.272	0.112	0.114
Hickory-Lenoir-Morganton NC Metropolitan Statistical Area	25860	0.400	0.445	0.087	0.114
Hilo HI Micropolitan Statistical Area	25900	0.190	n/a	0.001	n/a
Hilton Head Island-Beaufort SC Micropolitan Statistical Area	25940	0.456	0.427	0.213	0.215
Hinesville-Fort Stewart GA Metropolitan Statistical Area	25980	0.238	0.180	0.082	0.059
Hobbs NM Micropolitan Statistical Area	26020	0.280	0.331	0.026	0.036
Holland-Grand Haven MI Metropolitan Statistical Area	26100	0.356	0.410	0.012	0.010
Homosassa Springs FL Micropolitan Statistical Area	26140	0.253	0.263	0.009	0.009
Honolulu HI Metropolitan Statistical Area	26180	0.451	0.514	0.049	0.080
Hope AR Micropolitan Statistical Area	26260	0.287	0.241	0.089	0.082
Hot Springs AR Metropolitan Statistical Area	26300	0.461	0.552	0.108	0.177
Houma-Bayou Cane-Thibodaux LA Metropolitan Statistical Area	26380	0.422	0.453	0.146	0.177
Houston-Sugar Land-Baytown TX Metropolitan Statistical Area	26420	0.478	0.560	0.243	0.340
Hudson NY Micropolitan Statistical Area	26460	0.548	0.576	0.124	0.127
Humboldt TN Micropolitan Statistical Area	26480	0.418	0.407	0.194	0.232
Huntingdon PA Micropolitan Statistical Area	26500	0.714	0.729	0.161	0.161
Huntington-Ashland WV-KY-OH Metropolitan Statistical Area	26580	0.541	0.592	0.108	0.133
Huntsville AL Metropolitan Statistical Area	26620	0.476	0.537	0.279	0.318
Huntsville TX Micropolitan Statistical Area	26660	0.189	0.128	0.033	0.026
Hutchinson KS Micropolitan Statistical Area	26740	0.378	0.409	0.038	0.043
Indianapolis-Carmel IN Metropolitan Statistical Area	26900	0.630	0.704	0.357	0.457
Indianola MS Micropolitan Statistical Area	26940	0.290	0.303	0.126	0.202
Indiana PA Micropolitan Statistical Area	26860	0.566	0.536	0.064	0.048
Iowa City IA Metropolitan Statistical Area	26980	0.391	0.386	0.045	0.024
Ithaca NY Metropolitan Statistical Area	27060	0.269	0.310	0.023	0.029
Jacksonville FL Metropolitan Statistical Area	27260	0.504	0.526	0.326	0.374
Jacksonville IL Micropolitan Statistical Area	27300	0.558	0.519	0.087	0.058

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Jackson MI Metropolitan Statistical Area	27100	0.585	0.657	0.235	0.285
Jackson MS Metropolitan Statistical Area	27140	0.545	0.570	0.382	0.412
Jacksonville NC Metropolitan Statistical Area	27340	0.254	0.239	0.067	0.084
Jackson TN Metropolitan Statistical Area	27180	0.485	0.554	0.319	0.362
Jacksonville TX Micropolitan Statistical Area	27380	0.289	0.358	0.072	0.107
Jamestown-Dunkirk-Fredonia NY Micropolitan Statistical Area	27460	0.448	0.532	0.028	0.050
Janesville WI Metropolitan Statistical Area	27500	0.513	0.598	0.097	0.159
Jefferson City MO Metropolitan Statistical Area	27620	0.479	0.535	0.123	0.157
Jennings LA Micropolitan Statistical Area	27660	0.277	0.316	0.085	0.099
Jesup GA Micropolitan Statistical Area	27700	0.321	0.315	0.090	0.092
Johnson City TN Metropolitan Statistical Area	27740	0.477	0.518	0.060	0.073
Johnstown PA Metropolitan Statistical Area	27780	0.621	0.643	0.107	0.138
Jonesboro AR Metropolitan Statistical Area	27860	0.421	0.419	0.113	0.101
Joplin MO Metropolitan Statistical Area	27900	0.354	0.397	0.015	0.022
Kalamazoo-Portage MI Metropolitan Statistical Area	28020	0.470	0.491	0.184	0.221
Kankakee-Bradley IL Metropolitan Statistical Area	28100	0.579	0.687	0.349	0.476
Kansas City MO-KS Metropolitan Statistical Area	28140	0.577	0.686	0.354	0.467
Kennett MO Micropolitan Statistical Area	28380	0.473	0.523	0.111	0.122
Key West FL Micropolitan Statistical Area	28580	0.411	0.473	0.069	0.103
Killeen-Temple-Fort Hood TX Metropolitan Statistical Area	28660	0.353	0.369	0.106	0.113
Kingsport-Bristol-Bristol TN-VA Metropolitan Statistical Area	28700	0.420	0.461	0.040	0.060
Kingston NY Metropolitan Statistical Area	28740	0.389	0.415	0.062	0.080
Kingsville TX Micropolitan Statistical Area	28780	0.287	0.289	0.014	0.016
Kinston NC Micropolitan Statistical Area	28820	0.433	0.465	0.319	0.336
Knoxville TN Metropolitan Statistical Area	28940	0.529	0.567	0.236	0.315
Kokomo IN Metropolitan Statistical Area	29020	0.424	0.478	0.122	0.181
La Crosse WI-MN Metropolitan Statistical Area	29100	0.345	0.391	0.014	0.012
Lafayette IN Metropolitan Statistical Area	29140	0.333	0.328	0.028	0.014
Lafayette LA Metropolitan Statistical Area	29180	0.443	0.489	0.255	0.284
LaGrange GA Micropolitan Statistical Area	29300	0.323	0.375	0.134	0.175
Lake Charles LA Metropolitan Statistical Area	29340	0.604	0.615	0.427	0.438
Lake City FL Micropolitan Statistical Area	29380	0.406	0.384	0.128	0.110
Lake Havasu City-Kingman AZ Metropolitan Statistical Area	29420	0.219	n/a	0.005	n/a
Lakeland-Winter Haven FL Metropolitan Statistical Area	29460	0.397	0.501	0.169	0.269
Lancaster PA Metropolitan Statistical Area	29540	0.503	0.577	0.079	0.092
Lancaster SC Micropolitan Statistical Area	29580	0.319	0.277	0.149	0.141
Lansing-East Lansing MI Metropolitan Statistical Area	29620	0.507	0.535	0.138	0.166
Laredo TX Metropolitan Statistical Area	29700	0.199	n/a	0.001	n/a
Las Cruces NM Metropolitan Statistical Area	29740	0.261	0.283	0.011	0.012
Las Vegas-Paradise NV Metropolitan Statistical Area	29820	0.281	0.326	0.066	0.110
Laurel MS Micropolitan Statistical Area	29860	0.460	0.427	0.237	0.217
Laurinburg NC Micropolitan Statistical Area	29900	0.252	0.297	0.099	0.109

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Lawrence KS Metropolitan Statistical Area	29940	0.234	0.261	0.011	0.017
Lawton OK Metropolitan Statistical Area	30020	0.248	0.295	0.060	0.092
Lebanon NH-VT Micropolitan Statistical Area	30100	0.389	n/a	0.012	n/a
Lebanon PA Metropolitan Statistical Area	30140	0.403	0.362	0.022	0.015
Lewisburg PA Micropolitan Statistical Area	30260	0.743	0.545	0.342	0.118
Lewisburg TN Micropolitan Statistical Area	30280	0.363	0.366	0.121	0.143
Lewiston-Auburn ME Metropolitan Statistical Area	30340	0.575	n/a	0.120	n/a
Lexington-Fayette KY Metropolitan Statistical Area	30460	0.451	0.473	0.141	0.202
Lexington Park MD Micropolitan Statistical Area	30500	0.346	0.318	0.086	0.068
Lima OH Metropolitan Statistical Area	30620	0.512	0.536	0.182	0.205
Lincoln IL Micropolitan Statistical Area	30660	0.636	0.654	0.209	0.252
Lincolnton NC Micropolitan Statistical Area	30740	0.336	0.348	0.036	0.042
Lincoln NE Metropolitan Statistical Area	30700	0.367	0.390	0.033	0.030
Little Rock-North Little Rock-Conway AR Metropolitan Statistical Area	30780	0.560	0.602	0.340	0.396
Longview TX Metropolitan Statistical Area	30980	0.330	0.372	0.115	0.158
Los Angeles-Long Beach-Santa Ana CA Metropolitan Statistical Area	31100	0.545	0.584	0.220	0.268
Louisville/Jefferson County KY-IN Metropolitan Statistical Area	31140	0.562	0.628	0.362	0.443
Lubbock TX Metropolitan Statistical Area	31180	0.373	0.450	0.172	0.240
Lufkin TX Micropolitan Statistical Area	31260	0.421	0.430	0.165	0.212
Lumberton NC Micropolitan Statistical Area	31300	0.333	0.344	0.135	0.150
Lynchburg VA Metropolitan Statistical Area	31340	0.358	0.364	0.165	0.173
Macomb IL Micropolitan Statistical Area	31380	0.457	0.490	0.056	0.085
Macon GA Metropolitan Statistical Area	31420	0.502	0.530	0.323	0.338
Madera-Chowchilla CA Metropolitan Statistical Area	31460	0.365	0.447	0.079	0.075
Madisonville KY Micropolitan Statistical Area	31580	0.403	0.443	0.062	0.079
Madison WI Metropolitan Statistical Area	31540	0.461	0.477	0.066	0.070
Magnolia AR Micropolitan Statistical Area	31620	0.303	0.327	0.134	0.134
Malone NY Micropolitan Statistical Area	31660	0.773	0.700	0.327	0.179
Manchester-Nashua NH Metropolitan Statistical Area	31700	0.391	0.376	0.022	0.012
Manhattan KS Metropolitan Statistical Area	31740	0.391	0.482	0.073	0.125
Mankato-North Mankato MN Metropolitan Statistical Area	31860	0.366	n/a	0.019	n/a
Mansfield OH Metropolitan Statistical Area	31900	0.607	0.632	0.261	0.291
Marion-Herrin IL Micropolitan Statistical Area	32060	0.346	0.390	0.025	0.048
Marion IN Micropolitan Statistical Area	31980	0.501	0.546	0.113	0.145
Marion OH Micropolitan Statistical Area	32020	0.567	0.525	0.213	0.169
Marquette MI Micropolitan Statistical Area	32100	0.637	n/a	0.085	n/a
Marshall MO Micropolitan Statistical Area	32180	0.278	0.256	0.043	0.041
Marshall TX Micropolitan Statistical Area	32220	0.374	0.336	0.179	0.176
Martin TN Micropolitan Statistical Area	32280	0.399	0.333	0.063	0.033
Martinsville VA Micropolitan Statistical Area	32300	0.318	0.329	0.143	0.166
Mayfield KY Micropolitan Statistical Area	32460	0.481	0.503	0.067	0.075
Maysville KY Micropolitan Statistical Area	32500	0.579	0.576	0.109	0.101

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
McAlester OK Micropolitan Statistical Area	32540	0.472	0.490	0.115	0.076
McAllen-Edinburg-Mission TX Metropolitan Statistical Area	32580	0.341	0.393	0.025	0.023
McComb MS Micropolitan Statistical Area	32620	0.299	0.277	0.149	0.125
McMinnville TN Micropolitan Statistical Area	32660	0.259	0.200	0.015	0.014
Meadville PA Micropolitan Statistical Area	32740	0.504	0.492	0.031	0.050
Medford OR Metropolitan Statistical Area	32780	0.259	n/a	0.004	n/a
Palm Bay-Melbourne-Titusville FL Metropolitan Statistical Area	37340	0.448	0.476	0.138	0.171
Memphis TN-MS-AR Metropolitan Statistical Area	32820	0.591	0.638	0.427	0.492
Merced CA Metropolitan Statistical Area	32900	0.276	0.289	0.022	0.020
Meridian MS Micropolitan Statistical Area	32940	0.446	0.440	0.261	0.253
Mexico MO Micropolitan Statistical Area	33020	0.387	0.447	0.084	0.101
Miami-Fort Lauderdale-Pompano Beach FL Metropolitan Statistical Area	33100	0.581	0.636	0.377	0.428
Michigan City-La Porte IN Metropolitan Statistical Area	33140	0.573	0.629	0.216	0.257
Midland MI Micropolitan Statistical Area	33220	0.350	n/a	0.025	n/a
Midland TX Metropolitan Statistical Area	33260	0.391	0.461	0.089	0.148
Milledgeville GA Micropolitan Statistical Area	33300	0.311	0.317	0.126	0.138
Milwaukee-Waukesha-West Allis WI Metropolitan Statistical Area	33340	0.777	0.810	0.586	0.612
Minden LA Micropolitan Statistical Area	33380	0.348	0.373	0.214	0.218
Minneapolis-St. Paul-Bloomington MN-WI Metropolitan Statistical Area	33460	0.480	0.561	0.144	0.179
Minot ND Micropolitan Statistical Area	33500	0.333	0.487	0.039	0.047
Moberly MO Micropolitan Statistical Area	33620	0.264	0.325	0.046	0.068
Mobile AL Metropolitan Statistical Area	33660	0.580	0.631	0.420	0.493
Modesto CA Metropolitan Statistical Area	33700	0.255	0.283	0.011	0.013
Monroe LA Metropolitan Statistical Area	33740	0.624	0.653	0.482	0.532
Monroe MI Metropolitan Statistical Area	33780	0.464	0.497	0.058	0.075
Montgomery AL Metropolitan Statistical Area	33860	0.525	0.553	0.343	0.389
Morehead City NC Micropolitan Statistical Area	33980	0.440	0.383	0.069	0.056
Morgan City LA Micropolitan Statistical Area	34020	0.372	0.394	0.187	0.198
Morgantown WV Metropolitan Statistical Area	34060	0.368	0.422	0.039	0.032
Morristown TN Metropolitan Statistical Area	34100	0.389	0.409	0.028	0.035
Moultrie GA Micropolitan Statistical Area	34220	0.429	0.374	0.185	0.172
Mount Airy NC Micropolitan Statistical Area	34340	0.347	0.338	0.026	0.024
Mount Pleasant MI Micropolitan Statistical Area	34380	0.391	0.382	0.028	0.034
Mount Pleasant TX Micropolitan Statistical Area	34420	0.299	0.386	0.051	0.102
Mount Vernon IL Micropolitan Statistical Area	34500	0.604	0.632	0.185	0.164
Muncie IN Metropolitan Statistical Area	34620	0.465	0.540	0.240	0.327
Murray KY Micropolitan Statistical Area	34660	0.408	0.444	0.052	0.071
Muskegon-Norton Shores MI Metropolitan Statistical Area	34740	0.718	0.758	0.426	0.464
Muskogee OK Micropolitan Statistical Area	34780	0.458	0.517	0.147	0.199
Myrtle Beach-North Myrtle Beach-Conway SC Metropolitan Statistical Area	34820	0.403	0.443	0.141	0.176
Nacogdoches TX Micropolitan Statistical Area	34860	0.415	0.398	0.178	0.227
Napa CA Metropolitan Statistical Area	34900	0.563	0.532	0.054	0.051

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Naples-Marco Island FL Metropolitan Statistical Area	34940	0.441	0.548	0.090	0.150
Nashville-Davidson--Murfreesboro--Franklin TN Metropolitan Statistical Are	34980	0.525	0.560	0.286	0.352
Natchez MS-LA Micropolitan Statistical Area	35020	0.464	0.489	0.263	0.304
Natchitoches LA Micropolitan Statistical Area	35060	0.448	0.401	0.231	0.206
New Bern NC Micropolitan Statistical Area	35100	0.362	0.290	0.124	0.100
Newberry SC Micropolitan Statistical Area	35140	0.232	0.203	0.089	0.054
New Castle IN Micropolitan Statistical Area	35220	0.542	n/a	0.103	n/a
New Castle PA Micropolitan Statistical Area	35260	0.608	0.645	0.152	0.201
New Haven-Milford CT Metropolitan Statistical Area	35300	0.544	0.601	0.237	0.283
New Iberia LA Micropolitan Statistical Area	35340	0.409	0.421	0.224	0.231
Norwich-New London CT Metropolitan Statistical Area	35980	0.473	0.513	0.074	0.088
New Orleans-Metairie-Kenner LA Metropolitan Statistical Area	35380	0.597	0.669	0.438	0.527
New York-Northern New Jersey-Long Island NY-NJ-PA Metropolitan Statistical	35620	0.647	0.687	0.424	0.476
Virginia Beach-Norfolk-Newport News VA-NC Metropolitan Statistical Area	47260	0.449	0.449	0.276	0.295
North Wilkesboro NC Micropolitan Statistical Area	35900	0.432	0.500	0.058	0.067
Oak Harbor WA Micropolitan Statistical Area	36020	0.425	0.473	0.024	0.041
Oak Hill WV Micropolitan Statistical Area	36060	0.398	0.362	0.039	0.040
Ocala FL Metropolitan Statistical Area	36100	0.451	0.477	0.165	0.215
Ocean City NJ Metropolitan Statistical Area	36140	0.477	0.543	0.073	0.110
Ocean Pines MD Micropolitan Statistical Area	36180	0.524	0.532	0.194	0.214
Odessa TX Metropolitan Statistical Area	36220	0.306	0.360	0.073	0.109
Ogdensburg-Massena NY Micropolitan Statistical Area	36300	0.622	0.663	0.069	0.105
Ogden-Clearfield UT Metropolitan Statistical Area	36260	0.284	0.388	0.014	0.022
Okeechobee FL Micropolitan Statistical Area	36380	0.486	0.446	0.111	0.117
Oklahoma City OK Metropolitan Statistical Area	36420	0.487	0.533	0.236	0.299
Olean NY Micropolitan Statistical Area	36460	0.393	n/a	0.014	n/a
Olympia WA Metropolitan Statistical Area	36500	0.308	0.355	0.015	0.018
Omaha-Council Bluffs NE-IA Metropolitan Statistical Area	36540	0.588	0.657	0.282	0.370
Oneonta NY Micropolitan Statistical Area	36580	0.453	0.474	0.036	0.043
Opelousas-Eunice LA Micropolitan Statistical Area	36660	0.404	0.387	0.229	0.205
Orangeburg SC Micropolitan Statistical Area	36700	0.272	0.288	0.111	0.118
Orlando-Kissimmee-Sanford FL Metropolitan Statistical Area	36740	0.435	0.515	0.231	0.278
Oshkosh-Neenah WI Metropolitan Statistical Area	36780	0.431	0.531	0.039	0.058
Ottawa-Streator IL Micropolitan Statistical Area	36860	0.452	0.526	0.048	0.065
Owatonna MN Micropolitan Statistical Area	36940	0.489	n/a	0.083	n/a
Owensboro KY Metropolitan Statistical Area	36980	0.452	0.519	0.062	0.094
Oxford MS Micropolitan Statistical Area	37060	0.178	0.184	0.036	0.032
Oxnard-Thousand Oaks-Ventura CA Metropolitan Statistical Area	37100	0.244	0.342	0.009	0.017
Paducah KY-IL Micropolitan Statistical Area	37140	0.517	0.588	0.192	0.240
Palatka FL Micropolitan Statistical Area	37260	0.476	0.399	0.201	0.190
Palestine TX Micropolitan Statistical Area	37300	0.383	0.391	0.123	0.135
Palm Coast FL Metropolitan Statistical Area	37380	0.224	0.267	0.028	0.032

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Pampa TX Micropolitan Statistical Area	37420	0.443	0.536	0.048	0.091
Panama City-Lynn Haven-Panama City Beach FL Metropolitan Statistical Area	37460	0.434	0.476	0.177	0.210
Paris TN Micropolitan Statistical Area	37540	0.485	0.497	0.127	0.144
Paris TX Micropolitan Statistical Area	37580	0.479	0.482	0.148	0.170
Parkersburg-Marietta-Vienna WV-OH Metropolitan Statistical Area	37620	0.372	0.372	0.010	0.010
Parsons KS Micropolitan Statistical Area	37660	0.405	0.383	0.053	0.060
Pascagoula MS Metropolitan Statistical Area	37700	0.510	0.554	0.295	0.332
Pensacola-Ferry Pass-Brent FL Metropolitan Statistical Area	37860	0.465	0.498	0.224	0.246
Peoria IL Metropolitan Statistical Area	37900	0.690	0.707	0.331	0.336
Peru IN Micropolitan Statistical Area	37940	0.624	0.503	0.179	0.091
Philadelphia-Camden-Wilmington PA-NJ-DE-MD Metropolitan Statistical Area	37980	0.626	0.670	0.446	0.505
Phoenix-Mesa-Glendale AZ Metropolitan Statistical Area	38060	0.312	0.343	0.038	0.051
Phoenix Lake-Cedar Ridge CA Micropolitan Statistical Area	38020	0.734	0.764	0.279	0.130
Picayune MS Micropolitan Statistical Area	38100	0.455	0.451	0.132	0.130
Pierre Part LA Micropolitan Statistical Area	38200	0.511	0.502	0.245	0.246
Pine Bluff AR Metropolitan Statistical Area	38220	0.602	0.587	0.440	0.413
Pittsburgh PA Metropolitan Statistical Area	38300	0.649	0.684	0.356	0.427
Pittsfield MA Metropolitan Statistical Area	38340	0.378	0.404	0.035	0.032
Plainview TX Micropolitan Statistical Area	38380	0.231	0.261	0.016	0.020
Plattsburgh NY Micropolitan Statistical Area	38460	0.523	0.562	0.108	0.108
Pontiac IL Micropolitan Statistical Area	38700	0.629	0.661	0.136	0.139
Poplar Bluff MO Micropolitan Statistical Area	38740	0.378	0.413	0.055	0.083
Portsmouth OH Micropolitan Statistical Area	39020	0.623	0.666	0.092	0.123
Portland-South Portland-Biddeford ME Metropolitan Statistical Area	38860	0.507	0.415	0.051	0.017
Portland-Vancouver-Hillsboro OR-WA Metropolitan Statistical Area	38900	0.423	0.494	0.056	0.131
Pottsville PA Micropolitan Statistical Area	39060	0.630	0.716	0.152	0.137
Poughkeepsie-Newburgh-Middletown NY Metropolitan Statistical Area	39100	0.417	0.484	0.127	0.169
Prescott AZ Metropolitan Statistical Area	39140	0.161	n/a	0.002	n/a
Providence-New Bedford-Fall River RI-MA Metropolitan Statistical Area	39300	0.472	0.521	0.083	0.090
Provo-Orem UT Metropolitan Statistical Area	39340	0.205	0.268	0.002	0.001
Pueblo CO Metropolitan Statistical Area	39380	0.236	0.322	0.015	0.028
Punta Gorda FL Metropolitan Statistical Area	39460	0.428	0.390	0.051	0.036
Quincy IL-MO Micropolitan Statistical Area	39500	0.440	0.466	0.049	0.056
Racine WI Metropolitan Statistical Area	39540	0.475	0.522	0.145	0.208
Raleigh-Cary NC Metropolitan Statistical Area	39580	0.386	0.391	0.174	0.203
Rapid City SD Metropolitan Statistical Area	39660	0.264	0.372	0.014	0.017
Reading PA Metropolitan Statistical Area	39740	0.406	0.534	0.054	0.083
Redding CA Metropolitan Statistical Area	39820	0.264	0.245	0.003	0.004
Reno-Sparks NV Metropolitan Statistical Area	39900	0.257	0.280	0.011	0.012
Kennewick-Pasco-Richland WA Metropolitan Statistical Area	28420	0.240	0.313	0.005	0.010
Richmond IN Micropolitan Statistical Area	39980	0.429	0.496	0.048	0.065
Richmond-Berea KY Micropolitan Statistical Area	40080	0.407	0.403	0.037	0.051

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Richmond VA Metropolitan Statistical Area	40060	0.496	0.524	0.313	0.357
Riverside-San Bernardino-Ontario CA Metropolitan Statistical Area	40140	0.326	0.370	0.050	0.065
Roanoke Rapids NC Micropolitan Statistical Area	40260	0.293	0.307	0.131	0.152
Roanoke VA Metropolitan Statistical Area	40220	0.542	0.601	0.330	0.394
Rochester MN Metropolitan Statistical Area	40340	0.473	0.525	0.049	0.040
Rochester NY Metropolitan Statistical Area	40380	0.616	0.646	0.337	0.363
Rockford IL Metropolitan Statistical Area	40420	0.528	0.586	0.214	0.281
Rockingham NC Micropolitan Statistical Area	40460	0.242	0.270	0.065	0.084
Rocky Mount NC Metropolitan Statistical Area	40580	0.359	0.399	0.199	0.219
Rolla MO Micropolitan Statistical Area	40620	0.368	n/a	0.042	n/a
Rome GA Metropolitan Statistical Area	40660	0.445	0.538	0.169	0.228
Roswell NM Micropolitan Statistical Area	40740	0.205	0.242	0.006	0.011
Russellville AR Micropolitan Statistical Area	40780	0.443	0.449	0.029	0.037
Ruston LA Micropolitan Statistical Area	40820	0.439	0.489	0.281	0.333
Sacramento--Arden-Arcade--Roseville CA Metropolitan Statistical Area	40900	0.445	0.484	0.081	0.101
Saginaw-Saginaw Township North MI Metropolitan Statistical Area	40980	0.622	0.696	0.421	0.501
Salem OR Metropolitan Statistical Area	41420	0.291	0.337	0.008	0.015
Salinas CA Metropolitan Statistical Area	41500	0.435	0.509	0.076	0.093
Salina KS Micropolitan Statistical Area	41460	0.267	0.313	0.015	0.020
Salisbury MD Metropolitan Statistical Area	41540	0.412	0.434	0.237	0.255
Salisbury NC Micropolitan Statistical Area	41580	0.472	0.457	0.232	0.228
Salt Lake City UT Metropolitan Statistical Area	41620	0.322	0.331	0.013	0.011
San Angelo TX Metropolitan Statistical Area	41660	0.258	0.258	0.025	0.042
San Antonio-New Braunfels TX Metropolitan Statistical Area	41700	0.421	0.476	0.101	0.141
San Diego-Carlsbad-San Marcos CA Metropolitan Statistical Area	41740	0.386	0.438	0.062	0.095
Sandusky OH Metropolitan Statistical Area	41780	0.602	0.603	0.148	0.150
Sanford NC Micropolitan Statistical Area	41820	0.316	0.386	0.116	0.159
San Francisco-Oakland-Fremont CA Metropolitan Statistical Area	41860	0.505	0.566	0.158	0.242
San Jose-Sunnyvale-Santa Clara CA Metropolitan Statistical Area	41940	0.253	0.256	0.012	0.012
San Luis Obispo-Paso Robles CA Metropolitan Statistical Area	42020	0.510	0.495	0.186	0.082
Santa Barbara-Santa Maria-Goleta CA Metropolitan Statistical Area	42060	0.290	0.350	0.019	0.042
Santa Cruz-Watsonville CA Metropolitan Statistical Area	42100	0.215	0.221	0.003	0.003
Santa Fe NM Metropolitan Statistical Area	42140	0.193	n/a	0.004	n/a
Santa Rosa-Petaluma CA Metropolitan Statistical Area	42220	0.272	0.292	0.007	0.008
North Port-Bradenton-Sarasota FL Metropolitan Statistical Area	35840	0.503	0.641	0.174	0.284
Sault Ste. Marie MI Micropolitan Statistical Area	42300	0.823	0.739	0.370	0.146
Savannah GA Metropolitan Statistical Area	42340	0.470	0.545	0.305	0.396
Scottsboro AL Micropolitan Statistical Area	42460	0.478	0.531	0.046	0.066
Scranton--Wilkes-Barre PA Metropolitan Statistical Area	42540	0.496	0.585	0.062	0.063
Seaford DE Micropolitan Statistical Area	42580	0.336	0.339	0.078	0.074
Searcy AR Micropolitan Statistical Area	42620	0.315	0.355	0.027	0.033
Seattle-Tacoma-Bellevue WA Metropolitan Statistical Area	42660	0.430	0.479	0.075	0.092

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Sebastian-Vero Beach FL Metropolitan Statistical Area	42680	0.456	0.576	0.208	0.376
Sebring FL Micropolitan Statistical Area	42700	0.367	0.468	0.105	0.145
Sedalia MO Micropolitan Statistical Area	42740	0.397	0.458	0.106	0.206
Selma AL Micropolitan Statistical Area	42820	0.496	0.481	0.262	0.274
Seneca Falls NY Micropolitan Statistical Area	42900	0.669	n/a	0.185	n/a
Seneca SC Micropolitan Statistical Area	42860	0.459	0.503	0.103	0.129
Shawnee OK Micropolitan Statistical Area	43060	0.266	0.311	0.016	0.021
Sheboygan WI Metropolitan Statistical Area	43100	0.456	0.546	0.037	0.084
Shelby NC Micropolitan Statistical Area	43140	0.307	0.270	0.126	0.126
Shelbyville TN Micropolitan Statistical Area	43180	0.330	0.301	0.037	0.038
Sherman-Denison TX Metropolitan Statistical Area	43300	0.418	0.447	0.056	0.082
Shreveport-Bossier City LA Metropolitan Statistical Area	43340	0.553	0.557	0.391	0.401
Sierra Vista-Douglas AZ Micropolitan Statistical Area	43420	0.424	0.486	0.037	0.069
Sikeston MO Micropolitan Statistical Area	43460	0.612	0.599	0.260	0.236
Sioux City IA-NE-SD Metropolitan Statistical Area	43580	0.405	0.455	0.025	0.025
Sioux Falls SD Metropolitan Statistical Area	43620	0.465	0.405	0.045	0.014
Somerset PA Micropolitan Statistical Area	43740	0.780	0.784	0.140	0.204
South Bend-Mishawaka IN-MI Metropolitan Statistical Area	43780	0.496	0.571	0.199	0.261
Southern Pines-Pinehurst NC Micropolitan Statistical Area	43860	0.333	0.252	0.107	0.058
Spartanburg SC Metropolitan Statistical Area	43900	0.400	0.386	0.199	0.206
Spokane WA Metropolitan Statistical Area	44060	0.304	0.362	0.012	0.018
Springfield IL Metropolitan Statistical Area	44100	0.547	0.576	0.277	0.302
Springfield MA Metropolitan Statistical Area	44140	0.557	0.603	0.166	0.224
Springfield MO Metropolitan Statistical Area	44180	0.445	0.489	0.029	0.054
Springfield OH Metropolitan Statistical Area	44220	0.569	0.630	0.258	0.334
Starkville MS Micropolitan Statistical Area	44260	0.219	0.279	0.072	0.088
State College PA Metropolitan Statistical Area	44300	0.457	0.491	0.105	0.063
Statesboro GA Micropolitan Statistical Area	44340	0.252	0.228	0.072	0.074
Statesville-Mooresville NC Micropolitan Statistical Area	44380	0.429	0.373	0.169	0.154
Staunton-Waynesboro VA Micropolitan Statistical Area	44420	0.343	0.393	0.044	0.056
St. Cloud MN Metropolitan Statistical Area	41060	0.548	0.413	0.054	0.010
Steubenville-Weirton OH-WV Metropolitan Statistical Area	44600	0.546	0.604	0.123	0.174
Stillwater OK Micropolitan Statistical Area	44660	0.330	0.362	0.022	0.030
St. Joseph MO-KS Metropolitan Statistical Area	41140	0.414	0.448	0.053	0.055
St. Louis MO-IL Metropolitan Statistical Area	41180	0.710	0.732	0.538	0.567
St. Marys GA Micropolitan Statistical Area	41220	0.143	0.141	0.019	0.019
Stockton CA Metropolitan Statistical Area	44700	0.314	0.407	0.045	0.063
Sturgis MI Micropolitan Statistical Area	44780	0.490	0.531	0.069	0.103
Sulphur Springs TX Micropolitan Statistical Area	44860	0.418	0.432	0.092	0.127
Summerville GA Micropolitan Statistical Area	44900	0.481	0.458	0.131	0.121
Sumter SC Metropolitan Statistical Area	44940	0.335	0.393	0.185	0.217
Sunbury PA Micropolitan Statistical Area	44980	0.560	0.653	0.093	0.173

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Susanville CA Micropolitan Statistical Area	45000	0.588	0.609	0.118	0.139
Syracuse NY Metropolitan Statistical Area	45060	0.646	0.693	0.322	0.368
Talladega-Sylacauga AL Micropolitan Statistical Area	45180	0.309	0.312	0.147	0.130
Tallahassee FL Metropolitan Statistical Area	45220	0.419	0.423	0.243	0.251
Tallulah LA Micropolitan Statistical Area	45260	0.525	0.663	0.329	0.517
Tampa-St. Petersburg-Clearwater FL Metropolitan Statistical Area	45300	0.504	0.609	0.260	0.348
Terre Haute IN Metropolitan Statistical Area	45460	0.576	0.597	0.100	0.143
Texarkana TX-Texarkana AR Metropolitan Statistical Area	45500	0.410	0.419	0.197	0.221
The Villages FL Micropolitan Statistical Area	45540	0.667	0.318	0.331	0.068
Thomasville-Lexington NC Micropolitan Statistical Area	45640	0.547	0.556	0.164	0.220
Thomaston GA Micropolitan Statistical Area	45580	0.362	0.357	0.144	0.131
Thomasville GA Micropolitan Statistical Area	45620	0.350	0.379	0.133	0.157
Tiffin OH Micropolitan Statistical Area	45660	0.435	0.508	0.069	0.103
Tifton GA Micropolitan Statistical Area	45700	0.446	0.539	0.238	0.301
Toccoa GA Micropolitan Statistical Area	45740	0.262	0.211	0.056	0.059
Toledo OH Metropolitan Statistical Area	45780	0.630	0.696	0.383	0.464
Topeka KS Metropolitan Statistical Area	45820	0.480	0.513	0.102	0.131
Torrington CT Micropolitan Statistical Area	45860	0.306	0.295	0.009	0.006
Traverse City MI Micropolitan Statistical Area	45900	0.538	n/a	0.045	n/a
Trenton-Ewing NJ Metropolitan Statistical Area	45940	0.556	0.596	0.351	0.394
Troy AL Micropolitan Statistical Area	45980	0.231	0.270	0.079	0.108
Tucson AZ Metropolitan Statistical Area	46060	0.293	0.322	0.020	0.023
Tullahoma TN Micropolitan Statistical Area	46100	0.357	0.347	0.038	0.041
Tulsa OK Metropolitan Statistical Area	46140	0.517	0.558	0.280	0.358
Tupelo MS Micropolitan Statistical Area	46180	0.424	0.322	0.173	0.102
Tuscaloosa AL Metropolitan Statistical Area	46220	0.536	0.550	0.358	0.368
Tuskegee AL Micropolitan Statistical Area	46260	0.523	0.508	0.228	0.228
Tyler TX Metropolitan Statistical Area	46340	0.396	0.455	0.172	0.251
Union City TN-KY Micropolitan Statistical Area	46460	0.430	0.449	0.140	0.139
Union SC Micropolitan Statistical Area	46420	0.236	0.205	0.079	0.071
Utica-Rome NY Metropolitan Statistical Area	46540	0.612	0.634	0.173	0.174
Valdosta GA Metropolitan Statistical Area	46660	0.435	0.435	0.246	0.261
Vallejo-Fairfield CA Metropolitan Statistical Area	46700	0.291	0.315	0.067	0.083
Valley AL Micropolitan Statistical Area	46740	0.273	0.278	0.098	0.115
Vernon TX Micropolitan Statistical Area	46900	0.355	0.368	0.088	0.116
Vicksburg MS Micropolitan Statistical Area	46980	0.332	0.399	0.151	0.206
Victoria TX Metropolitan Statistical Area	47020	0.296	0.315	0.025	0.033
Vidalia GA Micropolitan Statistical Area	47080	0.252	0.239	0.065	0.060
Vincennes IN Micropolitan Statistical Area	47180	0.534	n/a	0.172	n/a
Vineland-Millville-Bridgeton NJ Metropolitan Statistical Area	47220	0.341	0.336	0.153	0.151
Visalia-Porterville CA Metropolitan Statistical Area	47300	0.312	0.385	0.013	0.019
Waco TX Metropolitan Statistical Area	47380	0.427	0.451	0.175	0.220

Geographic Area (CBSA)	CBSA code	Dissimilarity Index		Isolation Index	
		2010	2000	2010	2000
Walla Walla WA Micropolitan Statistical Area	47460	0.481	n/a	0.244	n/a
Walterboro SC Micropolitan Statistical Area	47500	0.239	0.227	0.069	0.061
Warner Robins GA Metropolitan Statistical Area	47580	0.230	0.299	0.077	0.107
Warrensburg MO Micropolitan Statistical Area	47660	0.365	0.356	0.027	0.039
Washington-Arlington-Alexandria DC-VA-MD-WV Metropolitan Statistical Area	47900	0.561	0.597	0.391	0.440
Washington NC Micropolitan Statistical Area	47820	0.287	0.295	0.093	0.094
Waterloo-Cedar Falls IA Metropolitan Statistical Area	47940	0.616	0.691	0.272	0.332
Watertown-Fort Drum NY Micropolitan Statistical Area	48060	0.354	0.441	0.035	0.066
Wauchula FL Micropolitan Statistical Area	48100	0.262	0.265	0.029	0.086
Waycross GA Micropolitan Statistical Area	48180	0.365	0.364	0.198	0.226
West Point MS Micropolitan Statistical Area	48500	0.159	0.140	0.044	0.034
Wheeling WV-OH Metropolitan Statistical Area	48540	0.539	0.558	0.103	0.112
Wichita KS Metropolitan Statistical Area	48620	0.528	0.564	0.231	0.314
Wichita Falls TX Metropolitan Statistical Area	48660	0.452	0.525	0.153	0.199
Williamsport PA Metropolitan Statistical Area	48700	0.583	0.614	0.117	0.123
Willimantic CT Micropolitan Statistical Area	48740	0.413	0.436	0.026	0.025
Wilmington NC Metropolitan Statistical Area	48900	0.451	0.435	0.187	0.217
Wilson NC Micropolitan Statistical Area	48980	0.336	0.395	0.163	0.221
Winchester VA-WV Metropolitan Statistical Area	49020	0.332	0.413	0.039	0.066
Winfield KS Micropolitan Statistical Area	49060	0.326	n/a	0.024	n/a
Winston-Salem NC Metropolitan Statistical Area	49180	0.512	0.570	0.290	0.362
Wooster OH Micropolitan Statistical Area	49300	0.458	0.526	0.018	0.026
Worcester MA Metropolitan Statistical Area	49340	0.473	0.481	0.061	0.049
Yakima WA Metropolitan Statistical Area	49420	0.320	0.366	0.007	0.012
Yazoo City MS Micropolitan Statistical Area	49540	0.436	0.371	0.250	0.188
York-Hanover PA Metropolitan Statistical Area	49620	0.477	0.678	0.125	0.194
Youngstown-Warren-Boardman OH-PA Metropolitan Statistical Area	49660	0.658	0.715	0.346	0.436
Yuba City CA Metropolitan Statistical Area	49700	0.261	0.301	0.011	0.019
Yuma AZ Metropolitan Statistical Area	49740	0.311	0.334	0.012	0.021
Zanesville OH Micropolitan Statistical Area	49780	0.477	0.513	0.059	0.072

Note: Segregation indices reported only for geographic areas with at least 1,000 African-American residents in a given year.

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RACIAL/ETHNIC RESIDENTIAL SORTING IN SPATIAL CONTEXT: TESTING THE EXPLANATORY FRAMEWORKS[1]

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Abstract: There are four major explanatory frameworks on racial/ethnic segregation and its changes: Assimilation, Stratification, Resurgent Ethnicity, and Market-Led Pluralism. Previous efforts to evaluate the significance of each framework, mainly relying on cross-urban metrics, pay less attention to intraurban residential patterning even though each framework leads to a different expectation about it. In response, this paper examines the validity of each framework in terms of intraurban segregation and changes. Following Brown and Chung's (2006) suggestion, this investigation utilizes a set of local segregation measures—Location Quotient and Local Moran's *I*—that shows where segregation occurs within a city. They are applied to the Columbus, Ohio MSA for 1990 and 2000. The overall findings support Resurgent Ethnicity and Market-Led Pluralism as the most relevant of the four frameworks. [Key words: segregation, race, ethnicity, assimilation, stratification, resurgent ethnicity, market-led pluralism, location quotient, local Moran's *I*, Columbus, Ohio.]

INTRODUCTION

Concerning the mechanism of racial/ethnic segregation in U.S. cities, four explanatory frameworks have been proposed: Assimilation, Stratification, Resurgent Ethnicity, and Market-Led Pluralism. Previous efforts to evaluate the significance of each framework, mainly relying on cross-urban metrics, pay less attention to intraurban patterning of segregation even though each framework produces different expectations about it. Accordingly, this article examines the fit between each framework and the empirical reality of residential patterning within a city through cartographic analyses. In so doing, it

[1]We acknowledge and very much appreciate the insights of Sang-Il Lee, Edward Malecki, Michael Tiefelsdorf, Elvin Wyly, three anonymous reviewers for *Urban Geography*, and the encouragement of David Wong. We also appreciate audience responses to presentations at meetings of the Association of American Geographers, European Regional Science Association, Population Association of America, and the Western Regional Science Association.
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Urban Geography, 2007, **28**, 4, pp. 312–339.

also contributes to a broader concern about the primary process(es) of racial/ethnic clustering, intermixing, and dispersal.

Our study area is the Columbus, Ohio MSA. Data consist of the block group locations of African Americans, Asians, Caucasians, and Hispanics for 1990 and 2000, as reported by the U.S. Census of Population. The residential patterning of each group for each year, and its change, is calibrated by local measures of clustering/segregation that show where grouping occurs within a city. Local Moran's *I* and Location Quotients are employed, as recommended by Brown and Chung (2006). We also use several *ad hoc* measures to obtain a finer grain of observation. Assessing the four segregation frameworks involves cartographic analysis that is informed by our local, largely qualitative, knowledge of the Columbus MSA in terms of its neighborhoods, their change over time, and broader dynamics of the MSA itself—thereby incorporating a broad range of approaches to geographic understanding.

This study begins by summarizing the four segregation frameworks. We then step back from them to describe our research design and provide a set of expected findings for each framework that, if borne out, would support the framework. The fourth section reports the results of our empirical analyses, and the fifth is an evaluation of findings in terms of the hypotheses associated with each framework. The article closes with a summary, a discussion of results, and pointers concerning future research directions.

FRAMEWORKS FOR UNDERSTANDING RACIAL/ETHNIC PATTERNING IN U.S. CITIES

Racial/ethnic segregation has been one of the most controversial issues in U.S. urban geography. Some scholars stress that segregation persists; others argue that we are experiencing its marked decline. Some focus on continuing discriminatory practices in housing markets; others on its historically low levels. Some emphasize that racial/ethnic minorities continue to face barriers to residential choice; others highlight their new opportunities and progress made. And in a tangential vein, some scholars see integrated neighborhoods as beneficial; others argue similarly for racial/ethnic concentrations.

To appreciate the controversy surrounding these issues, and the immense amount of disagreement, one only needs to read Clark (2007). As underscored in his abstract (p. 295) "The debate is between those who … place the emphasis for continuing segregation on discrimination and White prejudice and those who place greater emphasis on income, wealth, and residential preferences." More succinctly known as the *class versus culture* debate, Clark's strong argument in favor of class evoked very strong reviewer reactions. This is distinctly indicated by his (exceptionally long) first footnote (pp. 310–312), which is a response "to several serious reviewers who argued that [Clark] 'mischaracterized' researchers with whom [he] disagrees," and goes on to refute that statement by dissecting, through quotes, the articles of five major researchers in the area.

Our task is simple by comparison. We acknowledge the controversy, but recognize that at its core is the question of why segregation occurs and/or persists. In this regard, there are at least four explanatory frameworks—Assimilation, Stratification, Resurgent Ethnicity, and Market-Led Pluralism—each varying in the degree to which they embrace class, culture, or both, and which we will evaluate from a spatial perspective.

Assimilation, closely associated with the melting-pot ideal (Alba, 2000), embodies the Chicago School's version of segregation change. Segregation, as a spatial outcome of socioeconomic factors, is attributed to low assimilation of a minority group to the majority society (Massey, 1985). Assimilation is differentiated as being *structural*, indicated by socioeconomic status such as income and educational attainment, and/or *cultural*, indicated by acculturation such as English-language ability and length of stay in the United States (Gordon, 1964). Taken together, these perspectives see an inverse relationship between assimilation and segregation, hypothesizing that a minority group becomes residentially integrated with the majority group as it becomes wealthier, educated, acculturated, and fluent in English (Massey and Denton, 1985). A recent recognition from assimilation theorists is *segmented assimilation* (Portes, 1995; Portes and Rumbaut, 1996; Zhou, 1997), which embraces divergent paths of assimilation: (1) acculturating middle-class values of the racial/ethnic majority society; (2) falling toward underclass status; or (3) advancing socially while keeping strong ties with origin ethnicity (Wright and Ellis, 2000, p. 201). Empirical analyses include those by Alba and Logan (1993), Hwang and Murdock (1998), Logan et al. (2004), Massey and Denton (1985), and Newbold (2003).

Second, the *Stratification* framework attributes the persistence of segregation to housing discrimination, racial stereotyping, and prejudicial preferences, which lead to segmented housing markets and a stratification of neighborhoods within urban areas (Logan and Molotch, 1987; Farley et al., 1994; Yinger, 1995, 1996). Discriminatory practices include racial steering and blockbusting by real estate agents and redlining by mortgage lenders. Steering, based on neighborhood stereotyping along racial/ethnic lines, concentrates minority groups in certain parts of urban space. Blockbusting accelerates racial/ethnic turnover and keeps the minority groups segregated even after their relocation to other neighborhoods. Their concentrations are vulnerable to deterioration because redlining promotes disinvestment by preventing them from receiving proper mortgage loans. As a result, racial/ethnic minorities are relegated to lower status housing markets and their upward residential mobility is impeded, even after socioeconomic improvement. Empirical analyses, enhanced by the Home Mortgage Disclosure Act of 1975 and the fair housing audits that followed, include those by Gotham (2002), Dingemans (1979), Galster (1990), Galster and Godfrey (2005), and Myers and Chan (1995).

Third, *Resurgent Ethnicity* attempts to explain why segregation persists even after improvement of the socioeconomic status (SES) of racial/ethnic minorities and amelioration of discriminatory practices. This framework emphasizes racial/ethnic preference in residential choice, sometimes termed in-group attraction, but also recognizes there may be racial/ethnic differences in the degree of in-group attraction. In-group attraction based on race/ethnicity, combined with out-group aversion, generates a particular preference in the racial/ethnic composition of one's neighborhood, entailing segregation. An explicit statement of Resurgent Ethnicity is provided by Logan et al. (2002) in their study of Asian and Hispanic immigrants who settled in affluent suburbs of New York and Los Angeles, often without cultural assimilation such as English fluency. They argue that these racial/ethnic settlements could be better understood as *ethnic communities* driven by preference and choice rather than *immigrant enclaves* driven by economic and cultural constraints (also see Logan et al., 2004). The Resurgent Ethnicity framework hypothesizes that racial/ethnic cohesion (re-)generates segregation even though residential

integration (as in Assimilation) is socioeconomically feasible and housing discrimination (as in Stratification) has been abated. Pertinent empirical analyses include Charles (2005), Clark (2002), and Krysan and Farley (2002).

Resurgent Ethnicity could arise, and transform racial/ethnic geography, in three ways. First is as a spillover effect. Mass immigration makes traditional enclaves unable to hold newcomers, as shown for Mexican concentrations in Los Angeles in 1990 (Allen and Turner, 1996b, p. 153) and Puerto Ricans (Massey, 1985). The second is chain migration: new immigrants who have ties with residentially assimilated relatives or friends tend to settle near them (Alba et al., 1999, p. 458). The third involves the high socioeconomic status of some new immigrants, as depicted by Logan et al. (2002). For example, Japanese nationals who work for Japanese corporations directly settle in more affluent co-ethnic suburbs in Southern California (Allen and Turner, 1996b, p. 152). Other examples include Chinese and Koreans in Los Angeles County (Allen and Turner, 1996a). Finally, whereas the preceding scenarios are sketched in terms of immigrants, the Resurgent Ethnicity hypothesis applies as well, if not more poignantly, to native-born people residing in traditional racial/ethnic enclaves, who experience an increase in SES, and choose either to remain in the traditional enclave or to move to another racial/ethnic enclave commensurate with their SES.

For both immigrant and native-born population, therefore, Resurgent Ethnicity implies two types of racial/ethnic neighborhood—one that is disadvantaged, and one that is better endowed but spatially and socially separated from comparable neighborhoods—thus embellishing sociospatial polarization. Traditional enclaves expand, absorbing lower-SES, less culturally assimilated immigrants and natives. Simultaneously, new racial/ethnic neighborhoods emerge in relatively advantaged areas of the city, providing shelter to entrepreneurs, professionals, and the like. Chain migration is common to both types of concentration, spillover effects apply more to traditional racial/ethnic enclaves, and socioeconomic status effects apply more to new racial/ethnic neighborhoods.

Fourth, *Market-Led Pluralism* (Brown and Chung, 2008) highlights the increasing role of market-makers in racial/ethnic urban geography. Discriminatory housing practices (central to Stratification) are illegal, of reduced profitability, and thus greatly attenuated in their impact. Concerning Assimilation, heterogeneous neighborhoods *per se* are not necessarily attractive, and might in fact be a marginal or irrelevant criterion in housing choice (Portes, 1995; Wright and Ellis, 2000). Also, racial/ethnic preference regarding neighborhood composition plays some role in residential sorting, but its role is inconsistent across cities and groups (Charles, 2005). In response, Market-Led Pluralism argues that market makers are central in shaping today's racial/ethnic mosaic, focusing on five components.

Housing developers continually unveil new urban spaces with culturally open communities. Mortgage lenders, encouraged and supported by government policy, provide affordable mortgages to an increasingly wide range of households. Real estate agents link buyers, sellers, and lenders in a largely nondiscriminatory manner. Consumers operate under a similar consumption equation that seeks neighborhood and housing amenities, tempered by affordability, and within their set of preferences racial/ethnic composition is relatively low in priority. Local communities impose their own development agendas, or lack thereof, on the market place, which ultimately affect the cost, type, and quality of housing and related amenities; may affect the nature of employment and occupations; and

thereby impact the racial/ethnic character of residential space. Facilitating the efforts of these actors is information that is pervasive and fluid (e.g., via the Internet, e-mail, cell phone); procedures that are systematized, automatic, and transparent; and smoothly functioning market mechanisms. As a result, new racial/ethnic minority residences are spread throughout the urban area in a manner that mirrors its spatial growth, and their clusters or concentrations overlap with those of other groups.

All in all, the four frameworks above attempt to answer why segregation occurs and/or persists. Each highlights different factors that cause changes in segregation (or intermixing): assimilation (as in the Assimilation framework), discrimination (Stratification), in-group attraction (Resurgent Ethnicity), and market makers (Market-Led Pluralism). Even though these factors are not mutually exclusive, it is important to weigh the validity of each framework to better understand the future of change in residential patterning.

An extensive body of evaluative studies on segregation frameworks has employed cross-urban comparison metrics, examining a large number of MSAs (Massey and Denton, 1989, 1993; Farley and Frey, 1994; Frey and Farley, 1996; Massey, 2000; Logan et al., 2004; Wilkes and Iceland, 2004) or focusing on several of the largest MSAs and/or immigrant gateway cities (Alba et al., 2000; Poulsen, Forrest, and Johnston, 2002; Poulsen, Johnston, and Forrest, 2002; Clark and Blue, 2004). It is also common to rely on the central city–suburb dichotomy in approaching segregation change, recognizing minority decentralization (Logan and Schneider, 1984; Massey and Denton, 1988; Alba and Logan, 1991, 1993; Logan and Alba, 1993; Logan, Alba, and Leung, 1996; Logan, Alba, McNulty, and Fisher, 1996; Alba et al., 1999; Clark, 2007).

Findings from cross-urban studies, however, are somewhat circumstantial and fall short in shedding light on underlying processes of segregation change in metropolitan areas. For instance, in their examination of White–Black segregation change during 1980s, Farley and Frey (1994) noted, "a high percentage of new housing is linked to declines in segregation" (p. 40) without saying why that is so. Another example is Logan, Alba, and Leung's (1996) study on minority residential patterns in eleven MSAs. They conclude that finding a positive relationship between minority population size and segregation, is "most consistent with the … stratification model: that Whites use segregation to preserve their social position in the face of a threatening—that is, large—minority advance" (p. 875). One cannot, however, move from this conclusion to predict that a particular MSA with a large number of minorities, even one of those studied, has a higher White aversion to minorities. A third example is Logan, Stults, and Farley's (2004) analysis of segregation in all MSAs in 2000. They noted "[the] segregation of both Hispanics and Asians grew the most in centers of durable-goods manufacturing, suggesting that the economies of these places somehow promote the segregation of all groups" (p. 19), but again without discussing underlying mechanisms.

We diagnose such shortcomings as the result of neglecting local variability within the metropolitan area, including the use of measures that show where segregation occurs within the city. Thus, insufficient attention has been paid to intraurban racial/ethnic residential sorting even though each framework leads to a different expectation about that process. By contrast, we evaluate the significance of each framework through cartographic analyses and local measures that better portray the geography of *intra*urban residential sorting along racial/ethnic lines. The following section presents our research design and hypotheses concerning the spatial patterning implied by each framework.

RESEARCH DESIGN AND METHODS

One reason segregation has received so much attention is that residential location and neighborhood characteristics affect one's accessibility to urban resources such as jobs and education. It should be apparent, then, that segregation is an intraurban, rather than interurban, issue and is better treated as such. Hence, we have advocated using local measures that show where segregation, or racial/ethnic assemblages, occur within a city; in particular the following (Brown and Chung, 2006).

Local Moran's *I* (*LM-I*) is calculated as:

$$I_i = (b_i - b^*) \Sigma_j w_{ij} (b_j - b^*)/[\Sigma_i (b_i - b^*)^2/n], \quad (1)$$

where b_i is the percent Black for location i; b^* is the mean percent Black for the study area; n is the number of areal units; w_{ij} is a spatial weights matrix between i and j (Anselin, 1995, p. 99); and it is understood that Black refers similarly to African American, Asian, Caucasian, and Hispanic.[3] The values of I are distributed in accordance with a z-score metric centered on 0.0. To gauge significance, we first append a plus sign (+) to high-value clustering and minus sign (–) to low-value clustering to indicate whether it pertains to the racial/ethnic group of concern or not; then, we use an *LM-I* of $z = +1.0$ or greater to indicate significant concentration of the racial/ethnic group, and an *LM-I* of $z = -1.0$ or lesser to indicate under-representation; these thresholds correspond with one standard deviation above or below the *LM-I* mean of $z = 0$.

The Location Quotient (*LQ*) provides a second measure:

$$LQ_i = (b_i/t_i)/(B/T), \quad (2)$$

where b_i and t_i are the Black and total population in areal unit i; B and T are the Black and total population in the entire study area. In its application to racial/ethnic segregation, the value of 1 indicates that the representation of a racial/ethnic group in a local areal unit is equal to that for the urban area overall; a value greater than 1 indicates more representation in a local areal unit than that for the urban area overall; a value less than 1 indicates less representation. To gauge significance, we use *LQ* of 1.33 or greater to indicate a significant concentration of the racial/ethnic group, and an *LQ* of 0.67 or less to indicate under-representation (Brown et al., 1996, p. 188).[4]

Choosing one standard deviation as being significant for the *LM-I* measure follows the procedures of Anselin (1995, 1996, 2000) and Tiefelsdorf (1998) for exploratory data analysis. That value also has a logic to it. The issue is not statistical significance *per se* so much as the degree to which an urban area today departs from the stereotypical

[3]In our particular application, each element of the spatial weight matrix is calculated as adjacent, and valued as 1, if two areal units share any part of their boundary; otherwise the value 0 is given. Following this tabulation, the matrix is row-standardized.

[4]A critique of our using *LM-I* and *LQ* could include their univariate nature given that segregation generally is viewed in a comparative frame of reference—for example, a White majority compared to a Black minority using the Dissimilarity Index. Only currently are bivariate spatial statistics being developed as in Lee's (2001a, 2001b) Local L_i, and this approach might be recommended for future research. There remains, however, the limitation that only two groups are considered, unlike the Entropy index (Brown and Sharma, 2007).

expectation(s) in both its spatial patterning and trajectory of change. In this regard, that a neighborhood has 33% more of a particular minority than would be expected given its average representation (city-wide) is indeed meaningful, and significant, in our opinion.[5] Given this determination, a similar procedure is used for LQ, wherein 1.33 indicates 33% greater representation than would be expected.

The Location Quotient has the advantage of simplicity, straight-forwardness, and familiarity; Local Moran's *I* is better grounded statistically. But there also is a difference in what each measure portrays. *LQ* treats each unit independently, thus indicating single-unit concentration, whereas Local Moran's *I* gauges a unit in terms of the characteristics of its neighbors, thus indicating clusters of areal units. Hence, Local Moran's *I* is more precise and conservative in identifying a racial/ethnic cluster, but the Location Quotient better illuminates the entire fabric of racial/ethnic locations, including outliers that indicate spatial trends. To capture this distinction, in subsequent analyses groupings identified via *LM-I* are termed *clusters*, and groupings identified via *LQ* are termed *concentrations*.

To examine the spatial properties of the four frameworks concerned with residential patterning in urban areas, the *LM-I* and *LQ* are applied to the three primary minority groups in the Columbus, Ohio MSA for 1990 and 2000—Non-Hispanic Blacks or African Americans (AA), Asians (A), and Hispanics (H), as reported by the U.S. Census of Population.[6] Residential location of each group is identified at the block group level. Since our concern is with the process of change in residential patterning, the primary focus is to compare the spatial distribution of clusters and concentrations in 2000 with that in 1990.

We also performed three finer-grained analyses as a means of augmenting *LM-I* and *LQ* findings. These are more sensitive to ongoing and incipient change.

First, we mapped *new* concentrations and clusters. A *new concentration* is identified when *LQ* is significant in 2000 (>1.33) but not in 1990, and a *new cluster* is identified when *LM-I* is significant in 2000 (>1.0) but not in 1990.

The second finer-grained analysis highlights *new neighborhoods* and *settlements* in order to understand residential pattern changes outside the clusters and concentrations. A *new neighborhood* is indicated where a block group has at least one minority person in 1990; more than 20 in 2000; more than a 50% increase in that minority during the 1990–2000 decade; and is not yet a concentration in 2000 ($LQ < 1.33$). A *new settlement* is indicated where a block group has no minority person in 1990 but more than 10 in 2000.

Taken together, then, we measured four degrees of change in neighborhood patterning. *LM-I* changes between 1990 and 2000 define new clusters, *LQ* changes between 1990 and 2000 define new concentrations, minority population growth between 1990 and

[5]This follows from the normal curve characteristic that one standard deviation represents approximately 66% of the observations, half above and half below the average.

[6]Each racial/ethnic group was treated in its entirety. It should be noted, however, that separating a racial/ethnic group by age cohort, or an ethnic group by a cohort reflecting their time in the United States, could alter our findings. For example, age affects wealth, which in turn affects where one lives; time in the United States affects assimilation, and immigrants arriving in the post–World War II era and before the civil rights legislation of the 1960s faced a distinctly different social environment than those arriving later. See, for example, Newbold (2004) and Newbold and Spindler (2001).

2000 (that remains below the concentration level) defines new neighborhoods, and no such population in 1990 but minority presence in 2000 defines new settlements.

The third finer-grain analysis involves residential intermixing between groups. *Racial/ethnic heterogeneity* is indicated when a block group has *LQ* of 1.0 or greater for more than one racial/ethnic minority in 2000. This is mapped for AA-A, AA-H, A-H, and Caucasian–Any Minority.

EXPECTED FINDINGS FOR EACH FRAMEWORK IN A SPATIAL CONTEXT

This section sets out expected findings for each framework in the context of our analytical procedures. To the degree that these findings occur, the framework would be supported, but findings also may be contradictory to a framework. Table 1 summarizes the following discussion of expected findings. Assessing the statistical findings also is informed by our local, largely qualitative, knowledge of the Columbus MSA in terms of its neighborhoods, their change over time, broader dynamics of the MSA itself, physical geography, institutional structures that might induce separation or intermixing (e.g., Ohio State University, and the like)—the ground-level reality that is indispensable for reaching a geographic understanding (Brown, 1999).

The spatial manifestation of traditional Assimilation would be a heterogeneous mixing of racial/ethnic groups in a sort of salt-and-pepper fashion outside of racial/ethnic enclaves. In terms of our measures, this would be supported by a dearth of (new and existing) clusters (*LM-I*s) and concentrations (*LQ*s) because minorities would overlap residentially with the majority. The same process would give rise to finding new neighborhoods and settlements since minorities move into majority neighborhoods, and finding racial/ethnic heterogeneity since movement is unimpeded. Traditional assimilation also would be supported if the 1990–2000 change in clusters or concentrations occurred contiguously, indicating that they were serving as a (temporary) shelter to new migrants with low structural and cultural assimilation, and/or if change dispersed outward from the city center in a spray-like fashion. A contra-indication of assimilation would be new clusters and/or concentrations in formerly majority areas that are spatially separate from existing racial/ethnic enclaves, a phenomenon better associated with resurgent ethnicity.

The spatial manifestation of Stratification would be a marked clustering of both existing (1990) and new (1990–2000) minority group residences, indicating that minority movements are sharply constrained. Also supportive would be if new minority block groups (whether concentrations, neighborhoods, or settlements) adjoined 1990 clusters or concentrations. In general, then, 2000 patterns of minority residences are correlated highly with 1990 patterns. A contra-indication of stratification would be finding a number of new concentrations, new neighborhoods, or new settlements that are geographically separate from existing racial/ethnic enclaves and/or finding racial/ethnic heterogeneity with the majority Caucasian population.

The Resurgent Ethnicity framework suggests two types of residential patterns. One consists of higher socioeconomic status households residing some distance from longer-standing racial/ethnic enclaves; this would be supported by the locations of existing (1990) clusters and concentrations, and new (1990–2000) clusters, concentrations, neighborhoods, or settlements. The second type of residential pattern consists of higher socioeconomic status households residing adjacent to or within longer-standing racial/ethnic

TABLE 1. EXPECTED FINDINGS FOR EACH FRAMEWORK[a]

	Clusters and concentrations	New clusters and concentrations	New neighborhoods and settlements	Heterogeneous neighborhoods
Assimilation	*Only in, or contiguous to, traditional racial/ethnic enclaves in lower SES areas; Not elsewhere*	*Only in, or contiguous to, traditional racial/ethnic enclaves in lower SES areas; Not elsewhere*	Occur throughout the MSA	Occur throughout the MSA
Stratification	*Marked clustering, especially but not necessarily in lower SES areas; Few, if any, concentrations*	*Adjoin existing clusters/concentrations*	Adjoin existing clusters/concentrations	Only among minority groups
Resurgent ethnicity	*Clusters or concentrations (1) distinctly apart from existing racial/ethnic enclaves; or (2) adjacent to/ within enclaves but of higher SES than neighbors*	*New clusters or concentrations (1) distinctly apart from existing racial/ethnic enclaves; or (2) adjacent to/ within enclaves but of higher SES than neighbors*	New neighborhoods (1) distinctly apart from existing racial/ethnic enclaves; or (2) adjacent to/ within enclaves but of higher SES than neighbors	Occurrence is a contraindicator; Should not be found
Market-led pluralism	*Clusters and concentrations spread throughout the MSA, mirroring its spatial evolution and the SES of local areas*	*New clusters and concentrations spread throughout the MSA, mirroring its spatial evolution and the SES of local areas*	*New neighborhoods spread throughout the MSA, mirroring its spatial evolution and the SES of local areas; often located beyond more dense settlement*	Heterogeneity expected among all racial/ethnic groups, especially evident with Caucasians

[a]Italicized findings are most prominent or distinctive indicators.

enclaves. This would be supported if new clusters, concentrations, neighborhoods, or settlements in such locations also had higher indicators of socioeconomic status than their neighbors. A contra-indication of resurgent ethnicity would be racial/ethnic heterogeneity within block groups.

The spatial manifestation of Market-Led Pluralism should be evident, or not, through all our indices. On the one hand, existing and new minority residences should be spread throughout the MSA in a manner that mirrors its spatial evolution, which can be seen

through both clusters (*LM-I*s) and concentrations (*LQ*s). Second, minority residences should increase their intermixing with Caucasians. This can be deduced by the locations of clusters and concentrations, but also more directly by the locations of new neighborhoods and settlements and by the third finer-grained analysis, showing where block groups have an *LQ* of 1.0 or greater for more than one racial/ethnic minority and Caucasians in 2000. That measure also will reveal whether there is greater intermixing of minorities, an expectation under Market-Led Pluralism. Finally, drawing on our understanding of the Columbus MSA as a place, it is expected that racial/ethnic minorities will be well represented in areas that have been built up since 1990.

The following section presents a brief introduction to our case study area and the results of the empirical analyses. This is followed by an evaluation of findings in terms of the expectations just delineated.

THE FRAMEWORKS IN CONTEXT: THE COLUMBUS, OHIO MSA

Each of the four frameworks—Assimilation, Stratification, Resurgent Ethnicity, and Market-Led Pluralism—sets forth a different process of residential sorting, leading to different, though not necessarily mutually exclusive, patterns of segregation or racial/ethnic assemblages. In this section, we identify and describe these patterns for African Americans, Asians, and Hispanics in the Columbus MSA for 1990 and 2000. The subsequent section uses this information to draw generalizations and evaluate the four frameworks in the context of a contemporary, mid-sized urban area.

Attention is first given to the Columbus MSA as a backdrop to subsequent analyses. We then turn to formal indices that reveal the geography of racial/ethnic assemblages—Local Moran's *I* and the Location Quotient—and the results of applying those indices. A second empirical step turns to finer-grained analyses that augment the more formal indices by better indicating ongoing and incipient change.

The Columbus MSA: The Backdrop

The Columbus MSA in 1990 and 2000 represents mid-sized metropolitan areas that experienced significant racial/ethnic changes only during the past quarter-century. In 2000, the MSA had slightly less than 1.6 million population, 80.8% of whom were Caucasian (C), 13.0% African American (AA), 2.4% Asian (A), and 1.8% Hispanic (H; Table 2). Compared to 1990, the entire population grew by 14.8%, the Caucasian portion grew less (8.3%), and each racial/ethnic group grew markedly more (African Americans 25.6%, Asians 81.4%, and Hispanics 181.3%). From Figure 1 we see that the MSA is comprised of seven counties, the county seats of which constitute satellite cities to Columbus; that Columbus city encapsulates several independent cities and neighborhoods; and that the city is defined by its interstate highway system with I-70 running east west (Pittsburgh to Indianapolis), I-71 southwest to northeast (Cincinnati to Cleveland), an inner belt (I-670) that surrounds the CBD, and an outer belt (I-270) that represented the farthest extensions of growth when first built (north-to-south and east-to-west) but now is engulfed by subsequent rings of growth since 1980 that go far beyond.

Segregation/clustering in the MSA overall is indicated by computing a Global Moran's *I* for each racial/ethnic group, and Dissimilarity Indices for all pairs of racial/

TABLE 2. RACIAL/ETHNIC COMPOSITION IN COLUMBUS, OHIO MSA[a]

	1990	2000
Caucasian	1,178,794 (85.58)	1,277,091 (80.77)
African American	163,763 (11.89)	205,633 (13.01)
Asian	20,449 (1.49)	37,093 (2.35)
Hispanic	10,106 (0.73)	28,424 (1.80)
Others[b]	4,308 (0.31)	32,825 (2.07)
Total	1,377,420 (100.00)	1,581,066 (100.00)

[a]Number in parenthesis is percentage.
[b]Includes Native Americans and population of two or more races.
Source: U.S. Bureau of the Census.

ethnic groups (C-AA, C-A, C-H, AA-A, AA-H, and A-H; Table 3).[7] Global Moran's *I*s reveal that, as groups, Caucasians and African Americans were highly clustered in 1990 and 2000, Asians moderately so in 2000, Hispanics slightly clustered in 2000; that Asian and Hispanic clustering increased noticeably between 1990 and 2000; and that the clustering of all is statistically significant at the .01 level. Concerning the separation of racial/ethnic groups, *D*-Indices show that separation was highest for African Americans vis-à-vis Caucasians and Asians in 1990 and 2000 (*D*s at 60 or greater); that separation was at a middle range for other pairings in 2000 (*D*s in a 40–60 range); and that, importantly, all *D*-Indices fell markedly between 1990 and 2000. Translated into more prosaic terms, there is relatively little intermixing of residential spaces between African Americans and Caucasians or Asians, and an intermediate amount of intermixing between other pairings; furthermore, the intermixing of residential spaces increased noticeably between 1990 and 2000.

To gain an understanding of the spatial patterning that underlies global indices reported in Table 3 and as a basis for evaluating the four segregation frameworks, attention

[7]Global Moran's *I* (Cliff and Ord, 1981) provides a measure of clustering or segregation over the entire study area for each racial/ethnic group. A value approaching +1.0 indicates a very high level of clustering, a negative value indicates dispersal, and values in between can be evaluated accordingly, but also by their significance level (Kaluzny et al., 1998, p. 125). Global Moran's *I* (*GM-I*) relates to its Local Moran's *I*s in that *GM-I* equals the average over all *LM-I*s. The widely used Dissimilarity Index (Kaplan and Holloway, 1998) indicates the proportion of the population that would need to move to bring about evenness in the distribution of two racial/ethnic groups.

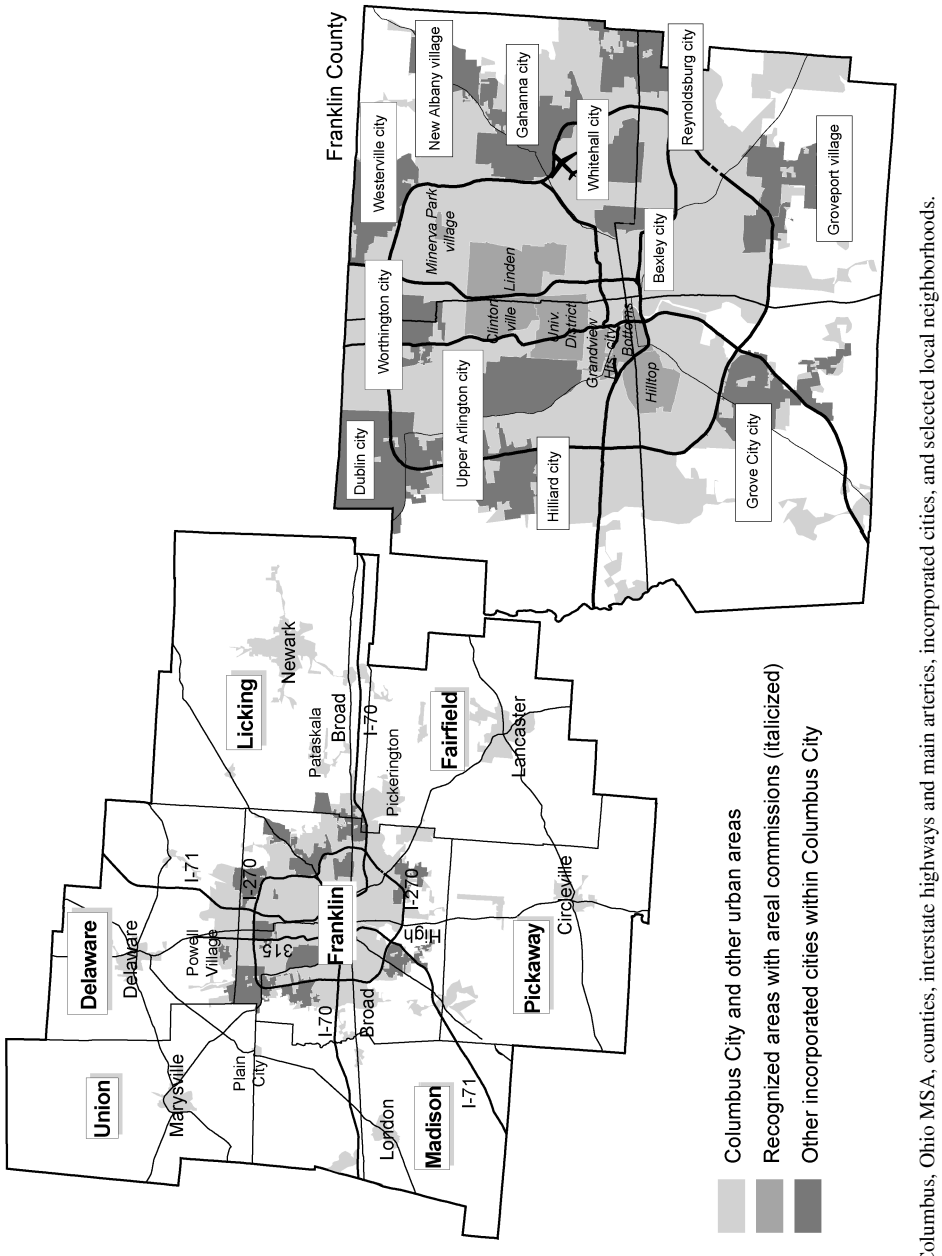

Fig. 1. Columbus, Ohio MSA, counties, interstate highways and main arteries, incorporated cities, and selected local neighborhoods.

TABLE 3. SEGREGATION IN GLOBAL PERSPECTIVE[a]

	1990				2000			
	Caucasian	African American	Asian	Hispanic	Caucasian	African American	Asian	Hispanic
Caucasian	*.791**	.708	.593	.553	*.812**	.655	.457	.400
African American		*.805**	.763	.700		*.841**	.650	.509
Asian			*.204**	.637			*.544**	.447
Hispanic				*.085**				*.249**

[a]Nondiagonal cells contain the Dissimilarity Index. Italicized diagonal cells contain Global Moran's *I* measures.
*Significant at the .01 level.

now turns to local measures of racial/ethnic assemblages for the Columbus MSA at the block group level for 1990 and 2000.

Racial/Ethnic Assemblages from a Local Perspective

Now turning more broadly to the *LM-I* and *LQ* maps, we see a number of interesting features in the spatial patterning of racial/ethnic groups within the Columbus MSA. This discussion draws on Figures 2 (African Americans), 3 (Asians), and 4 (Hispanics) as they cross-reference with relevant Columbus characteristics, which are shown in Figure 1.

African Americans show a distinct cluster within the outer belt of Columbus's interstate system, which encompasses most of Columbus city. This cluster occurs in the eastern portion of that area and expanded somewhat between 1990 and 2000, primarily eastward toward the outer belt and south of Broad Street, a major east–west artery. It encompasses an area immediately east of the CBD, which in the 1960s was the focus of War on Poverty programs (Andrew, 1998), including designation as Columbus's Model Cities area. The African American cluster also occupies an area south of Broad Street extending some distance eastward through Whitehall, a middle-class blue-collar neighborhood, and it further extends northeast through Linden, a former Italian enclave that also was/is middle class and blue collar. Just east of the African American *LM-I* cluster, and directly east of downtown, is the upper-middle-class municipality of Bexley, which has served as a barrier to eastward expansion of the African American cluster, but nevertheless became enveloped by African American residential movements, a phenomenon highlighted by *LQ*s.

When we turn to the *LQ* maps, a more dynamic picture emerges. We see that within the outer belt in 1990 African American residential concentrations also were present in the western half of Columbus city—especially its southern and western segments that encompass Hilltop, the Bottoms, and Urbancrest (areas generally lower in SES) as well

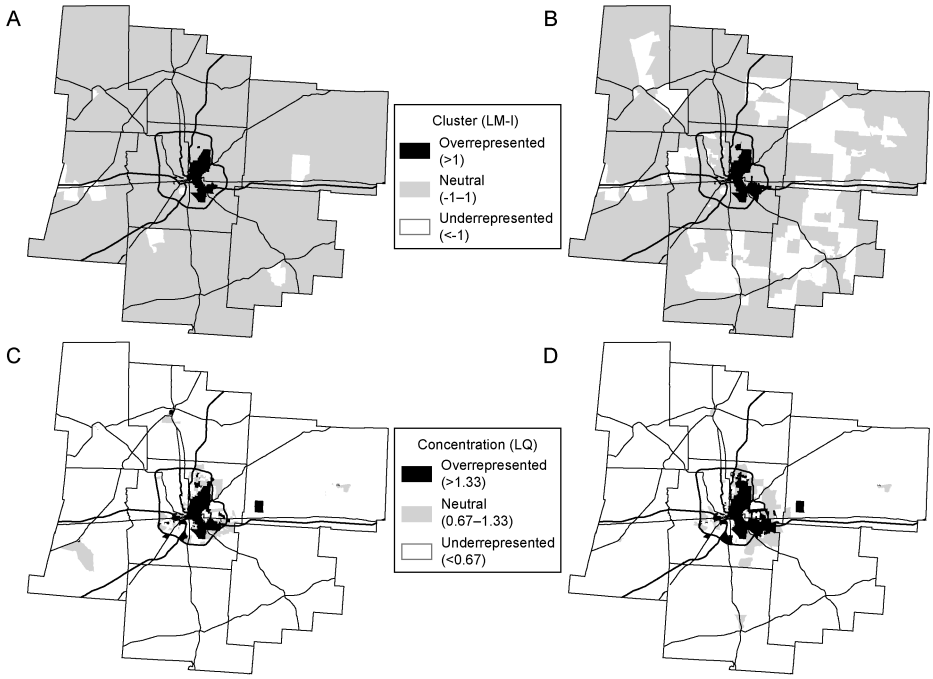

Fig. 2. African American clusters and concentrations in Columbus, Ohio MSA: (A) Cluster in 1990, (B) Cluster in 2000, (C) Concentration in 1990, (D) Concentration in 2000.

as the satellite cities of Delaware and Pataskala.[8] By 2000, African American concentrations moved northward from their major settlement area to encompass Minerva Park, the Northland area, and Worthington; they also moved eastward beyond the outer belt into the Reynoldsburg area. In addition, when we consider one level below concentrations, areas noted as neutral on the map, we see incipient settlement even farther to the east and south in the vicinities of Gahanna, Groveport, Canal Winchester, and Westerville. Much of this expansion occurred through new homes or rental units, and/or by filtering as older homes were vacated by people moving to newer homes. *LM-I* and *LQ*s analyses together also reveal that the African American cluster moved only to the edge of Westerville, a higher SES community, while it was partially penetrated by AA concentrations.[9]

Overall, then, we see a classic instance of an historically African American area that has spread to contiguous locations in a uniform, layered pattern, largely through

[8]The Delaware concentration reflects that it was a stop on the underground railway of the mid-1800s; likewise for Urbancrest. The Pataskala concentration reflects the "Blanche Addition" (also known as Furrsville), a community created in 1929 by Reverend Levi Furr, whose wife was named Blanche, both of whom had moved from Columbus. Although historically African American, the community now includes a number of Caucasian residents as well (Triplett, 1999).

[9]In that Bexley and Westerville are both upper-middle-class communities and have been a barrier to African American expansion, one might conclude that impedance process was similar. But these (*continues on next page*)

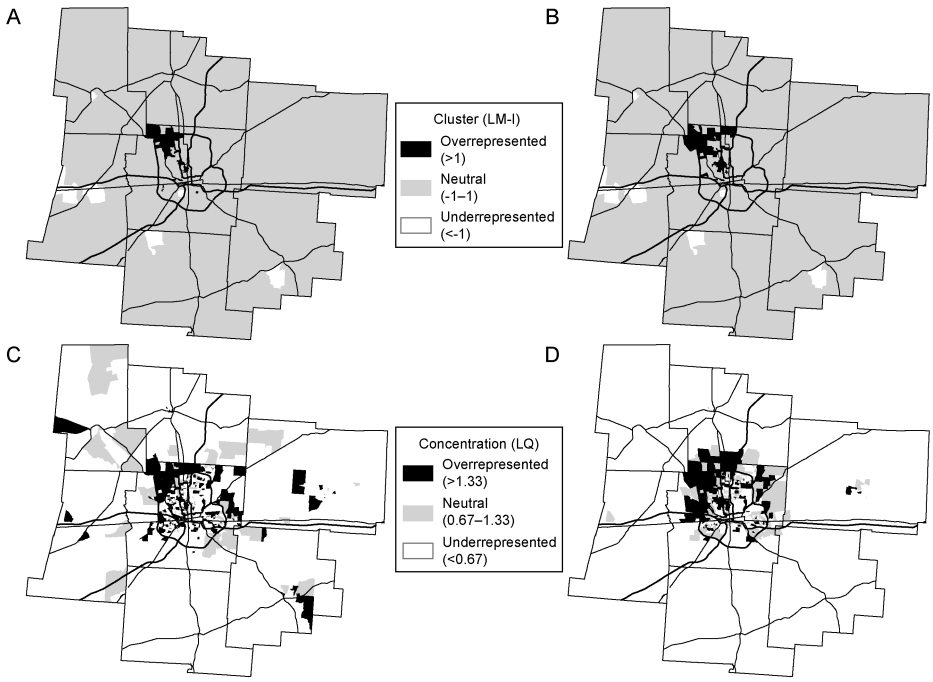

Fig. 3. Asian clusters and concentrations in Columbus, Ohio MSA: (A) Cluster in 1990, (B) Cluster in 2000, (C) Concentration in 1990, (D) Concentration in 2000.

well-known processes such as invasion-succession and the filtering of housing stock (Kaplan and Holloway, 1998; Gotham, 2002), but with temporary impedance from upper-middle-class communities. Not a part of the classic picture, however, is the role of new housing, which we deem to be significant.

The *Asian* cluster presents another scenario. *LM-I*s for both 1990 and 2000 show it to be centered on the upper-middle-class municipalities of Dublin, Upper Arlington, and Worthington in the northwest corner of Franklin County, often beyond the outer belt, and spreading diagonally southeastward toward Ohio State University. An important factor

[9](*Continued*) are very different settings. Bexley is a long-established enclave of the well-to-do that straddles Broad Street, the major east–west artery prior to the interstate era, and is approximately mid-way between the CBD and the Franklin County border. Its housing stock dates to the early and mid-20th century, but property values have been maintained and increased. Steering by real estate agents, housing discrimination, and similar prejudicial actions must have contributed to Bexley's present-day situation given that it was hit by the wave of African American residential expansion in the 1970s and 1980s. By contrast, Westerville is located at the edge of Franklin County, lies between the major east–west and north–south growth trajectories of mid-century Columbus, and was a small town, remote from Columbus until the early 1980s. About that time, extensive home building and suburbanization took place, schools were improved significantly, and northward expansion into Delaware County occurred together with public water availability and the creation of recreational parks. Hence, Westerville's situation today is likely related to housing costs, and its relative distance from areas tied more directly to Columbus historically. While discriminatory-type activities might have played a role, Westerville's growth in general was subsequent to that era.

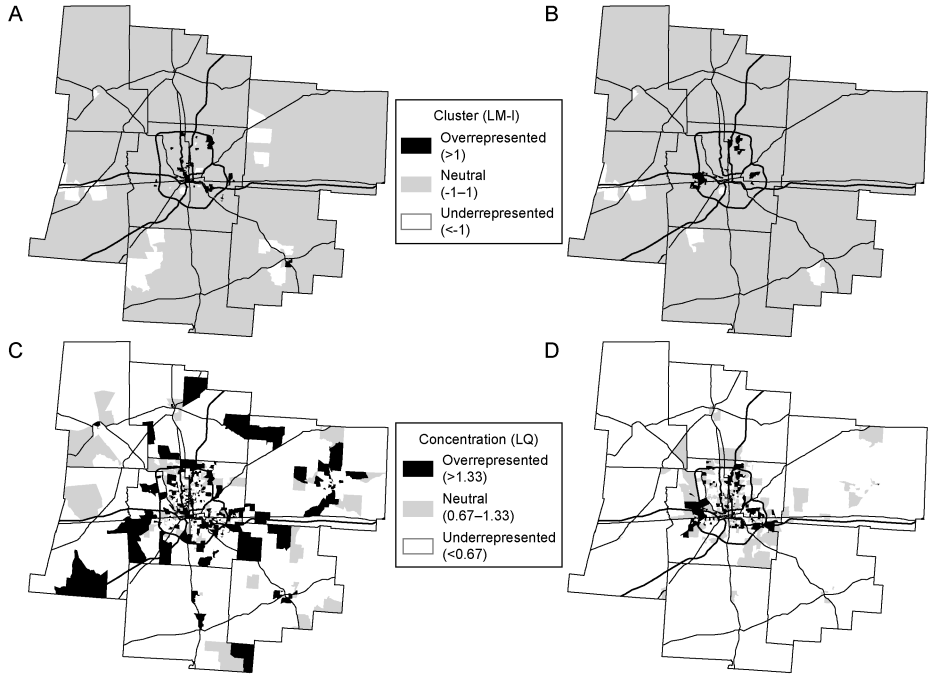

Fig. 4. Hispanic clusters and concentrations in Columbus, Ohio MSA: (A) Cluster in 1990, (B) Cluster in 2000, (C) Concentration in 1990, (D) Concentration in 2000.

underlying this pattern is the Honda plant in Marysville (Union County, shaded area, Fig. 1), a satellite city that is part of the Columbus MSA and a few miles northwest of the areas of clustering shown by *LM-I*s. This plant, established in 1982, brought with it, and subsequently attracted, a number of related industrial establishments with a strong Asian dimension in organization and employee profile. Another important factor is the University, which attracts many Asian students and their families.

A more complex pattern of Asian residential settlement is revealed by *LQ*s. In addition to the clusters just described, we see a strong presence in western Columbus north of Broad Street and into Hilliard; a strong presence in southern Delaware County; encroachment into the western edge of Westerville; and strong concentration in eastern Franklin County near Gahanna, New Albany, Port Columbus Airport, and in the path of the major eastward expansion of the MSA.[10] More scattered concentrations occur near Grove City, Groveport, Reynoldsburg, and eastward in the satellite city of Newark. Many concentrations in 2000 are adjacent to, and can be seen to have grown out of, concentrations in 1990, similar to the contiguous, layered expansion of African American settlement. But there also are new areas of settlement such that the overall pattern in 2000 was considerably

[10]Delaware County was among the 100 fastest growing counties in 2000, ranked 16th. Its southern segment up to Delaware City was the primary contributor to this ranking.

more dispersed across the city of Columbus. Another characteristic is that Asian concentrations tend to straddle the outer belt, which provides ready access to all of the MSA.

Hispanic clusters are only evident in a few scattered areas through the *LM-I* screen—one in the northeast near Minerva Park; a second at the edge of the built-up area in western Columbus, north and south of West Broad Street and on both sides of the outer belt; and a single cluster near Whitehall. These areas are blue collar and middle class, and contain many rental units. The 2000 pattern bears very little relationship to the 1990 pattern, which we ascribe to the low number of Hispanics overall, especially in 1990, and the rapidly changing nature of that population group.

Location quotients again indicate a much richer fabric of Hispanic settlement. The western Columbus, Minerva Park, and Whitehall clusters are noticeably more extensive geographically. But we also see concentrations scattered throughout Columbus city within the outer belt and, considering neutral areas as well, there is expansion beyond the outer belt in the vicinities of Hilliard, Groveport, Canal Winchester, Reynoldsburg, Pataskala, Delaware, southern Delaware County, Dublin, Pataskala, and Newark.

In both the *LM-I* and *LQ* analyses, 2000 patterns bear little relationship to 1990 patterns. Once again, we ascribe this to the low number of Hispanics overall, and the changing nature of that population.

All in all, Local Moran's *I*, the most conservative measure of racial/ethnic assemblages, indicates that African American and Asian residences are locationally distinct from one another and spatially concentrated, forming large clusters. Hispanic clusters are more scattered and less extensive. When these are combined with findings from location quotients, "dispersed and decentralized assemblages" is the best description of overall racial/ethnic patterning in Columbus MSA between 1990 and 2000. Minority concentrations are not limited to the inner city or inside the outer belt, but are spread throughout the MSA.

Finer-Grained Analyses

The fluidity seen in the *LM-I* and *LQ* spatial patterns is both remarkable and unexpected. Hence, through three analyses that focus below the level of clusters and concentrations, we now seek an even more nuanced view of the change in residential patterning between 1990 and 2000 in terms of race/ethnicity.

First, let us consider new racial/ethnic clusters and concentrations in 2000 (Fig. 5), where a new cluster block group is indicated if *LM-I* is significant in 2000 (>1.0) but not in 1990, and a new concentration block group is indicated if *LQ* is significant in 2000 (>1.33) but not in 1990. New clusters and concentrations may be an accretion to existing clusters/concentrations or independently formed. In the case of both African Americans and Asians, most notable is that new clusters and concentrations are primarily accretions to existing clusters/concentrations and dispersed outward, but they differ in that African American dispersal occurred largely in the eastern half of Columbus, whereas Asian dispersal occurred throughout the city. Also, independently formed concentrations are more noticeable for Asians than for African Americans. Hispanic change is more difficult to gauge because the 1990 pattern reflects a very small population and, accordingly, less stability in residential patterns; but simply looking at the map suggests many

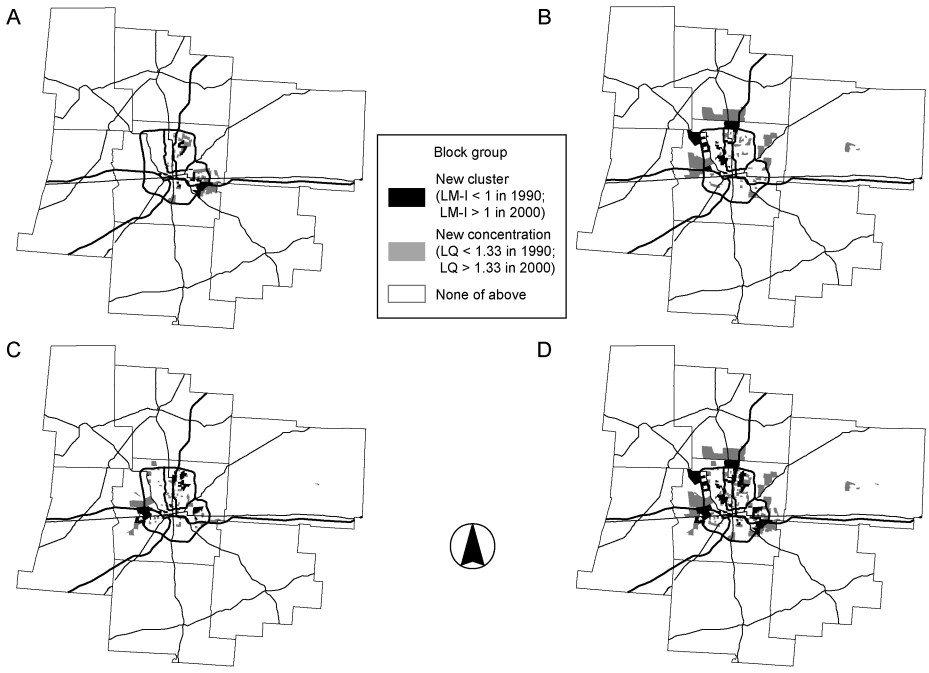

Fig. 5. New racial/ethnic clusters and concentrations in Columbus, Ohio MSA, 2000: (A) African American, (B) Asian, (C) Hispanic, (D) Minority.

independently formed new clusters and concentrations. The fourth panel showing all minorities indicates that, even under the restrictive *LM-I* and *LQ* indices, the heart of the Columbus MSA experienced enormous change between 1990 and 2000, both within and beyond the outer belt.

Another finer-grained analysis identifies new neighborhoods and settlements in 2000 (Fig. 6). Our criteria were the following. If a block group had more than one minority person in 1990, more than 20 minority persons in 2000, experienced a 50% increase in that minority between 1990 and 2000, and had an *LQ* below 1.33, indicating that it was not already a concentration—that block group was designated as a new neighborhood. A new settlement is designated if a block group had no minority in 1990 but a minority of greater than 10 in 2000. Most remarkable here is the indication of a major dispersal throughout the MSA where all minority groups extend into every MSA county, primarily as independently formed units rather than as accretions to existing clusters or concentrations. For African Americans, new neighborhoods are found all around Columbus, not only in its eastern portion: in satellite cities such as Marysville, Delaware, Newark, and Circleville; and in distinctly exurban and/or recently developed areas such as between Pataskala and Newark, Pickerington, Groveport, and south of Groveport as well as southern Delaware County. Asian new neighborhoods are more constrained, occurring in exurban areas such as Pickerington, Groveport, and astride the Franklin County line well to

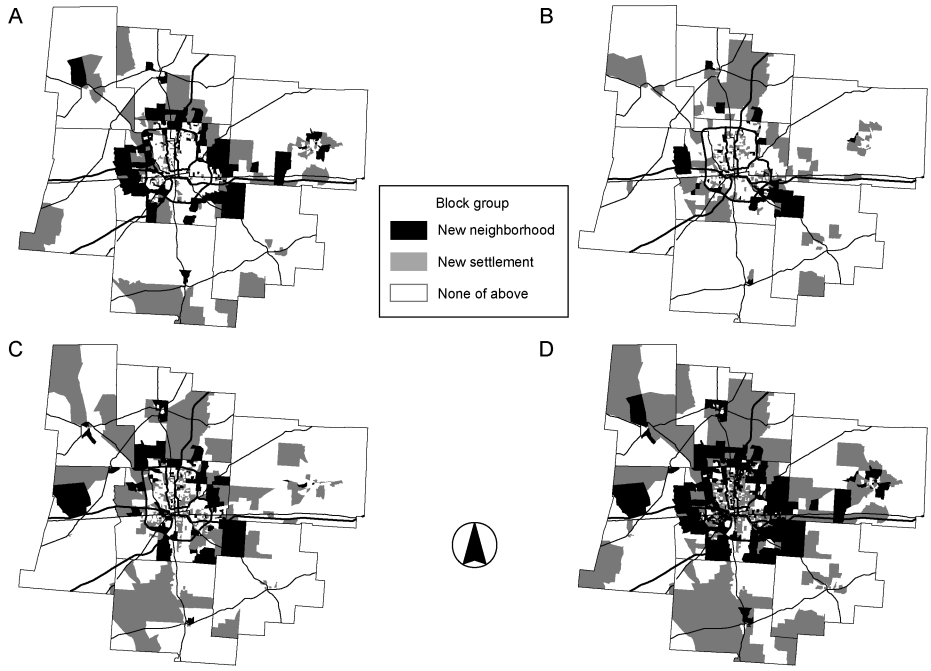

Fig. 6. New neighborhoods and settlements in Columbus, Ohio MSA, 2000: (A) African American, (B) Asian, (C) Hispanic, (D) Minority.

the west of the outer belt in the vicinity of Hilliard; in suburban areas such as Powell and Westerville; and near the satellite cities of Delaware and Newark. Hispanic new neighborhoods are found near the satellite cities of London, Marysville, Delaware, and Circleville; in the exurban areas of Pickerington, Canal Winchester, east of Grove City, and southern Delaware County; and closer to Columbus city in Dublin, Gahanna, Worthington, and Westerville.

The third finer-grained analysis considers the heterogeneity of racial/ethnic concentrations (Fig. 7), indicated by a block group having an LQ of 1.0 or greater for more than one racial/ethnic minority in 2000. For African Americans and Asians, this occurs in a scattered pattern throughout Columbus city, but interestingly, the scattering only slightly penetrates the major African American cluster in the eastern portion of Columbus and does not penetrate the major Asian Cluster in the northwestern portion of Columbus. African American and Asian heterogeneity also are found in Delaware and in more recently developed areas in the vicinity of Pataskala, Canal Winchester, Reynoldsburg, and Grove City. African American and Hispanic heterogeneity is scattered inside the outer belt, within the major African American cluster/concentration in the eastern half of Columbus, and in the Hilltop/Bottoms area. African American and Hispanic heterogeneity also occurs in recent housing developments in the vicinity of Groveport and Canal Winchester, just beyond the southeast outer belt, and in the satellite city of Delaware.

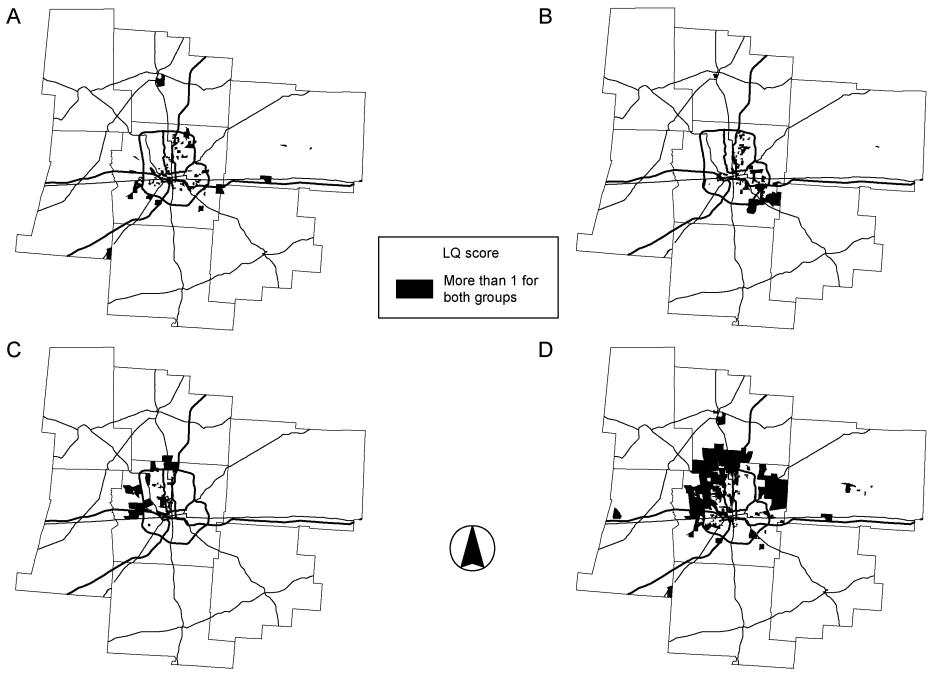

Fig. 7. Racial/ethnic heterogeneity in Columbus, Ohio MSA, 2000: (A) African American and Asian, (B) African American and Hispanic, (C) Asian and Hispanic, (D) Caucasian and any minority group.

Asian and Hispanic heterogeneity is found to straddle the outer belt directly east of central Columbus around Interstate 70, a lower-socioeconomic-status portion of the city with many rental units; in the vicinity of Hilliard, a more middle-class area; in Dublin and Worthington, which tend to be higher in SES; and in the vicinity of Ohio State University. Of interest here is that Asian and Hispanic heterogeneity penetrates the major Asian cluster in the northwestern portion of Columbus, whereas African American/Asian heterogeneity does not. Finally, we consider heterogeneity in terms of Caucasians with any minority—African Americans, Asians, or Hispanic. This is very marked in the northwestern quadrant of Columbus city and outward through Hilliard, Dublin, Worthington, Westerville, much of southern Delaware County, and the areas of Gahanna and New Albany. Caucasian–Minority heterogeneity is also substantial beyond the outer belt in the northeastern portion of Franklin County and in the satellite cities of Newark, Delaware, and London.

To summarize, the finer-grained analyses show that racial/ethnic minority residences have spread throughout the MSA and include an exceptionally broad range of areas in terms of SES characteristics. Especially noticeable is the occurrence of new minority residences in exurban and/or recently developed areas. Also noteworthy is the widespread intersection of racial/ethnic concentrations, indicating a plethora of multiethnic neighborhoods, especially within Franklin and southern Delaware counties.

WHAT DOES THE EMPIRICAL EVIDENCE SAY? THE FRAMEWORKS EVALUATED

Attention now turns to evaluating the four segregation frameworks—Assimilation, Stratification, Resurgent Ethnicity, and Market-Led Pluralism—on the basis of the empirical evidence presented above. Note, however, that while discussion revolves around the mapping of our empirical results, it also draws on our knowledge of metropolitan Columbus as a place as well as locales within it; thus our conclusions conform both to this understanding and the considerably more intimate, primary-data-driven, on-the-ground approach taken in Brown and Chung (2008).

First considering Assimilation, this would be indicated (a) by *LM-I*s, *LQ*s, and new clusters and concentrations (Figs. 2–5; Table 1) if they appear only in, or contiguous to, racial/ethnic enclaves and not elsewhere; and (b) by new neighborhoods (Fig. 6), new settlements (Fig. 6), and heterogeneous neighborhoods (Fig. 7) occurring throughout the MSA. For African Americans, expectation (a) maintains; for Asians, expectation (a) maintains in terms of *LM-I*s, but not *LQ*s; for Hispanics, expectation (a) maintains, albeit less clearly so than for African Americans. Concerning expectation (b), new neighborhoods and settlements occur more broadly throughout the MSA than might be anticipated, but this is less true for African Americans and Asians and, even when the entire set of minorities is considered, they are not represented in several large spaces of the Columbus MSA. The latter observation is further underscored by considering racial/ethnic heterogeneity. For minority group pairs, heterogeneous block groups are sparse and largely within or immediately adjacent to the outer belt that roughly defines Columbus city. The pattern is more persuasive when considering Caucasians and any minority, but it still remains largely within Franklin and the far south of Delaware counties. In terms of spatial evidence, then, we find support for the Assimilation framework, but in a manner that is less than convincing.

Stratification would be indicated (a) by *LM-I*s and *LQ*s (Figs. 2 and 3; Table 1) if there is marked clustering and few, if any, concentrations; (b) by new clusters concentrations, neighborhoods, and settlements (Figs. 4–6) that adjoin existing clusters and concentrations; and (c) by heterogeneous neighborhoods (Fig. 7) if they only occur among minority groups. None of these expectations are sufficiently supported. While there is marked clustering, there also are numerous concentrations for all racial/ethnic groups. There is a tendency for new groupings to adjoin existing clusters and concentrations, but they also occur elsewhere with great frequency. And perhaps most glaringly is the fact that heterogeneous neighborhoods matching Caucasians with any minority occur broadly within Franklin and southern Delaware counties. Finally, the most striking evidence against Stratification is the occurrence of new neighborhoods and settlements throughout much, although not all, of the MSA. Revisionist Stratification thinking posits the occurrence of inertia effects, and these were found. But because inertia is not directly associated with the use of discriminatory housing practices, using that occurrence to support Stratification mislabels the process. Hence, Stratification is not supported.

Resurgent Ethnicity would be indicated by *LM-I*s, *LQ*s, and new clusters, concentrations, neighborhoods, and settlements (Figs. 2–6; Table 1) that are distinctly separate from existing racial/ethnic enclaves or adjacent to/within enclaves but of a higher socioeconomic status than their neighbors. Also, heterogeneous neighborhoods (Fig. 7) are a

contra-indicator of Resurgent Ethnicity. In Columbus, some concentrations are distinctly separated from others, as in Delaware and Pataskala for African Americans or Newark for Asians, but the former traces to historical, rather than present-day, occurrences and the latter likely is employment-related. Concerning new clusters, concentrations, neighborhoods, and settlements, many lie distinctly apart from racial/ethnic enclaves and in more affluent areas, which would seem to be strong evidence for Resurgent Ethnicity. Alternatively, heterogeneous neighborhoods also are found scattered throughout the MSA and quite strongly in Franklin County.

We therefore conclude the following concerning Resurgent Ethnicity. First, whereas Assimilation, Stratification, and Market-Led Pluralism are general processes concerning racial/ethnic patterning, Resurgent Ethnicity is more particular in that one set of people might evince in-group affinity, another does not, and therefore, they go their separate ways within the MSA; in other words, in-group attraction *per se* is not pervasive as a driver of racial/ethnic residential patterning. Second, we also recognize that nucleations might occur as the result of personal networks and contacts as well as by preference. Third, the block group may be too large a unit for observing Resurgent Ethnicity, especially in an MSA such as Columbus, which is mid-sized and less multicultural than larger MSAs. Finally, since in-group attraction is a personal matter, it is best identified through an interview or survey strategy, rather than secondary data analysis. On balance, then, our statistical evidence lends support to Resurgent Ethnicity, and we believe it applies to a portion of the population. But we also advocate further study to better understand its role in the racial/ethnic patterning of today's urban areas.

Finally, Market-Led Pluralism would be indicated (a) by *LM-I*s, *LQ*s, and new clusters, concentrations, neighborhoods, and settlements (Figs. 2–6; Table 1) that are spread throughout the MSA, mirroring its spatial evolution; (b) by new neighborhoods and settlements that are found well beyond the built-up area of higher-density settlement; and (c) by heterogeneity among all racial/ethnic groups, especially so with Caucasians (Fig. 7). All three of these conditions are found, albeit to different degrees. Clusters and concentrations are limited in their dispersal, occurring largely within Franklin County, but their dispersal is clearly outward, particularly for Asians and Hispanics. A more dramatic picture is provided by new neighborhoods and settlements that occur throughout the seven-county MSA area. This is particularly notable for African Americans and Hispanics; Asians are somewhat more constrained but, nevertheless, found in every MSA county. Furthermore, new neighborhoods and settlements for all groups go well beyond the built-up area of Franklin County and its satellite cities. We also note that the high degree of fluidity observed through our analyses is not consistent with Assimilation or Stratification, but is with Market-Led Pluralism. On the basis of spatial patterning, therefore, we find very strong support for Market-Led Pluralism, a process that has become significantly more important in recent decades.

CONCLUDING OBSERVATIONS

The processes underlying racial/ethnic segregation, and its change, have been addressed by four explanatory frameworks—Assimilation, Stratification, Resurgent Ethnicity, and Market-Led Pluralism. This article examined the validity of each in terms

of *intra*urban residential patterning within a contemporary U.S. metropolis, the Columbus, Ohio MSA.

Two formal measures of segregation were used—Local Moran's *I* (*LM-I*), which indicated racial/ethnic clusters, and Location Quotients (*LQ*) which indicated concentrations. We also employed a set of finer-grained measures to identify new neighborhoods, new settlements, and racial/ethnic heterogeneity. Observations involved block groups from the 1990 and 2000 U.S. Censuses of Population.

At the *LM-I* level, the most conservative measure of clustering/segregation, African American and Asian residences are spatially concentrated and locationally distinct from one another, while Hispanic residences are more scattered and less extensive spatially. But in considering these together with *LQ*-based concentrations, *dispersed nucleations* best describes the overall patterns of racial/ethnic settlement in the Columbus MSA. Indeed, minority assemblages are not limited to the inner city or even inside the outer belt, but are well spread throughout the metropolis.

Our finer-grained analyses are designed to look below the level of clusters and concentrations and thereby capture a more nuanced view of the fluidity and change in residential patterning between 1990 and 2000. New clusters and concentrations, represented by block groups that held that designation in 2000 but not 1990, are largely accretions to existing clusters/concentrations for African Americans and Asians, and dispersed outward. But they differ in that African American dispersal is largely confined to the eastern half of Columbus, whereas Asian dispersal occurred throughout the city and was more often independently formed. Hispanic new clusters/concentrations tend to be independently formed, in part because of their very low numbers in 1990.

New neighborhoods and settlements in 2000, indicated by a minority population of 20 and 10 individuals, respectively, among other criteria, occurred throughout the MSA, mirroring a powerful centrifugal force. Heterogeneity, indicated by a block group having an $LQ > 1.0$ for two minorities or any minority and Caucasians, is scattered; most notable is the minority–Caucasian mix, which is dense throughout Franklin and southern Delaware counties as well as satellite cities of the MSA.

Taking these measures collectively, we found that racial/ethnic minority residences have spread throughout the entire MSA, include an exceptionally broad range of areas in terms of socioeconomic status characteristics, and encompass exurban and/or recently developed areas, not just older, built-up ones. Especially noteworthy in our opinion is the widespread intersection of racial/ethnic concentrations that indicates a true intermixing. At least in terms of spatial patterns, we find clustering, but neither segregation intensification nor ghettoization. Further, the decade of 1990–2000 evidenced considerable fluidity in residential patterning among minorities. Inertia effects remained, of course, especially among African Americans, but our finer-grained analyses indicate this is being overcome, perhaps more rapidly than anyone would anticipate.

In evaluating the four segregation frameworks, we found some support for Assimilation, no support for Stratification, some support for Resurgent Ethnicity, and strong support for Market-Led Pluralism. But we also recognize that the frameworks are complementary, not mutually exclusive. At any given time, some will seek assimilation *per se*; certain real estate agents will steer their clients in a discriminatory manner; many decisions will include in-group attraction as a factor; and the market-makers will operate in a manner that alters the racial/ethnic fabric of the metropolis. That having been said,

we believe that assimilation *per se* is not the driver of housing choice that it once was and might in fact be a marginal or irrelevant criterion for many, if not most, people. Stratification has passed a historical moment in its significance, even though discriminatory practices continue at a low level. In-group attraction plays a part in racial/ethnic patterning across urban space, but further investigation is needed to sort out its role relative to personal networks and contacts. And we champion Market-Led Pluralism on the basis of its newness and the variance in racial/ethnic intermixing that it explains relative to other frameworks (Brown and Chung, 2008). That it also fared noticeably better in spatial-analytic testing reinforces our stance.

More broadly, considering pattern alone, it seems that both pluralism and heterolocalism (Zelinsky and Lee, 1998; Zelinsky, 2001) are apt descriptors. We did not find an evenly spaced heterogeneity, salt-and-pepper type distribution, as perfect assimilation would suggest. We did not find high levels of segregation, clustering, or distinct ethnic enclaves, even though we know they exist elsewhere. Instead, we found dispersed nucleations that were also heterogeneous in the sense of being spatially mixed with other nucleations and that often maintain a distinct cultural identity, social cohesion, and ongoing linkages with others in their particular group. The pattern, therefore, resembles the one pointed out by Zelinsky, "a mosaic of self-sustaining ethnic communities … [which] takes the form of a patchwork of ethnic enclaves that persist over time [pluralism] or an ethnic community … without any significant clustering … maintaining strong social cohesion … despite the lack of propinquity [heterolocalism]" (Zelinsky and Lee, 1998, pp. 284–285, 293). This is also consistent with the Market-Led Pluralism framework.

Our study is pioneering in its application of spatial and cartographic analyses to evaluate four distinct frameworks pertaining to racial/ethnic aspects of residential space. We recognize, however, that spatial patterns are only one dimension of relevance. We also recognize that evaluating process through spatial pattern is subject to controversy. In particular, whereas this study was conducted in the proper manner—beginning with conceptual frameworks, elaborating expected findings derived from each framework, and then conducting empirical tests to see which framework(s) held up—we know that a single process can give rise to a variety of patterns, and that different processes can give rise to identical patterns—the equifinality conundrum. Given that a similar critique applies to other approaches, ranging from modeling (e.g., simplification and reductionism) to regression analysis (e.g., the ecological fallacy and spurious correlation) to ethnography (e.g., representativeness of the sample), we feel comfortable with the findings reported here. Moreover, this comfort is buffered by the fact that in assessing statistical outcomes, we drew on our local, largely qualitative knowledge of the Columbus MSA in terms of its neighborhoods, their change over time, and broader dynamics of the MSA itself (Brown, 1999). At the same time, knowing that our approach supplies only one perspective on the subject, and that the dynamics of racial/ethnic intermixing represent a significant and ongoing debate in social science, we also advocate that future research gauge the frameworks within a broader range of indices and epistemological approaches.

Future attention also needs to be given to the intersections of race/ethnicity and class. There are two aspects to this. One involves systematic differences between racial/ethnic groups in, for example, their life trajectory, culture, values, and even the categories

themselves (Phoenix and Rattansi, 2005). In general, this aspect has not been a concern of the research tradition in which we write (although some think it should be). The second aspect involves a concern with interactive effects. Here, to facilitate the argument, race/ethnicity and socioeconomic status are treated as being independent of one another. In reality, however, racial and ethnic groups often reside in areas with inferior schools and inferior neighborhood resources; minority children who reside in better neighborhoods often are disadvantaged due to their level of preparation upon entering that neighborhood; groups differ in how education is valued, authority arrangements within families, and gender roles; and there often are unintentional outcomes in matters such as hiring or who is favored in the workplace or school (Brown and Chung, 2008). It is difficult to imagine how this issue could have been interwoven into the present research, but incorporating the intersectionality of race/ethnicity and class into future research is clearly important.

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