

Undergraduate Research Symposium May 17, 2013 Mary Gates Hall

Online Proceedings

POSTER SESSION 1

Commons West, Easel 36

11:00 AM to 12:30 PM

Are we Specializing Ourselves to Ruin?

Joshua Dreau (Josh) Hooker, Senior, Political Science

Mentor: John Wilkerson, Political Science

Mentor: Nicholas Stramp, Department of Political Science, Center for American Politics and Public Policy

America has become a world leader in medical research because of the achievements in research and technology made by pioneering physicians in various specialist medical fields. In America, specialist physicians have come to dominate the physician population, more than in other developed nations. For government health insurance programs such as Medicare, specialist physicians already receive substantially higher reimbursements than primary care physicians, namely because of the higher costs of running their practice, in addition to complex and risky nature of their field of medicine. Medicare calculates reimbursements based on the costs, skills and liability of a physician's practice at the same rate throughout the country. However, Medicare provides for regional adjustments of these costs through the Geographic Practice Cost Index. I hypothesize that the geographic index amplifies the difference in how much specialist physicians make compared with their primary care counterparts. As the index increases in value, the compensation gap between the two groups widens, providing additional incentives for specialists to practice in areas where the geographic index is high. Using physician population statistics and the Geographic Practice Cost Index, I ask whether the income advantage of specialty physicians where the index is high leads to an undersupply of primary care physicians compared to other areas.

POSTER SESSION 1

Commons West, Easel 35

11:00 AM to 12:30 PM

The Counterproductive Effects of Food Aid on Political Violence against Refugees in Africa

Saori Ichikawa, Senior, Political Science

Mentor: John Wilkerson, Political Science

Mentor: Nicholas Stramp, Department of Political Science, Center for American Politics and Public Policy

In Africa, emergency humanitarian relief operations, in response to ongoing conflict and natural disasters, continue to struggle with violent, targeted attacks on humanitarian workers, aid supplies and refugees. While food aid plays an important role in addressing food shortages, previous studies suggest that food aid can contribute to the spread of civil conflicts under certain conditions. The purpose of this study is to examine the possibility that certain levels of food aid could exacerbate political violence against refugees in Africa because armed groups are likely to be motivated to prevent food aid distribution to an opponent refugee population, and to achieve material gain. To evaluate this claim, I analyze the relationship between three different types of food aid and delivery methods reported in the World Food Programme between 1988 and 1998, and data on affected refugee population by political violence against refugees in African countries. Food aid, defined as emergency food aid, programme food aid and project food aid, is delivered through direct transfer, local purchase and triangular purchase. In this study, the basic conditions of food aid consist of all commodities and all donor countries. There are fifty-three African countries that reported the amount of food aid they received, and twenty-six African countries that reported the number of refugees affected by political violence during the years of study. Based on the available data, I create several regression models that show the effects of each food aid and delivery method on rate of violence. I expect that emergency food aid and direct transfer have a strong positive correlation with violence involving refugees because they are directly delivered to targeted refugees who are at risk for insurgent attack.

POSTER SESSION 1

Commons West, Easel 34

11:00 AM to 12:30 PM

Do Governors Matter? Gubernatorial Effect on State Economic Performance

Jaewook Jun, Junior, Political Science

Mentor: John Wilkerson, Political Science

Mentor: Nicholas Stramp, Department of Political Science, Center for American Politics and Public Policy

Does gubernatorial leadership matter? Declining revenues associated with the great recession encourage state governments to use their limited resources more efficiently. However, elected officials will often disagree about priorities,

which can make enacting necessary reforms difficult. The goal of this research is to investigate whether state variations in gubernatorial powers impact the ability of governors to respond to important challenges, such as the effects of the great recession. I study fifty states from 1960 to 2012, and ask whether unified government versus divided government, the strength of the governor's veto power and the strength of the governor's budget powers is related to a state's economic performance. Controlling for other factors, I expect to find that states where governors have more veto and budget power, and where the government is unified under same party also tend to have lower unemployment rates. By improving our understanding of the relationship between governors and state economic performance, this study may also shed light on how national reforms strengthening the executive powers might impact presidential economic performance.

POSTER SESSION 1

Commons West, Easel 38

11:00 AM to 12:30 PM

Is Gender Important? Analyzing Disparities in the Budget Priorities of Male and Female Governors

Emily Ann (Emily) Clarkson, Junior, Political Science

Mentor: John Wilkerson, Political Science

Mentor: Nicholas Stramp, Department of Political Science, Center for American Politics and Public Policy

Since gaining the right to vote, women's influence in the political sphere has been on the rise. While voters have started to embrace women as political leaders, research done by Huddy and Terkildsen on gender stereotypes and their effects on candidates finds that female leaders are not given the same respect as male leaders when it comes to military and police issues. Their research also finds that the inverse is true; male leaders are not perceived to have the same competence as female leaders on social welfare issues such as health care and family support programs. I will investigate this question of gender issue ownership by examining the impact of gender on gubernatorial power in 50 states over ten years. I will compare the changes in state spending across policy areas. I hypothesize that, other things equal, a change in the gender of the governor will predict changes in program spending across policy areas. I expect that governors who are perceived to be more competent in a specific policy area will have a greater effect on the spending in that area and therefore that a change in gender of the governor will predict a change in spending.

POSTER SESSION 1

Commons West, Easel 37

11:00 AM to 12:30 PM

A State-by-State Analysis of the Effects That Government Incentives and Regulations Have on the Growth of Bioscience Industry

Derek Jaron (Derek) Fletcher, Senior, Political Science (Political Economy)

Mentor: John Wilkerson, Political Science

Mentor: Nicholas Stramp, Department of Political Science, Center for American Politics and Public Policy

One role of the state is to help foster economic growth. Financial incentives and regulations are thought to play important roles in industry location and investment decisions. Industries related to bioscience address important problems in society, from how to increase food production to how to defend against viruses. These industries are projected to see large levels of growth over the next 20 years. To explain differences in bioscience industry growth across states, I created a data series that analyzes the incentives available in each state against the impact of each of their bioscience industries. I then defined the quantitative and qualitative effects of these policies in order to show which provide the best areas for growth of bioscience firms and in-turn State economies. I expect to find that high levels of state incentives and reduced regulation directly lead to increased levels of employment, increased number of bioscience establishments, and an overall more impactful bioscience industry.

SESSION 2M

POLITICS AND POLICY IN AMERICA

Session Moderator: John Wilkerson, Political Science

284 MGH

3:45 PM to 5:15 PM

* Note: Titles in order of presentation.

Buying Votes as Public Service: The Electoral Implications of Federal Stimulus Spending

James William (James) Ganas, Senior, Political Science

Mentor: John Wilkerson, Political Science

Mentor: Nicholas Stramp, Department of Political Science, Center for American Politics and Public Policy

Earmark spending has proven to be a popular political tool for members of Congress because it allows them to claim credit for a concrete economic benefit for their districts. I ask whether expectations of political benefits similarly influence large-scale stimulus spending allocations and, more importantly, whether these allocations have political benefits for the incumbent president. This research project examines the link between federal spending and shifts in election outcomes. It asks whether spending in the stimulus package of 2009 substantively influenced President Obama's share of the popular vote in 2012. Other things equal, did competitive regions of the nation receive disproportionately more spending, and

was that spending associated with increased vote shares for the incumbent president between 2008 and 2012? To answer these questions I examine government spending and popular vote shares in over 3,000 counties from 2008 to 2012. I also control for underlying social and economic issues by county, such as foreclosure and unemployment rates. Finally, I control for other political influences on stimulus spending, including whether certain counties had representatives in powerful congressional roles. Overall, this study will promote understanding of the political implications of large-scale federal spending. It will also shed light on the political dynamics of “swing counties” and whether stimulus spending is a useful political tool for winning these counties.

SESSION 2N

MCNAIR SESSION - IMPROVING LIVES VIA ENGINEERING, NEUROSCIENCE, EVOLUTIONARY BIOLOGY, AND PSYCHOLOGY

*Session Moderator: Gene Kim, Education, Office of
Minority Affairs & Diversity*

287 MGH

3:45 PM to 5:15 PM

* Note: Titles in order of presentation.

A New Approach to Controlling Epilepsy through p38 MAPK

Vicky Herrera, Senior, Biochemistry

Amgen Scholar, McNair Scholar, Undergraduate

Research Conference Travel Awardee

Mentor: Nicholas Poolos, Neurology

Epilepsy is a neurological disease characterized by recurring seizures and it affects millions. We hypothesize that modulation of p38 mitogen-activated protein kinase (p38 MAPK) will influence hyperpolarization-activated cyclic nucleotide-gated (HCN) channel activity, affecting the frequency of seizures in an animal model of epilepsy. p38 MAPK is a kinase activated by conditions of cellular stress. It strongly stimulates the HCN channels, which are voltage gated ion channels that are highly expressed in the cortex and hippocampus, brain regions where seizure onset occurs. A decrease in HCN channel expression or function has previously been observed in epileptic animals associated with a loss of p38 MAPK activity, which produced neuronal hyperexcitability. We hypothesized that increasing p38 MAPK activity might decrease neuronal activity and decrease seizure frequency. In this experiment, Epilepsy was induced in Sprague Dawley rats through treatment with pilocarpine, a convulsant drug. Recurrent, unprovoked seizures were seen after three weeks of treatment. An osmotic pump was placed in the

rats, delivering drugs that modulate p38 MAPK. The drug SB203580 (SB), a specific inhibitor of p38 MAPK, was administered, as was anisomycin, a non-specific activator of p38 MAPK. Animal brain activity was analyzed with video electroencephalography through electrode implants in the skulls of the rats. Inhibition of p38 MAPK by SB increased seizure frequency by 179 % as predicted, however, anisomycin also increased seizures by 236%. We hypothesize that this may be due to non-specific actions on other signaling pathways like the Jun N-terminal kinase pathway (JNK). We're investigating the role of JNK in modulating seizure frequency, and this may point us to some new therapies. The implications of this study may indicate a new approach to the control of epilepsy via anti-epileptic drugs targeting p38 MAPK.

POSTER SESSION 3

Commons West, Easel 38

2:30 PM to 4:00 PM

Drug Recognition Experts (DRE): Impaired Driving and the Prescription Drug Abuse Epidemic Challenge

*Eduardo Mejia, Senior, Criminal Justice, Washington State
University*

McNair Scholar

*Mentor: Nicholas Lovrich, Political Science, Washington
State University*

Since the development of the Drug Recognition Expert program in the 1970s, police officers are trained to recognize impairments and have the expertise to identify these influential drugs opposed to, or along with alcohol. This research is a part of an ongoing partnership between the Washington State University Division of Governmental Studies and Services and Washington State's DRE program. The goal of the work entails determining whether the current evaluation standards set forth by the Washington State Patrol are sufficiently strict and assessing the accuracy of the DRE officers' assessments of impaired drivers. The analysis will be based on the coding and digitization of all 5000+ DRE assessments done over the period 2006 to 2010 (5 years) and will include the identification of Type I errors (failure to detect) and Type II errors (false attention) as determined by toxicology reports on blood samples. An examination will be made to determine whether the Type I and Type II errors detected are related to driver racial and ethnic background, gender, and age. With this research an understanding of how law enforcement training on “drugged driving” can be improved in Washington State. Resolving DRE training issues will ensure that individuals' constitutional rights are fully protected while law enforcement safeguards their ability to enforce the states driver safety laws in Washington.