We invite you to explore the second volume of *Paideia*—a collection of student-authored academic papers and alumni career experiences. Together, these papers and spotlights illustrate the diversity of current and past Political Science students’ knowledge, worldviews, and experiences.

Last year, Political Science students introduced *Paideia* as a method for tangible representation of student and alumni successes. This year, we continue *Paideia* with the aim of establishing the journal as a well-regarded tradition of the Political Science Department.

Our desire is that the collective viewpoints expressed through the included student works inspire intellectual discourse of pressing world issues. Our hope in featuring alumni is that current students will be inspired to explore the immense versatility and value of their Political Science degree through learning from the career paths and experiences of their predecessors.

As you read, step into this newfound tradition of ours to explore the thoughts and experiences our Political Science family puts forth in this second volume of *Paideia*.

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CHARLES BELL is the Deputy City Attorney for San Diego and graduated from Cal Poly in 2004 with a degree in Political Science.
ALUMNI SPOTLIGHT
Charles Bell

From the moment he wrote his fifth grade book report on Brown v. Board of Education, Charles Bell knew he wanted to become a lawyer. In pursuance of this goal, Charles decided to use his time at Cal Poly not only get a degree in Political Science, but to actively engage in making Cal Poly a better learning environment for everyone. As a football player, Charles noticed that the football team had a difficult time retaining its minority athletes struggling academically. Inspired to help his fellow minority athletes, Charles created the Minority Athletic Mentoring Program (MAMP) for his senior project. Charles also served as ASI’s Head of Diversity and helped faculty to update, revise, and reframe curriculum in a way that encouraged diversity in Cal Poly classrooms.

Senior year of college was an incredibly busy one for Charles. In addition to his efforts to universalize Cal Poly’s appeal and curriculum, he also served as a file clerk for a local civil litigator, Terry Schubert. Not only was he taking a full load of difficult classes, but Cal Poly’s football season was also in full swing and Charles had to prepare for the LSAT. Without the genuine care and concern for him by Political Science professors, Charles was certain he would’ve been completely overwhelmed by all that was on his plate. With the
support of his professors, Charles made it through his final year at Cal Poly and charged ahead toward law school.

At twenty-two years old, Charles was a confident young man, but that first year of law school, was by far one of the most challenging years of his life. “The thing about the first year of law school—it tears you down and builds you back up. You lose your confidence, but eventually you gain it back.” Despite all of the challenges law school posed, Charles was proud to say that Cal Poly prepared him in ways that students from other universities were not. Charles was used to the smaller class sizes and he was used to the shorter timelines thanks to Cal Poly’s quarter system, which made him more competitive than many of his peers. His competitiveness showed as he secured a job right out of law school with the Public Defender’s office. Unfortunately, the 2008 Financial Crisis was in full swing, and the position fell through. Charles relied upon the strong relationships he built at Cal Poly to explore other career opportunities and was fortunate to land a job in the private sector within the residential mortgage industry practicing civil litigation. Today, Charles proudly works as the Deputy City Attorney for San Diego, where he handles complex cases that deal with employment and government affairs litigation. When asked what the best part about his job was, Charles emphatically responded, “I get to represent a city I love by doing what I love.”

In addition to his career, Charles remains active throughout the San Diego and Cal Poly communities. In San Diego, Charles serves as the president of the Earl B. Gilliam Bar Foundation, which aims to diversify the legal community. He also serves as a mentor to students of the Crawford High School Law Academy by guiding them through the stressful college application and decision process. As for Cal Poly, Charles serves as Founder and President of the Cal Poly Black Alumni Affinity Chapter. Charles’s purpose for creating the alumni chapter is to ensure that the experience of current students and incoming students are just as amazing as his experience was. “To go to Cal Poly and to be able to find a home and a surrogate family was amazing. I want all students to feel that way about Cal Poly.”

As for Political Science students in particular, Charles encourages every student to find a mentor as soon as possible. “A mentor is simply someone you can talk to. You’re going to go into a career that, one way or another, will impact your personal life and mentors allow you to gain the information necessary in order for you to make the best possible decision.” He also encourages
students to utilize the plethora of resources available at Cal Poly—especially Political Science professors. Lastly, Charles would like all Political Science students to know that, “there are so many creative ways to use your political science degree, and it’s good to keep an open mind and interact with a lot of different professionals. Don’t think that you are limited to conventional ways of using your degree. Get creative. You are a smart student who is capable of so much more than you realize.”
ASHLEY STEPHENS is a graduating Political Science major. Throughout her four very short, memorable years at Cal Poly, she studied abroad in London, volunteered her time with the National Society of Collegiate Scholars, and worked for both the Department of Chemistry and the Alumni Association. Although she is sad to leave this little slice of paradise called Cal Poly San Luis Obispo, Ashley looks forward to moving up to San Francisco following graduation.
CLIMATE CHANGE: EFFECTS ON THE USE OF BIOTECHNOLOGY IN AGRICULTURE
Ashley Stephens

History of Climate Change and Biotechnology Effects on Agriculture
The scientific community generally defines climate change as “a large-scale, long-term shift in Earth’s weather patterns and average temperatures.”¹ The idea that human activity affects climate change took hold in 1896 thanks to Swedish chemist Svante Arrhenius.² He argued that industrial-age coal burning will magnify the natural greenhouse effect, raising Earth’s surface temperature by as much as 5 degrees Celsius over the next three thousand years.³ In 1958, scientists substantiated part of Arrhenius’s claims when they proved the steady rise of carbon dioxide in Earth’s atmosphere. In fact, the rise of carbon dioxide levels occurred much more quickly than Arrhenius originally predicted, which

caused scientists to question humans’ role in the rapid increase. Despite growing evidence of human-induced climate change, the topic was barely a blip on international and national radars. Even with the establishment of the Montreal Protocol in 1987, which limited the use of chemicals that damage the o-zone layer, the ultimate concern was human health rather than the chemicals’ effects on Earth’s atmosphere. Finally, climate change became a focus of the international community in 1988 with the formation of the Intergovernmental Panel of Climate Change (IPCC). Still, climate change did not gain the attention of the general public until the early 21st century when the IPCC and former United States Vice President Al Gore made a conscious effort to educate the public on climate change with the production of “An Inconvenient Truth”. Today, one of the main concerns in regards to climate change is its effects on the world’s agriculture.

In 2014, Harvard University’s environmental health expert, Seth Meyers, found that the rising levels of carbon dioxide in Earth’s atmosphere reduce the nutritious value of some of the world’s staple crops. Meyers conducted field trials on 41 different strains of wheat, rice, maize, and soybeans on three different continents. One group of crops was grown at current average carbon dioxide levels (380-390 parts per million) and a second group of crops was grown at carbon dioxide levels expected by 2050 (548-585 parts per million). “Wheat grown in high carbon dioxide levels had 9% less zinc and 5% less iron, as well as 6% less protein, while rice had 3% less zinc, 5% less iron and 8% less protein. Maize saw comparable falls while soybeans lost similar levels of zinc and iron but, being a legume not a grass, did not see lower protein.” The decrease in such nutrients is a major concern as the decrease can cause a multitude of issues for the immune system, fertility, child growth and development, and blood cells.

Meyer’s research is not the only research showing the effects of climate change on agriculture. The two most recent IPCC assessment reports suggest climate change...
change has both beneficial and damaging effects on agriculture. However, the damages heavily outweigh the benefits. Currently, 2.4 billion people get at least 60% of their zinc and iron from wheat, rice, maize or soybeans, which means the world will likely see a rise in iron and zinc deficiencies if something is not done to stop these crops from losing nutritional value. The prospect is daunting considering there are already 2 billion people who suffer from such deficiencies.\(^9\) Simply eating more staple crops is a lofty goal because rising populations alone will require food production to double by 2050 without any consideration for the changing nutritional values of staple foods.\(^10\) As the rising agricultural needs of the globe become continually harder to meet, the agricultural industry struggles to come up with agreeable methods with which to close that gap. Many such methods involve biotechnology, which according to the *United States Department of Agriculture*, involves “a range of tools including traditional breeding techniques, that alter living organisms, or parts of organisms, to make or modify products; improve plants or animals; or develop microorganisms for specific agricultural uses. Modern biotechnology today includes the tools of genetic engineering.”\(^11\) While biotechnology can make growth and production cheaper and more manageable, there are many ethical concerns surrounding the issue, particularly with respect to the altering of genes in plants and animals. As climate change continues to add to food insecurity, and as ethical concerns surrounding biotechnology increase, the following research question needs answering: How will climate change affect the use of biotechnology in world agriculture?

**Conventional Wisdom**

Conventional wisdom holds that many people distrust the use of biotechnology in agriculture, with a particular distrust towards genetically modified food. A *Gallup* poll conducted in July of 2013 reported that 48% of Americans believe that foods produced using biotechnology pose a serious health hazard to consumers.\(^12\) The *Gallup* poll also found that only 12% of Americans

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\(^9\) *Op. Cit.*, fn. 4

\(^10\) *Op. Cit.*, fn. 4


follow biotechnology in agriculture very closely, and 28% of Americans follow the issue only somewhat closely. Thus, the majority of Americans know little to nothing about biotechnology techniques in agriculture.\textsuperscript{13} Another survey conducted by the Pew Research Center found that 57% of U.S. adults think genetically modified foods are generally unsafe to eat.\textsuperscript{14} Furthermore, while climate change is a major issue for most people, food insecurity is not. A study conducted by the Pew Research Center shows that 54% of the world population views global climate change as a major threat to their countries. However, not even one of the 39 countries surveyed viewed food insecurity as one of the top three major threats.\textsuperscript{15}

Based on these non-partisan public opinion polls, conventional wisdom on biotechnology in agriculture is misguided. Conventional wisdom ignores the fact that biotechnological uses, particularly genetically modified organisms, are indeed safe for consumption. A study carried out by geneticist Alison Van Eenennaam of the University of California-Davis’s Department of Animal Science is the most comprehensive study of GMO food ever conducted. Van Eenennaam’s research, which encompasses observations of more than 100 billion animals over the past 29 years, indicates that livestock fed GMO food is no less safe to consume by humans than livestock fed non-GMO food.\textsuperscript{16}

This research question also challenges the conventional wisdom because the layman’s view does seriously consider the fact that climate change may force the agricultural industry to turn to biotechnological solutions. The recently released IPCC report indicates that the effects of climate change on crop and food production are evidently negative in multiple regions of the world.\textsuperscript{17} Crop yields have shown to be very sensitive to increased extreme daytime temperatures

\textsuperscript{13} Ibid.
\textsuperscript{14} “5 Key Findings on what Americans and Scientists Think About Science,” Pew Research Center, January 29, 2015, http://www.pewresearch.org/fact-tank/2015/01/29/5-key-findings-science/.
\textsuperscript{17} Intergovernmental Panel on Climate Change, “Climate Change 2014: Impacts, Adaptation and Vulnerability,” (March 31, 2014), 488.
and increased levels in carbon dioxide. As a result, growers have to get creative with solutions to avoid crop loss. For example, crop growers may need to genetically alter crops in order to make them more water efficient in times of drought, since traditional methods of crop growing such as irrigation may fail to bring enough water to non-altered plants. Throughout the following case studies, the data and analysis presented will show that climate change is indeed changing the way the agriculture industry works and that biotechnology is becoming an increasingly invaluable tool to said industry during this time of change.

**Extreme Weather Events**

Extreme weather events such as floods and droughts have increased over the past 40 years largely due to the increased concentration of carbon dioxide in the atmosphere. Carbon dioxide molecules trap heat; thus, the rising culmination of such molecules in Earth’s atmosphere increases the amount of heat that is unable to leave the planet. The result is warmer overall temperatures on Earth’s surface, which in turn increases the likelihood of droughts and floods, as the globe has seen in recent years. While the connection between warmer temperatures and droughts may be somewhat obvious, the connection between warmer temperatures and floods is not so immediately apparent. Warmer air holds more moisture, which means there is a greater likelihood of tropical storms and hurricanes. The precipitation accompanying such storms is often the cause of floods. Both droughts and floods have significant, negative impacts on agriculture—particularly when it comes to crops. Each type of crop has its own specific thresholds for temperature and precipitation, which makes them especially sensitive to sudden or prolonged extreme weather events.

Agricultural droughts are prolonged periods of “precipitation shortages, soil water deficits, and reduced ground water or reservoir levels needed for

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irrigation.” Often times, droughts are accompanied by heat waves, in which temperatures rise above average for an extended period of time. The United Nations’ World Meteorological Organization (WMO) released a report in 2013 indicating that the United States, Mexico, the Mediterranean basin, northern China, southern Africa and Australia, and parts of South America have been and will continue to be particularly prone to harsh drought conditions as a direct result of warming temperatures.

Crops are particularly sensitive to the increased frequency of droughts, because droughts indicate an extreme change in temperature, carbon dioxide levels and precipitation frequency. Every crop species needs to grow in specific temperatures in order to maximize both yield and nutritional value. When non-optimal temperatures persist for a prolonged period of time as they do in droughts, the crops suffer either total failure or a significant loss in yield and nutritional value. For example, 2012 corn yields in the United States were reduced 12% per month because of a drought that caused high nighttime temperatures. Furthermore, high temperatures during the pollination stage of fruit, grains and fibers may lead to significant losses in both yield and nutritional value. While warmer temperatures can make crops grow faster, those temperatures also reduce the amount of time seeds have to grow and mature below optimal timeframes. In turn, the seeds cannot soak up enough nutrients from the soil to come to fruition.

One of the few benefits of elevated carbon dioxide levels is the increased water-efficiency in crops, although the reason for this causal relationship is unclear. While this is a much-needed relief, the increased water-efficiency is not enough to fully protect these crops from droughts. A study conducted in Africa, consisting of 20,000 trials over the span of nearly a decade, indicated

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26 Ibid.
that for each day temperatures rose above 30°C, there was a 1.7% decrease in crop yield. California’s driest year on record is 2014, during which the state saw a 1% drop in orange production, an 8% drop in grape production, and a 4% drop in peach production. The crop reduction is significant because California is one of the largest producers of such crops in the United States.

The main adaptations for droughts include the development of drought-resistant crops, and the increased efficiency and use of irrigation systems. The development of drought-resistant crops will improve crop yields by an estimated average of 10-20%. Drought-resistant crops are genetically modified plants that have had drought-resistant genes from other plants inserted into their genomes. Unfortunately, this type of molecular breeding is limited to the farmers who can afford it, which often times excludes small farmers and farmers in developing countries. This limiting factor is combatted by the Generation Challenge Program (GCP), which aims to standardize phenotyping protocols, provide access to and promote the use of genetic diversity, and to “use genetic diversity and advanced science to develop products for plant breeding program[s] to improve the livelihoods of resource-poor farmers in marginal, drought-prone environments.”

Floods are another result of extreme weather that significantly affects agriculture. Floods usually occur following tropical storms, hurricanes and cyclones, which scientists believe are occurring more frequently because the warmer air holds more moisture. The Caribbean region in particular has fallen victim to hurricanes, floods and droughts. From 2002 to 2008 Jamaica’s agriculture sector sustained heavy crop loss due to flooding by Hurricanes Charley and Ivan, and a seven-month drought that followed the flood. Tropical Storms Wilma

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30 *Op.Cit.*, fn. 27

31 *Op.Cit.*, fn. 27

32 *Op.Cit.*, fn. 29

and Noel and Hurricanes Dennis, Dean and Emily succeeded the drought and caused major flooding and continuous rainfall. These extreme weather events devastated the Caribbean’s agricultural industry. Unfortunately, preliminary data indicates that the entire Caribbean region expects to see a rise in both floods and droughts over the next century. Europe will also experience an increase in flood issues as flood instances may double by 2050. Similarly, the United States and Southeastern Asia will experience more flooding because of an increase in hurricane occurrence and severity. Adapting to floods is considerably more difficult to manage than droughts because the excess water essentially drowns the plants. Some of the only ways to protect crops from floods is the traditional use of barriers such as levees or the movement of crop fields to higher grounds. In the future, biotechnology may provide another solution in the form of flood resistant crops. Such crops may be possible as scientists with University of Nottingham and the University of California Riverside recently discovered the molecular mechanism plants use to detect low oxygen levels.

Weeds, Insects, and Diseases
Three pests have always plagued agricultural crops: weeds, insects, and diseases. According to the National Climate Assessment conducted by the U.S. Global Change Research Program, weeds account for 34% of crop loss, insects account for 18% of crop loss, and diseases account for 16% of crop loss. The national average reflects worldwide averages as well. According to the 2014 IPCC report, insects and diseases account for 18% and 16% of worldwide annual crop loss.

34 Ibid.
35 Op.Cit., fn. 33
41 Intergovernmental Panel on Climate Change, “Climate Change 2014: Impacts,
In the United States alone, the public and private sectors spend a combined $11 billion annually just to combat weeds.\(^{42}\) Unfortunately, for crops, scientists project that the pest problem will only rise over the next century.\(^{43}\)

Increases in carbon dioxide levels not only increase the water-efficiency in crops, but it also increases the water-efficiency in the invasive weeds that the farmers wish to avoid. There is also evidence to suggest that these weeds thrive more than crops in these hotter, more carbon dioxide rich conditions.\(^{44}\) North America in general is set to experience the northward migration of invasive weeds.\(^{45}\) In the United States, invasive weed species such as *Privet* and *Kudzu*—weeds traditionally found in southern states—may expand their territory into northern United States as changes in temperature occur.\(^{46}\) The weed migration is not just limited to North America; an increase in overall average global temperature will result in the rapid expansion of weed seed dispersion across the entire world.\(^{47}\) Thus, crop growers everywhere can expect to deal with weeds they may have never encountered before, which means crop growers will have to invest in researching and implementing ways to combat the new weeds. In the meantime, their crop yields will be at the mercy of untamed weeds.

Adaptations utilized to combat weeds are becoming increasingly ineffective. A disappointing finding is the apparent reduced effectiveness of one of the most popularly used herbicides in the world: Glyphosate (also known as RoundUp). Within the next century, glyphosate’s effectiveness will considerably reduce due to the projected increases in carbon dioxide levels.\(^{48}\) If newer technologies are not developed, farmers will have to resort to more frequent sprayings, which impose costs on the economy, the environment, and human health.

With increasing temperatures, there will also be a spike in the population of harmful insects. Insects “synchronize their development and reproduction with warm periods and are dormant during cold periods. Higher winter temperatures

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Adaptation and Vulnerability,” (March 31, 2014), 500.

\(^{42}\) *Op.Cit.*, fn. 40
\(^{43}\) *Op.Cit.*, fn. 40
\(^{44}\) *Op.Cit.*, fn. 41
\(^{45}\) *Op.Cit.*, fn. 41
\(^{46}\) *Op.Cit.*, fn. 40
\(^{47}\) *Op.Cit.*, fn. 41
\(^{48}\) *Op.Cit.*, fn. 40
increase insect reproductive rates and allow for multiple generations.”\textsuperscript{49} Unlike crops, insects have the ability to adapt to a changing climate very quickly because of their high reproductive ability, short generation time, and high mobility. High mobility allows the insects to move around, as certain locations become unfavorable to them while other locations become more favorable.\textsuperscript{50} The potential for insect mobility now leaves crops open to entirely new insect problems, which could prove devastating to entire growing seasons. What makes the situation even worse is that producers may be unable to predict and thus unable to prevent which insects will attack their crops. Warmer trends may expose coffee crops in Ethiopia, Kenya, Uganda, Rwanda, and Burundi to an increase in the population of the coffee berry borer—one of the most devastating insects to coffee plants.\textsuperscript{51} On average, crops in Spain face at least one new insect every ten months as the pests migrate northward from Africa.\textsuperscript{52} The population of the coffee nematode, a parasitic worm, will likely increase in Brazil while the walnut pest population in California also increases because of rising temperatures.\textsuperscript{53}

Like weeds, harmful insects are often the target chemical sprayings known as pesticides. These pesticides aim to kill insects by disrupting growth and development.\textsuperscript{54} Crops are also genetically modified to release a toxin that kills harmful insects. However, insects are highly adaptable creatures and within a few generations, they become resistant to the genetically modified crops.\textsuperscript{55} In this regard, biotechnology may not be as useful in combatting the effects of climate change as the ability of insects to quickly gain resistance to genetically modified crops outweigh the heavy financial costs of creating those crops.

Scientists have yet to conduct in-depth studies of the effects of climate change on diseases, but the \textit{National Climate Assessment} suggests that high

\textsuperscript{49} From \textit{Op.Cit.}, fn. 40.
\textsuperscript{50} Moshe Coll and Tarryn Schuldiner-Harpaz, “Effects of Global Warming on Predatory Bugs Supported by Data Across Geographic and Seasonal Climatic Gradients” PLOS One, Vol. 8 no. 6 (June 2013): 1-9.
\textsuperscript{51} From \textit{Op.Cit.}, fn. 41.
\textsuperscript{52} From \textit{Op.Cit.}, fn. 41.
\textsuperscript{53} From \textit{Op.Cit.}, fn. 40.
\textsuperscript{54} “Insects, Nematodes, and Biotechnology.” \textit{National Institute of Food and Agriculture}, (March 18, 2009).
\textsuperscript{55} Ibid.
temperatures and drought increase aflatoxin production—a toxin produced by fungi that grow near and on crops. Insects can increase the production of aflatoxins—which are harmful to humans and livestock—in host crops.66

Europe’s crops face a variety of diseases including the phytophthora cinnamomi disease, which causes roots to rot, and the phoma stem canker in oilseed rape, which kills seedlings before they have a chance to grow.67 Europe will also see an increase in winter infection root and stem diseases, Fusarium blight, and a black rot fungus. Denmark, Finland, Iceland, Norway and Sweden will be seeing an increase in both pathogens and insects, as they will be less protected by the cold, long winters.68 While the Nordic countries will become more suitable for cereal crops, they will also become more suitable for diseases such as Eyespot and Anamorf. These two diseases alone could result in 50% crop yield reductions if the diseases cannot be controlled.69 Bananas grown in Angola and Guinea face an increased risk of Black Leaf Streak Disease as minimum temperatures continue to increase across Africa.70 The conventional adaptation for dealing with crop diseases is fungicides, which like herbicides and pesticides, involve spraying chemicals onto the plants. However, diseases are showing increasing resistance to fungicides which means other adaptations must be explored.71

Reduced Yields and Nutritional Value

Food security is an increasing concern in the face of the growing evidence towards climate change’s negative effects on agriculture. With demand for food already set to increase by 14% per decade until 2050, reduced yields is considered a major threat to food security. Furthermore, from now until 2050, experts expect the average worldwide crop yield to drop by as much as 2% per

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66 Op.Cit., 40
70 Op.Cit., fn. 58
Beyond 2050, the average crop yield decrease will likely rise beyond 2%. Already, the thinning Ozone layer is blamed for roughly 10% of wheat and soybean yield loss and 3-5% of the yield loss for maize and rice.\textsuperscript{63} There is a consensus among scientific research than an average temperature increase of 3°C or more will reduce all crop yields if adaptations are not undergone.\textsuperscript{64}

The relationship between climate change and yields is often both region and crop specific and thus, it is pertinent to examine several different regions and crops.\textsuperscript{65} Perennial crops are crops that are planted once and harvested repeatedly over many years. Perennial crops grown in Africa face grave danger where rising average temperatures will leave little land suitable for planting.\textsuperscript{66} The conventional adaptation to this problem would be to plant crops at a higher altitude. However, the high-altitude option will be severely limited due to the scarcity of suitable higher altitude locations. In the absence of a better solution, Africa faces the very real risk of catastrophic economic troubles due to severely reduced yields of high-value perennial crops such as tea, coffee and cocoa.\textsuperscript{67} South America faces a similar fate as Africa in regards to its perennial crops. Costa Rica, Nicaragua, Columbia, and El Salvador face a 40% reduction in coffee crop productivity if they do not relocate coffee crops to higher altitudes by 2050.\textsuperscript{68}

Grain crops also face a significant reduction in yields due to average rising temperatures. If the temperature rises only 3°C, both Africa and South Asia face an overall 8% yield reduction by 2050 in wheat, maize, sorghum and millets.\textsuperscript{69} In the event of a 5°C rise in temperature, Africa stands to lose 19% of its maize yields and 68% in bean yields.\textsuperscript{70} Central America, Brazil, and the Andean Region face a significant decrease in crop yields that will lower food security of


\textsuperscript{63} Ibid.
\textsuperscript{64} Ibid.
\textsuperscript{65} Intergovernmental Panel on Climate Change, “Climate Change 2014: Impacts, Adaptation and Vulnerability,” (March 31, 2014), 506.
\textsuperscript{66} Ibid.
\textsuperscript{67} Ibid.
\textsuperscript{68} Ibid.
\textsuperscript{69} Ibid.
\textsuperscript{70} Ibid.
the area’s poorest populations.\textsuperscript{71} Such crops are vital to food security across the globe because they serve as one of the core components of the typical human diet. Furthermore, grain crops such as corn also serve as the main component of livestock diets, which further threatens the food security of humans.

A popular adaptation is to extend growing seasons for oilseed, wheat, soybeans, and maize into cooler months to compensate for the increase in warmer months at the tail end of growing seasons. Studies have shown that changing planting dates may help increase yields by as much as 17\%.\textsuperscript{72} While this may be enough in areas such as South America, earlier planting dates do not work for areas like the Mediterranean, where early planting is dependent on adequate rainfall in the autumn season. However, it is likely that rain in the area will decrease during the autumn which means planting dates could be pushed back rather than pushed forward.\textsuperscript{73} A second adaptation is moving crop-planting areas further north and south of the equator—in areas where global warming has raised temperatures to suitable crop-growing conditions. A third option involves selective breeding and genetic engineering, in which growers design and breed plants to withstand higher temperatures. However, this takes anywhere from 8 to 20 years to develop.\textsuperscript{74} It also involves maintaining extensive gene banks from which producers would be able to select favorable genes. The more genetically diverse such banks are, the more options scientists will have from which to pull favorable genes for biotechnological adaptations.

Aside from the steady rise in average global temperatures, water scarcity also affects crop yields. An estimated 80\% of the world’s crop area is rain-fed. Moreover, this rain-fed area accounts for 62\% of the world’s staple crops.\textsuperscript{75} With rainfall becoming more sporadic and unpredictable, these numbers are likely to dwindle.\textsuperscript{76}Although irrigation will be affected by changing rainfall and runoff patterns, it will remain a key aspect of maintaining crop yields in the face of climate change. As a testament to irrigations effectiveness, irrigated

\begin{footnotesize}
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\item \textsuperscript{71} Ibid.
\item \textsuperscript{72} Intergovernmental Panel on Climate Change, “Climate Change 2014: Impacts, Adaptation and Vulnerability,” (March 31, 2014), 507.
\item \textsuperscript{73} Ibid.
\item \textsuperscript{74} Ibid.
\item \textsuperscript{75} United Nations Food and Agriculture Organization, “Climate Change, Water and Food Security,” (September 2008), 47.
\item \textsuperscript{76} Ibid.
\end{itemize}
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crops account for 40% of the world’s food supply despite the fact that irrigation is responsible for watering only 20% of the global crop area. Clearly, irrigation is efficient despite its economic costs. Furthermore, irrigation is vital to densely populated countries such as China, Pakistan and India, where water may be a scarce resource. Future adaptations will likely involve a focus on the expansion and improvement in the efficiency of current irrigation systems.

Food security is not just about the amount of crops we can produce; it is also about the nutritional value of those crops. There is evidence that increased temperatures cause cultivated plants to mature more quickly than the soil can handle. The faster growth is due to the increased levels of carbon dioxide in the atmosphere, which increases the rate of photosynthesis. Thus, even though plants grow faster (and thus, can be picked earlier), the plants lose some of their nutritional value because the soil cannot provide those nutrients quickly enough. Even if crop yields remain constant over the next century, it would take more food to provide people with adequate nutritional value. Cereal crops (wheat, rice, and corn) grown under elevated carbon dioxide levels have decreased protein content. Mineral concentration in edible plant tissues is also reduced when grown under increased levels of carbon dioxide. Early evidence suggests that biotechnology can be used to increase micronutrients such as vitamins and beta-carotene into crops. Scientists identify genes that perform the needed function and inject them into the genomes of the desired

crops. The world heritage site, Kew Gardens, is home to a seed bank that holds wild, undomesticated relatives of the world’s twenty-nine most crucial crops. One of the reasons these crops are saved is to provide a buffet of genes to choose from in the event that crops need to be enhanced with certain types of genes.

**Implications**
Climate change has and will continue to affect world agriculture. The severity of extreme weather events will rise over the next century. Drought-resistant crops are already available to farmers and researchers continually work toward making even more crops drought-resistant. Flood-resistant crops are not yet in use, but there is progress toward their development with the discovery of the molecular mechanism plants use to detect low oxygen. Changing weather patterns have caused an increase in invasive weeds, insects, and diseases. The increasing pest problem will be difficult to control considering increasing resistance to chemical solutions. Enhanced irrigation systems will be vital in combatting water scarcity, but many scientists fear this will not be enough to maintain sufficient crop yields.

Climate change has already begun to push agriculture away from the equator. The migration is deeply concerning because countries near the equator are the ones with the most food insecurity. Climate change has also pushed crops to higher altitudes. Unfortunately, there are only so many high-altitude places in the world and there is only so far north or south to push crop fields. The evidence presented in the case studies suggests that migration of crop fields is not a sustainable answer for the long-term despite its efficiency in the short-term.

Although it may be too early to tell precisely how climate change will affect world agriculture, it appears that sustainable world agriculture lies increasingly within biotechnology. The main setback to biotechnology is the time, effort, and money it takes to research and develop needed solutions. However, a rise in the use of biotechnology in agriculture may be inevitable. The world will need both drought and flood-resistant crops. The world will need crops

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84 Ibid.
86 *Op.Cit.*, fn. 82
to be more weed, pest and disease resistant. The world will need crops that can withstand higher average temperatures with less water. Finally, the world will need crops with dense nutritional value. In the short-term, conventional adaptations of crop field migration, increased herbicide and insecticide sprayings, and enhanced irrigation systems may meet these needs. However, these solutions become increasingly unrealistic in the long run due to a variety of reasons including limited growing areas and high environmental costs. The implications of the lack of other long-term options means that biotechnology may be a keystone solution to the negative effects of climate change on world agriculture. There is still much controversy over the use of biotechnology in the food we eat, but the fact of the matter is we may not have a choice if we want to maintain complete and nutritional diets.
LINDA BARGER BODENLOS is the Corporate Knowledge and Communications Branch Chief of the Chief Information Office for the USDA Forest Service. She graduated from Cal Poly in 1972 with a degree in Political Science.
ALUMNI SPOTLIGHT

*Linda Barger Bodenlos*

Linda Barger Bodenlos began her Cal Poly career as a Social Science major, but jumped at the opportunity to switch into Political Science the moment she heard Cal Poly was opening up such a major. It was motivating and new! During her time at Cal Poly, Linda worked on a variety of interesting projects including a project that involved studying Arroyo Grande’s tax base and how it would change if the city converted its mobile home parks into apartment complexes or single-family homes. She also helped run an election campaign in Arroyo Grande. However, Linda had her sights on becoming a paralegal after graduating, so she decided to take an internship with the District Attorney’s Office for her senior project.

After graduation in 1972 as a student of Cal Poly’s first Political Science class, Linda searched for a job so she would be able to afford UCLA’s paralegal certification program. She found a full time position with the organization she had worked for during her college summers—the U.S. Department of Agriculture (USDA), Forest Service. While working and after several moves, her focus shifted from becoming a paralegal to becoming a teacher, so Linda earned her Early Childhood teaching credential and began substitute teaching. Despite her enthusiasm for teaching, Linda just couldn’t stay away from
the USDA and decided to return to working full-time for the Forest Service. Thirty-six years later, Linda lives with her husband near Portland, Oregon with whom she raised two sons and has two grandchildren. Linda also remains with the USDA Forest Service, serving the Chief Information Office as its Corporate Knowledge and Communications Branch Chief. However, her rise to the top was no easy feat; at the time of her entry into the full time workforce, the Forest Service was very much a male-dominated culture and as such, it was very difficult to get ahead as a woman. Linda, who began a permanent job as a Personnel Clerk, knew she didn’t want to be a support person—she wanted to do her own thing. She attributes her willingness to challenge the status quo in part to her Political Science background, which taught her to question and negotiate everything. Thus, she took it upon herself to always volunteer first. When Equal Employment Opportunity (EEO) became a prominent topic in the work place, Linda volunteered to be one of the first EEO counselors in her unit. When the Forest Service began using corporate computers, Linda jumped at the chance to learn as much as possible about how they work and how to use and teach others how to use them. Cal Poly’s Learn by Doing motto and her personal love for learning were at the core of Linda’s enthusiastic attitude for tackling every new opportunity that arose. Her persistence served her well as she has held numerous leadership positions for the Forest Service. She’s worked at all levels of the agency including field units, research labs, regional offices and now in the Washington Office detached in a virtual position. She has served as a Forestry Technician, Systems and Network Administrator, Program/Project Manager, Assistant Director and now is a Branch Chief with Project Management Professional (PMP) and Information Technology Infrastructure Library (ITIL) certifications. She has also served on numerous national projects and major initiatives as a team member or leader.

Linda’s love for the USDA Forest Service and its values are apparent. “Our motto is Caring for the Land and Serving People. Our mission at the Forest Service is to sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations. We evaluate climate change and resilience, severe wildfire behavior due to drought and effects of invasive species.” One of the things she loves most about the Forest Service is her ability to hold different types of positions. “There are so many interesting jobs within the Forest Service because it serves such diverse purposes. There’s a job in USDA or the Forest Service for pretty much any
type of work you would want to do.” In her current position, Linda works closely with her team to implement effective communications and training for IT projects impacting customers.

Linda’s advice to Political Science students is to always volunteer first and always be willing to try anything in terms of career opportunities. She also encourages students to get their master’s degrees. “We have many young people working for us and the vast majority of them have a master’s degrees or specialized certifications.” Linda points out that as the world becomes more technical, people tend to lose sight of the importance of interpersonal skills in the workplace and the valuable experiences you can learn by being a supervisor. Excellent writing, public speaking, teambuilding, and emotional intelligence skills are all vital to a successful career. Regardless of whether or not you know what you want to do, Linda insists that all students should find a mentor and take advantage of other people’s experiences. Find out what they know and what they’ve been through and use it to build your own experience. Most importantly, Linda says, “Lead from where you are. It doesn’t matter what your job title is or isn’t. Lead to the best of your abilities and people will start respecting you from where you are. It doesn’t matter where you start—you just have to get started. Don’t try to predict which path you’ll take, just make good choices. If you don’t know where you’re going, it doesn’t matter how you get there – It’s all about the journey.”
SARAH GLENDON is a graduating Political Science and Communications major with a concentration in Pre-Law. During her time at Cal Poly, Sarah enjoyed participating in intramural sports, volunteering, and using Cal Poly’s beautiful Rec Center. In her free time, Sarah enjoys the local beaches, and works on do-it-yourself projects. After graduation, Sarah plans to attend law school.
Many women face additional risks as a result of being homeless that go beyond the typical disadvantages homeless men face. These disadvantages include increased risk of sexual exploitation, domestic violence, and the inability to care for their children. During my overnight stay at the El Camino Homeless Organization (ECHO) Shelter in Atascadero, I met a woman in her late seventies known only as Sunshine. She told me about her life before homelessness, her children, and the disease that is taking her life. My conversation with Sunshine mirrors past and present research concerning the disproportionately poor conditions endured by older homeless women. These women are particularly prone to such poor conditions because of economic disadvantages, physical and mental problems, and a lack of family support.

I first met Sunshine when she stopped in the hallway to catch her breath after taking a shower. During our chance encounter, I learned that Sunshine is one of seven women who attended Cal Poly in 1956—the first year Cal Poly allowed female students to enroll after a temporary ban on female students was repealed. Sunshine laughed when I asked her what she had done with her two majors and replied, “Absolutely nothing. I got married and had children.”
Sunshine is a part of a significant demographic of elderly women who never worked and remained, throughout their lives, reliant on their spouses’ income. Before homelessness, Sunshine—and many women like her—held low-wage jobs or remained unemployed for extended periods of time. According to a study commissioned by the Women’s Institute for a Secure Retirement, 49% of surveyed women over the age of 70 lost 50% or more of their income after their husbands’ death. The study also reports that only three in ten widows held primary responsibility over their household finances.¹ Like many of these women, Sunshine’s work as a homemaker leaves her financially insecure today.

The economic issues elderly women face emerge from the difference between past homemaking practices and the modern expectation of the working woman. As a result, the previously gender-segregated labor market influences the benefits elderly females receive today. Traditionally, “[a]fter age 65 economic inequality has been thought to narrow as government benefit programs replace the labor market as elderly people’s primary source of income.”² This is not the case for Sunshine and similar elderly women who find that their lack of past employment exponentially intensifies their low economic status. Moreover, current data shows that economic inequality increases with age: “[a]mong persons ages 35 to 44, the poorest 40 percent had 18.4 percent of the total economic resources, and the richest 20 percent had 40.2 percent. By age 75, the poorest 40 percent of the population had only 14.9 percent of the total resources, and the richest 20 percent had 46.7 percent.”³ These figures may be a representation of the economic inequalities that elderly women faced in midlife, which have worsen with old age.

Economic figures worsen when observing poor elderly women who often have severely limited economic resources and therefore are more susceptible to homelessness than their impoverished male counterparts. Reports show that about “three fourths of the older persons who live below the poverty line are women, with most dependent on social security…. These factors render older women more vulnerable than older men to becoming homeless, a trend that will continue as the baby boom generation ages.”⁴ The economic disadvantages

³ Ibid.
⁴ Anne Kisor, and Lynne Kendal-Wilson, “Older Homeless Women: Reframing the Stereotype
that elderly females are subject to are often a result of their lack of planning for retirement. Social security can only do so much for this group of women because they, unlike elderly males, never had the opportunity to acquire a pension or other employer retirement saving plans. This is evidenced by a study conducted by Boston University professor, Judith Gonyea, who found that “social security was 84 percent effective in helping white men escape the official poverty rate… [and for] white women it was 69 percent effective in raising them above the poverty line.” Thus, it appears as though white males are the only group that can consistently use social security to stay above the poverty line.

Physical health and mental illness are also significant issues for elderly homeless women. Sunshine revealed that she was diagnosed with Parkinson’s disease a couple of years ago. The disease not only affects her physical wellbeing, but her mental health as well. As a result of dealing with her failing physical health, Sunshine developed depression. Studies show that Sunshine’s situation is more common among the elderly homeless population than it is among the younger homeless population. One study found that between younger and older homeless populations, “respondents over age 50 were significantly more likely to report a chronic medical condition (85.1% vs. 55.6%), 2 or more medical conditions (59.4% vs. 27.8%), or a mental health condition (74.0% vs. 56.7%).” Although the study does not confirm any causal connection between physical illness and homelessness, the data does show an increased likelihood that the elderly homeless will suffer from physical and mental illness.

The homeless are more likely to have certain degenerative syndromes associated with old age. One study found: “syndromes including functional and mobility impairment, frailty, depression, visual impairment and urinary incontinence were significantly more common in the homeless compared to their housed counterparts.” Many geriatric syndromes result in cognitive impairment to varying degrees. Carl Cohen, Psychiatry Professor at SUNY Downstate

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University, found that “cognitive impairment can precipitate homelessness…[with] levels of cognitive impairment [among the elderly homeless ranging] from about 10-25%.” Some data suggests that geriatric syndromes that cause cognitive impairment could, in fact, cause homelessness among those affected. A review of data reports that the cognitive impairment among the housed is “about 2–3%, whereas most studies of the homeless have shown much higher rates reaching 30–40%.” The data available suggests a significant correlation between cognitive impairment and homelessness.

Many geriatric syndromes make it difficult for the homeless to take adequate care of themselves and often cause severe depression. Furthermore, elderly homeless women report mental illness more frequently than elderly homeless males. A study in Baltimore, “found that [50%] of homeless men and [60%] of homeless women aged 50 and older had psychiatric disorders.” Physical and mental illnesses are often debilitating without proper treatment. A study done on Boston’s elderly homeless population reports that “nearly 40 percent experienced major depression, and one-quarter suffered from cognitive decline, primarily impaired executive function (decision-making, planning and judgment).” These statistics mirror Sunshine’s own experiences and beliefs as she attributes her depression to her Parkinson’s disease.

A lack of family support is yet another issue that many homeless women face. Sunshine spoke briefly about how proud she is of her children, but quickly veered to a new topic. An ECHO staff member mentioned that many of the older women staying at the shelter have physical and mental illness that family members cannot handle or do not want to deal with. One study reveals, “Reasons for homelessness were arguments with friends or family members, spousal abuse, family violence, and the lack of social support [reported by] 73.5% [of homeless elderly female respondents].” Some researchers have gone so far as to say that after economic factors, family breakdown and neglect

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10 Op. Cit., fn. 8
are the second major causes of homelessness among elderly women. Jennifer Davis-Berman, a professor of Social Work and the University of Dayton, Ohio, found that “older adults [often tip] into homelessness in later life as unresolved issues continue to mount. Related to this, lack of family support and stressful life events were seen to predict homelessness in older adults in New York.”

Family breakdown is a recurring in elderly female homelessness. Davis-Berman’s studies also suggest “up to one third of older homeless respondents said that they had family with whom they could stay, but that family problems and dissent prevented that from being a viable option.” Elderly women are more likely to become homeless because of a family crisis than their male counterparts are. Thus, the importance of social networks for poor elderly females is vital for remaining housed.

In many of these cases, these women tend to rely on family members until they have exhausted their social networks. Eventually, their temporary housing with family members falls through and elderly women must fend for themselves. Instances of homelessness among this population are worse when family dysfunction in the form of elderly abuse and neglect is a factor. Neglect occurs when caregivers fail or refuse to meet the basic needs of the elderly dependent. For these women, “abuse and neglect can tip the balance from marginal housing to homelessness, supporting studies that indicated that family dysfunction is a significant factor in older women’s homelessness.”

Elderly homeless women like Sunshine need care that is both time-consuming and costly. If family networks are unable or unwilling to provide the extensive care needed by women like Sunshine, then those women have no choice but to survive on their own.

The cumulative disadvantages of economic inequality, physical and mental illness, and a lack of family support disproportionately affect elderly homeless women. For many of these elderly women, poverty is a new experience. Like Sunshine, they come from a middle class background and relied on their husbands’ income. For these women, homelessness is a harsh reality of how little social security can actually do to keep them above the poverty line. Most

homeless elderly women face physical conditions, mental conditions, or a combination of the two. These issues make it more difficult for them to find housing in the future. The final straw for this population of the homeless is often a lack of familial support, which can tip them from temporary housing into homelessness. The subpopulation of homeless elderly women may be small but it is growing. The economic basis for their poverty is largely a result of the working norms of their youth. Mental, physical, and familial issues only exacerbate this problem. Sunshine, and other elderly homeless women like her, represents the reality that homelessness is often caused and worsened by things outside their control.
CONTRIBUTOR BIO

PATRICK HALE is the President and Chief Executive Officer of PHC Group Inc. and graduated from Cal Poly in 1977 with a degree in Political Science.
ALUMNI SPOTLIGHT

Patrick Hale

A true forger of new paths, Patrick Hale’s insatiable curiosity has driven him to learn and master as much as he possibly can. Such curiosity is clearly evidenced in Patrick’s unique, multi-faceted trajectory. Even during his time at Cal Poly, Patrick packed his schedule with six to seven classes a quarter in order to learn as much as he could as quickly as possible. He spent time in professors’ offices hours to ensure all his questions were answered. Whilst taking his Political Science courses, Patrick realized that the mere facts he was learning weren’t necessarily the important part of his education—rather the important part was learning how to connect all of that information and identify overarching themes. As one of his professors stated, “It appears that you have learned how to think critically. Put it to good use and you’ll be surprised what happens.” Looking back, Patrick attributes Cal Poly’s Political Science courses with honing his critical thinking skills. As Patrick put it, “That ability served me well over the years in the business world. No matter what I did, I always told myself to master the past, analyze the present, and prepare for the future. Political Science helped nurture the tools I needed to enjoy some modicum of success while remaining true to my core beliefs and values.”

Speaking of the business world, Patrick has had incredible success, which he
attributes to learning by doing. According to Patrick, his failures outnumber his successes, but he’s learned so much more simply because he had to do more in order to overcome those failures. And Patrick sure has done a lot over the years. His career path is not a straight one; he’s been the Chief Information Officer for several counties and a city, the lead agency of a consortium that provided nationwide network connectivity for the Transportation Security Administration (TSA), a campaign worker, a political candidate, and a legislative aid in addition to many more. However, one of his greatest passions has always been starting and growing companies based on what fascinates him. The first companies he founded were in the computer field. According to Patrick his companies, “provided symmetrical multi-processor capabilities before it was cool.” Today, Patrick serves as the Founder and CEO of a 6.4 billion dollar holding company, which has businesses of all types including wineries and companies within the entertainment, computer hardware, cloud services, venture capital, and data encryption sectors. Putting it simply, Patrick’s company buys or starts firms and mixes them in with the rest of his company’s portfolio of interests.

Patrick’s Political Science degree has also helped shape him as a leader; “knowing how politics and political organizations works helps me when I manage others. The same skills of organization, consensus, and vision used in politics help me manage others in both private sector and public sector pursuits.”

On top of his entrepreneurial pursuits, Patrick has found the time to write thirteen novels and is currently in the process of writing his fourteenth. He can’t get his editors to review them as quickly as he’d like. Taking the advice from a past teacher, who told Patrick that the key to believable writing is writing about what you know, Patrick’s novels focus on a variety of politically themed topics including espionage, international intrigue, technology, and abuses of power. As Patrick would say, “between studying government, working in it, and working with it I believe I’m reasonably fluent in themes that revolve around Political Science.” Patrick writes for his own enjoyment and the fact that other people read and enjoy his books is “a never-ending source of wonder and humility” for him.

Patrick’s advice to Political Science students is to never stop learning. “Learn everything you can, but do so with an eye toward the elements that tie seemingly disparate themes into a coherent whole. Never stop questioning, even yourself, and always learn. Never accept the answer, ‘That’s the way we’ve always done things.’ Any sentence that starts with, ‘You don’t understand…’ is really telling
you that you do understand, but you're rocking the proverbial boat. When you learn something new, always ask yourself, ‘How does this new fact relate with the ones I believe to be true?’ Resolve any conflicts and then accept or reject the new data based on your existing and constantly growing knowledge base.” Patrick also encourages students to pursue every avenue that seems interesting. “A mind is not a vessel to be filled, but a fire to be kindled. Ignite your spark, kindle your fire, and help it to burn as hot as possible. For the rest of your life, your fire’s warmth and light will shelter you from the cold and guide your steps through the darkness.”
OLIVIA BAUER is a graduating Political Science major who greatly enjoyed her time at Cal Poly San Luis Obispo. She is constantly impressed by the caliber of both professors and students within the Political Science department. She believes that Cal Poly has provided her with all of the skills necessary to be extremely successful in the future. After graduation, she plans to move back to the San Francisco Bay Area and begin her career.
THE TOOTHLESS CONVENTION: THE LACK OF POLITICAL WILL TO UPDATE THE BIOLOGICAL WEAPONS CONVENTION

Olivia Bauer

Real World Observation
On September 10, 2014, The New York Times reported a stabbing that took place in the airport in Lagos, Nigeria. The article continues to say that a federal air marshal was stabbed with a syringe, “an incident that is raising concerns about whether the deadly Ebola virus could be harvested from the widespread outbreak in West Africa and used as a bioweapon.” The initial tests done on the contents of the syringe do not detect Ebola or any other dangerous biological agent, and the air marshal was examined and released from a hospital in Houston with no sign of sickness. While “experts say it would be extremely hard for a group to grow large amounts of the virus and turn it into a weapon that could be dispersed over a wide area, [...] it is harder to completely discount

the possibility of a smaller attack.”\(^2\) Ebola is not a particularly contagious virus, but it is has a high mortality rate once contracted. Its fatality is clearly seen in the most heavily affected areas of the Ebola outbreak. As of September 25, 2014 “at least 2,909 people have died in Guinea, Liberia and Sierra Leone, with 6,242 reported Ebola cases over all, according to the latest report of the United Nations’ health body. Nigeria and Senegal have recorded a total of eight deaths and 21 cases of infection.”\(^3\) The United States government has responded quite dramatically to the Ebola outbreak in Africa with an unprecedented commitment of military forces. Dan Lamothe with *The Washington Post* reported that President Obama “framed the ongoing Ebola epidemic in western Africa as a potential threat to global security, a two-star Army general and his staff were already on the ground in Liberia, preparing for a mission that is expected to include about 3,000 service members and has no end in sight.”\(^4\) While the reaction on the part of the United States is unprecedented, the threat of biological agents and their potential use as biological weapons has existed for some time.

In recent years, biological agents have been assessed with increasing frequency as having a dangerous and pressing potential for use as weapons. A recent example occurred in April of 2013, when *The New York Times* reported, “a letter sent to a U.S. Senator from Mississippi tested positive for the poison ricin.”\(^5\) While the letters were successfully intercepted and analyzed, the existence of an attack like this one serves to show the progress that still needs to be made in eliminating the potential for biological agents to be used against citizens, and even states. These domestic attacks are only evidence of the terrifying possibility of an interstate biological weapons attack. Historically, when it became clear that biological weapons were a threat to state actors, the Biological Weapons Convention (BWC) was written and signed in 1972. In 1975, the


United States ratified the BWC, and today, there are 165 signatory states. The State Department defines “the BWC [as being] critical to international efforts to address the threat posed by biological weapons—whether in the hands of governments or non-state actors—and to remain effective it must continue to adapt to the wider range of biological threats we face in the 21st century.” However, in the years since its ratification, the BWC has not been updated or given teeth, despite the increased threat of a biological weapons attack. This leads to the following research question: Why is there a lack of political will to update the Biological Weapons Convention?

**Theoretical Paradigm**

International Legal Realism is the theoretical paradigm that best frames the research question and its potential answers. International Legal Realism assumes that states wield power through rules and laws that govern behavior between nations. This paradigm also assumes that change occurs on the international stage when prompted by a state with relative power. The three main proponents and founders of International Legal Realism are Hans Morgenthau, Harold Lasswell, and Myres McDougal. Hans Morgenthau explains that international laws need “to be seen within the sociological context of economic interests, social tensions, and aspirations for power, which are the motivating forces in the international field, and which give rise to the factual situations forming the raw material for regulation by international law.” Relating to the core assumptions, this standard for international laws explains that relative power is what controls and drives outcomes on the international level. Similarly, Lasswell “defined politics as the adversarial process of decision about the distribution of values in society.” Furthermore, Lasswell and McDougal together “defined law as the subset of the flow of decisions that could be said to be both ‘authoritative’ and ‘effective.’” Effective in this case is defined as controlling with power. Clearly, from the definitions given by the three founders of the paradigm, relative

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9 Ibid.
power is crucial to interstate behavior and outcomes on the international stage. These assumptions are the reason why International Legal Realism best frames this research question and its answer. Lasswell and McDougal, in their “Criteria For a Theory About Law,” state that “an emphasis explicitly focused upon the institutions of the modern state […]], unable to observe in the world arena either appropriate centralized institutions or an identifiable monopoly of force, has insoluble difficulty in accounting for the patterns of authority and control transcending nation-state lines.”10 The BWC can certainly be classified as an institution of the modern state, but more specifically, it lacks verification or centralization. Without teeth or hard international law, there can be no concrete authority or enforcement on an issue such as biological weapons. This aspect of the theoretical paradigm relates to the first case study, which focuses on the Biological Weapons Convention Verification Protocol. The paradigm also frames the threat inflation case study through its assumptions about interaction between states and the role of power. Threat inflation in the case of biological weapons reflects the more abstract concept that is the shift to a unipolar international system. Lasswell and McDougal “emphasize that law as an on-going process is located in a larger social context […] and legal problems are generally attributable to the broader social setting,” described as the big blooming ongoing confusion, “in which they always occur.”11 Finally, as it applies to the final case study, the decline in arms control, International Legal Realism explains that the state with the most power drives change. Change in this final case study is a shift from arms control to nonproliferation, or the prevention of the spread of weapons like biological weapons. The United States set the precedent for other nations to adopt a defeatist policy when it comes to biological weapons control. However, this assumption of International Legal Realism also applies to the larger picture of the research question. “The Lasswell-McDougal approach was designed to develop social policies through careful and rigorously organized theoretical deliberation.”12 While a shift in outlook on biological weapons can be standardized by the United States, the

development of a solution to the BWC issue can as well.

**Failure to Implement the Biological Weapons Convention**

The Biological Weapons Convention’s failed Verification Protocol and other similar attempts serve as empirical instances that represent a broader and more abstract concept. In the exploration of a reason for lack of political will to update the BWC, an important idea that often comes up is the concept of sovereignty and the desire of states to keep their relative power unchecked. The Verification Protocol and its failed ratification by the United States is an excellent representation of this independent variable, which may be causing a lack of political will among states to redo the BWC in a way that gives it teeth, which the Verification Protocol would have accomplished. The BWC was written and negotiated from 1969 to 1971, opened for signing in 1972, and was ratified by 43 countries by the time that the United States ratified it in 1975. The biological weapons treaty “prohibits the development, production, stockpiling or acquisition by other means or retention of microbial or other biological agents, or toxins.” However, dating back to the creation of the BWC, efforts to strengthen its policies and give it some force have been fairly unsuccessful and, some say, even half-hearted. A couple of fairly obvious barriers became apparent when the BWC entered its negotiation phase. One such obstacle “lies in the dual-use nature of the materials, equipment, and know-how fundamental to legitimate research laboratories and multinational industries. Avenues to biological weapons cannot be completely closed off without sacrificing the beneficial science […] that depend on these dual-use items.” The more troublesome impediment is the effect that enforcement would have on states’ sovereignty. From this obstacle stems a long history of paradoxical statements and actions in the United States.

Even in the process of its negotiation, the BWC proved difficult for the two world superpowers at the time—the United States and the Soviet Union—to agree to under certain provisions that would leave them vulnerable to sovereignty infringement. The dichotomy between support of the BWC and desire to

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maintain control over defense and military research and development surfaced in the negotiation period of the convention. In a memorandum to President Richard Nixon, Henry Kissinger informed the President “we have supported negotiation of a prohibition on biological weapons and toxins along the lines of the 1969 UK draft convention.” Later in the same memorandum, Kissinger implied that intrusive investigations into states’ activities involving biological weapons programs should be avoided. According to Jonathan B. Tucker of the Arms Control Association, “by the time the Cold War superpowers finished reworking the BWC, they had dropped all formal verification provisions, […] enabling Moscow and Washington to use their veto power to block inquiries into their own activities or those of their allies.” Though a formal verification protocol was yet to be established, the United States and Soviet Union both clearly opposed intrusive investigations by the BWC even at the risk of crippling the convention.

In the first few years after the ratification of the BWC, “the participating states tried to strengthen the convention by establishing several politically binding confidence-building measures (CBMs), including annual declarations of high-containment biological facilities designed for work with dangerous microorganisms, and reports of unusual disease outbreaks.” However, the lack of penalty for abiding by these CBMs led to a ridiculously low number of states that upheld them. Similarly, “Article IV of the treaty requires member states to pass domestic legislation that would penalize bioterrorists operating within their borders by outlawing offensive biological weapons activities.” A similarly low number of states adhered to this policy. Finally, “at the Third BWC Review Conference, European countries sought a rigorous and intrusive on-site inspection regime analogous to the one then being elaborated for the Chemical Weapons Convention (CWC).” In response, the United States

16 Ibid.
18 Op. Cit., fn. 14
19 Op. Cit., fn. 15
along with Iran, Russia, and others opposed this proposed protocol due to its potential infringement on these states’ ability to research biological defense. “The American negotiating position on a verification protocol had been driven by restrictions desired by the Department of Defense, […] apparently trying to prevent the exposure of biodefense activities taking place in the United States.” Following the United States’ adamant refusal of on-site investigations, it became clear that the BWC was going to deteriorate without any hard law to support it.

From this point on, a pattern among Presidents of the United States appeared in which their public statements on the BWC expressed clear support and steadfast commitment to its strengthening, while their archival documents revealed serious hesitation about allowing any form of verification that may give teeth to the treaty. In a report to the National Security Council in 1970, the Interdepartmental Political-Military Group asked, “Should the U.S. maintain an option to develop capabilities to retaliate with toxins against chemical or biological attack?” Presidents, advisors, and other officials have continually asked this question throughout the years since the creation and ratification of the BWC, and it seems that their actions answer in the affirmative. On February 16, 1995, President Bill Clinton sent a message to Congress saying, “The United States was an active participant in the Special Conference of States Parties [and] the Special Conference produced a mandate to establish an Ad Hoc Group whose objective is to develop a legally binding instrument to strengthen the effectiveness and improve the implementation of the BWC.” In actuality, the Ad Hoc Group, also known as verification experts or VEREX, only encouraged off-site surveillance that did little beyond create suspicion among party states. While President George W. Bush made a similar statement supporting the strengthening of the BWC in November of 2001, in July of 2001, he “decided

21 Ibid.
24 Op. Cit., fn. 20
not to sign the protocol to strengthen the Biological Weapons Convention by providing monitoring and compliance provisions, citing the administration’s doubts about the ability to verify compliance with the treaty and its concerns about [its] impact.”26 Bush’s policy has bled over into the Obama administration, which has done nothing to further the verification process of the BWC. It is clear from this string of presidential decisions and statements that sovereignty plays a large role in the lack of political will to update the Biological Weapons Convention. With that said, other factors are also very influential in hindering political will and action regarding the convention.

Threat Inflation of Bioterrorism
This second case study aims to represent the shift to a unipolar world in the international system. The rise of the United States and the fall of the Soviet Union after the Cold War brought about the shift from a bipolar to unipolar world. As Detlev F. Vagts stated in his piece on Hegemonic International Law, “America is in a position to reshape norms, alter expectations and create new realities.”27 America’s unique position is due to its role as the hegemon on the global stage. Yet, this ability also comes with responsibilities and, perhaps more importantly, risks. As the political and military leader of the world, the United States constantly runs the risk of being targeted or seen as being too powerful. For this reason, the United States government must constantly be concerned with the threat of attack while simultaneously working to avoid a security dilemma, in which an adversary state becomes threatened by the United States’ increase in military capabilities, and in turn, increases its own capabilities, creating a cycle of paranoia and security expansion.

In regards to biological weapons, American citizens and officials alike see the threat of bioterrorism as a menacing possibility. The intuitive assumption regarding the connection between threat inflation and action to update the BWC is that due to the expanded threat, the United States should be more inclined to promote the restraint of biological weapons development elsewhere in the world. It also seems quite possible that as a result of the threat, the United

States would want to maintain its own biological capabilities. In an article on arms control, Jack Beard explains, “a state actor is unlikely to forgo a particular class of weapons permanently unless it receives assurances that adversary states are reciprocally so committed and an effective monitoring regime is in place to ensure against a ‘surprise deflection,’ that is, cheating.”28 If this is the case, then the threat inflation of bioterrorism certainly could be affecting the lack of political will to update the BWC. Before that can be determined, it is important to analyze the perceived threat.

First, the presidential archives show that the threat of biological weapons has been a pressing matter since the development of such weapons. However, over the years, presidents became increasingly worried and behaved more cautiously on the matter. President George Bush Sr. stated, “On November 16, 1990, in Executive Order No. 12735, I declared a national emergency under the International Emergency Economic Powers Act […] to deal with the threat to the national security and foreign policy of the United States caused by the proliferation of chemical and biological weapons.”29 In November of 1993, President Bill Clinton “extended the national emergency on the basis that the proliferation of chemical and biological weapons [continued] to pose an unusual and extraordinary threat to the national security and foreign policy of the United States.”30 At this point in time, the major terrorist attacks of 2001, which include the anthrax attacks and September 11th attacks, had not yet occurred. This implies that the threat was inflated before there was any real tangible cause for concern.

More recently, in 2002, Defense Horizons published a piece explaining that “the current state of U.S. knowledge tells us that: almost any potential U.S. military adversary either has biological weapons or has a program to get

them [, and] technology is changing rapidly and […] offering more state and non-state actors the means to exploit biological processes for military ends.”

Similarly, an article on biological warfare from The National Security Archive from 2001 warns that terrorists may have access to even eradicated biological agents, such as smallpox. In 2011, the Assistant Secretary of the Bureau of International Security and Nonproliferation stated, “We fully recognize that a major biological attack on one of the world’s major cities could cause as much death and economic and psychological damage as a nuclear attack.” From this history of threat inflation, it is evident that the threat has at least remained constant, if not increased, over time.

A good portion of this expanded threat comes from the uncertainty and suspicion about the activities of other states. The National Security Council released a document stating, “Distinguishing illicit intent within the expanse of legitimate activity presents a unique challenge. It is quite possible that we would not obtain specific warning of an imminent threat or impending attack in time to stop it.” In reaction to this fear, the United States has taken more aggressive strategies in the past. “Justification for the 2003 invasion of Iraq included the immediate threat posed by Iraq’s purportedly resurgent weapons programs.” Of course, the United States cannot simply invade every nation suspected of expanding their biological weapons programs. Unfortunately, government officials do not see verification of the BWC as a potential solution. A National Security Council official stated, “The [verification] protocol does not stop the threat posed by the spread of biological weapons […] but the protocol’s requirement that states declare facilities in which weapons are made and permit them to be inspected does put our bio-defense activities […] at risk.” This statement clearly sums up the entirety of threat inflation’s effect on lack of political will to redo the BWC. Without the ability to protect

32 Op. Cit., fn. 26
35 Op. Cit., fn. 14
36 Op. Cit., fn. 20
itself, the United States sees the risks as being too high to chance a last minute withdrawal from a renewed and enforced Biological Weapons Convention by an adversary state.

Decline in Arms Control
This third case study considers the concept of a paradigm shift between international relations theorists and government officials, in which nonproliferation replaces arms control. Arms control is considered a form of hard law, whereas nonproliferation is considered a form of soft law, also known as a gentleman’s agreement. This shift represents a type of defeatist attitude towards control of state and non-state actors with access to biological weapons. Biological weapons proliferation and the likelihood for their use has been deemed “too intractable” to be easily fixed. The overall decline in arms control, and its replacement with nonproliferation strategies, has affected the lack of political will to update the BWC because strengthening the convention would be following a hard law and thus, the arms control approach. Just as with threat inflation, evidence of the decline of arms control is apparent in archival documents as well as scholarly works.

In pieces written on and about the Verification Protocol, many references were made to the effect that the protocol would utilize an arms control approach. In September of 2000, Dr. Susan Koch of the Department of Defense stated, “we do not believe that the Protocol being negotiated will be able to provide the kind of effective verification that exists in other arms control treaties.” However, the Verification Protocol would have used more of an arms control strategy than has ever been applied regarding the BWC. Such a statement by the Secretary of Defense seems to signal a turning point in the recent history of arms control decline. More recently, “between 2007 and 2010, the Biological Weapons Convention Work Program resumed its focus on biosafety and pathogen security, national implementation and codes of conduct for scientists, and also focused on disease surveillance capacity building and assistance in the event of a suspicious outbreak or alleged use of BW.” Interestingly, the majority of these

38 Op. Cit., fn. 20
39 Op. Cit., fn. 33
new goals for the BWC are domestic, and only “surveillance capacity building” would have any effect on foreign states. In the new biosecurity strategy revealed after the Seventh Review of the Biological Weapons Convention, the Obama Administration “views the role of the government as supporting this organic, bottom-up process by conducting outreach to raise awareness, promoting dialogue among the various stakeholders, […] supporting community-based approaches to identifying and addressing irresponsible conduct,” and essentially establishing a new set of ethics around the issue.  Again, there is a huge gap between this new policy’s strategy and the arms control strategies of the Nixon era, when biological weapons and research first affected national security.

The decline in arms control that is evident from the recent history of records and scholarly works certainly is affecting the lack of political will to update the BWC. Even in the formation and negotiating of the BWC, there was a clear lacking of hard law that would have allowed for nations like the United States to enforce violations of the treaty. In addition to avoiding intrusive development investigations, the United States and other world powers chose to form the final draft of the BWC with “soft structure” as opposed to “hard legally binding obligation.” States adhered to these weak policies even when blatant violations occurred, such as the anthrax outbreak at a research facility in Sverdlovsk, Russia in 1979. Seeing as no intervention or real arms control was required by the BWC, the United States did nothing more than make a statement on the matter. In a speech to the United Nations General Assembly in 1982, President Ronald Reagan stated, “The Soviet Union and their allies are violating the Geneva Protocol of 1925, related rules of international law, and the 1972 Biological Weapons Convention.” Without the obligation to intervene, the United States was able to take a much less costly route in “dealing”

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42 Op. Cit., fn. 28

43 Op. Cit., fn. 37

with the issue. For this reason, the decline in arms control is influencing political will in regards to the Biological Weapons Convention. If states like the United States have a choice to do nothing, thereby saving resources, time, money, and protecting their sovereignty, they would have no reason to attempt to change this reality.

On the other hand, some theorists argue that soft law can be just as effective as hard law in negotiating and deterring states. In the case of biological weapons, this means that nonproliferation should, in theory, be as effective as arms control. As is evident by past violations of the BWC, this is not the case. “In spite of the many proponents and purported advantages of soft law in other contexts, its indeterminate dimension appears to be a dangerous choice for a design element in multilateral disarmament regimes, particularly when member states face acute security dilemmas and effective transparency measures are not available.”

While this is playing out to be true, the United States government continues to follow this policy of anti-arms control. Brad Roberts and Michael Moodie of Defense Horizons stated, “When deterrence strategies prove unreliable in dissuading a U.S. adversary from preparing or conducting BW attacks on its forces or interests, the focus of U.S. efforts must shift to prevention.” It seems as though hard law and arms control are a thing of the past, specifically in relation to biological weapons. In its place, soft law and talk of prevention and influence aim to get the job done.

Implications
There is no doubt that political will is seriously lacking on the issue of biological weapons and the Biological Weapons Convention. However, it is not without reason. The United States, along with the other world powers at this moment in history, have a few prominent obstacles to overcome before any serious changes can be made to foreign policy. The research discussed demonstrates that avoidance of verification measures, threat inflation of bioterrorism, and the decline in arms control strategy are affecting political will on this topic. Something must change for the safety of not only the United States, but also the nations of the world. With swiftly advancing technologies in the biotechnological field,

45 Op. Cit., fn. 28
46 Op. Cit., fn. 31
the threat of biological warfare, while inflated, remains serious and frightening. The prospect of a biological attack on any nation is a horrifying and fearsome image that must be prevented from turning into a reality. Unfortunately, without compromise by powerful nations on the international stage, bioterrorism and interstate attacks could become an actuality.

In order to overcome these obstacles, powerful states will need to set a precedent for the rest of the international community. While *The Independent* variables examined are evident and do affect political will on the issue of biological weapons and the BWC, there are ways of influencing and overcoming them for the greater good of the world. For example, desire for full sovereignty and for maximization of capabilities must be decreased in order to give the BWC some form of validation and enforcement. This means that nations like the United States will need to take risks and forgo some of their sovereignty for the safety of the global population. In regards to threat inflation, the United States will probably remain hegemonic in a unipolar international system for the foreseeable future. However, by cooperating and compromising with other world powers, the United States can diminish the perceived threat of bioterrorism and biological attacks to a reasonable level, allowing for the further development and strengthening of the BWC. Finally, the United States must return to an arms control strategy. It is clear from recent efforts and policy changes that soft law alone cannot change and restrain the dangers that threaten the international stage and its actors. A combination of nonproliferation and arms control could potentially reduce the threat. Since the emergence of biological weapons as a viable form of warfare and weaponry, technologies have changed rapidly and so, too, should the laws used to restrain them.
AMANDA ROBINSON is the Owner and Community Outreach Extraordinaire of AR Consulting in Santa Cruz and graduated from Cal Poly in 2010 with a degree in Political Science.
ALUMNI SPOTLIGHT

Amanda Robinson

From the get-go, Amanda Robinson knew she wanted to major in Political Science. Her love for the subject stemmed from an eleventh grade U.S history teacher who challenged the way she perceived the world around her, encouraging her to look at the world through different lenses. From that point on, she knew she wanted to be involved in electoral politics—at least in some capacity. As college graduation approached, Amanda decided she would take some time off to travel. Inspired to experience the places she learned about in a class on Latin American Politics, Amanda headed to Peru where she spent her time volunteering. Before her visit to Pisco, Peru, the area experienced an earthquake, which damaged many of the city’s vital buildings and economy. Amanda volunteered with a disaster relief organization by building schools and working on different beautification projects. While Amanda was in Peru, the organization got wind of the city’s plans to place a landfill on a beach. She helped successfully lobby the Pisco city council to place the landfill somewhere other than on the beach.

Upon her return to the States in September of 2010, the economy was terrible, nobody was hiring, she had no experience, and grudgingly moved in with her parents. Her now-fiancé, got a job offer in Santa Cruz, so Amanda took the opportunity to move to the Santa Cruz area in January of 2011, where she
began volunteering for a few family resource centers. Many of her volunteer jobs involved event planning, and at one of the annual events she planned, a board member for the organization was thoroughly impressed with the work Amanda did. As a result, the board member asked Amanda if she would be interested in serving as the Campaign Manager for Eric Hammer, who was running for 5th District County Supervisor in 2012. Amanda wasn’t quite sure if campaigns were exactly the direction she wanted to go in, but decided it would be silly not to try it out.

Amanda embraced Cal Poly’s learn by doing model when she decided to take on the campaign. Having never worked for a campaign in her life, Amanda literally had to learn by doing. Hammer was running against the previous Secretary of State under Arnold Schwarzenegger. Hammer, who was little-known, was running against big money and huge name recognition. In many ways, Amanda considers their loss a success, because Hammer only lost by 123 votes despite running against a well-known opponent. To Amanda’s surprise, Hammer’s campaign set her career trajectory. Amanda loved the rush of campaigns and now works for herself with the title of Community Outreach Extraordinaire. Her business, AR Consulting, is run entirely by word of mouth, and she works on all sorts of campaigns including public relation, electoral, and fundraising campaigns. She even worked on an El Salvadorian presidential campaign for Salvador Sanchez Ceren after meeting an individual connected to his campaign through her previous work. Amanda was brought on to lobby local cities and community groups as well as to create positive press in the United States in hopes that the El Salvadorian press would pick up something published in California. Ceren’s opposition claimed he was a Communist and therefore not welcome in the USA; Amanda was part of a team who negated that by bringing Ceren to the United States to help build and grow relationships between El Salvador and the United States. Amanda’s efforts played a huge role in Ceren’s eventual victory for El Salvador’s presidential office.

Even though Amanda’s career has taken off, she still makes the time to volunteer for causes dear to her heart. She’s heavily involved in the Democratic Party and serves as the Vice-Chair to the Democratic Central Committee in Santa Cruz County. She also represents the Santa Cruz County Democratic Party at the California Democratic Party, which involves going to conventions every other year to discuss party platform. Despite starting out in 2012 with no political contacts in the area, Amanda was recently named Democrat of
Amanda Robinson

the Year for Santa Cruz County. She’s also started a working group within the
Silicon Valley Young Democrats whose aim is to increase the voting propensity
of individuals between the ages of 18 and 34.

Amanda encourages Political Science students to think about what they want
to do and to reach out to their professors and people living in the community
they want to move to. “Never be afraid to ask for a meeting or an informational
interview. Don’t feel bad about working your network, it really is all about who
you know and how you present yourself, especially in the campaign industry.
If you don’t know what you want to do, then volunteer—it helps you start the
career you want to have. I didn’t want a 9 to 5 job. I wanted to improve the
community, be involved in deciding the direction, and have a strong connec-
tion to my neighbors. Volunteering helped put me in a position that allowed
me to pursue my goal.”
MATTHEW NESTLE is a graduating Political Science major with a concentration in American Politics. At Cal Poly, Matthew was most involved in the Mustang Marching Band. When he wasn’t making music or studying, Matthew spent time hiking and exploring the San Luis Obispo area. After graduation, Matthew plans to attend either graduate school or law school.
A NORMATIVE POSITIVISM: LINKING STRUCTURAL AND PROCEDURAL PRINCIPLES TO CONCEPTIONS OF AUTHORITY USING HART’S RULE OF RECOGNITION
Matthew Nestle

Natural and Positive Law

Of all the different legal theories that exist under the umbrella of jurisprudence, the divide between legal positivism and natural law theory is perhaps the most fundamental. Indeed, this disagreement regards the very nature of how systems of rule and order gain the authority of law. At least, this is the common belief regarding this division. Lon L. Fuller and Jeremy Waldron, founders of two very prominent positivist theories, justify their principles in a circular manner, but they can be externally justified using Hart’s secondary rules and normative conceptions of authority. In this paper, I will attempt to show that there is no such thing as a purely positivist conception of law by linking Fuller and Waldron’s formal and procedural principles with Hart’s secondary rule of recognition through such normative conceptions of authority. By doing so, I will show that any seemingly positivist principles of validity are rooted in some sort of normative conception of authority.

The central idea of natural law is that there is some set of rules that are
inherent in nature, from which all man-made systems of law must, in some way, be derived. Because of this, there is a true justice, and any rule or system of rules that does not support this conception of justice is not valid law. Unsurprisingly, many natural law thinkers are theological, and their conception of law is strongly tied to their religious ideas. For example, Saint Thomas Aquinas wrote that there was a difference between the law that man made and the natural law that is created by God. The latter is inherent in the world itself, and thus is limited in how it may be changed. According to Aquinas, “by way of addition….nothing hinders the natural law from being changed, since many things, for the benefit of human life, have been added over and above the natural law both by the divine law and by human laws.”\(^1\) However, the natural law may not be subverted by man-made law. All laws must be derived from natural law, and if the two conflict then man-made law is invalid. Furthermore, just law must always be directed to the public good by definition. The ultimate end of human life is happiness, and therefore “the law must needs [sic] regard principally the relationship to happiness. Moreover, since every part is ordained to the whole as imperfect to perfect, and since a single man is part of the perfect community, the law must needs regard properly the relationship to perfect happiness.”\(^2\) According to Aquinas, any rule without the chief aim of happiness loses the authority to command as law. For natural law proponents, law has requirements beyond that of form and function that include the purpose and effect of said law. Put simply, a law is a rule that promotes justice and acts to secure the common good.

This is in stark contrast to the ideas of the positivist law theorists. This branch maintains that laws and morals are completely separated, which means a law is not defined by any end it seeks (like the common good, or human happiness, as Aquinas said). Furthermore, there is no concrete conception of justice or natural order to which a system of laws must adhere to be valid. On this difference between natural law and legal positivism, Hart explains:

it cannot seriously be disputed that the development of law… has in fact been profoundly influenced both by the conventional morality and ideals of particular social groups…. But it is possible to take this truth illicitly, as a warrant for a different position: namely that a legal system must exhibit some specific conformity with morality or justice…. Though this proposition may, in some sense, be true, it does not follow from it that the criteria of legal validity of… a legal system must include, tacitly if not explicitly, a reference to morality or justice.³

In other words, although most laws are often influenced by the morality of those who established them, a law or system of laws does not need to adhere to any specific conception of morality to be legitimate. Indeed, Hart says that “theories that make this close assimilation of law to morality seem… to confuse one kind of obligation for another, and to leave insufficient room for differences in kind between legal and moral rules and for divergences in their requirements.”⁴ We will return to Hart’s distinction between these types of obligations later.

Instead of a specific norm or ideal, the legitimacy of a legal system is defined only by some set of objective characteristics that separate it from a lesser set of rules. This does not mean that every positivist is in agreement about which characteristics are the right ones, but that only certain kinds of characteristics can be the basis of a positivist theory. Lon L. Fuller, for example, has a set of requirements that distinguishes a system of rules from a legal system based on certain formal principles. According to Fuller, a system of rules is only a system of laws when those rules have certain characteristics. Fuller has eight rules for legal systems, and if a system fails one of the tests, it cannot rightly be called a system of laws; in other words, there are eight ways to fail to make a law. According to Fuller:

[t]he first and most obvious lies in a failure to achieve rules at all, so that every issue must be decided on an ad hoc basis. The other routes are: (2) a failure to publicize, or at least to make available to the affected party the rules he is expected to observe; (3) the abuse of retroactive legislation, which not only cannot

itself guide action, but undercuts the integrity of rules prospective in effect; (4) a failure to make rules understandable; (5) the enactment of contradictory rules; (6) the enactment of rules that require conduct beyond the powers of the affected party; (7) introducing such frequent changes in the rules that the subject cannot orient his action by them; and finally (8) a failure of congruence between the rules as announced and their actual administration.\(^5\)

Fuller writes that these failures are fatal to a rule’s status as a law. Listed positively, these failures can be called the principles of generality, publicity, prospectivity, intelligibility, consistency, practicability, stability, and congruence. These are the eight structural principles that Fuller says define a legal system.

Jeremy Waldron has a stricter set of rules for defining a valid legal system. He agrees with Fuller’s structural principles and adds a series of procedural requirements to which a system must comply to rightly be called a legal system. For Waldron, the way in which the law is applied is an important part of the definition of a legal system. He states that no one can have legal action taken upon them except through procedures that include a hearing by an impartial tribunal, a legally trained judicial officer, a right to representation by counsel and the time necessary to prepare a case, a right to be present at all critical stages of the proceeding, a right to confront witnesses, the right to the assurance that all evidence was obtained legally, the right to present one’s own evidence, the right to make an argument on one’s behalf, a right to hear reasons from the tribunal for their decision, and some right of appeal.\(^6\) According to Waldron a legal system complies with these rules to dictate how the members of a society are treated by the system itself. These requirements essentially form the single requirement that there exists some institution that might be called a court. For Waldron, the necessity of these procedural rules is based on the agency of each of its citizens, and all of Fuller’s structural principles are meaningless if the system does not administer its rules in ways that treat its citizens with dignity.

All these principles, as seemingly objectively verifiable as they are, beg the


question of external justification. The justification provided by Fuller and Waldron is essentially that a legal system must treat its citizens with the respect due to them as a result of their agency because such a nature is intrinsic in law. The positivists fail to provide a reason for this, most likely because they are afraid of slipping into the territory of natural law. The answer to this problem of external justification is found in conceptions of legitimate political authority. First, however, it is necessary to understand a different brand of positivism.

**Hart’s Rules of Obligation**

Hart, a world-renowned legal philosopher, submits that a society has rules of obligation, which can be divided into two groups: primary and secondary. A primary rule of obligation is any norm or rule that a society has and which creates a sense of legal obligation as defined above. A set of primary rules of obligation by itself does not constitute a legal system because of three specific defects that keep it from having the strength of law. The first defect is the uncertainty bred of such a system. If a doubt arises as to the nature or scope of a rule, there is no method to settle a dispute arising from this confusion. Secondly, the rules have a static character, because “the only mode of change in the rules known to such a society will be the slow process of growth” whereby actions once thought optional slowly become obligatory or vice versa. The third defect is its inefficiency, as “punishments for violations of the rules…are not administered by a special agency but are left to the individuals affected or to the group at large.”

These defects are solved in a system of law by the incorporation of what Hart calls secondary rules of obligation. According to Hart, a legal system is the union of any set of primary rules of obligation and this set of secondary rules of obligation. The first of these, and the only one that concerns this discussion, is the rule of recognition, a solution to the first defect of uncertainty. This rule specifies “some feature or features possession of which by a suggested rule is

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taken as a conclusive affirmative indication that it is a rule of the group to be supported by the social pressure it exerts.” 9 This rule can take any number of forms, ranging from the very simple to the very complex. In an autocratic regime, for example, the rule of recognition is simply that the sovereign is the one who established the rule. In the U.S. though, there is a very complex rule of recognition laid out in the Constitution. Hart posits that a set of primary rules connected with a secondary rule of recognition is a necessary and sufficient condition for the existence of law. In this way, the authority of any particular law is determined by whatever a society’s rule of recognition is. If a conception of legitimate authority is synonymous with the rule of recognition, then it may be possible to derive some structural and procedural principles of valid legal systems, such as the lists composed by Fuller and Waldron, from various conceptions of authority.

**Authority**

Authority is the root of all political power, and there are countless different views as to where authority to rule comes from. The first conception of authority is anarchism, which is belief that there is no legitimate authority, or that there is no way by which a person may justly be made to obey the command of another person or institution. A popular and simple conception of anarchism is laid out by Robert Wolff in his book, *In Defense of Anarchism*.10 Wolff asserts that there is no such thing as legitimate authority because the primary personal good is autonomy, and no man may be forced to act against his own autonomy. In short, autonomy is one’s ability to decide for oneself what is right and wrong. Authority is the right of he who has authority to command, and the complementary duty of the subject to obey. It is important to note that obeying a command means doing what is commanded because it was commanded, not for reasons pertaining to what was commanded. According to Wolff it is impossible to obey a command and maintain one’s autonomy because obeying a command is to perform an action for a content-independent reason, and this is mutually exclusive with deciding one’s own morals. Wolff maintains that autonomy is the

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highest priority in justice, as it is a uniquely human characteristic, and there is no conception of authority that does not violate the autonomy of its subjects. Therefore there is no such thing as legitimate authority.

In the language of Hart’s definition of law, this means there is no characteristic that satisfies any just rule of recognition; there is no possible characteristic a rule could possess that would give it the weight of law. Or rather, there is no such rule that is true for every member of a society. Every individual has his or her own rule of recognition—whatever rules I decide to govern my own life by carry the weight of law and may be enforced by myself upon myself. However, a set of “laws” that a person exerts over himself can hardly be considered an actual legal system. Under this conception of authority, all of Fuller’s structural principles technically apply, but they are superfluous, because other principles such as “laws may not be enforced upon people who did not establish said law” also apply. Likewise, all of Waldron’s procedural principles apply, but they are similarly unnecessary because the principle “no person can be tried and punished for breaking a law they did not voluntarily submit to on an individual basis” also applies. In a sense, every possible principle that could conceivably limit the nature of what makes a valid law applies, because there is no possible valid law. This is an extreme, and somewhat absurd, example of applying a conception of authority through a rule of recognition to establish structural and procedural principles of a legal system, because it is more accurately described as a conception of no-authority. Still, it serves to demonstrate the connection between normative ideas of authority and positivist definitions of a legal system, albeit through the most null form of the idea.

To truly explore the connection between these two ideas, we move to a more substantive but still very limited conception of authority. Scott Shapiro explains this theory, which he calls the constraint conception of authority, in his article, “Authority.” Shapiro approaches the idea of the state’s right to rule from the anarchistic point of view and through this angle aims to truly justify his model of legitimate authority. Instead of the basis for authority being rooted in what power the state ought to have, for indeed the state can claim any power, it now lies with what duty a citizen has to obey the rule of the state. Shapiro argues that democracy based on a model of arbitration holds legitimate authority in that it satisfies the paradoxes of authority.

The anarchist philosophy Shapiro uses consists of the idea that authority is flawed because of two paradoxes inherent within the idea. These are the
paradoxes of autonomy and rationality. The former is essentially Wolff’s argument that legitimate authority and moral autonomy are not morally compatible. This is also different from power, which is simply the ability to command. This includes coercion, whereas authority extends beyond the power to enforce to the right to rule.

The conflict between authority and autonomy lies in the nature of authority as a reason to act. Authoritative directives are both peremptory—they exclude deliberation—and content-independent reasons to act. They are peremptory because once a command has been given, the subject is intended to stop considering the merits of the action being commanded. Furthermore, as Shapiro explains: “one who obeys a command treats the command as a content-independent reason, because he complies for the reason he was commanded, not because he has reasons to act on the content of that command.”\(^1\) The paradox of authority and autonomy asserts that legitimate authority is impossible because no one has the natural right to usurp a person’s moral autonomy.

The paradox of authority and rationality states that authoritative directives can never be reasons for action. The reason for this lies in the assertion that directives are dubious when incorrect and still troubling when they are correct. If the balance of reasons supports the action of a command, then the subject of the command should perform the action, not because it was commanded, but because one should act in ways supported by reasons. If the action commanded is not supported by reason then the subject should not perform it because one should not act against reason. If obeying authority is following a command because it was commanded, with no consideration of the nature of said command, it becomes clear that rational agents can never obey authority.

Shapiro’s response to these paradoxes of authority is the constraint model of government authority. This model is the key to solving the paradoxes in a way that ties legitimacy to authoritative directives. This model states that an authoritative directive is a preemptive reason not to act on the reasons to act in the opposite manner. In other words, an agent submits to authority to prevent his future self from acting in ways contrary to what his present self wants. This model works in the following way: an agent decides he wants to perform a

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certain act, but knows that in the future he may fail to perform the act because of less important, perhaps compulsive, reasons. He then gives an authority the power to enforce a command to perform the action. His future self will submit to this command, and perform the action. This model provides an answer to both paradoxes of authority.

For the model to satisfy the paradox of authority and rationality, it must be shown that it is rational for an agent to follow both directives supported and not supported by the balance of reasons. For the former, assume an agent is committed to an authority to benefit from its directives, and this authority gives a directive that in the agent’s mind is not supported by the balance of reasons. According to the constraint model, once an agent has successfully submitted to an authority, she has no choice but to apply the directive when it is applicable. Compliance is the only available choice and is thus the optimal choice. Shapiro demonstrates that the constraint model also satisfies the paradox of rationality when the subject of the directive is supported by the agent’s own reasoning. For this to work, the directive must still factor into her reasoning. In the constraint model, directives work not by changing an agent’s beliefs or preferences about the options for action, but by transforming the set of feasible options entirely. Shapiro explains: “hence, even if the agent preferred to conform prior to the issuance of the directive, once the directive is issued, it will leave its practical mark – what was once feasible is no longer feasible.”12 No matter the case, the directive plays a role in the decision of the rational agent.

Shapiro’s constraint model also constitutes an effective response to the paradox of authority and autonomy. According to this view, the will of another possesses normative power over the autonomous agent because of its causal power. By altering the realm of feasible options the directive constitutes a content-dependent reason to obey, and makes compliance the best option by default. The constraint model does not suggest that it is morally permissible to abdicate control over one’s actions unless one has a good moral reason to do so. In other words, “one cannot absolve oneself of responsibility simply by claiming one had no choice but to follow orders when one made the choice not

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to have a choice."\textsuperscript{13} It is this relationship between the past and future self that allows the agent to maintain her autonomy by obeying an authoritative directive.

After establishing a model for authority that solves both of the paradoxes of authority, Shapiro moves on to explain how one can possess this authority through what is called the arbitration model, which states that the function of authority is to arbitrate between rival parties. Shapiro explains that his arbitration model and the mediation model differ in several ways, most importantly in the relationship between the authority and legitimacy. In a mediation model, the relationship is direct: authorities are legitimate to a subject if and only if they serve their mediating purpose for that subject. In an arbitration model the relationship is more indirect. The arbitration process gives agents a reason to accept the outcome of the process, and such acceptance provides the process with legitimacy. They also differ in the ultimate grounds of legitimization. In a mediation model, authorities gain legitimacy from dependent reasons. In an arbitration model, subjects might do worse in terms of the dependent reasons; what binds them is the acceptance of the process. These differences can be summed up in a simple contrast. In a mediation model, obedience is instrumentally valuable, while in an arbitration model the parties do not benefit through obedience. Rather, obedience is the price they must pay in order to secure the compliance of others.\textsuperscript{14} In fact, disobedience to the will of the arbitrator amounts to a claiming of unreasonable power, while obeying authority in a democratic society actually shows a great respect for autonomy.

This conception of authority seems entirely removed from any sort of rule of recognition at first glance, but it is deceptively simple to translate Shapiro’s language into Hart’s terms. The feature that the rule of recognition identifies is that the rule is being established by whatever entity society chose to constrain its future actions through promulgating laws and establishing and carrying out punishments. The task of extrapolating structural principles from this conception is more complicated than with pure anarchism, for now laws can have some characteristics but not others. First, we examine the principles Fuller lays out and see which can be externally justified by a rule of recognition based on

\textsuperscript{13} Ibid.

the constraint principle. The most obvious affirmative is the second principle, publicity. A person cannot constrain his future self through an authority to act in ways of which he is not informed. This is a breach of the sovereign’s authority under the constraint conception. Fuller’s first principle, generality, is less obvious. At first it seems plausible that a subject could give an authority the right to decide how to constrain the subject in any specific case relevant to the authority given by the subject. However, when this happens, the subject is no longer acting for content-dependent reasons, and is now taking an action because he was commanded to by the authority.

It follows from this that the constraint model justifies the principle of generality, as a person cannot give an authority the right to decide how the person is to be constrained at the future time of constraint, but at the time the authority is given the right to command. The third principle, prospectivity, is also intuitively affirmed; a person cannot be punished for failing to act in the way he constrains his future self to act before the act of constraint. Similarly, the principles of intelligibility, consistency, practicability, stability and congruence are all affirmed by definition by the constraint model. A person cannot logically constrain his future self to act in ways that are beyond his future self’s ability, and the authority exercising power in ways not congruent with the power given it by the act of constraint exceeds the power given by the constraint conception.

So, all of Fuller’s structural principles are affirmed by the constraint conception, but what of Waldron’s procedural principles? These are more troublesome, as many of them are not as intuitive as the structural principles. The link between the constraint model and any sort of procedural requirements is not obvious as it is for the structural requirements, but the arbitration model provides the connection. If the state acts as ultimate arbiter between rival parties in solving disputes, then it does so in cases where the state or Authority is one of the parties. If it is necessary to treat the subject with autonomy and agency in this case, then almost all of Waldron’s principles are affirmed. The only ones that do not seem to be affirmed prima facia are the right to an appeal and the right to counsel. A subject can still be treated as an autonomous agent in a case of arbitration against the state without an appeal if he has all of the other rights laid out by Waldron’s principles in the original arbitration. Similarly, it does not seem evident on its face that one cannot act as an agent if one must represent oneself at said arbitration. These rights might add to one’s ability to do so, but it does not seem that the ability to act autonomously is absent without them.
Finally, we must look at a slightly more extensive conception of authority to see if a more extensive rule of recognition leads to different structural and procedural principles. One such conception is John Locke’s social contract theory, as explained in The Second Treatise of Government. Locke’s argument centers on the assertion that there is a god that created the entire world, including all of the people in it. Locke also asserts that God created all the people in the world to be equal and refutes the claim that certain people have an inherent right to political power because they are descended from Adam, to whom God originally gave political authority. Locke asserts that political power and paternal power are completely separated. No one person has political authority over the rest, or is appointed by God to be greater than anyone else. This of course, begs the question: where does power come from?

Locke argues that political authority comes from the people, and he justifies this with a lengthy explanation of what he believes to be the natural state of man. In the state that God created men, they are equal, and have an equal right to the entire world. Because God created men, they are all his property, and it is against natural law to destroy God’s property. Therefore, the only rules in the state of nature are that one is not allowed to kill another person or oneself, and that one is not allowed to allow someone to kill someone. Furthermore, people are to be punished for breaking these rules in a manner equivalent to the crime they committed. The only punishment appropriate for murder or attempted murder is death as this is the only way to fully protect mankind from further breaches of the law of nature. Locke then argues that a person who tries to take another man’s liberty may as well be trying to kill him, because once a man loses his freedom, there is nothing stopping his oppressor from killing him. Because of this, a man may kill someone who tries to enslave him. Furthermore, a man may not voluntarily enter slavery. A person cannot give someone else authority that they do not possess themselves, and a man does not have the authority to kill himself under the law of nature. Because one has the authority to kill a man for trying to kill him, one also has the right to enact lesser punishments for lesser crimes, such as stealing. All these principles regarding property lead to Locke’s argument about what happens when there are no longer enough resources left for a person to sustain their own life.

According to the law of nature, Locke argues that all men have an obligation to keep their fellow men alive. Because of this, when there is not enough
land for anyone else to make any their own, someone must give them some of their property in exchange for labor. This system of employment causes men to join into communities. No man can be forced into joining a community; he must do it by choice. Once a community is formed, according to Locke, men will naturally form a government. A government provides for men in a community three important things that do not exist in nature: “An established, settled, known law;” “a known and indifferent judge;” and “the power to back and support the sentence.” Men join a state by choice alone, as forcing them into the authority of one would be an act of enslavement, which violates the law of nature. Consequently, all of the people in a state must agree to join it, and must agree on the rules that govern it.

The rule of recognition based on Locke’s conception of authority is more complicated than that for the constraint conception. In addition to a law being required to come from whatever government the people created, it must adhere to certain qualities. For example, if a rule does not treat subjects equally, then it is not valid law. Similarly, if it infringes on certain God-given rights, then it is not law. These two aspects of the rule of recognition translate to two more structural principles that were not present in Fuller’s list. We can call these the principles of equality and of adherence to rights. If the rules of a society based on this conception of authority do not meet these principles then those rules cannot rightfully be called laws. Furthermore, it is possible that at least one structural principle Fuller proposes is not affirmed by this conception. It seems allowable that laws can be contradictory so long as those laws are also not congruent in regards to their wording and actual administration. Consider two laws compelling subjects to act in mutually exclusive ways, but one of those laws is administered in a particularly incongruent way, so that the laws do not place subjects in an impossible position practically speaking. As long as the practice of these laws meets all the other structural requirements, including the two new principles, it is not clear this creates a problem. This being so, Locke’s version of the social contract theory as a rule of recognition does not strictly affirm those two structural principles.

**Conclusion**

This discussion yields two important ideas. The first is the external justification of structural and procedural principles of law by normative conceptions of authority as rules of recognition. The second is the realization that as different conceptions of authority are used as rules of recognition, they result in different sets of such principles. These results suggest a strong link between natural law theory and positivist principles of law. Not only are these principles justified by natural law ideas, but different natural law justifications yield different principles. Therefore, any set of principles, including the ones submitted by Fuller and Waldron, is based on some particular natural law justification. This suggests that any limitation on what constitutes a legal system, even limitations that seem positivist in nature, are connected in some way to normative values regarding legitimate authority. Hart writes that law is influenced by morality but is not beholden to any particular set of morals. It seems that when one tries to establish any concrete set of principles to define law, they cross the bridge to normative theory. Meanwhile Hart stays rooted strongly in positivism, because his theory of primary and secondary rules prescribes no particular set of rules. Indeed, as we saw in this discussion, a secondary rule of recognition can take many forms, and no particular one is more correct in Hart’s eyes. However, different rules do each yield very different systems with different structural and procedural requirements. In other words, even so-called positivist definitions of law come from and are shaped by, on some level, a normative theory of the source of authority.
HANS POSCHMAN is the Program and Fellowship Director at the Institute for Advanced Technology & Public Policy and graduated from Cal Poly in 2007 with a degree in Political Science and in 2009 with a Master’s of Public Policy degree.
ALUMNI SPOTLIGHT

Hans Poschman

When Hans Poschman applied to Cal Poly, he was accepted as a Mathematics major. However, after taking a government course during his last trimester of high school, Hans fell in love with politics. A quarter into his college career, Hans switched into Political Science and has since pursued his passion for legislative politics. Hans began his legislative career as an intern with San Luis Obispo’s local Republican Party in 2004. Through the connections he developed as a hard working intern, Hans took on more responsibility by working on a local ballot measure after which he took a job working for the College Republican National Committee (CRNC).

As a field representative for the CRNC, Hans traveled to Washington State where he organized students from numerous Washington universities. His job was to encourage college students to vote and to volunteer for the Republican Party and its candidates. Part of Hans’s job was to organize student volunteers to campaign and participate in various parades and street skits, which helped promote the party’s causes and messages. One skit Hans is particularly fond of is called Debate Dodge Ball, in which volunteers depicted a U.S. Senator refusing to debate her challenger by playing a game of dodge ball with said Senator as the dodger. Hans recollects that one of the joys of working on campaigns as a
college student is the ability to get creative with earned media by doing events like street skits. His work in Washington did not go unnoticed, as Hans was named Field Representative of the Year by the CRNC.

After earning his undergraduate degree in Political Science and spending his extra time interning and volunteering, Hans continued his education at Cal Poly as a graduate student in the Masters of Public Policy Program. During his graduate years, Hans worked as Executive Director for the SLO Republican Central Committee. His duties involved handling day-to-day operations of the party, including campaign events, fundraising activities, and taking a leadership role in numerous local races. Hans particularly enjoyed this position because it gave him the opportunity to heavily engage in campaign strategy while building stronger relationships with candidates.

This experience helped Hans earn a job working for the then California Assembly member Sam Blakeslee. Hans began at the entry-level, completing any and all tasks related to being responsive to constituents’ needs. As he proved himself, Hans was given more responsibilities, which included meeting with various organizations and individuals, speaking to large groups, and working with people to resolve problems with state governments. As Blakeslee rose, so did Hans. When Blakeslee won a Senate seat, Hans earned the District Director position, overseeing staff and offices across the five county district. Among his proudest moments working for the legislature was when a local legislative proposal he worked on became law, and the times when a simple call from the Senator’s office could solve a constituent’s problem.

Following his work with the Senator, Hans became involved in the Council of State Governments (CSG), which is a non-partisan, non-profit association of state legislatures. CSG offers consulting on public policy issues as a service to state legislatures. Hans was part of CSG’s Western office where he worked directly with the legislatures of 13 Western states. Based in Sacramento, Hans served as a policy advisor on agriculture, water, and the environment.

As much as Hans enjoyed his work outside of San Luis Obispo, he couldn’t resist the opportunity to return to his college town. Today, Hans works as the Program and Fellowship Director of the Institute for Advanced Technology and Public Policy on Cal Poly’s campus. He is currently focused on launching the Institute’s Digital Democracy website which allows users to do a Google-like search of the words spoken at legislative hearings and to pull up specific moments in videos which can be easily shared on social media. The goal of the
project is to make the legislative process more transparent. The program employs Cal Poly students of all disciplines enlightening them to the cross-disciplinary nature of legislative issues and public policy.

Hans’ best advice to students is to volunteer. “If you show up, do the work that is asked of you, and prove your competency, you can earn opportunities to work on bigger and more exciting projects.” He also advises that, especially in politics, new opportunities arise by building relationships. Hans says that “the best thing a student can do for him or herself is to intern, volunteer, and to meet people within your desired field. Use your time in college to experiment with jobs and career paths so you know what you like before you leave college and build the connections that can lead to a job after graduation.”
EMILY MATTHEWS is a second year at Cal Poly who hopes to continue her involvement with Paideia and become involved with the Political Science Department’s other programs as she continues her college career. Emily plans on taking two quarters off to work on Kamala Harris’s Senate campaign with the candidate’s consulting firm. Beyond Cal Poly, Emily plans on attending graduate school and working in a legislative position with a focus on U.S. foreign policy and environmental policy.
History of U.S. Foreign Environmental Policy
On September 27, 2014, President Obama addressed the United Nations General Assembly at the U.N. Climate Change Summit, where he encouraged countries to fight global warming.\(^1\) He declared that the United States recognizes its role in the climate change problem and plans to take responsibility for combating it, stating “we can only succeed in combating climate change if we are joined in this effort by every nation.”\(^2\) President Obama’s speech occurred right after *The World Bank* released a global carbon pricing declaration which is signed by 74 countries and more than 1,000 businesses and investors.\(^3\) Carbon pricing, if adopted globally, “has the potential to bring


\(^3\) *Op. Cit.* , fn. 1
down emissions in a way that supports clean energy and low-carbon growth, while giving businesses the flexibility to innovate and find the most efficient choices.” Despite global enthusiasm for the declaration, the United States has yet to sign it, mainly due to partisan divisions. Senate Majority Leader Mitch McConnell stated that carbon pricing “won’t have any meaningful impact on global carbon emissions” and that it will ship jobs overseas and raise the cost of living for many dependent on the coal industry.

President Obama’s enthusiasm for global environmental policy highlights a pattern of past practices in United States foreign environmental policy. In the late 1960s through the 1970s, the United States was very active in adopting environmental foreign policies. In fact, the U.S. lead the world in international agreements that were adopted in the 1971 Convention on Wetlands and in the 1973 Convention on International Trade in Endangered Species. Since the Reagan Administration, presidents have relied largely on executive action to effect environmentally friendly policies as Congress was far too divided to take action. For example, President Clinton implemented a series of executive orders after Congress was unable to pass legislation in the late 1990s. In the 2000’s, however, the U.S. has not adopted many new policies as evidenced through its rejection of the declaration for carbon pricing and the 2000 Cartagena Protocol on Biosafety. Although, President Obama did enact an executive order initiating the Climate-Resilient International Development, which requires agencies to “factor climate-resilience considerations systematically into the U.S. government’s international development work.” Clearly, such actions reflect a pattern of

5 Op. Cit., fn. 1
6 Op. Cit., fn. 1
10 Op. Cit., fn. 8
11 “President Obama Announces New Actions To Strengthen Global Resilience to Climate
using executive action when Congressional partisan divisions prevent change.

The lack of environmental policy agreements has a number of implications for American foreign policy. The United States has experienced a pattern of partisan divisions that have limited domestic leadership in environmental policies. The only way that the U.S. has been able to adopt global agreements has been through executive action as evidenced in the above discussion. However, executive action is still met with criticism from congressional members such as Senator McConnell and House Speaker John Boehner, both of whom indicate that they plan to do all they can to delay the implementation of the Environmental Protection Agency’s (EPA) policies to reduce emissions.\(^\text{12}\) Without agreements sanctioned by both Congress and the Obama administration, U.S. efforts will fall flat, and the U.S. will continue to be one of the largest carbon emitters in the world. To understand why the United States has not joined other countries at the forefront of these policy changes leads to the following research question: Why is the United States unable to adopt a leadership role in global environmental politics?

**Partisan Divisions: The Default Answer**

Conventional wisdom blames Congressional partisan divisions for the stagnation of environmentally friendly polices. In a poll of registered voters conducted by the Pew Research Center, the non-partisan research found that 69 percent of Democrats stated that environmental issues are very important when they vote for a congressional candidate, whereas only 36 percent of Republicans said so.\(^\text{13}\) In another poll conducted by CBS News and The New York Times, researchers found that 40 percent of Republicans think that the environment should be given priority even at the risk of lowering economic growth, while Democrats were at 63 percent.\(^\text{14}\) These polls reveal a stark contrast between Republican and


\(^\text{14}\) “With which one of these statements about the environment and the economy do you most agree? Protection of the environment should be given priority, even at the risk of curbing
Democrat concern over environmental issues, which reflects what members of Congress prioritize. These polls reflect that these divisions are at the core of the United States’ inability to adopt global environmental policy.

While partisan divisions do inhibit the United States from accepting environmental policies, this conventional wisdom is incomplete. There are additional factors that must be taken into account to fully understand why these partisan divisions occur, and why the United States is unable to adopt environmental policies. Furthermore, there is still debate about whether or not human activity causes climate change. In addition to differing views, special interests and economic growth considerations lead many politicians to be cautious when committing to environmental policies. These factors, combined with partisan divisions in Congress, considerably hinder the U.S. from becoming a global leader in fighting climate change. The following case studies examine these factors and provide an in-depth explanation as to why the U.S. is falling behind many other countries in its environmental policy.

Economic Growth Concerns
The United States has participated in several conventions surrounding climate change policies and initiatives, such as the United Nations Convention on Climate Change (UNFCC). These international conventions, and more specifically the UNFCC, have sparked concerns within Congress over the “cost, purpose, direction, efficiency and effectiveness” of the financing of these policies and initiatives. Furthermore, a Congressional Research Service Report (CRS) released in 2011 stated that members in Congress argue that “international financing would incur costs to the United States” and take away from potential funds that could help the U.S. domestically. Congressional members also argue that the U.S. should use available funds for “domestic priorities such as fostering renewed economic growth and creating jobs.”


Ibid.
international environmental efforts at a minimum of $4 billion annually by 2030, and most agreements would have the wealthiest countries, such as the U.S. and China, provide a sizeable amount of such funding. Environmental policy is associated with U.S. foreign economic aid, which initiates concern over the prevention of economic growth due to the costs of aid, provoking arguments that the funding would take away from domestic issues.

Moreover, Senators argue that the UNFCC agreement could impact the competitiveness of the country, thus impacting U.S. potential growth. The EPA found that, in order to meet the National Ambient Air Quality Standards (NAAQS) of 0.070 parts per million, as opposed to the current 0.075 ppm standard currently in place, it would cost at least $11 billion by 2020. In addition to these added domestic costs, the U.S. agreed in 2009 to produce $100 billion annually to “assist developing countries to mitigate [greenhouse gas] emissions and adapt to climate change.” Senator McConnell also stated that international agreements such as the U.S. agreement to cap emissions with China would “ensure higher utility rates and far fewer jobs.” The economic growth concerns stem from the reliance on coal mining jobs and the economic growth associated with the industry. The costs to adopt these policies and standards require a large upfront investment, which causes legitimate concerns over the ability to spend this amount of money.

Nevertheless, economic growth and renewable energy have been strong and productive in recent years. As energy efficiency improves, renewable energy growth has met America’s energy needs more so than oil, coal, natural gas and nuclear power combined. Furthermore, one-eighth of the U.S. electricity

18 Ibid.
supply is considered renewable energy, which makes the country likely to meet proposed carbon dioxide emissions standards.\(^24\) This shows that America is beginning to change energy norms, and is shifting more towards cleaner and more efficient energy. Additionally energy efficiency is linked to saving billions of dollars annually, and has allowed the U.S. to adopt greener practices.\(^25\) Therefore, it is in the interest of the United States to favor the trends of environmentally friendly practices because the country will reap economic benefits. Furthermore, it is argued that adopting climate change policies in which the U.S. would give economic aid to developing countries would “allow U.S. industries to make competitive inroads into rapidly expanding markets, improve the advancement and commercialization of U.S. technologies, mobilize greater investment in domestic sectors, and enhance job creation in the United States.”\(^26\) Without this U.S. funding, American influence in global markets could be impaired and it would be difficult for developing countries to improve environmental conditions.\(^27\) Additionally, if the U.S. does not respond to the increasing number of climate change related issues, the costs to aid these countries when catastrophes occur could be much higher than it would be to begin preventing them now.\(^28\) Economic growth concerns over environmental policies are misplaced. As the U.S. moves towards renewable energy, economic growth will come from these new clean energy sectors as a result of the creation of jobs and new markets.

**Differing Views in Science**

Within the scientific community, there is a consensus that the world has warmed by “1.1 to 1.5 degrees Fahrenheit since the Industrial Revolution (measured since 1880).”\(^29\) There is debate, however, centered upon the causes of climate change, the impacts of climate change, and how to solve the issues that arise because of that climate change. Some scientists argue that climate change could come from “natural variability” instead of human-induced carbon dioxide

\(^{24}\) Ibid.


\(^{26}\) Op. Cit. , fn. 19

\(^{27}\) Op. Cit. , fn. 19

\(^{28}\) Op. Cit. , fn. 19

emissions. For brevity’s sake, this case study will focus on the theorized causes of climate change, the conflicting views on impacts of climate change, and the different solutions that are proposed.

The arguments pertaining to the cause of climate change concentrate upon whether human activity or natural variability are to blame. This was demonstrated in the scientific community’s reaction to Hurricane Sandy in 2012. The storm itself was a rare occurrence that caused scientific debate over whether the hurricane was an example of climate change’s effects on large storms. Some scientists theorized that the effects of human induced greenhouse gas emissions intensified the storm. Nevertheless, “hurricanes tend to rise and fall in a recurring cycle over time, so it is possible that natural variability accounted for the recent trends.” Furthermore, scientists recognize that there is a fair amount of natural variability in Earth’s climate; however, scientists state that the recent temperatures have been so extreme, that it cannot be solely due to natural weather variability. Researchers have also found that there is a small likelihood that the temperatures induced by greenhouse gases will exceed 9 degrees Fahrenheit, which is above the natural variability, by 2100. With a lack of consensus on what causes climate change, it is difficult to propose whether the solution should be human driven, or if this is just part of the natural environment.

The Intergovernmental Panel on Climate Change (IPCC) report released in 2007 met severe criticism after it was revealed that statements within the report were exaggerated. The report estimates that the Himalayan glaciers have a “very high” likelihood of disappearing by the year 2035 or sooner if the Earth kept warming. The IPCC later issued a statement that this was a

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32 Ibid.
33 Ibid.
35 Ibid.
36 Intergovernmental Panel on Climate Change, “The Himalayan Glaciers,” IPCC Fourth
“poorly substantiated estimate.” This is an example of one of several mistakes contained in the IPCC report feeds the critical arguments from those that see institutions, such as the United Nations, as over-exaggerating climate change. Mistakes like these are detrimental to combating climate change and demean the importance of climate change and data that is presented.

While there is a consensus that the Earth is warming, the impacts of this change are hotly debated. There have been conflicting conclusions about whether or not the “projected increases in [greenhouse gas] concentrations would raise temperatures significantly.” This presents a significant issue because the lack of a consensus that greenhouse gases significantly affect the environment indicates that policies will not be effectively geared towards minimizing greenhouse gas effects. Scientists also have several different views in regards to “how much concern to give to ecological impacts.” These different concerns manifest themselves in the concerns of the severity of climate change impacts that would affect natural systems and humans.

The U.S. has a robust economy and resources that would allow it to adapt successfully to these climate changes. However, developing countries will most likely suffer greatly when addressing these climate changes due to economic barriers. Climate change is projected to impact freshwater sources and agriculture in many regions, but because climate change “will occur with different magnitudes and characteristics in different regions,” disparities in some countries will be greater than others, causing or even exacerbating political instability in regional hotspots. An IPCC synthesis report released in 2014 stated that there is high confidence in food security being negatively affected due to climate change impacts on production as food demands continue to increase. As a result of the U.S. being the world’s largest food producer, it will likely reap the benefits from the lack of food security in other regions. The potential benefits that the Assessment Report: Climate Change (online report, 2007).

37 Intergovernmental Panel on Climate Change, “IPCC Statement on the Melting of Himalayan Glaciers” (online statement, Jan. 20, 2010).
38 Op. Cit., fn. 34
39 Op. Cit., fn. 34
40 Op. Cit., fn. 34
U.S. may experience due to climate change could cause the country to avoid adopting certain policies that would inhibit economic growth.

In addition to these scientific disagreements, there are conflicting views on how to solve global warming. One of the proposed solutions to address these issues is through the use of geoengineering. Geoengineering, which is supported by many conservatives, uses technology to counter global warming and regulate the earth’s climate system.43 This solution to climate change would use technology that is already available in order to offset some of the effects that have harmed the environment. This would be through practices such as cloud seeding, filtering sunlight, or man made algae blooms. However, it is uncertain whether these practices would be efficient and what the precise impacts would be on the world’s weather systems. Furthermore, if these practices were put into place and a disaster occurred, it would be difficult to know if it was “caused by global warming, the solar filter, or natural variability.”44 It also inhibit current efforts to curb carbon emissions. Geoengineering could also go against the 1978 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Treaty, which states that countries cannot “engage in military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects.”45 By using geoengineering, states would directly go against the convention by modifying the natural environment, which would potentially have widespread effects. Other suggestions to curb climate change are through agreements such as the previously mentioned cap on carbon, which would not have the same scientific uncertainties as geoengineering, but does have economic implications. Another option is to provide tax incentives by planting trees, although it doesn’t fully address the emissions issue. Differences in scientific opinion pose many issues for adopting global policies, because without a consensus on what drives climate change, what the impacts of these changes are, and how to solve this issue, agreements will not be easily made.

44 Ibid.
Special Interests

Special interests are a fact of politics and they exist on all levels, but pose a critical problem because they drive what different groups prioritize. Coal is a large part of the energy sector that supplies half of the energy used for electricity; as energy consumption continues to grow, reliance on coal has increased.\(^\text{46}\) Coal exports have been rising in recent years, which shows the demand for coal is still quite high despite its high carbon output.\(^\text{47}\) The large need for coal and its dominance in the electricity sector, reveal how lucrative the coal business is. In order to protect their industry, coal companies put large amounts of money behind certain political campaigns to help serve their interests. The coal industry sees agreements such as a carbon emissions caps as taking money away from deserving investors. In order to avoid unfavorable legislation, coal companies use Congress members to slow down bills that would not support their industry.\(^\text{48}\) This was illustrated in the Waxman-Markey bill, which was drafted by two Democratic representatives and was highly favorable to coal, reflecting that these special interests are not purely partisan.\(^\text{49}\) This bill was supported by Democratic members—despite the party’s preference for environmental protection—which shows that special interests drive many political decisions. Furthermore, lobbyists for the coal companies continually attempt to “slow down the pace of any cap-and-trade system, using lower carbon caps that kick in more slowly.”\(^\text{50}\) One lobbying firm went so far as to forge letters opposing a climate bill to 12 members of Congress, and was employed by the American Coalition for Clean Coal Electricity.\(^\text{51}\) Coal companies such as Alpha Natural Resources and American Electric Power have helped bring “hundreds


\(^{49}\) Ibid.

\(^{50}\) Ibid.

of thousands of additional dollars to the group.”52 Because coal contributes to high carbon emissions, it is often the target of regulation. Thus, coal companies make great efforts in fighting such restricting policies.

The gas industry is very similar to the coal industry in its special interests regarding climate policies. The gas industry’s activism became clear in a letter to the EPA from Attorney General Scott Pruitt of Oklahoma. He stated that, “federal regulators were grossly overestimating the amount of air pollution caused by energy companies drilling new natural wells in [Oklahoma].”53 After emails were released between Pruitt and William F. Whitsitt of Devon Energy, Oklahoma’s biggest oil and gas company, it became evident that Pruitt was working with Devon Energy to stop climate change policies that would negatively affect it. In fact, the letter was largely written by Devon Energy’s lawyers and lobbyists, and then given to Pruitt to send to the EPA.54 The incentive for several attorney generals to work with such companies is that they provide large amounts of money for their campaigns, including at least $16 million in 2014.55 The oil and gas industry also faces economic restraints as new policies proposed generally have more costly environmental regulations. These alliances with politicians strongly suggest that special interests drive what is prioritized in policy-making.

In addition to politicians and different industries, scientists are also guilty of being driven by special interests. Government money accounted for 55 percent of basic funds supporting scientific research and development conducted within the United States in 2014.56 Thus, scientific research relies heavily on what the government chooses to fund. Therefore, scientists have a strong incentive to produce significant findings in order to ensure future funding. The funding for scientific research has been increasing steadily since President Bush came into

53 Ibid.
55 Op. Cit., fn. 52
office in 2001.\textsuperscript{57} The funding for climate change research was $77 billion from the years 2008 to 2013, with a majority of the funding devoted to technological development.\textsuperscript{58} Furthermore, this emphasis on research developments was outlined in President Obama’s Climate Action Plan, in which he states the use of sound science to manage climate change impacts.\textsuperscript{59} Scientists have benefited professionally from the government funding they have received, and as climate change continues, this area of scientific research and development will only increase.

The role of special interests in science was seen in the incorrect IPCC report issued in 2007. A series of mistakes in a report that is a product of an authority group must be attributed to something more than an oversight, especially because these scientists are quite reputable. It was argued that the exaggerations that occurred in the report were emphasized in a way to support scientists’ funding from several different groups.\textsuperscript{60} Additionally, in 2009 hundreds of emails demonstrating scientists discussing ways in which to exaggerate their findings in order to convince skeptics of climate change were exposed to the public.\textsuperscript{61} One of those exposed emails contained scientist Phil Jones stating that he manipulated data in order to hide a decline in temperatures.\textsuperscript{62} In the interests of scientists, data that supports climate change will allow further funding for research and development on these issues. Scientists, in addition to industries, have their own stake in climate change, and incorporate their interests, such as areas of research and development, into the policies and science behind global warming.

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\textsuperscript{57} Ibid.
\textsuperscript{59} “The President’s Climate Action Plan,” Executive Office of the President (online report, June 2013).
\textsuperscript{62} Ibid.
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Implications of Research Findings

It is apparent that there are several obstacles to overcome when adopting climate change policies, but it is not impossible to change United States’ practices. The research presented comes at a point where environmental concern is quite high and the stakes are large. The research findings give a more in-depth explanation as to why the U.S. is still unable to adopt environmental policies and why these partisan divisions are occurring in response to environmental issues. The partisan divisions that inhibit the U.S. tend to be confined purely to Republican and Democratic divides by conventional wisdom thinkers. However, the research shows that both parties have interests politically and economically in industries that are not environmentally friendly. These findings are noteworthy because they show that the unwillingness to adopt policies does not rest with one single group. Rather, this research emphasizes that everyone is a player in the game and everyone has his or her own interests to pursue. Furthermore, this research is important because the U.S. is at a critical point in adopting environmental foreign policy. With the upcoming climate summit in Paris in 2015, the U.S. has the chance to seize the opportunity for a leadership role.

These findings have a number of implications for U.S. foreign policy. As one of the world’s largest emitters, the problem will not be solved without the help of America. The economic prosperity in the climate change and energy sectors will increase U.S. interests in environmental policy. The biggest implication is how the different scientific views of climate change will affect whether technology or policy will be a more effective solution. As climate change becomes more accepted in the U.S., foreign policy will focus more on technological and political approaches, rather than whether or not climate change exists. Clearly the United States will only benefit from adopting environmental policies, and as the largest world power, it is the country’s responsibility to adopt a leadership role in the upcoming climate change agreements.
CONTRIBUTOR BIO

KATIE HOSELTON is an intern for the Hagar International in Vietnam and graduated from Cal Poly in 2014 with a degree in Political Science.
Before Katie Hoselton graduated in 2014, she embarked on her Senior Project, which allowed her to utilize her passion for global politics and advocacy to change Cal Poly for the better. Katie’s Senior Project was unique, daunting, and ultimately, successful. After learning about the violence caused by the conflict mineral trade in the Democratic Republic of Congo, Katie was inspired to make sure Cal Poly didn’t add to that violence by purchasing electronics from companies who used minerals obtained from corrupt mines in Congo. As one of the largest and most prominent polytechnic universities in the nation, Cal Poly’s public acknowledgment and commitment to using products certifiably free from conflict minerals would be huge in terms of implications for companies like Dell and Apple, who cannot always guarantee their products are free from such minerals. With a goal in mind, Katie began the advocacy process.

The advocacy process was difficult to begin as Katie didn’t know where to start (although, she realized afterwards that it didn’t really matter where she started). So she began where any student would by talking to professors and administrators who may have an interest in the topic or may know someone who has leverage in the school’s policy-making process. After two long months, Katie finally got into touch with the right people who were...
willing and able to help her through the process. One surprising obstacle Katie faced was a lack of student support. ASI even rejected her proposal, deeming it too controversial. Garnering student support was also difficult not because students opposed her cause, but because Katie was just one person. She overcame this obstacle by spending hours visiting classes, giving presentations and raising student awareness. Her efforts gained 500 student signatures in support of Cal Poly going conflict mineral-free.

A second major obstacle was a lack of faculty support; there were some faculty who thought that there wasn’t any way Katie could get something like that passed. A few actually suggested that she try something else for her senior project. Luckily, Katie had at least one faculty member on her side: “thank goodness I had Dr. Shelley Hurt by my side the entire time, encouraging me and providing me with a constant stream of support. There was one time that I nearly gave up and wanted to write a paper instead, and Dr. Hurt smacked some sense into me and pushed me to keep going. I attribute a large portion of my success to her.” Despite these setbacks, Katie pursued her goal, proposed a resolution to Cal Poly, which was eventually signed by President Armstrong, effectively committing Cal Poly to favor certifiably conflict-free products when considering future electronic purchases.

Katie’s advice to students looking to make a change in policy is that the process will almost always be harder than expected and there will be setbacks, but staying positive is crucial and those obstacles make the process challenging and exciting. Katie said, “About half way through my endeavor, I realized that even if my resolution didn’t pass, I will have made a significant attempt and will have learned a ton in the process. I also realized that if Cal Poly intentionally voted against a resolution to go conflict-free, that would be huge news in and of itself and I would publicize the heck out of that fact. It is challenging to make yourself vulnerable, but in the end, you really have nothing to lose, only experience and insight to gain.” Most importantly, Katie says that students should never be afraid to pursue something they are passionate about.

Today, Katie’s passion and experience have brought her to Vietnam where she works for Hagar International—a non-governmental organization (NGO) committed to the rehabilitation and economic empowerment of women and young girls who have been victims of human trafficking, domestic violence, and/or sexual abuse. Katie helps Hagar by writing, conducting research projects, and working on outreach in the community to coordinate efforts between Hagar
and other NGOs in the field. Katie was surprised at how Hagar operates: “it operates at a different pace than previous NGOs I’ve worked for in the United States. I am more used to pressing deadlines and a bit more stressful, time-oriented atmosphere. In Vietnam, things just seem to get done when they are done, and I would say that the quality of work is emphasized over expediency. In the U.S., local governments often greatly support NGOs; however, the opposite is the case in Vietnam where NGOs are completely on their own and rely solely on foreign donors for financial support.”

Although it’s a challenging experience, Katie encourages any student thinking of working or studying abroad to do it. “It always helps to see if and how you can adapt to a different way of life, and see how people on the other side of the world live. Also, don’t be afraid to go alone. I went to Vietnam alone and have been traveling around Asia by myself and it has been a wonderful experience. You meet so many more people traveling alone as you are forced to talk to strangers way more than if you were with a friend. Just be safe and have your wits about you and you will meet people that will shake the way you think and feel about the world.”
CODY PAJUNEN graduated from Cal Poly with his degree in Political Science in Winter of 2015. While at Cal Poly, he spent time traveling to places, which Kenya and Turkey among many others. He was also very involved in Greek Life. In Cody’s free time, he loves watching ice hockey and listening to country with his buddies as well as reading Foreign Affairs magazine. He is currently awaiting his departure to join the army in mid-June.
THE LONE WOLF TERRORIST: MECHANISMS AND TRIGGERS OF A PROCESS-DRIVEN RADICALIZATION

Cody Pajunen

Introduction
In early 2015, the Islamic State in Iraq and the Levant (ISIL) launched a social media campaign calling for the enlistment of “lone wolf” terrorists to carry out attacks throughout Great Britain.1 Providing an assortment of attack recommendations and suggestions online, ISIL sought to galvanize individuals to carry out devastating violence on its behalf. The ISIL “call to duty” is not directed at specific individuals, yet British anti-radicalization expert Haras Rafiq claims these virtual threats must “be taken with the utmost seriousness.”2 Rafiq’s instruction should not be overlooked. Lone wolves represent a small, yet potent threat to national and international security. Although normally carried out by single individuals, the amount of lone wolf terrorist attacks between the 1970s to the present have increased by forty-five percent in the U.S. and by

2 Ibid.
four-hundred and twelve percent throughout Europe. Lone wolves represent a threat to security because of their unpredictability. They attack in sporadic intervals for a variety of causes and come from a diverse array of backgrounds. No single profile of a lone wolf can be constructed and, as a result, they are extremely difficult to detect and neutralize before they violently act out. Because one common profile of lone wolves can be difficult to construct, it may seem as though they will be impossible to identify. However, a commonality between all lone wolves exists: radicalization. According to the UK government, radicalization is “the process by which a person comes to support terrorism and forms of extremism leading to terrorism.” If this process can be identified by authorities, lone wolves and their impending attacks could be undermined in the future. This begs the question: how does an individual become radicalized to the point of carrying out a terrorist attack as a lone wolf?

To answer this question, what a lone wolf terrorist is must first be established. For starters, lone wolves are terrorists. According to the Central Intelligence Agency, a terrorist is an individual who executes premeditated violence against noncombatant targets for political purposes. Terrorist actions are subsequently carried out to redistribute political resources in a society. Lone wolves are individuals who execute violent actions for political purposes, however, they represent a distinct variation of terrorism. Lone wolf expert, Dr. Ramon Spaaij, differentiates lone wolf terrorists from other types of terrorists by looking at three key factors: operating individually, not belonging to a formal terrorist group or organization, and having a modus operandi that is not subject to

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external influence. This does not mean lone wolf terrorists (LWTs) are not under the ideological influence of a specific movement or organization but rather that their actions are self-initiated, self-directed, and self-sustaining. However, what specifically drives an individual to autonomously carry out an act of terror has remained elusive even to experts. In an attempt to highlight the transition from civilian to lone wolf terrorist, forensic psychology experts J. Reid Meloy and Jessica Yakeley believe it necessary to look at one issue in particular: how the lone wolf terrorist morally sanctions his or her actions. This process of an individual morally sanctioning terrorist actions is known as radicalization. Radicalization is a dynamic, fluid path that prompts individuals to commit violence on behalf of a certain political goal. Political forces should subsequently be the focus of radicalization. A comprehensive blueprint of the radicalization process lone wolf terrorists undergo from a political perspective has yet to be established. This research seeks to illuminate the radicalization that lone wolf terrorists undergo occurs in a step-wise process. This process starts with the isolation experienced by lone wolves. Identification with a certain cause or social movement by the lone wolf is subsequently covered. Finally, the way in which lone wolf terrorist attacks are physically externalized is addressed.

**Isolation**

**Mechanisms**

Political forces are the most substantial drivers of lone wolf radicalization. However, it should be noted that psychological mechanisms have set the stage in aiding an individual autonomously sanctioning politically motivated violence. Many lone wolves, although not all, have suffered from the limited development of the prefrontal cortex region of the brain. As a result, they may display traits of impulsivity, grandiosity, and vulnerability that are all indicative of psychological immaturity. The combination of these factors relating to an underdeveloped prefrontal cortex in an individual forges isolated tendencies. Psychological immaturity and vulnerability makes the threat of social rejection unbearable. As a

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result, physical isolation can be partially derived from pre-existing psychological forces. However, these psychological forces are not a sufficient means of explaining the isolation of lone wolf radicalization. According to a United States Naval Postgraduate statistical analysis of fifty-three American LWTs, there is no significant correlation between psychological disorders and the formation of a LWT.10 Lone wolves are supposedly autonomous actors, but how can this be if other factors aside from their own psyches are necessary in catalyzing their violent actions? The answer lies in the fact that acting autonomously is not necessarily the same as thinking autonomously.

**Triggers**

LWTs are differentiated from their organization-Affiliated terrorist counterparts because they act autonomously. Terrorists obtain the label “lone wolf” based off their actions, not their beliefs. Lone wolves acquire their label by acting autonomously not necessarily by thinking autonomously. Coming under the ideological influence of a terrorist organization does not necessarily nullify the LWT label because beliefs can be separated from actions. Radical influences such as terrorist dogma can prove extremely influential among isolated individuals. For example, United States Army Major Nidal Malik Hasan believed that Muslims were being exploited as a result of the US’s wars in the Middle East—a belief held by many radical jihadi groups to which Hasan was exposed. His perspectives on Islam and the plight of modern Muslims were formed in isolation via external jihadi influence. However, he independently executed the Fort Hood massacre from resource and tactical standpoints. By acting in an autonomous manner, Hasan fills all the criteria of a LWT even though his beliefs were influenced by a broader social movement. Hasan’s isolation allowed his belief system to be heavily swayed by external tides of jihadi beliefs. It was these beliefs, constructed in isolation that prompted Hasan to execute the massacre at Fort Hood. Therefore, the effect of beliefs in isolation can be seen as a crucial precursor to action.

External radicalizing agents, such as beliefs, solidify physical and spiritual isolation within lone wolves. Preexisting psychological tendencies have set up isolationist tendencies within vulnerable individuals; however, it is the

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influences that stress politicized beliefs that trigger sustained isolation. These politicized beliefs can take many forms but nonetheless stress the necessity of a redistribution of power throughout the world. General Hasan fell prey to the belief system of jihadi ‘crusaders’ who stress the plight of Muslims throughout the world. He withdrew himself to such an extent that the Fort Hood massacre came as a complete shock to all affected. The overarching political forces of existing jihadi dogma surrounding Hasan triggered genuine isolation that helped drive his eventual attack. Isolation, however, is only a stepping-stone on the path of radicalization on which lone wolves embark. External politicizing agents help trigger sustained isolation within lone wolves and continue to drive radicalization. The accumulation of external radicalizing agents aligns potential lone wolves with a certain identity—an identity that forms another necessary facet of the radicalization process.

Identification

Identification Mechanisms

Two mechanisms act as structural elements that set the stage for potential LWTs to embark on the process of identification. The first mechanism is that of the social movement. Social Movement Theory describes the effects of social movements and gives great insight into the diffusion of external influences that play a part in shaping and projecting individuals’ ideas. It asserts that social movements consist of a “set of opinions and beliefs in a population which represents preferences for changing the social structure and/or reward distribution of a society.”11 The primary goal of a social movement is to garner the sympathy of a population so that the movement’s cause can gain societal traction. To acquire this sympathy, a social movement may have a relatively broad platform of beliefs so that it may appeal to a wide range of individuals. Organizations direct operations amongst a population to diffuse the idea that social movements provide. These are known as social movement organizations (SMOs). Al-Qaeda is an example of an organization advancing the spread of the broader jihadist social movement.

Social movements produce belief systems attractive to those looking to manifest intrinsic political frustrations. Lone wolves latch on to these diffused

belief systems. Being isolated, lone wolves often fuse these external belief systems with their own. These belief systems are violent in nature. Al-Qaeda’s adherence to its interpretation of jihadism, for example, blends individual beliefs with militant and homicidal undertones. The belief systems of lone wolves adhering to Al-Qaeda-inspired dogma are infiltrated and manipulated by violent beliefs and values. Social movements thus serve as mechanisms that help structure the identity of lone wolves. Lone wolves take up a cause that a social movement advocates for, come under the influence of the movement’s belief system, and subsequently identify with its goals and vision.

SMO operations revolve around maintaining group survival and ensuring a favorable cost/reward relationship for individuals that participate in their activities. In short, organizations need dedicated followers to advance their goals. To acquire followers, organizations need to deploy resources in order to make their cause attractive. Resources represent the second identification mechanism. Moral, cultural, human, material, and socio-organizational resources all aid in advancing the efforts of an SMO. Moral resources appeal to value systems of populations. Cultural resources provide organizations with “strategic know-how” that enables efforts to sustain recruitment amongst a specific population. Human resources solidify an organization’s expertise, labor size, and leadership to give it credibility in numbers, charisma, and work capacity. Material resources include tangible assets such as monetary funds, property, and supplies that an organization has at its disposal. Socio-organizational assets constitute an organization’s infrastructure, social network, and organizational capacities. These different types of resources function as a mechanism of the identification process of LWT radicalization by structuring the societal image of social movements and organizations. They ultimately lay the foundation for the diffusion of an SM’s or SMO’s goals. Such diffusion creates the appeal of movements and organizations to make its message more conducive to attracting potential LWTs.

The extent to which these resources can be acquired and deployed thus

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dictates the success of an SMO. Al-Qaeda is an organization emblematic of effectively distributed resources. It has been supported by international “celebrities” such as Osama bin Laden and enjoys sympathy from national governments such as Saudi Arabia and Yemen, giving it ample moral resources. Culturally, Al-Qaeda targets potential LWTs by using social media to facilitate the international popularity of its Inspire Magazine, which diffuses its message and ideology across the globe. Al-Qaeda’s human assets include experts trained in the art of terror tactics, the maintenance of terror financing networks, and warfare. Al-Qaeda’s material resources entail the acquisition of safe-haven property and transnational funding. From a socio-organizational resource standpoint, Al-Qaeda offers potential recruits access to digital support networks so that physical contact doesn’t have to ever be made for belief alignment to be diffused.

By combining all these variations of resources, Al-Qaeda has had the opportunity to diffuse its ideological base to lone wolves. The organization projects its message as a product made available for potential consumers and potential lone wolves to access. The act of employing multiple resources simultaneously to make a certain message or product appealing to isolated individuals is known as “slick packaging” in Social Movement Theory. Slick packaging is deployed to increase the overall appeal of a certain social movement product. The more appealing the message, the more likely an isolated individual will enter the process of lone wolf radicalization. The resources deployed by social movement organizations thus operate as a mechanism for lone wolf identification by providing an appealing message with which to align.

**Identification Triggers**

The mechanisms that may lead isolated individuals down the path of radicalization do not themselves forge a lone wolf to identify with a greater cause. Millions of individuals worldwide are exposed to radical movements daily, yet a seemingly negligible percentage of this vast population turn out to become lone wolves. This is because only an intrinsic trigger can forge a lone wolf. This trigger comes in the form of a personal grievance. Most of society becomes exposed to social movement ideologies yet few harbor a grievance that produces the propensity for violent action. In the case of lone wolves, a grievance consists

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of an inner animosity aimed at an external source.

The fact that lone wolves exhibit grievances is not surprising given their tendencies to be narcissistic and isolated. Being narcissistic, lone wolves often times perceive events only in the context of how they are affected and blame external sources for misfortune that has befallen them. This grievance can be derived from a variety of sources but nonetheless is individually constructed. Social movement entities, such as Al-Qaeda, prey on existing grievances that many have such as the disenfranchisement of Muslims in poor European communities. The message Al-Qaeda sends of justice via violence becomes appealing to many who inhabit grievances regarding the plight of Muslims in these areas. Once external messages meet internal animosities, the process of lone wolf identification culminates. Lone wolf grievances find seemingly credible outlets such as social movement organizations to manifest their frustrations and remain loyal to them as result.

Grievances, although necessary, are not a sufficient trigger to solidifying lone wolf identification. Grievances help lone wolves align their inner beliefs with external sources. They run individual beliefs parallel to that of a certain movement or group but have not been able to completely converge the two belief systems. In order for a potential lone wolf to completely identify with a specific movement or group, an individual must undergo vicarious cognitive dissonance. Vicarious cognitive dissonance occurs when an individual’s belief system is altered after a person of an in-group is observed committing a hypocritical act.\textsuperscript{16} This hypocritical act creates dissonance in the observer. The observer wants to fully identify with a group or individual but has a difficult time in doing so as a result of the hypocritical act that was witnessed, creating dissonance between the observer’s preexisting morals and the urge to identify with an external source. To quell this dissonance, the attitudes towards the hypocritical act are altered to support it.

By morally sanctioning the wrongful act of an outside source, attitude changes become solidified as both belief systems converge. In this case, the structured message of an external force solidifies identification by providing a product with such high appeal that individual, internal psychological impulses

force the convergence of belief systems between the mechanism and individual. This convergence is catalyzed by the trigger of psychologically vulnerable individuals to dedicate themselves to an entity bigger than themselves at the cost of their natural moral compass. Identification is completed when this forced convergence in belief systems is solidified. After the completion of identification, the final necessary means in the radicalization process of potential LWTs is initiated: externalization.

**Externalization**

At this point in the radicalization process, potential LWTs are isolated and have subsequently identified with an overarching movement. As complex as these first two steps may be, a lone wolf terrorist has not yet been formed. Rather, a socially marginalized “ideologue” has been produced. In order to be considered a terrorist, one must perform a terrorist act. To be considered an act, a potential LWT must physically externalize his or her inner frustration. A new combination of mechanisms must come into contact with a different set of triggers in order for externalization to occur.

**Mechanisms of Externalization**

Similarly to isolation and identification, externalization manifests via structural elements. These three elements include the formation of a perceived injustice, development of a negative identification, and a lack of legitimate political outlets available to externalize frustrations. These mechanisms interact with one another to direct a potential LWT’s inner animosity outward. Once in place, these elements lay fertile ground for certain triggers that ultimately result in a terrorist act. The three mechanisms of lone wolf externalization follow a pattern. First, the root of a certain problem is identified by the lone wolf. Next, the perceived reason as to why a problem needs to be addressed is solidified. Finally, the lone wolf creates a blueprint as to exactly how a problem is going to be addressed.

During the identification process, lone wolves form a favorable opinion of a certain movement’s values, beliefs, and actions. These favorable opinions form what is known as positive identification. This positive identification, depending on the movement with which the potential LWT is identifying, can have negative effects. Identifying with a certain movement or group means that those opposed to it may be viewed in a negative light. Since social movements are formed in order to change the status quo of a certain issue, antagonistic forces, such as those trying to maintain the status quo or change it, may be seen as
the enemy. Usually, this is not an issue because social movements and their entailing organizations are not militant toward one another. In the context of transnational terrorist or criminal entities, however, militancy is the lingua franca. Groups or individuals impeding the progress of a certain militant movement are seen as enemy forces that need to be completely undermined or destroyed. In the case of lone wolves, the process of vilifying an asserted antagonistic entity results in negative identification towards those opposed to the interest of the lone wolf’s Affiliations.

Negative identification has grave consequences when contextualized in lone wolves. If an influential social movement or organization designates a group as its enemy, members become fixated on destroying it. Isolation has strong additive effects on a lone wolf’s dedication to acting on negative identification. The extent to which a problem is occurring in society can be drastically miscalculated among isolated actors, especially when psychologically vulnerable to narrow-minded assertions and the appeal of grandiose actions. This fixation ultimately turns a certain entity, whether it is a person, group, government, or label, into an enemy. Since both parties are opposed to one another in terms of competing for similar resources of a shared issue, the enemy’s gain is seen as the potential LWT’s loss. Thus, the enemy becomes a target so that it cannot decrease the LWT’s operations. This targeting acts as a structure for externalization because it provides the potential LWT with a direction in which actions can be aimed if need be.

Negative identification provides the “what” of externalization. At this point a potential LWT may have a good idea as to “what” should be targeted if necessary. The second externalization mechanism, a perceived injustice, provides the potential LWT with the “why”. A perceived injustice is exactly as it seems: an action by another, seemingly adversarial, entity that is seen as a direct attack on the potential LWT and his or her identified group or goal. This injustice is “perceived” because it may or may not have been a direct attack on the LWT. The action was construed by either the potential LWT or his or her identified group as an attack. Such an “attack” justifies the reasons for hating a certain enemy in the first place. The perceived injustice thus structures the potential LWT’s opinions by making them believe something must be done to counter it so that similar actions do not reoccur.

A third structural mechanism for externalization is the lack of legitimate political outlets through which frustrations can be expressed. If a potential
LWT is exhibiting frustrations but is willing to use a legitimate outlet to induce change, the externalization of a terrorist act could be nullified. However, the positive use of political processes do not always pan out. Even if legitimate political outlets do exist, isolated individuals may be so delusional about a certain problem that they deem any form of accepted political activism as inherently corrupt and unable to yield preferred results. Whatever the cause, a lack of actual or perceived political outlets give the potential LWT the “how” to externalize his or her action. If legal means of externalizing a frustration are not available, a different route must be chosen. A lack of effective political mechanisms thus structures the externalization of a potential LWT action by convincing the individual that the way in which frustrations can be vented must include something outside the parameters of legality. In the case of militant movements, violence is usually considered a more than viable action. The “what,” “why,” and “how” of externalization integrate at this point and cumulatively provide the basis for lone wolf terrorist action to be physically manifested.

**Triggers of Externalization**

Three triggers accompany each of the aforementioned structural mechanisms of externalization. These triggers are a development of strong reciprocity, moral obligation, and the formulation of alternative strategies to vent frustrations. An important point to note is that these triggers are largely derivatives of an individual’s psyche. Only the lone wolf can decide to act on the structural mechanisms. This point illustrates the very nature of LWTs and their ultimate autonomy in formulating decisions. These triggers, like their respective mechanistic counterparts, follow a process that results in lone wolf terrorism.

The first trigger in this process is strong reciprocity. Strong reciprocity occurs when an individual is willing to make a sacrifice for a thing or idea by which he or she is not directly affected.17 The development of this psychological inclination is actually derived from altruism. Individuals who exhibit strong reciprocity want to put forth their resources to sustain an overall cause or idea they deem worthy. However, in any social environment, there will always be those who free-ride off of altruistic behavior (defectors). Those who defect from cooperating with a cause or movement are considered an enemy

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by individuals who behave altruistically because they (the defectors) impede upon the advancement of a certain movement, idea, or goal for which others are working toward. Strong reciprocity induces individuals to remedy the problem of defectors by either coercing them into cooperation or exterminating them. The defectors represent the entity which the lone wolf negatively identifies with and subsequently plan to attack. Strong reciprocity thus triggers lone wolf attacks by providing justification for attacking a specific target.

A second externalization trigger presents itself in the form of moral obligation. A moral obligation produces the trigger as to why a lone wolf must externalize an inner frustration in the form of a terrorist act. At this point, a social movement or organization has already provided a message clarifying the reasons as to why a certain entity must be perceived as the enemy. Lone wolves subsequently develop an intrinsic justification of attacking the target laid out by the social movement or organization. Once the moral obligation of a lone wolf to carry out an attack on specific target converges with the message of an outside radicalizing agent, the externalization process is further solidified.

The final trigger leading to a lone wolf attack is a plan of execution. Here, the lone wolf has solidified his or her moral obligation to exhibiting strong reciprocity against a specific target. What has not yet been determined is exactly how such a moral obligation will be acted on. In order for the lone wolf to carry out his or her perceived moral obligation, a plan outside the legal realms of political representation must be devised. Although acting autonomously, it is important to remember that lone wolves act under the influence of a certain, often violence-prone, group or movement. The alternative strategy a lone wolf devises is thus frequently a violent act. This strategy integrates the power of the two previously mentioned triggers and guides them to a self-directed plan of action. When an alternative, violent outlet to vent a political frustration is acted upon, a terrorist act is executed and a lone wolf terrorist is formed.

Conclusion
The process of an individual transforming into a lone wolf terrorist contains an immeasurable amount of interacting factors. These factors differ from individual to individual as psyches and experiences are never the same between any two people. However, a commonality among all lone wolves is that each underwent a process consisting of isolation, identification, and externalization. This process, no matter the amount of variables involved, forged an individual that
autonomously committed an act of terror. These acts of terror, without a doubt, have and will continue to differ according to place, time, extent of destruction, and justification. The point of this paper is not to give an exact formula for the type of person that will become a lone wolf terrorist but to provide a procedural framework in regards to the political forces that interact in the process of lone wolf radicalization. The effects of both structural mechanisms and intrinsically driven triggers show that more factors than just the individual are at play in the formation of lone wolf terrorists. Rather, learned behaviors combine an individual’s environment and psychological impulses to produce actions. This complex combination forges the radicalization process of the lone wolf terrorist.
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