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The students featured on the following pages are to be congratulated for their outstanding academic achievements. These students have responded exceptionally well to the challenges and opportunities afforded them through their participation in the University Honors Program, with their efforts culminating in the production of an original work of scholarship. Their respective accomplishments reflect well on the University, the academic departments of their respective majors, and the Honors Program. The quality of the theses summarized on the following pages continues a growing tradition of quality undergraduate scholarship produced by Honors students and sets a high standard for future Honors graduates.

Phillip F. Elliott
Director
University Honors Program
Achievement
JAIME E. SELIGMANN
Dual Majors: Biochemistry and Biology
Minor: Mathematics
Plans to Attend Medical School
Thesis Title: The Synergistic Effects of Insecticides on Various Pest Populations
My thesis was based on the increasing environmental and health concerns surrounding the subject of insecticides. I aimed research towards developing combinations of prevalent insecticides that could have a greater efficacy on common pests using lower dosages than the individual chemicals alone. I determined the LD30 and LD50 (30% mortality rate and 50% mortality rate of insects, respectively) for insecticides with different modes of action on each pest species. Although more research is intended to solidify results, I have found that certain combinations of insecticides with differing modes of action are, in fact, synergistic, while those with the same modes of action are not synergistic.

LUKE G. BOYD
Major: Political Science
Pursue a career in Civil Service for the State of Louisiana
Thesis Title: Gay Rights in the Anglosphere: The Affect of Political Opportunity Structures on Movement Success
I framed my analysis of gay rights with the largest, oldest, and most successful English-speaking democracies: Australia, Canada, the United Kingdom and the United States and sought out the statutory archives of each of these states to determine their acceptance of the Gay Rights Movement across the goals of same-sex marriage, couple adoption, and anti-discrimination legislation. I departed from the traditional school of the political opportunity structure which focuses on institutional opportunities, to incorporate religious beliefs and secularism as an intervening variable. I found that while similar in many ways, each state deals with the gay rights question in a unique fashion. Some legislate top-down, while others devolve the political question to localities and territories. Those more traditionally European (Canada, UK), are more tolerant and devoid of religious zealotry, while the U.S. and Australia still harbor political elites who refuse to acknowledge the Gay Rights Movement. I learned that the movement has already been successful in the 'Anglosphere' as gay people have many freedoms guaranteed to all citizens. A larger study could focus on those states that still condone violence towards its gay population, and the prospect of global freedom for the gay community. organizational commitment.

ANDREA L. ZULLO
Major: Biology
Minor: Spanish
Pursue Masters Degree in Biology and Secondary Education Certification at Southern Connecticut State University
Thesis Title: Rhagoletis meigenii granivory on non-native Berberis thunbergii in eastern Connecticut
Berberis thunbergii (Japanese barberry) is an invasive plant found in many forests in the northeast. Rhagoletis meigenii, a small fly, lays its eggs inside the fruit. The larva will eat the seeds of the fruit when the hatch as part of their life history. I identified the current levels of infestation of B. thunbergii by R. meigenii at several locations in northeastern Connecticut in order to determine if R. meigenii might be used as a form of biological control.

CARA L. BROWN
Major: Political Science
Concentration: 7-12 Certification
Plans to teach High School History/Social Studies and attend Graduate School
Thesis Title: Determinants of Voter Turnout Across the American States: An Analysis of the 2004 Presidential Election
My thesis examined determinants of voter turnout in the 2004 Presidential election using state-level data. I examined the relationships between voter turnout and individual-level variables, such as age, race, income, gender, marital status, education, and residential mobility, as well as aggregate variables, such as region, legislative term limits, ballot initiatives, registration laws, political party strength, strength of alternative parties, and electoral competition. I found that at the state-level in the 2004 Presidential election, race, marital status, voter registration laws, and electoral competition were important determinants of voter turnout rates. Based on my research, I would recommend that states consider revising their voter registration laws to allow later registration closing dates or perhaps even Election-Day registration.
ZACHARY M. DOTY  
Major: Economics  
**Thesis Title:** Sweden and the United States: An Environmental Kuznets Curve Analysis  
According to Environmental Kuznets Curve (EKC), as income increases, noxious emissions should decrease. My thesis examines how income effects noxious CO2 emissions for the countries of the United States and Sweden, during the period 1980-2004. Initially, it appeared that although the United States and Sweden are comparable in terms of income per capita, Sweden appears to follow the EKC while the United States does not. Using self-generated econometrical models, as well as first hand experience with both cultures, I sought to determine the degree to which either country illustrated the predictions of the EKC.

JOHN S. FOURNIER  
Major: Political Science, Sociology  
Minor: Criminology  
Pursue Masters Degree and PhD in Sociology at the University of Connecticut  
**Thesis Title:** Absentee Landlords and Off-Campus Alcohol Abuse  
It has always been my interest to make an observable impact on my local community. For this reason, I chose to engage in research that might be useful to the Willimantic Police, ECSU administrators, and the town of Windham. My research focused on the rates of high risk drinking among college students renting properties in Willimantic. Through the generous cooperation of many faculty, I was allowed to survey several hundred ECSU students and compile a substantial amount of data. In the course of this study, I found that students who rented from absentee landlords reported a significantly higher rate of binge and high-risk alcohol consumption. It is my hope that the community is able to put this data to good use.

JENNIFER R. ROYALS  
Major: Environmental Earth Science  
Anticipates Teaching Elementary Education and Pursue Masters Degree in Secondary Education  
**Thesis Title:** Sequence Stratigraphic Interpretation of the Jurassic Portland Formation, Hartford Basin, CT  
For my thesis I examined the red rocks of Manchester, a part of the Portland Formation in the Hartford Basin. I measured a 55-meter section, and using drafting software, plotted this data into stratigraphic columns. Based on my data, I determined that a braided river deposited this outcrop in the Jurassic period, which agrees with findings from nearby outcrops.

SCOTT G. SEAMAN  
Major: Mathematics  
Concentration: Secondary Education  
Anticipates Teaching Secondary Education  
**Thesis Title:** Cycles of Weighted Graphs: The Chinese Postman and Traveling Salesman Problems  
This thesis is a part of the mathematical branch of study known as Graph Theory. The “graphs” of graph theory are collections of vertices and the edges that connect them, and are often discussed in terms of the specific sequences of these vertices and edges contained within. In this thesis, I introduce the topic of graph theory, discuss some historically important theorems and their proofs, and discuss two well-known and related problems: The Chinese Postman Problem and The Traveling Salesman Problem.
PETER E. REINHOLD
Double Majors: Biochemistry and Biology
Pursue Graduate Studies at the University of Connecticut
Thesis Title: Growth and Mutagenesis of Halobacterium NRC-1 on the Surface of Mars
For my thesis I explored the subject of astrobiology, an interest stimulated by an Honors Colloquium on this subject. With the aid of my faculty mentors, I formulated a hypothesis based upon current findings by NASA missions to Mars. We decided to examine whether a form of halophile (salt-loving bacteria) could have possibly existed on a transitioning Martian surface. We reasoned that ultraviolet radiation may have provided the means for a cold-adapted halophile. In order to test my hypothesis I set up an ultraviolet light above agar dishes containing Halobacterium NRC-1. I then incubated the plates in varying temperatures and monitored growth following U.V.C. radiation. I determined that the U.V.C. radiation had no affect on the growth of the organism and temperature became the only factor affecting growth.

BRISA PALIKUQI
Double Majors: Biochemistry and Biology
Pursue PhD in Biochemistry or Biology
Thesis Title: Electrophoretic Analysis of Muscles of Blue Crab
In my thesis research I tried to find out whether there is a difference in protein content among the muscles that control the movement of different legs in the Blue Crab. Using SDS Electrophoresis I compared protein content in the red and white muscles fibers of legs that are used for different purposes. I also studied protein content in atrophied muscles that have lost their load due to leg loss.

AMY E. GROVER
Major: Mathematics
Pursue a Career as an Actuary
Thesis Title: Dynamical Systems and Their Applications to Finance
I applied dynamical system models to two publicly-traded stocks, American Airlines and Southwest Airlines in an attempt to build a model that would accurately predict the respective stock prices. The first model, applied to American Airlines, was a random walk model, \( P_{t+1} = P_t \times \text{rand}(x) \times \text{weighted average} \), for \( t = 1, 2, 3, \ldots \), where \( P_t \) is the value at the previous point and \( \text{rand}(x) \) is a random variable \( x \). This model predicted prices that were excessively high or extremely low. Subsequently, I attempted the process with Southwest Airlines stock prices. However, the results for this were even more varied and demonstrated that this method did not work to chart stock prices. Next, I tried the Hurst model, \( \frac{R}{S} = (aN)^H \), where \( R \) is the difference between the maximum and the minimum within a certain period of time, \( S \) is the standard deviation for the same period of time, \( N \) is the period of time, \( a \) is a constant, and \( H \) is the Hurst coefficient. Using this equation, I solved for the Hurst Coefficient, \( H \). The Hurst coefficient for American Airlines was 0.676 and the coefficient for Southwest Airlines was 0.704. This model proved to be fairly reliable, and also revealed that the amount of time that affects current stock prices is no more than 30 months for American Airlines and no more than 15 months for Southwest Airlines. Overall, the ability to estimate stock prices relies heavily on the fact that stocks do have a cutoff point and any data before that cutoff point really does not matter when trying to estimate future values.

STEPHANIE M. GRUESSNER
Major: English
Minors: Writing, Spanish
Pursue Masters Program at Southern Connecticut State University to Study Fiction Writing
Thesis Title: They Fell Like Confetti: A Collection of Short Stories
This collection of short stories chronicles chapters in the life of a young female protagonist from her childhood through her twenties. Through a series of miscalculations, lies, and earthtongue family meals, this protagonist struggles with her identity. Each story finds this same narrator immersed in a search for human connection that plays out through radio static, personal stories, and awkward convenience store holdups with near-strangers. Most importantly, I hope these stories explore expression and communication, both being conscious and fierce needs to be understood not simply by oneself but by others.
SARA E. HANRAHAN
Major: Mathematics
Concentration: Secondary Education
Plans to Teach High School Mathematics
Thesis Title: On the Intersection of Modular Circles with the Modular Hyperbola $xy \equiv 1 \mod n$

The question that inspired my thesis was to find formulas to count the number of intersections of modular circles with the modular hyperbola $xy \equiv 1 \mod n$. I conducted simulations using MAPLE mathematics software, studied the data, and subsequently discovered the target formulas. The largest part of my thesis concerns the process of proving these formulas. With the help of many different strategies, previous research in related topics, and the guidance of my advisor, I was able to successfully write proofs to confirm my findings. Having proven the formulas for the number of intersections between these sets, I expanded my thesis to determine formulas to count the number of modular circles given a value of $n$. Following the same procedure, the formulas and proofs proved reliable. Finally, I attempted to determine formulas to count the intersection of the modular hyperbola with the difference of squares. Although the accuracy of these formulas is supported by the data generated using a MAPLE program, formal proofs have not yet been developed.

CODY M. GUARNIERI
Dual Majors: Political Science, History & Social Science
Will attend the University of Connecticut School of Law
Thesis Title: Electoral Fairness: Assessing the Electoral Impact of Campaign Finance Regulations on Gubernatorial Elections

I performed a statistical analysis to consider the effects of states’ campaign finance regulations on electoral competition. My analysis considered 47 contests in 45 states in 2004 and 2006. I conclude that there is evidence that suggests that more stringent campaign finance regulations in a state tend to aid the electoral fortunes of Democratic candidates, while damaging the fortunes of Republican candidates.

KERIN JAROS-DRESSLER
Major: Communication
Minor: Theater
Pursue a Career in Video Production and Advertising
Thesis Title: Design Center East: Designing a Video Advertisement

For my thesis, I produced two television commercials for a local Willimantic business that are currently being broadcast on Lifetime and HGTV. I evaluated the effectiveness of increased customer traffic and sales. In addition to creating two television commercials, my thesis project included a narrative in which I describe, and reflect on, the entire experience of taking on the roles of producer, writer, director, editor, and media buyer.

DREW L. MIZAK
Major: Political Science
Minor: History
Plans to Teach High School History/Social Studies
Pursue Graduate School
Thesis Title: No Legislator Left Behind: A Case Study on How the Congressional Lawmaking Structure Often Renders Complex Legislation Ineffective

For my thesis I used the No Child Left Behind Act as a case study to examine the internal lawmaking structure of the United States Congress. My study examined the political context that produced NCLB, and used the law to understand and illustrate the American legislative process. My study examined the growing belief that the American political structure is incapable of addressing and solving pressing complex problems. I found that due to the negotiations that go on behind the scenes, the president, senators, and representatives all get part of their ideas into the final bill. My study found the concessions that are made to ensure passage often weaken the final product and make the law difficult to implement.