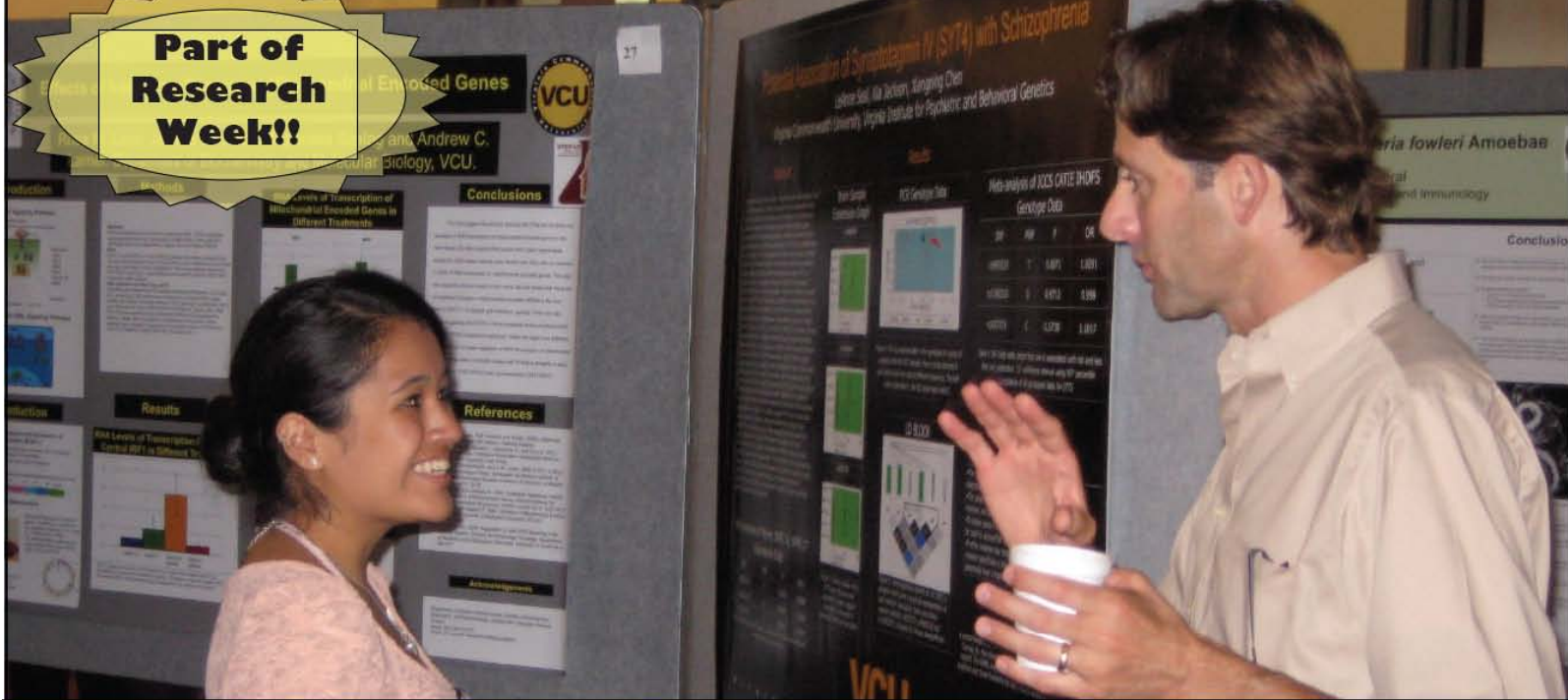


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The following individuals and departments are acknowledged for their many contributions:

- Ann Nichols-Casebolt, Ph.D., Office of Research
- Frank Macrina, Ph.D., Vice President for Research
- Herb Hill, UROP Coordinator
- Tamara Highsmith, VCU Dining Services
- Sarah Golding, Ph.D, UR Coordinator, Biology
- Jacqueline Smith-Mason, Ph.D., Assistant Dean & Director of Undergraduate Research, The Honors College
- VCU Student Research Organization
- The Honors College, Student Council
- Department of Psychology
- VCU School of Arts
- Undergraduate Research Opportunities Program (UROP)
- Beverly Warren, Ph.D, Provost
- Elizabeth Johns, VCU Libraries
- Karen Rader, Ph.D, Science, Technology and Society Program
- Faye Prichard, Honors College
- VCU Research Week Task Force
- School of Social Work
- Mary Boyes, University College
- Department of Chemistry
- Sarah Cunningham, Director of Research, Arts
- Rosalyn Hobson, Ph.D, School of Engineering

The posters presented were supported by the generosity of many VCU, governmental and private funders, including:

AD Williams Trust Funds
American Heart Association
Amgen Summer Scholars Research Program
British Academy
Honors Summer Undergraduate Research Program
Howard Hughes Summer Scholars Program
Jeffress Memorial Trust
Levehulme Trust
National Institute on Drug Abuse
National Institutes of Health
National Science Foundation
Ronald McDonald Charities
VCUarts Grants for Undergraduate Students
VCU Center on Health Disparities
VCU Clinical Research Center
VCU Department of Biology
VCU Department of Psychology
VCU General Clinical Research Center
VCU School of Education Research Grants Program
VCU School of Engineering
VCU School of Social Work
VCU Undergraduate Research Opportunities Program (UROP)
VCU University College
Virginia Institute for Psychiatric and Behavioral Genetics
Virginia Premier Health Plan
Virginia Tobacco Settlement Foundation

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All Abstracts Organized by Poster Number

1. Suicide and Gender Roles

Christina Epperson, Dept. of English, with Prof. Mary Boyes, University College

Suicide is one of the top three leading causes of death among adolescents in the United States, males and females alike. While females are more likely to attempt suicide, males are more likely to successfully commit suicide. Research has shown that there are differences in methods of suicide between adolescent males and females, respectively. These differences may be affected by societal gender roles. However, current suicide treatments and prevention programs do not address the differences presented by males and females regarding methods of suicide. The inclusion of treatments specifically pertaining to males and females, respectively, would, in all likelihood, significantly decrease suicide rates as well as greatly improve suicide treatments and prevention programs; because gender has been seen to have a noteworthy effect on methods of suicide, it must be assumed that suicide treatments that relate specifically to males and females, correspondingly, would be more effective than current suicide treatments. In short, this research problem is an examination of the current societal gender roles of adolescents in the United States, and how these gender roles may influence the chosen methods of suicide of males and females, as well as how these results may be used to tailor suicide treatments and prevention programs. This research has shown that while it is acknowledged that there are differences in the chosen methods of suicide between adolescent males and females in the United States, current treatments do not take these differences into account. There are no suicide treatments that specifically pertain to either gender, but it can be inferred that such treatments would be more beneficial.

2. Swarm Robotics and Gold Mining: A Feasibility Study

Lucas Potter, School of Engineering, with Mary Mullins, University College

Currently, gold mining is an industry that is both costly and, in some cases, dangerous, as methods used today include mercury processing and cyanidation. These two approaches can cause terrible health damage. For instance mercury can (at the lowest levels of exposure) result in symptoms such as shortness of breath, cough, bloody sputum, and impairment of pulmonary function. Additionally, the lethal dose of cyanide for humans is 1–3 mg per kilogram of body weight, and this exposure, while the use of cyanide in gold mining continues, become more and more probable. However, there is a possible solution to the use of toxic chemicals in gold mining: A solution that eliminates not only the use of these dangerous chemicals, but the involvement of humans in the dangerous and frequently fatal world of mining. The solution is swarm robotics, which is using a collective of robots that have the ability to communicate with each other in order to optimize their performance. Research used case studies in swarm robotics (such as the Sambot of the University of Beijing and driverless haul trucks currently being used in Australian mines), as well as new research in computer science (in the form of dynamic partitioning and distribution) and in the sensing technologies field (Simultaneous Localization and Mapping, or SLAM). The final finding on the feasibility of utilizing swarm is presented through the lens of a modified Technology Readiness Level scale, developed by NASA for indicating precisely how ready a certain technology was for use in extra-terrestrial

applications, and changed for use in a more conventional environment. The paper then goes onto the possible further research and uses of swarm robotics.

3. A Proposal for the Treatment of Pancreatic Adenocarcinoma

Kaitlyn Proctor, Department of Biology, with Mary Boyes, University College

The National Cancer Institute at the National Institutes of Health estimates that pancreatic cancer will claim the lives of 37,390 individuals in the United States in 2012 alone (2008). Chemotherapy treatments for pancreatic cancer have been unsuccessful due to its resistance to most chemotherapy drugs; therefore discovering a new treatment option for this cancer is of great importance. Although many treatments have been tested—such as multi-drug treatments of Fluorouracil (5FU), Mitomycin C, and Gemcitabine Hydrochloride, the use of heat shock proteins, and the manipulation of intrinsic and extrinsic pathways—pancreatic cancer has been relatively unresponsive. Studies have shown minor successes in the treatment of pancreatic adenocarcinoma with the identification of specific genes and micro RNAs (miRNAs) that control the actions of malignant cells although no definitive treatment has been determined. Many studies making use of each of the above treatments separately have been reviewed in hopes of discovering a new method of pancreatic adenocarcinoma treatment, but little progress has been made. Multi-drug treatments of 5FU, Mitomycin C, and Gemcitabine Hydrochloride; the use of heat shock proteins, the manipulation of intrinsic and extrinsic pathways, and the identification of specific genes and miRNAs must be combined in clinical trials to determine a standard treatment plan. Through these clinical trials, scientists have a greater chance of putting an end to this relentless disease.

4. The Use of DID in Contemporary Film to Illustrate Conflicting Cultural Dictates about Prescribed Gender Roles

Christian Ruiz, Department of Chemistry, with Mary Boyes, University College

Art is considered both a mirror to reality and a means of critiquing society. This is especially evident through contemporary filmmakers' use of dissociative identity disorder (DID) in psychological thrillers from the 1990s to 2012, which is a time frame in which both film and society were notably different from those of the previous decades and in which there has not been extensive cultural study regarding DID. Through the presence of multiple selves, which is characteristic of DID, filmmakers illustrate their main characters' attempts to resolve a stressful or traumatic situation. This study is an examination of the ways in which the main characters of *Primal Fear* (1996), *Fight Club* (1999), *Black Swan* (2010), and *Silent House* (2011) use DID to cope with pervasive and debilitating gender role expectations. For men, there is an increasing cultural call to act in accordance with the feminine traits of sensitivity and submission, which are contradictory to the masculine roles of being macho and independent. For women, there is a cultural call to continue to adhere to the traditional roles of being submissive, to allow themselves to be repressed by men and to be bound by being caretakers. While the men in these movies struggle to reassert their traditional, masculine roles of machismo and independence in the wake of a feminizing society, the women struggle to break away from traditional gender roles in order to become more like men, which are conflicts with the submissive roles that they are also forced to play. In essence, through this conflicting dichotomy of gender roles that both sexes are forced to play, the characters become fractured and beaten by these debilitating cultural expectations.

5. Comparisons and Contrasts Between Marketing Techniques Used by the Tobacco Industry and Public Health Figures

Dorothy Yen, Department of Biology, with Mary Boyes, University College

The tobacco industry has long been known for its aggressive advertising techniques to promote its product to the general public; conversely the public health field has long been regarded as the main opposing force to the tobacco industry's efforts. The public health field's techniques of manipulating and presenting information has not been examined to the degree that the tobacco industry's techniques have been due to public health's mostly-accurate message regarding tobacco smoke. This review was performed by analyzing a variety of articles and academic sources focused on this subject. This review was conducted to examine as well as compare and contrast the methods used by both the industry and accredited public health officials and institutions. Neither the tobacco industry nor public health professionals can deny scientific findings or empirical evidence regarding tobacco smoke and its harmful qualities but that does not deter them from manipulating evidence or even producing their own contradictory studies. The tobacco industry's public relation efforts to promote its product have long been a part of the industry's history. It has also been shown that accredited health professionals (such as the Surgeon General) use manipulative methods to promote their bias on the issue of tobacco and smoking. Accredited health professionals display conflicts of interest when definitively shutting down any opposing opinions regarding the health risks involved with tobacco smoke. Because of the utmost importance of maintaining credibility in the public eye, both institutions must remain careful and tactful in their marketing techniques. The public, however, does not internalize the PR from the tobacco industry in the same way that it does the governmental institutions. While the government is rightfully protecting the public against the damages and harms of tobacco smoke, it is suppressing some of the potential research that can and should be conducted in order to further the public's knowledge on the issue of tobacco smoke and its byproducts.

6. Let Me Tell You About Homestuck

Ryan Lee, Creative Advertising, with Jessica Gordon, University College

Hypertext stories are ergodic stories-- stories that require a non-trivial effort in the act of reading. Specifically, hypertext stories are stories in which several packets of story are connected to each other via links. Unfortunately, study of hypertextual works has been limited due to the relatively few works written in the style. In my UNIV 200 study, I look at what many people are calling the first hypertext epic: Homestuck. I explore the wide success of Homestuck as a hypertext narrative and what this means for the future of ergodic literature.

7. Negative Perception of Sexuality in Advertising and the Counterarguments or Solutions to These Reactions

Rachael Mott, Dept. of Biology and Psychology, with Mary Boyes, University College

This paper focuses on the perception of sexuality in advertising and how negative reactions may be prevented or counteracted. Analyzing articles on the perception of sexuality revealed that sexuality in advertising can negatively affect product perceptions. Consumers find public sexuality offensive and sexuality also reduces brand recall. However, all of these negative effects can be prevented or offset. A product with pre-existing sexual connotations is found less offensive to consumers. Also, while sexuality in advertising decreases brand recall, it increases attention. Sexuality in the context of a relationship is less likely to upset women

because it fits with their ethical viewpoints. These examples show that sexuality in advertising must be dealt with carefully to prevent negative feedback from consumers. These findings allow readers understand when sexuality in advertising sells. This research can allow companies to understand which products would benefit from – and how to treat – sexuality in advertising.

8. Effects of Touch Therapy on Autistic Children

Pahul Hanjra, Depts. of Chemistry and Philosophy, with Faye Prichard, Honors College

Autism causes impediments for children with the disorder that they carry as obstacles to overcome for their entire lives. Major characteristics of autism include social delays such as inhibited interaction with others, touch aversion, as well as abnormal intake of sensory information, with understated reactions or high sensitivity to external stimuli. As a result of the many inhibitions the disorder places on afflicted individuals, day-to-day life can be a struggle. The prevalence of autism spectrum disorder is increasing in the United States and the world, and the publication of the DSM-IV has broadened the definition of autism to include forms of varying severity including Asperger syndrome and Rett syndrome. As the influence of autism grows, a greater number of treatments including medicine as well as alternative methods are considered. The objective of this research project was to determine what effects touch therapy has on children with autism spectrum disorder between the ages of 2 and 16. To accomplish this, I surveyed various studies regarding different massage methods and measures of effects on autistic children. Articles examined included: a study that assessed the level of reactivity children expressed prior to, and after, receiving various forms of therapy, multiple studies assessing the effectiveness of different forms of massage developed by researchers in improving attentiveness of autistic children in school settings, studies which looked at the effect of massage therapy in decreasing anxiety often expressed in autistic children, studies that assessed the impact of massage therapy on the communicative abilities of autistic children as well as examined the relationship between autistic children and their parents, and a meta-analysis which reviewed the validity of other studies regarding massage therapy and its benefits in treating symptoms of autism in children. The studies suggest that massage therapy seems to be an effective treatment to decrease the off-task behavior of autistic children in school, to assuage anxiety, to ameliorate hyper-sensitivity to external stimuli, as well as to further cement intimate bonds between children and their parents, although all acknowledge that their experimental design reduces the ability of results to be generalized. The meta-analysis concluded that there is not yet sufficient empirical data to provide any conclusive support for the benefits of touch therapy in treating autism. Current studies' findings suggest that massage is indeed therapeutic for autistic children, though they remain inconclusive; as such, these findings, and by extension, the potential benefits of massage as a therapy to mitigate obstacles autistic children face, merit more large-scale, empirical research.

9. A Review of Hip Resurfacing Arthroplasty and Total Hip Replacement for Younger Patients

Kayvon Mobarakeh, Biomedical Engineering, with Faye Prichard, Honors College

While Total Hip Replacement (THR) has traditionally been the primary surgical procedure for hip replacements, Hip Resurfacing Arthroplasty (HRA) is growing in popularity especially among younger patients. A few decades ago, hip replacement had generally been reserved for patients over the age of 60 with severe osteoarthritis or other hip dysfunctions. After hip replacement, these patients could expect limited mobility and a return to a much less active lifestyle. However, patients in their 40's and 50's have recently been getting hip replacement surgery with quite different expectations. Younger patients expect to return to an

active lifestyle and participate in sports such as tennis and downhill skiing. With the addition of a younger population of patients, it is necessary to evaluate the current perspectives on the different options regarding hip replacement and assess whether the traditional aspects of THR or the new methods of HRA are best fulfilling the expectations of younger patients. I selected and analyzed articles that primarily dealt with five core factors of the functional outcomes of hip surgery. These include: bone mineral density, metal ion levels, range of motion, quality of life and satisfaction, and restoration of normal hip anatomy. The results of this study showed that HRA is certainly an appropriate surgical procedure for younger patients as it preserves greater bone density in the femur, minimizes metal ion levels of cobalt and chromium, and allows patients to participate in sporting activities after surgery. It is difficult to isolate differences between HRA and THR because there are many inherent differences between the patient populations of both procedures. Research, for example, is often skewed in the HRA procedure's favor due to the lower age and BMI of its typical patients. A problem with HRA is that it is consistently associated with lesser ranges of hip motion, inhibiting the intensity levels of sporting activities. However, patients with HRA have high levels of satisfaction postoperatively as measured by surveys, insinuating that patients are still happy with the replacement despite certain downfalls. Although patients who receive HRA are happy with their procedures, more long term research must be conducted to investigate areas such as the magnitude of carcinogenic effects of high metal ion levels in order to form a concrete conclusion of which procedure is superior for younger patients.

10. Student Perceptions of the City of Richmond: The good, the bad, and the unsafe

Brennan Owings, with Reed Pongonis, Eric Rippel, and Matthew Cook, Business and Marketing, with Suzanne Makarem, School of Business

Successful branding of a city is a key factor in its desirability for future inhabitants, tourists, people considering jobs and students considering colleges in that city. Therefore, successful branding of a city can affect the performance of organizations operating in that city. One major component of brand value is the perceptions of the brand by its customers. The goal of our research is to examine perceptions of the city of Richmond by people living in the city; more specifically we want to find out how the students of Virginia Commonwealth University perceive the City of Richmond and its best and worst qualities. In 2012, we conducted a focus group and surveyed 100 VCU students to investigate their evaluation of different aspects of Richmond city. The focus group qualitative data indicated that safety is a major concern for students in Richmond and that student perceptions of the city might be affected by their age and whether they are younger than 21 years of age or not. The results of the empirical survey data analysis using SPSS, showed that safety is overwhelmingly the worst aspect of Richmond, as indicated by 48% of students in our sample. In total, 33% of participants thought diversity was their favorite quality, the highest of any quality. A Chi-square test did not support our hypothesis about differences between students under the age of 21 and those over 21 in their rankings of the best and worst aspects of the city ($\chi^2 = 4.725$, $p\text{-value} = 0.580 < \alpha$). We used t-tests to compare mean student satisfaction ratings for different aspects of the city on a 1 to 5 scale (1 being very dissatisfied and 5 being very satisfied). We found that restaurants were rated significantly higher (mean = 4.06) than all other aspects of the city including: Outdoors ($m=3.86$, $t\text{-statistic}= 2.283$, $p\text{-value}= .025$), Museums/Art ($m=3.78$, $t\text{-statistic}= 3.375$, $p\text{-value} = .001$), and Nightlife ($m=3.46$, $t\text{-statistic}= 6.675$, $p\text{-value} < .001$). These results indicate that the city of Richmond should focus on improving safety and focus promotion efforts on its diversity and its dining options.

11. Sociological Sexuality: An Appeal to a Wider Perspective on Risky Sexual Behavior within the Gay Community

Hannah Morgan, Philosophy and Sociology, with Jessica Gordon, University College

It only takes a quick scroll through your local Craigslist website to see that anonymous, risky sex among gay men is no rare occurrence. Our society views frequent, risky sex with strangers as an individual psychological issue, best handled by a mental health professional and possibly even diagnosed and treated as a sex disorder by a psychiatrist. However, in recent years, a growing field of research has shown that frequent, anonymous sex among gay men is less about the individual than it is an outcome of a prejudiced heteronormative society. In my research, I examine the dangerous norms which have developed in the subculture of gay men who have frequent, anonymous sex. I also investigate how our society has provoked these developments through the dichotomy of masculinity and femininity, the shame that accompanies marginalization, and the destabilizing effect of “coming out” in a heterosexist culture. I argue that the common perspective that homosexuality is inferior or wrong can become internalized by some gay men and in effect cause resistance to intimacy, visibility, and care and compassion for themselves. Additionally, I suggest that frequent gay anonymous sex can serve as an aggressive affirmation of masculinity and also a way to focus on the purely physical in order to avoid confrontation with one’s own homosexual identity.

12. The effects of sleeping position on infant general health and physiology

Kaitlyn Thomas, Biology, with Faye Prichard, VCU Honors College

The health and safety of infants is a concept that concerns multiple populations, from physicians to caregivers to family members. There are numerous aspects of infancy and infant care that have been studied and improved upon, though there are a few questions that have continued to remain unanswered. One such existing controversy is the best position to place infants to sleep in during the first six months of life. Infants are not always closely monitored during sleep, as parents must sleep as well, and so it is pertinent to know how to position them to ensure their health and safety throughout the night. The two prominent and stable positions are the prone and supine positions, and determining which of the two is better required analysis of research previously conducted on the subject. Researchers in physiological and pediatric fields have studied the effects of both positions, individually reporting results regarding specific consequences of each. Some have reported associations between positioning and the occurrence of illnesses, as specific as SIDS and broad as a fever, finding that sleeping in the supine position tends to reduce incidences; others have attempted to determine the physiological changes that result from each position and suggest the significances of such, resulting in the discovery of increased diaphragm thickness and decreased breathing capacity or decreased tissue oxygenation and impaired response to stress in the prone position. Each conclusion implied the superiority of one position over the other, and a total of eight sources, seven secondary based off primary research and one meta-analysis, were considered and incorporated into an overall decision of the best sleeping position. Although putting infants to sleep in the prone position has been advocated in the past, the supine position is better because it has no detriments when a balanced positioning policy is used, reduces the risk of SIDS, and has physiological benefits, such as reduced instances of illness, efficient respiratory function, and improved circulatory control. Therefore, the safest position to place infants to sleep in during the first six months of life is the supine position. While additional evidence of the superiority of the supine position is not necessary, further research into infant positioning

should still be conducted; though the research presented here provides suggestions, the true cause of the positional link to SIDS remains unknown, and discovering this would allow for a more complete understanding of physiological mechanisms, possibly aiding in prevention and decreasing infant mortality rates.

13. Strategies to improve oral health systems in rural Vietnam

Dylan Vu, Chemistry, with Faye Prichard, VCU Honors College

Oral health care systems seek to prevent and treat problems related to the mouth as well as restore teeth and the tissues that support the teeth. Oral health is important because it is closely related to general health and affects quality of life, food consumption, and physical appearance (Uetani et al., 2006). Poor, rural areas of the world especially do not have the oral health care system to keep up with the worsening oral health statuses of their people due to a lack of resources and/or infrastructure (Kandelman et al., 2012). Such is the case of Vietnam, where according to the National Oral Health Survey of Vietnam from 2001 and data from the World Health Organization, “large parts of the population of Vietnam must have incomplete natural dentitions” due to a high number of extractions and the average number of dental caries (cavities) is higher than the global average (Bhide et al., 2008; Nguyen et al., 2010, p.1). Rural areas of Vietnam are vulnerable because dental decay is prevalent but access to dental professionals is limited. While the oral health of individuals goes untreated, pain increases and quality of life deteriorates. This paper sought to create a plan for improving the oral health care system in rural Vietnam by analyzing a range of previously performed studies. The studies offered different perspectives and suggestions, which were then evaluated and compared to inspire new oral health strategies. One article provided a historical overview of Vietnam’s health care system as it transitioned from a planned to market economy, and another discussed health care issues that rural areas of Vietnam currently have. Multiple studies investigated the oral health status of Vietnamese people and two others analyzed the effectiveness of national health programs in rural areas. Moreover, several studies gave a general overview on oral health care systems and how to improve them. Results of the investigation reveal that although there are not many resources in rural areas of Vietnam to have a robust and sophisticated oral health system, a combination of preventive, structural, and curative strategies can help improve oral health in rural Vietnam. For example, preventive strategies include promoting school education programs and fluoridation treatment. Structural strategies offer changes to how the oral health system is organized, such as creating regional and local plans or using general health care workers to perform oral health tasks. Curative strategies include trying to restore teeth to a functional state instead of extracting them and emphasizing the importance of anterior teeth. Most importantly, the plan should be cost-effective and suit local priorities. Once an improved model is developed in rural Vietnam, it can be used as a model to improve oral health in poor areas around the world.

14. The Spoiler Effect

James Falls, Print Journalism, with Prof. Jeff South, Mass Communications

In today’s world of social media people evaluate modern film making more scrupulously than ever before. Months before a film even enters production there are people evaluating the screenplay online; hours after it premieres hundreds of reviews are accessible, and exponentially more if you include the countless bloggers, twitter posters, and discussion boards all over the internet; and every one of them attempt to make their own unique point. When there’s such a large amount of discussion occurring a problem arises. A problem that’s

been characterized by the same social media culture that accentuated it in the first place, and that is the problem of “spoilers.” The cognitive dissonance towards our generation’s greatest modern achievements in filmmaking that has swept over the social media landscape is extremely prevalent. Every day people will read spoilers and decide to skip watching, rationalizing, “I know how it ends” or “I know the best part.” While there are films and shows that when you find out those facts ahead of time it does make them somewhat irrelevant to watch, but the times where that’s the case, the work itself is what’s irrelevant. Films and TV series are artistic expressions meant to transport the viewer into a world where things outside the realm of possibility happen right in front of their eyes; only in that world, those implausible things make perfect sense. It could be a trailer, a review, a commercial, or even just a picture of the film set; potentially anything could spoil a movie experience. That then begs the question: how do you know the significance of a spoiler when you’re seeing it?

15. The New Fundamental Law of Hungary and its Effect on Social Cohesion

Veronica Peterkin, Biomedical Engineering, with Faye Prichard, VCU Honors College

During the Hungarian Revolution of 1956, citizens of Hungary stood side by side to revolt against Communism. Today, the Fidesz party, a right wing group that considers itself more moderate than the infamous Jobbik party, has a majority in Parliament as well as the presidency and recently proposed a new constitution that took act on January 1, 2012. Through analysis of survey studies and interviews conducted by researchers with citizens and scholars, I determined that social trust has decreased and the presence of racism has increased in Hungary during the past three years. Although the idea of passing the new constitution, *Fundamental Law of Hungary*, was appropriate since the nation is in need of a new constitution, the recent changes in Hungarian laws and government in the past three years has deteriorated social cohesion among Hungarian citizens by causing a decrease of social trust and an increase of discrimination.

16. Single cell analysis of HER2 mRNA transcripts with single molecule RNA FISH

Sarah Cameron, Biomedical Engineering, MIT Summer Research Program

The goal of this study is to investigate whether DNA copy number influences messenger RNA (mRNA) transcription level. To discover whether increased levels of mRNA transcription can arise from additional DNA loci, we compared mRNA transcription levels in three separate cell lines by using a high resolution single molecule fluorescent in situ hybridization (smFISH) technique. We compared mRNA transcript level of human lung epithelial cells, human mammary epithelial cells, and overexpression (SKBR3) cells. We choose these cells lines due to their DNA copy number. Our preliminary studies with high resolution DNA FISH found that human lung epithelial cells and human mammary epithelial cells have normal DNA copy number. Literature indicates that SKBR3 cells have additional copies of the HER2 loci (1). Previous studies have shown that additional copies of select genes, such as HER2, can lead to overproduction of protein, which is thought to be linked some HER2 related cancers (2). Increased levels of protein could arise from many points along the path from DNA to protein. Our research aims to use this single cell data to isolate and analyze the mechanism from DNA to mRNA, and gain a new understand of the overexpression of proteins.

1. Tseng P.H., Wang Y.C., Weng S.C., Weng J.R., 2012, Overcoming Trastuzumab Resistance in HER2-Overexpressing Breast Cancer Cells by Using a Novel Celecoxib-Derived Phosphoinositide-Dependent Kinase-1 Inhibitor, *Molecular Pharmacology*, **5**: 1534-154

2. Zhang Y., Gonzalez R., Zangar R., 2010, Protein secretion in human mammary epithelial cells following HER1 receptor activation: influence of HER2 and HER3 expression, *BMC Cancer*, 11:69

17. Future Funding for the Farm-Fox Experiment

Katie McAndrew, Biology, with Faye Prichard, VCU Honors College

The Farm-Fox experiment is a fifty year old ongoing experiment based at the Institute of Cytology and Genetics in Novosibirsk, Russia that has expanded the scientific community's knowledge of the genetics/process of domestication. The experiment has provided a valuable resource for ongoing experimentation, by creating a domesticated population of silver foxes through selection solely for friendliness towards humans. Despite its contributions and value, the experimenters are experiencing difficulty obtaining enough funding to maintain the large population of domesticated foxes because of the economic state of Russia, and the cost of maintaining/waning interest in long term experiments. In an effort to solve the funding problem, surplus foxes are now being sold as pets. Due to the nature of foxes, the cost of obtaining one, and the rigidity of laws regarding the ownership of wild animals, the effectiveness of this method is questionable. I read five articles on the structure and results of the Farm-Fox experiment, considered two blogs regarding the funding crisis and the purchase of surplus foxes from the experiment, and analyzed a questionnaire required to obtain a pet fox. The relevance and value of this experiment appears to have been forgotten. Results from the Farm-Fox experiment support the "correlated by-product theory," which states that the ability of dogs to read human cues resulted as a by-product of selection for amenability. This has implications not only for those studying the evolution of dogs, or evolution in general, but also for those studying the evolution of humans into intuitive social beings. Due to recent advances in technology, a meiotic linkage map for the domesticated foxes is under construction. This map will allow improvement of the meiotic linkage map for dogs, and may lead to a better understanding of genetic diseases such as OCD, autism, and depression. Due to the value of the Farm-Fox experiment as a resource for furthering our understanding of various topics and the ability of that understanding to improve people's lives, it is pertinent that the international scientific community pull together to insure that this experiment receives the funding it needs in order to continue.

18. A Broken Model: Solving America's Airport Security System

Danielle Honings, Biology, with Faye Prichard, VCU Honors College

In the wake of the September 11, 2001 terrorist attacks, the need for heightened security in all aspects, especially for airports, created reciprocal tensions amongst air passengers as resentful Americans looked to President George W. Bush for answers. As the Homeland Security Alert Code escalated in threat level and airline ticket sales continued to plummet, only the

assurance of a new security system could offer a temporary saving grace for airlines in the United States. In response, body scanners arose with the intentions and promises offering speedy checking times and processing large volumes of people at once, however, the implementation of these scanners comes with a hefty list of consequences. Although doing away with body scanners entirely is probably not feasible, we should limit and reduce their usage in the US airport security model because the costs outweigh the benefits, they cause privacy and health concerns, and there are much better alternatives to add and even replace them. I analyzed sources from departments in the United States government, including the Department of Homeland Security, and among the leading scientific journals, most notably the *Journal of Transportation Security* and the *Law and Security Review*. In approaching this question from varying angles, I concentrated my research on sources offering general information about the Israeli and American airport security models, sources arguing in favor of low-tech solutions, sources concerning true public opinion, and sources describing the effectiveness of mixing security techniques. The body scanners are extremely expensive considering the current TSA's budget proposals and the Homeland Security section of the US budget. For all that the manufacturers claim about the scanners, especially speedy scanning rates and the complete detection of explosives and triggers on the body, they have not lived up to expectations set by the manufacturers. In addition, the body scanners work by emitting low-dose backscatter radiation, and there are concerns about possible long-term health effects. Privacy issues have also arisen in response to evidence suggesting that sensitive photographs taken by the scanners have been kept despite the manufacturer's reassurances. Although the US has poured much money into the body scanners, all is not lost, as there are still a myriad of other alternatives that can be explored to ensure the safety of airport passengers and workers. Among these options include: behavioral detection techniques, the Computer Assisted Passenger Pre-screening System (CAPPS), the privatization of airport security, improved baggage screening techniques, Express Checks for frequent flyers, a profile for illicit drug traffickers and sky-jackers, and a special interviewing process for identifying potential threats.

19. Odor Discrimination Between Old and Young Mice

Thien Thanh Nguyen, Chemistry, with Dr. Richard Costanzo, Dept. of Physiology and Biophysics

It is well established that human olfactory function declines with age. Major impairment has been found in over 75% of adults who are greater than 80 years old. Recent data from a study of old mice (> 2 years old) has shown a disruption of odorant receptor mapping in the olfactory bulb. To test the hypothesis that old mice have impaired olfactory function, we measured their performance on an odor discrimination task. Two groups of mice were studied: Group A, 2 months old (N=7) and Group B, >2 years old (N=7). Mice were first trained overnight to discriminate between a target odorant (S+, phenylethyl alcohol) associated with a reward (liquid Ensure), and a second odorant (S-, geraniol) that they were trained to ignore. They were tested 24 hours later with S+ and S- stimuli randomly presented for a total of 100 trials in a single session. Test sessions were repeated every other day for a total of 8 sessions, or until the mice achieved a performance criteria level (>80% correct) for three consecutive sessions. After the 8th session, none of the young, Group A mice had achieved criterion performance levels on the odor discrimination task. However, four out of seven of the old, Group B mice reached criterion levels on or before the 5th session. In contrast to our hypothesis, these data demonstrate that old mice performed better than young mice on this odor discrimination task. The observation that none of the young mice were able to learn this task suggests that a modification of experimental design may be required. Future studies are needed to determine if additional non-olfactory variables contributed to these findings. This work was supported by the Richmond Eye and Ear Foundation and the HERO Summer Research Program.

20. The child welfare system: problems and solutions

Rebecca Ribley, Social Work, with Dr. Janet Hutchinson, Wilder School of Government and Public Affairs

The child welfare system has a long-standing reputation of letting children fall through the cracks. The general public has a negative regard for the system and its flaws, yet its workers are upheld as noble and ethical, completing a task that only special people are capable of. The following includes a review of the literature in hopes of discovering what the specific problems are that inhibit the child welfare system from being effective. They include internal flaws such as lack of funding, high turnover and heavy caseloads. The child welfare system's problematic relationship with the court system also diminishes efficiency and effectiveness in the serving of clients. The problems taxing this relationship, critical to the lives of vulnerable children in the child welfare system, include inherent organizational conflicts, negative attitude, lack of experienced legal professionals. The overall themes affecting the child welfare system both internally and in its relationship to the courts are low ascribed status of child welfare professionals which leads to a lack of funding, high caseloads, high turnover rate, lack of experienced workers and therefore poor continuity in the system. The National CASA association is suggested as an intervention to the problems the child welfare system faces. Personal experience as a CASA volunteer as well as research on CASA's effectiveness is examined. Overall CASA could provide the foundation of an effective intervention to many of the problems the child welfare system.

21. Love the One You're With: Rejection and Trait Forgiveness Predict Partner Attraction

Priya Lall and Chelsea Reid, Psychology and Criminal Justice, with Dr. Jeff Green, Social Psychology

Rejection presents a strong belonging threat, but how do individuals regain a sense of belonging? Would you be more attracted to a partner in an existing relationship if you were rejected by others? Participants completed a measure of trait forgiveness and were then asked to write either about a time they were rejected or accepted by someone other than their romantic partner. After the rejection manipulation, participants completed questionnaires regarding their feelings toward their current romantic partners. Participants reported greater attraction to their partners following the rejection manipulation, and the effect was moderated by trait forgiveness. When participants possessed low levels of trait forgiveness, rejection resulted in greater attraction toward their partners. The results suggest that existing relationships may act as a buffer for unforgiving individuals who experience an interpersonal rejection by a third party.

22. Texting and driving co-occurs with driving under the influence of alcohol and recreational drugs

Kris Mason, Psychology, with Dr. Eric Benotsch, Department of Psychology

Many young adults text while driving. Previous research has documented relationships between texting and driving and adverse outcomes including accidents and traffic-related fatalities. There is also a well-established literature on the risks of driving under the influence of alcohol and a smaller literature that examines the dangers of driving while intoxicated on recreational drugs. Previous studies have not examined associations between these different high-risk driving behaviors. The purpose of the present study was to assess the prevalence of

texting while driving in a young adult population, assess consequences reported by individuals who text and drive and determine if texting while driving co-occurs with other dangerous activities, including driving under the influence of alcohol and drugs. A brief survey was administered to young adults (ages 18-25) enrolled in undergraduate psychology classes at a large public university in the mid-Atlantic region of the United States. All surveys were completed anonymously online. The survey included questions assessing demographic information, cell phone ownership, substance use, and driving behavior. Among the 763 participants, the mean age was 18.9 years ($SD = 1.35$). The sample largely consisted of female participants (66%). The majority of the sample was white (52.9%), with the remainder being African American (19.3%), Asian American (12.3%), Latino/a (5.6%), Native American (0.1%), or other/mixed racial or ethnic heritage (9.7%). Overall, 83.9% of participants reported texting and driving (lifetime) and 51.8% reported texting and driving in the past week. Furthermore, 50.5% of participants reported intentions to text while driving in the coming week. Participants reported negative consequences of texting and driving, including swerving outside of their lane (49.7%), running a red light (28.9%), rear-ending another car (14.7%), and hitting a pedestrian (2.8%). Participants who reported texting and driving in the past week were significantly more likely to report driving under the influence of alcohol (lifetime), 30.1% versus participants who reported no texting and driving in the past week (16.0%), $\chi^2 (1, N=763) = 21.53, p < .001$. Similarly, participants who reported texting while driving in the past week were more likely to report driving under the influence of recreational drugs (28.9%) than individuals who did not text and drive (16.8%), $\chi^2 (1, N=763) = 15.71, p < .001$. Results showed high rates of texting and driving and future intentions to text and drive in young adults along with considerable negative consequences of texting and driving. In addition, this behavior was part of an overall high-risk driving pattern that included driving under the influence of alcohol and drugs. Intervention programs to warn young drivers about the dangers of texting and driving are needed. Our findings also suggest that information about texting and driving may be useful to incorporate into existing programs aimed at problem drivers (e.g., drinking and driving intervention programs) particularly if these programs are directed at young adults.

Our purpose was to assess the prevalence of texting and driving in young adults and determine if this behavior co-occurs with other dangerous driving activities. Overall, 51.8% reported texting and driving in the past week. These individuals were significantly more likely to reporting driving after using alcohol or drugs ($ps < .001$).

23. FDA Regulation of Direct-to-Consumer Advertising of Prescription

Drugs

Ritu Pandey, Biology and Economics, with Faye Prichard, VCU Honors College

Direct-to-consumer (DTC) advertising is the marketing of pharmaceutical drugs directly to patients. The Food and Drug Administration (FDA) is the body responsible for regulating this type of marketing by ensuring ads are truthful and contain the appropriate information needed to properly inform patients in the United States. Much controversy has been raised about such advertising because to date the only two nations that expressly allow such promotion are the United States and New Zealand while all other nations have a ban on DTC advertising. Limitations on DTC advertising exist because for most of the twentieth century pharmaceutical companies only marketed their products to physicians, as the idea of marketing drugs directly to consumers was taboo. However within the last twenty years DTC advertising of prescription drugs has gone from being a rarity to being one of the most widespread forms of advertising in

the United States, especially considering that many medications are now advertised as commonly as fast food and automobiles. While DTC advertising has grown in popularity, opposition to such promotion has grown as well. Multiple studies evaluating the adequacy of the FDA's review of DTC ads; their implementation of new regulations on DTC ads over the last few decades; spending on the promotion of prescription drugs in the pharmaceutical industry; and the consumer perception of the information presented in DTC ads were evaluated to assess the importance of the FDA's regulation. Although critics of DTC advertising of prescription drugs believe that such practices can be misleading and may cause the overuse of certain drugs, this is an advertising technique that pharmaceutical companies should be allowed to employ with limited FDA regulation because of the great educational potential such ads have and the increased doctor-patient interaction they create. Since the introduction of DTC advertising to the market, there has been much debate over whether it should be more strictly regulated by the FDA because many consumers feel ads are cryptic, exaggerate benefits, downplay risks, and are misinforming. However advocates for DTC advertising feel it has a great educational potential and that it is one of the most honest forms of advertising. Supporters of DTC advertising also argue that it spreads public awareness of the availability of treatments and it encourages people to talk to their physicians about health problems. Thus it is important to explore whether pharmaceutical companies should be allowed to directly market drugs to consumers or if the FDA needs to implement more strict regulations.

24. Determinants of Music Preference

Shannon Minor, Fashion Merchandising, with Mary Mullins, University College

Turn on the radio or click play; your favorite song begins to fill your ears. You bob your head and maybe sing along, but do you question why you like the music you are hearing? Many research studies indicate that people's emotional states dictate their music preference; however, music preference is determined by a combination of a person's self view and the culture they are immersed in. As technology advances and the music delivery system evolves, music is able to be played more and with the option of new genres and songs. My theory is, picture a world without music, and you will witness an identity crisis and silence consuming mostly everyone. This paper explores how people's values and self-views are shifting due to the correlation between the transformation of the music delivery system and the evolution of culture to a more technology driven world. In order to understand the connections between music preference and personality, I looked at research studies that focused on neurological responses to music, psychology of music, and human identity in connection to music. With this research, I divided music listeners into two categories of active and passive listeners. I found that the juxtaposition of a human's need to be an individual while still fitting in with a group shapes how a person projects their values in their environment. Overall, the technocentric world that we live in has produced a human desire of instant gratification in a disposable world, acting as an umbrella over the understandings as to why people like the music that they do.

25. The Psychological Factors that Affect Makeup Usage and the Perception of Makeup in Different Situations

Devina Narang, Biochemistry, with Faye Prichard, VCU Honors College

Today 44 percent of American women feel uncomfortable leaving their homes without makeup on, whether they are going to the movies, gym, school, work, or even the beach. Makeup has become a source of oppression among American women, and we do not feel beautiful without it. What psychological factors affect makeup use and how do others perceive it? To answer this dichotomous question, I analyzed eight sources stemming from peer-reviewed journals. Two of the sources identify which psychological factors positively correlate to makeup usage. Seven of the sources explain the change in perception of women physically with increased makeup usage, and three of the sources explain the change in perception of women internally with increased makeup usage. The results specifically revealed a multitude of things. Low self-esteem, low confidence, and high levels of anxiety lead to increased makeup usage. Increased makeup usage positively correlates to attractiveness, femininity, and sexiness and negatively correlates to likeability, morality, and competence. Lastly, third party observers perceive makeup based on the following factors: situation, race, and time. This knowledge is very advantageous to women because they now know how to alter their makeup usage to receive specific perceptions or reactions to some degree. Also, psychiatrists and other health care professionals could use this information to help diagnose female patients' mental disorders such as general anxiety disorder and chronic depression. Next, this information could be used to help eliminate hiring bias present within businesses and corporations. To elaborate further, employers would be aware of their general subconscious preconceived notions and make conscious efforts to combat them by judging job applicants solely on merit.

26. Recovery and Preparedness in Natural Disaster Management

Llewellyn Salgado, John Bruton, Amanda Minard, Jessica Spence, Tyler Torres, Homeland Security and Emergency Preparedness, with Dr. Jason Levy, Wilder School of Government and Public Affairs

Communities such as Xeabaj II suffer greatly from natural disasters, because of the location of the land and the income level of the community we must teach and aid them in providing for themselves through preparedness. Natural disasters can strike any location at any time causing massive damage to cities and people. A natural disaster's impact is much worse on a small community such as the Xeabaj II village in Guatemala. Due to the small size of the village and low land levels are always in danger from flood waters and mud slides. On October 2, 2005 Hurricane Stan tore through the community and left hundreds of villagers stranded without food, water or shelter. There is no way to prevent a natural disaster, but we can better prepare individuals and communities in case one happens. Teaching people to keep emergency supplies of water and non perishable foods such as canned food and items like MRE's, that the military uses, could potentially save lives in a future disaster. Technological advances are also another great way to prepare for a disaster. If you visit your local camping store you will find water purifying tablets that can turn almost any dirty water into drinkable liquid in case of emergency. Villagers from Xeabaj II recall the flooding and large quantities of sinking mud: "On Wednesday [October 5,2005] we left with our children barley wrapped in sheets and a few belongings that we could carry" (Xeabaj II women's group, 2010). They were left without adequate shelter, food and supplies for days before outside communities were able to provide aid. Having your own emergency kit with some life saving supplies could have really made a difference in that time of need.

Rodriguez, James. (2009-2010). *Xeabaj II: Beneath the Rock and the Storm*. n.p: MiMundo.org. <http://www.mimundo.org/2009/10/31/xeabaj-ii-beneath-the-rock-and-the-storm/>

27. Why Japan Won't Give Up Whaling

Taylor Early, Graphic Design, with Prof. Faye Prichard, VCU Honors College

In 1986, the International Whaling Commission passed a moratorium that banned all commercial whaling. Ever since its passage, Japan has been the leading proponent for ending the moratorium, resuming the hunting and selling of whale meat for commercial purposes. Joined by only a few other pro-whaling nations, Japan has become the face of opposition to the numerous Western nations that support the moratorium, including the United States, inciting sanctions and negative international reaction towards Japan's foreign policy. This study is an examination of the reasons behind Japan's staunch commitment to overturning the moratorium in face of heavy international opposition, risking serious international goodwill in order to continue its practice of hunting whales. I examined the economic benefits (and possible consequences) of returning to commercial whaling, the political systems in place in Japan, how public opinion affects policy, the historical and cultural context surrounding the issue, and how Japan is attempting to sway the International Whaling Commission. By examining a mixture of academic papers and literature from experts in international and political studies, public opinion polls, and scientific and economic research, I find that Japan is heavily influenced by the historical and cultural significance of whaling, impacting its public's strong, positive opinion. This, in addition to the political systems in place force Japan to focus only on the domestic benefits of arguing for a return to commercial whaling, while the structure of the International Whaling Commission leaves that an unlikely goal, resulting in positive national opinion, but negative international opinion. By analyzing these various components, this project will help illustrate the complexity and importance of the issue to the Japanese people. Japan will continue to move forward in its attempts to overturn the moratorium, leveraging political votes, scientific research, and cultural significance in ways that can negatively affect the country's foreign image.

28. Factor H Cleavage by the *Treponema denticola* Protease Dentilisin: Understanding the Pathogenesis of Periodontal Disease

Sahil Aggarwal, Department of Biology, with Dr. Richard Marconi, Department of Microbiology and Immunology, VCU School of Medicine

Periodontal disease is an infectious condition that results in the inflammation and gradual degradation of gum tissue and alveolar bone. Caused by plaque deposits on teeth that harden into tartar to inflame gum tissue, the condition is highly pervasive, with 15 percent of US adults over 30 years of age exhibiting destructive periodontal disease. The abundance of *Treponema denticola*, a spirochete, in the oral flora is strongly correlated with disease severity. *T. denticola* binds to Factor H (FH), a negative regulator of the complement system, through its Factor H binding protein (FhbB) to evade complement-mediated killing. The protease dentilisin, produced by *T. denticola*, cleaves FH for reasons that are still being studied.

We hypothesize that dentilisin-dependent cleavage of FH may result in the local dysregulation of the complement immune system, leading to gum destruction. The primary goal of this research project was to identify the specific location of FH cleavage by dentilisin. Characterization of the complex interaction between *T. denticola* and FH may explain the molecular pathogenesis of periodontal disease.

29. Women's Rights and Human Security in Guatemala

Aleesha Maewall, Homeland Security and Emergency Preparedness, with Dr. Jason Levy, Wilder School of Government and Public Affairs

Imagine a life where stepping outside of the home is a personal war zone. For tens of years, Mayan women are forced to live in fear of rape, mutilation, sexual slavery, forced abortion, sterilization, etc. This affects the women of all ages physically, mentally, and emotionally. Gender targeted violence and a lack of women's rights not only hurts the community, but also hurts husbands, fathers, and brothers, and those who feel unsuccessful in protecting their loved ones. There is a lack of funding to investigate cases like these and failure of the justice system to enforce them. There have been fewer than 30 sentences, which includes both convictions and acquittals. Since the victims are not able to get sufficient action done by others, they must step up and make a difference on their own. 24-year-old Laura from Guatemala suffered abuse in home by an alcoholic father, dropped out of school, and mothered her eight siblings. She made up an excuse to get out of the house, and pursued an internship with the Defense of Indigenous Women (DEMI). Every day, Laura gets the rewarding experience of changing girls' lives within her community. Today, she promotes for women and adolescents, because she received an opportunity to work with a project implemented by Population Council Guatemala, a grantee of the UN Trust Fund to End Violence against Women. The goal of the project is to inspire indigenous young women to become faces of change within their communities. Much like Laura, several tortured young women have been saved and are not living a much better life. The United Nations Entity for Gender Equality and the Empowerment of Women have been working on several projects that have reached over 4000 girls in 45 Mayan communities in five states across Guatemala. Donations made through the UN Trust Fund of End Violence against Women are one of the primary sources of support for advanced projects combating this ongoing issue.

Guatemala: Young Mayan Women Shape the Future | UN Women. (2011, November 21). *UN Women | United Nations Entity for Gender Equality and the Empowerment of Women*. Retrieved March 6, 2013, from <http://www.unwomen.org/2011/11/guatemala-young-mayan-women-shape-the-future/>

Mychalejko, C. (2012, July 03). Guatemalan femicide: The legacy of repression and injustice. Retrieved from <http://truth-out.org/opinion/item/10131-guatemalan-femicide-the-legacy-of-repression-and-injustice>

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30. Assessing the Effect of Various Environmental Conditions on the Excision of SCCmec in Staphylococcus aureus

Mrinmayee Takle, Dept. of Biology, with Dr. Gordon Archer, Department of Microbiology and Immunology, VCU School of Medicine

Staphylococcus aureus is a pathogen which causes lethal infections in humans. *S. aureus* has developed antibiotic resistance through horizontal gene transfer of the mobile genetic element SCCmec. This element carries the gene *mecA*, which encodes for resistance to beta-lactam antibiotics such as methicillin. SCCmec, which varies from approximately 20kb to >60kb, inserts into a chromosomal *att* site at the end of the gene *orfX* and is mediated by site-specific recombinases CcrA and CcrB. *S. aureus* that carry SCCmec are designated as methicillin-resistant *S. aureus* (MRSA), and those without SCCmec are known as methicillin-sensitive *S. aureus* (MSSA). Spontaneous excision of SCCmec has been observed *in vivo* in anterior nares (nasal cavities) of patients. This study examines various conditions which can be used to impact the frequency of SCCmec excision. Plasmid model experiments using a tetM marker electroporated into the *orfX* deleted strain (AW8) were used to test excision frequencies. This study found that higher excision frequencies are induced by higher ethanol concentrations, higher NaCl concentrations, and lower (more acidic) pH ranges. If such conditions can be shown to increase the excision frequency of SCCmec from MRSA, antibiotics can be prescribed to treat the resulting MSSA.

31. Reducing Security Risks in Guatemala (Xaebaj I)

Steven DeFrancesco, Joseph Comstock, Patrick Lindrew, and Dylan Meadows Homeland Security and Emergency Preparedness, with Dr. Jason Levy, Wilder School of Government and Public Affairs

Guatemala is ranked by the World Bank and the United Nations as the third most murderous country in the entire world. In recent years, Guatemala has been plagued with illegally armed groups and organized gangs such as Mara Salvatrucha and Barrio 18. These gangs and armed groups have caused large amounts of violence and political disrupt within Guatemala. Corruption in the policing systems such as the National Civilian Police or "PNC" is said to be occurring because of these drug traffickers and cartels. The former Guatemalan President Alvaro Colom said that drug traffickers were not only responsible for the 41 percent of violent incidents in Guatemala, but also for corruption within the police ranks. Through research and interaction with the indigenous communities within Guatemala, we hope to find solutions to making Guatemala a safer place. We also hope to find sustainable solutions to the following questions: How can we fix the corrupt policing and judicial systems in place? How can we reduce the illegal drug market and the violent culture that has engulfed Guatemala? If we are able to get to the roots of these issues within Guatemala, then we may be able to help Guatemalan society move in a safe and positive direction.

32. Environmental and Genetic Variables Converge: Regional Trends Determine Alzheimer's Disease Prevalence

Ellen Korcovelos, Bioinformatics, with Faye Prichard, VCU Honors College

Research on Alzheimer's disease (AD) has recently begun to expand in the scope of variables considered in examining prevalence worldwide; many scientists argue prevalence is related to geographic distribution of its major symptom, dementia. For this reason, I

researched the components of AD and their specific effects on the regional trends of dementia. Evidence from nine peer-reviewed journal articles authored by both neurologists and environmental scientists reveals that researchers argue either the environmental or genetic effects of location on dementia prevalence. However, it appears the regional bias for the disease seen worldwide is caused by a combination of environmental and genetic factors. A singular factor of AD cases varies among different regions of the world, yet always takes a role in prevalence rates: a population's ability to age. National development and modernization allow for a heightened life expectancy; therefore, the prevalence of AD has risen throughout those regions of the world that exhibit these characteristics. Likewise, as a population ages beyond 65 years old, the frequency of genetic influence increases as a result of the Apolipoprotein E. Together, the environmental and genetic factors of AD converge as one component stimulates the other. Thus, because the development of AD is determined by the aging of an individual, more efficient, accessible, and affordable methods of detecting dementia symptoms must be investigated. Observing AD results from both environmental and genetic characteristics, a systematic test that considers both variables would best lead to earlier detection of the disease in countries where its prevalence is more concentrated.

33. Caregiver Sleep and Pediatric Asthma Management in African American, Latino, and non-Latino White Families

Nnedinma Nwobodo, Psychology, with Dr. Robin Everhart, Psychology

Background: In comparison with non-Latino White (NLW) children, African American and Latino children have much higher asthma rates and can experience worse asthma symptoms. As pediatric asthma is managed by the child's caregiver, caregiver functioning, and in particular, sleep quality, has important implications for a caregiver's ability to effectively manage child asthma.

Objective: The purpose of this study was to examine racial and ethnic differences in caregiver sleep, as well as the association between asthma management efficacy and caregiver sleep.

Methods: Participants consisted of 102 caregivers and their children with persistent asthma (children aged 6-15 years). Thirty-three percent of caregivers were African American, 23% Latino, and 44% Caucasian. Caregivers answered an asthma management efficacy questionnaire and questions related to sleep disruption because of child asthma.

Results: Frequency of sleepless nights and being awakened at night because of child's asthma differed by race/ethnicity ($F(2,98)=8.13$, $p<.001$; $F(2,98)=4.96$, $p<.01$), with NLW caregivers experiencing better sleep. Caregivers who were sure they could get their child to a doctor's appointment experienced less sleepless nights ($r=.26$, $p=.002$) and less night awakenings ($r=.26$, $p=.008$).

Conclusion: Findings suggest that Latino and African American caregivers may experience more difficulty with sleep because of their child's asthma. Reasons for these differences might include issues related to urban living or more severe child asthma. Research should focus on the sleep of caregivers of children with asthma, as it may have an impact on a caregiver's ability to manage child asthma, which can lead to poor child asthma outcomes.

34. Using Nanoporous Gold as a Sensor to Make Electrochemical Measurements in Biologic Solutions

Jay Patel, Dept. of Biology, with Dr. Maryanne Collinson, Dept. of Chemistry

Nanoporous gold (NPG) serves as a useful material for applying electrochemical measurements to biomedical applications. NPG, which have pores that range from 10-50 nanometers, are made through exposure of 12 karat gold leaf to nitric acid. UV light treatment and electrode preparation follow, which ultimately result in a functional NPG electrode. A method used to determine the properties of NPG is cyclic voltammetry (CV) which is performed over a period of time in bovine serum albumin (BSA), porcine plasma, and porcine blood, to determine the extent of biofouling (the decrease in the rate of exchange of electrons between the electrode and the surrounding solution) of these electrodes. Minimized biofouling is necessary for a functional NPG electrode. CVs for NPG electrodes exposed to biological fluids display minor deviation from the CVs of electrodes not exposed to the biological fluids, showing that NPG effectively resists biofouling and allow electrochemistry measurements to be made in such complex solutions. Current experiments involve measuring reduction-oxidation potential in biologic solutions. A baseline redox potential value in the blood of various animals and humans will be obtained, so any alterations in physical condition can be conceived as a deviation from the baseline value. The purpose of constructing NPG electrodes is to have a sensor that effectively measures redox potential in a sample of blood as a means to gauge patient condition.

35. Sol-Gel Assembly of Ag Hollow Particles into Ag Aerogels

Hien Luong, Dept. of Chemistry, with Dr. Indika Arachchige, Dept. of Chemistry

The ability to assemble nanoparticles into functional structures is an important challenge that needs to be addressed for the generation of nanoparticle-based devices. Sol-gel method represents a facile yet powerful strategy for the self-assembly of metal oxides, chalcogenides, and metal-semiconductor hybrid nanoparticles into three-dimensionally connected porous nanostructures. In contrast to traditional metal oxides, where gel structures are formed by hydrolysis and condensation of molecular precursors, gelation in non-oxidic systems (with the exception of carbon), is achieved by condensation of the pre-formed nanoparticles. In this study, the application of later strategy for the assembly of Ag hollow particles will be discussed. Preliminary characterization of the resultant Ag aerogels is done using powder X-ray diffraction, transmission electron microscopy, infra-red and Raman spectroscopy and the surface area and porosimetry. The effect of synthetic parameters on the primary particle size, morphology, surface area, and optoelectronic properties of metallic gel networks will be discussed.

36. Mangrove forest age as a predictor of overwintering habitat quality for migratory songbirds

Ryan Weaver, Environmental Studies, with Dr. Lesley Bulluck, Dept. of Biology

Wetland ecosystems are critical habitats for a host of organisms including resident and migratory birds. Forested wetlands (i.e., mangroves) surrounding Panama City, Panama are currently being drained and cleared to allow for commercial development. Restoration or

replacement of mangroves (i.e. younger stands) may not be a sufficient surrogate for existing mature stands. Our main objective was to determine if mature mangrove forests provided higher quality habitat to (wintering) birds compared with younger mangroves. To assess this, we compared the following in mature and young mangroves in Panama (1) Prothonotary warbler and Northern waterthrush body condition, our most abundant species, and (2) feather reflectance criteria (specifically, carotenoid content) in prothonotary warblers occupying both types of mangroves. Carotenoid pigments are an honest indicator of the overall health and condition of a bird. By comparing reflectance of the carotenoid-pigmented breast feathers of prothonotary warbler, we are using feather reflectance as a proxy for an individual bird's condition). After accounting for sex and age differences in our model, breast feathers from prothonotary warblers in mature mangroves had higher carotenoid content than feathers from prothonotary warblers occupying younger mangrove stands. Site occupancy strongly predicted body condition of prothonotary warblers in our study, such that, mature mangroves supported birds in better body condition than younger mangrove sites. Together, these results suggest mature mangroves offer higher quality habitats for migratory songbirds during their overwintering period.

37. The Benefits of Working as an Undergraduate Teaching Assistant at VCU

Benjamin Ballou, Dept. of English, with Professors Peter Henry and Thad Fortney, University College

This project addresses the ability of the Undergraduate Teaching Assistant (UTA) program at VCU to train its participants to become leaders in and beyond the classroom. Data was collected through the use of an online survey that the UTAs were asked to fill out. The data collected shows how participating in the UTA program affects the UTAs themselves, as well as how the UTAs perceive their role affects their faculty mentor's teaching and their students' learning. This project examines the UTA's individual roles as well as illuminates how Undergraduate Teaching Assistant programs, if implemented in more colleges today, would be an effective new approach to teaching as well as raising leaders in higher education.

38. The Posthumous Reputation of J.D. Salinger

Allison Dae Newman, Dept. of English, with Dr. Bryant Mangum, Dept. of English

After years of personal and professional seclusion, J.D. Salinger's 2010 death may have sparked fresh interest in the author and hopes of new revelations about his life and work. Yet there has been little information about Salinger's unpublished writing. Meanwhile, in the final years of his life, publications such as Margaret Salinger's memoir *Dream Catcher: A Memoir* sought to shine light on Salinger's personality life. But do they succeed, or do they further the mystery and legend surrounding Salinger? With my project and poster, I will research Salinger's reputation in the final years of his life, and how his recent death has affected his reputation as a man and as an author. I will discuss both the development of scholarly criticism about Salinger and his works and non-scholarly publications such as websites and Margaret Salinger's memoir.

39. Condom Use & Negotiation Among African American College Students

Cherelle Wright, Depts. of Psychology and Sociology

In the past quarter century, AIDS has impacted African Americans more than any other racial group (Fullilove, 2006). Blacks account for about 13 percent of the U.S. population, yet make up fifty percent of the latest AIDS diagnoses. While Blacks are disproportionately infected with HIV, they also tend to have more negative outcomes after contracting the virus. They are less likely to seek medical attention swiftly, which increases the likelihood of being hospitalized and their chances of dying from causes related to the HIV virus (Fullilove, 2006). There are many factors which contribute to the vast disparity of HIV infection among African Americans, including societal conditions, community dynamics, and personal decisions (Fullilove, 2006). One of the most important personal decisions is the use of condoms, which play a strong role in protecting one against the HIV virus. However, there are many individuals who have negative attitudes towards condoms and do not use them on a regular basis. This study examined this phenomenon among African American college students. It examines whether the Raise 5 Project, a HIV prevention program for Black students at Virginia Commonwealth University, could help increase rates of condom and negotiation skills. More specifically, this study examined whether condom negotiation skills were associated with condom use among African American college students after participating in one of three evidence based interventions, Nia, Sista, or Safe in the City. It was found that condom negotiation was positively correlated with condom use, suggesting that the more negotiation skills one has, the more likely that they will use condoms. These findings have implications for methods of increasing condom negotiation skills and actual condom use among African American young adults.

40. Food For Thought: Organic food supply waste expenditure in the U.S.

Chris Quinn, Dept. of Business Administration, with Prof. Mary Mullins, University College

The United States of America wastes up to \$165 billion annually on food waste (Ahmed Shihab-Eldin). Many people would be surprised if they actually know the reality behind the largest contributors. Predominantly food retailers are the largest offenders and even more specifically organic food retailers have the largest contribution of them all. Organic establishments often present themselves as eco-responsible. As shown by mission statements and posted store values such as, "Whole Foods Market is a dynamic leader in the quality food business. We are a mission-driven company that aims to set the standards of excellence for food retailers." What the "dynamic" retailers don't express is the negative effects from all of their food waste. In my research I read though a lot of material uncovering this theory through many different social mediums. I read peer reviewed journals in food waste, economic aspects, videos, and even government documents. All of these resources had a part leading to this idea behind the waste. Looking more in depth it can be seen that although these retailers have good intentions, a combination of different factors that force the consumer to have a heavy influence on the waste. Factors such as in store liabilities, restricting government policies, shelf life/expiration dates, and most heavily the consumer's preference all have an influence. Consumers' fluctuating demand, high quality and quantity expectations, and accessibility drive the waste higher year after year.

41. Cell Surface Hydrophobicity of Bacillus Spores: Novel Forensic Signatures for the Holistic Characterization of Bacterial Threat Agents

Cristina Stanciu, Forensic Biology, with Dr. Christopher Ehrhardt, Dept. of Forensic Science

The goal of this study was to test whether the cell surface hydrophobicity could be used to identify different species/strains of biothreat agents and characterize forensically relevant aspects of the organisms' culturing environment. Spores from four different species of *Bacillus* (*B. cereus*, *B. thuringiensis*, *B. anthracis*, *B. subtilis*) were cultured using three different medium recipes (G Medium, Casein Acid Digest, and 1x Schaeffer's Medium). The cell surface hydrophobicity of all samples was then measured using Microbial Adherence to Hydrocarbon (MATH) and Hydrophobic Interaction Chromatography (HIC) techniques.

Results from the MATH assay showed that most *Bacillus* species showed a distinct range of hydrophobic retention values to hexadecane during an organic extraction. *B. cereus* spores ranged from 30 to 38%, *B. anthracis* from 35 to 40%, *B. thuringiensis* from 42 to 51%, and *B. subtilis* from 0% to 6%. Conversely, HIC tests revealed that growth in different medium formulations changed the surface chemistry of the spore such that each culture displayed different adsorbance capacities to sepharose beads. Growth in G Medium (formulation without enzymatically digested protein source) yielded spores with significantly higher HIC hydrophobicity compared to spores grown in media supplemented with peptone or tryptone (80-88% and 25-40%, respectively). Taken together, this indicates that MATH and HIC are powerful techniques for determining both the taxonomic identity of an unknown biothreat agent and phenotypic signatures that can assist in the forensic attribution of the organism.

42. Direct Analysis in Real Time-Mass Spectrometry (DART-MS)

Kristin Asal, Dept. of Chemistry, with Dr. Christopher Ehrhardt, Dept. of Forensic Science

Direct Analysis in Real Time-Mass Spectrometry (DART-MS) is a promising technique for rapid characterization of unidentified bacterial agents. Because there is little to no sample preparation and ionization occurs under ambient conditions, DART-MS may be used in a variety of biodefense and forensic applications. The goal of this study was to test whether DART-MS could be used to analyze *Bacillus* spore preparations by identifying the species present and any compounds that are uniquely associated with the culturing method. *Bacillus cereus* spores were cultured and then purified by centrifugation through a Renografin (Meglumine Ditrizoate) gradient. DART-MS was then used on whole spore suspensions and mass spectra collected in the range of 50-1000 m/z.

Results showed that mass spectral profiles of whole spore suspensions consisted of complex lipid assemblages that included branched-chain odd, branched-chain even, and straight-chained fatty acids. The relative ratios of fatty acid structures were indicative of the species. Lastly, meglumine ion (m/z 196) was detected on all spores purified with a Renografin gradient. Both fatty acids and meglumine were detected in bacterial concentrations as low as 1×10^8 cells/mL. Taken together, these results suggest that DART-MS can be a powerful tool for taxonomic characterization of unidentified spores as well as detecting compounds that are specific for a spore's production process.

43. The Effect of Geometry on Alveolar Lung Modeling Under Ventilation

Matthew Burnette, Mechanical Engineering, with Dr. Ramana Pidaparti, Dept. of Mechanical Engineering

The lungs are very complicated organs, which undergo large deformations during breathing. Computer models allow for easy implementation of new research methods before in vivo testing is conducted. This project modeled a human alveolus and simulated it under mechanical ventilation. The results were compared to a spherical model. The fluid only results agreed very closely with each other, so if only a fluid analysis is being conducted, the shape of the alveolus is negligible. However, the alveolar wall stresses differed by nearly a factor of 100, which suggests geometry greatly affects the stresses found in the lung's alveoli.

44. Molecular dynamics simulation of radiation damage of silicon crystals

Viatcheslav Orlov, UROP Fellow, Mechanical Engineering, with Dr. Brian Hinderliter, Dept. of Mechanical and Nuclear Engineering

We studied the effects of radiation damage on semiconductors, which resulted in crystalline defects, changes in the conductivity of the transistor's gate and fundamentally degrading semiconductor operation. The semiconductor studied was silicon with boron used as the dopant. The reduced transistor gate size in newer integrated circuits makes the impact more serious.

The radiation decay of interest was that of an excited state of boron-11m that decays into a lithium-7 and helium-4 isotopes, along with a great deal of kinetic energy given to each of these isotopes to cause silicon crystal lattice damage. A model was built and studied using molecular dynamics (MD) software. This package allowed creation of atomic system using the modified embedded atom model (MEAM). Virtual experiments enabled new research techniques and comparison with physical experiments. An MD simulation included developing the potentials of boron within the semiconductor. The displacement of the semiconductor silicon atoms is compared to the damage simulated from an external radiation source.

Another aspect of the research was measuring of the change in bulk semiconductor characteristics and developing a holder for measurements based on spectral impedance, which were indicative of the type of damage the semiconductor received and compared to the MD simulations predictions of change in conductivities. A wafer holder was manufactured previously for impedance measurements, but was remodeled and fabricated to use room temperature ionic liquid (RTIL) contacts. Some impedance measurements have been done, and additional measurements will be done using a frequency range from DC to 100 kHz on a Gamry Reference 600 spectrometer.

45. Parental stress and child behavior

Jakwame Carey, Tess Drazdowski, Katherine McClay, Alexandra Dahl, Dept. of Psychology, with Dr. Wendy Kliever, Dept. of Psychology

Research has shown that parent stress negatively affects their children's behaviors, specifically aggressive behavior. The literature also suggest that how accepted or rejected a child feels is related to both parenting stress AND the children's problem behavior. Our poster will examine if child acceptance or rejection mediates the relation between parenting stress and youth's physical and non-physical aggression. Two mediation models will be analyzed using regression analysis. The researchers hypothesize that the level of child acceptance or rejection will mediate the relation between parenting stress and both physical and non-physical aggression. Results from this study will hopefully inform parents that stress does result in adverse child behaviors; parents can change the way they interact with the child so that stress doesn't affect the child's feelings of acceptance or rejection thus reducing the child's problem behaviors.

46. Hawala and Underground Terrorist Financing Mechanisms in Belgium: A Multiple Criteria Decision Analysis (MCDA) Approach to Reducing the Threat

Daniel Ku, Political Science and International Relations, with Dr. Jason Levy, Wilder School of Government and Public Affairs

A large influx of Muslim immigrants (from Algeria, Morocco and Turkey in particular) were coined as the "New Belgium" in January 2012. These 2.8 million immigrants account for roughly 25% of the Belgian population (Verkiezingen, 2012). Muslim Immigrants are drawn to Brussels, Belgium because of a growing movement to establish an Islamic state in Secular Belgium. Reports estimate that by 2030, Muslims will be the majority political-religious group in Belgium (CBN, 2012).

Increasing resentment among native Belgians (Walloons and Flemish people) of the Muslim culture is largely stemming from the notion of incompatibility of Islam in secular Belgium. This paradox communicates a new perspective of Islam in Belgium in that it is not just solely packaged as a religion but its principles now distort public education, economy, and Belgian politics. It becomes problematic when the Muslim community isolates itself from the rest of the Belgian society who have traditionally advocated civic responsibility. While, it is natural to witness ethnic minority groups create enclaves, Islam in Belgium is a different case study because it affects so many facets of society. It is not the intolerance of Islam or discrimination against Muslims, but the inability of Muslim immigrants to adapt to the laws and customs of Belgium that makes the situation problematic.

In conjunction with this heightened animosity, Muslim immigrants use an underground monetary exchange system called "hawala." The word hawala refers to an informal monetary exchange system built on trust and personal networks. hawala transactions also benefit from more favorable exchange rates than regulated banks because they are not subject to many of the standard operating procedures that banks subject consumers to. They also do not charge any interest on loans, in accordance with generally held Muslim traditions. Hawala vendors

also do not forfeit any personal information about the consumer to any individuals including government officials (Glushchenko, 2005). This incentive has attracted primarily migrant workers across the world to send remittances back home through this exchange market because of the greater yield of consumer benefits that come with using a more direct system.

While, some are concerned that the lack of transparency in the hawala system has opened the gamut for terrorists to use these exchange systems to finance their operations. Terrorists, migrant workers and everyday people find solace in this unique trading mechanism because of a set of guaranteed shared principles that provide structure for the hawala system to operate: trust, confidentiality, efficiency and security (Glushchenko, 2005).

Thus, the scope of this research is focused upon examining the interactions between the “New Belgium” and native Belgians to gauge how the growing intolerance of each social group has lead Muslim individuals to use hawalas to fund terrorism.

47. The cycle of malnutrition in the Highlands of Guatemala

Kayla Vanhook, Dept. of Biology, with Dr. Jason Levy, Wilder School of Government and Public Affairs

Guatemala is in the top rankings for places in the world with the highest chronic malnutrition rates, coming in at number 4. This Service Learning Project will focus on the ongoing cycle of childhood malnutrition in the various communities of Guatemala. The issue with malnutrition is that if not addressed and solved, it often leads to mortality in children. Malnutrition in children starts with practices of the mother carrying the child. Oftentimes, when the mother was malnourished as a child herself, the child she is carrying will too become malnourished. It is a cycle that is difficult to break. Malnutrition in Guatemala often stems from the inability to maintain a healthy diet. In Guatemala, children most often suffer from malnutrition due to unhealthy nursing and bad eating practices, which includes limited access to drinkable water.

As a part of the Highland Support Project, The AMA, and Pop, infant and maternal well-being programs are in place to educate the women of Guatemala in leading healthy, sustainable lifestyles, to include eating practices in order to help solve the malnutrition issue. These programs that are put in place have absolutely helped to educate the local people of Guatemala on how to lead a healthier lifestyle for themselves and their children, but there is still an obvious need for additional methods to combat the malnutrition issue. One potential method could include distribution of nutritious supplements to help combat malnutrition closer access to treatment facilities to help depress child mortality rates because of malnutrition.

48. Assessment of the Motility Test Technique

Amanda Bristow, UROP Fellow, Clinical Laboratory Sciences, with Emily Hill, Immunology and Immunohematology

Motility testing is often a required component of routine identification algorithms to properly speciate microorganisms isolated from patient specimens. Although motility tests are simple to perform, interpretation is difficult and can lead to misidentification. The goal of this research project is to compare motility test techniques available for use in the clinical microbiology laboratory in regard to accuracy, ease of performance, and turnaround time. American Type Culture Collection (ATCC) strains and organisms isolated from patient specimens will be

tested. Results obtained will be used to recommend the motility test technique best suited for use in the clinical microbiology laboratory.

49. Affinity Reagents to Probe Molecular Recognition of Polyubiquitin Chains

Megan Reed, UROP Fellow, Dept. of Chemistry, with Dr. Ashton Cropp, Dept. of Chemistry

Ubiquitin (Ub) is a small protein that serves as a post-translational modification of lysine residues in eukaryotic cells. Once attached, oligomeric Ub chains can form at multiple lysines (K6, K11, K27, K29, K33, K48 or K63) to produce “signals” that modulate, traffic, and/or degrade protein function. We have recently embarked on exploring the structure of “atypically” linked poly-Ub signals and searching for potential receptors of these signals. Toward these goals we produced large quantities of Ub monomers, K6, K27, K29, and K33. These monomers were joined into linkages at their respective lysine residues by collaborators and subjected to small angle neutron scattering experiments to provide solution structural information. As a first step towards identifying poly-Ub receptors, a peptide phage display was panned against monomeric Ub. One successful selection has been completed. Subsequent analyses will focus on identifying peptide sequences that specifically bind poly-Ub signals.

50. A New Puzzle to an Old Solution for STEM Education

Robert Honeycutt, Mechanical Engineering, with Ramana Pidapari, Dept. of Mechanical and Nuclear Engineering

This project is collaboration among a high school student, an undergraduate student and a faculty advisor with a goal of developing an educational tool/toy to illustrate various geographic and environmental aspects as per VA SOL through a 3D puzzle. With recent interest in attracting students to pursue STEM fields, various organizations include NAE (National Academy of Engineering) and NRC (National Research Council) are emphasizing to innovate the curriculum and educational tools available to school teachers as well as students. The 3D puzzle project introduces a classroom tool/toy for K-12 education that emphasizes various aspects of geological and environmental aspects in an enjoyable and challenging fashion. Keeping children interested while educating them can help them retain more of what they learn and at the same time they will stay interested in learning longer. The 3D puzzle was designed in three layers using Autodesk Inventor software, each one having different educational aspects and geometry pieces to assemble them, and prototyped through 3D printing. A poster presented at the symposium would illustrate the design, development, and the prototype in a manner that highlights its educational value to K-12 teachers/students specializing in STEM.

51. States of mindful awareness improve episodic memory recognition accuracy.

Jacqueline Hoyt, Dept. of Psychology, with Dr. Robert Goodman, Dept. of Psychology

Attention and memory play a central role in the way people consciously experience their everyday lives. Research suggests attention influences memory encoding and memory recall.

The present study examined whether a particular quality of attention known as mindfulness -- an open and receptive awareness to the present-moment-- would influence the accuracy and recognition experience during episodic memory recall as measured by the remember-know paradigm. After completing a battery of self-report measures, participants were randomly assigned to receive a mindfulness induction or an active control induction. Next, participants viewed 60 random pictures (learning phase), before taking a recognition memory test about the pictures (test phase). Before the learning and test phases participants listened to a condition-specific audio induction over headphones. During the test phase, if the participant indicated recognizing a picture, they were asked to state whether they vividly relived their past experience of viewing the picture, or whether they just had a gut feeling of familiarity that the picture had been presented before. Compared to participants in the control condition, participants who received the mindfulness induction had significantly better memory accuracy, and had significantly more accurate memory when experiencing gut feelings of familiarity. These effects held even after controlling for attentional control, suggesting the improvement in episodic memory accuracy was specific to mindfulness. These results contribute to a growing body of literature linking mindfulness with adaptive cognitive functioning, and identify mindful awareness as a factor that improves episodic memory function.

52. "The Prison Child Dilemma: An Assessment of Human Rights Infringements and Custodial Autonomy in Bolivian Prisons"

Natasha Sheybani, Biomedical Engineering, with Prof. Mary Boyes, University College

The primary focus of this study is to assess the healthcare conditions and availability for imprisoned women and children in Bolivia. The international community has recently been faced with an overwhelming dilemma of children being subjected unjustly to prison conditions due to circumstances of parental incarceration. Commonly referred to as prison children, these dependents, ranging from newborns to adolescent minors in age, often follow their convicted mothers to prison due to lack of a better alternative. Research has indicated that while there is a tremendous threat to the safety, development, and general well being of innocent children residing in prison, one benefit includes that of remaining close to their mothers during key early emotional, physical, and mental development stages. Threats to these children persist in the categories of security and protection from abuse and sexual harassment, denial of rights to education, physical recreation, proper nutrition, and most importantly due medical attention. Deterioration of healthcare rights for women and children is currently one of the most significant sectors of human rights violations. Recent proposed legislative resolutions include development of an international prison monitoring system for nations that subject prisoners to sub-humane conditions due to socioeconomic disparities, birthing and childcare provisions for imprisoned mothers, mother-baby units in prisons, gender and child sensitive prison facilities, comprehensive record-keeping systems for children entering prisons, as well as availability of well-trained and more specialized medical staff to attend to the specific needs of women in prisons. A final resolution in this particular study will include that of development of a child welfare system specific to Bolivia that can be later adapted to other socioeconomically disadvantaged countries, modeled after the present system in the United States and nonetheless compatible with nations' respective resource bases.

53. "Photoinitiator effects on cytotoxicity and intracellular signaling transduction"

Natasha Sheybani, Biomedical Engineering, with Dr. Hu Yang, Dept. of Biomedical Engineering

Photopolymerization has been widely explored in biomedical and tissue engineering applications due to its widely held potentials in the biomedical field. Photoinitiators embedded within crosslinked scaffold materials could potentially serve as a more effective alternative to present uses of gamma radiation for sterilization of implants and biomaterials. The purpose of this study was to evaluate the cellular toxicity and the intracellular response of three ultraviolet (UV) sensitive photoinitiators including eosin Y, 2-hydroxy-1-[4-(hydroxyethoxy)phenyl]-2-methyl-1-propanone (Irgacure 2959) and dimethoxyphenyl acetophenone (DMPA) as well as the subsequent degree of proliferation of free radicals on HN4 cells. WST-1 assay indicated that HN4 cells can tolerate a wide range of concentrations of eosin Y and low concentrations of Irgacure 2959 (≤ 1 mg/ml) but not DMPA. Consistent with these results, eosin Y displayed no effect on intracellular AKT inactivation, but both Irgacure 2959 and DMPA concentration-dependently induced intracellular AKT inactivation. To initiate free radicals, these photoinitiators were exposed to UV light at 365 nm with an intensity of 100 watts for 30 minutes. In all three photoinitiating systems, HN4 cells failed to maintain cell viability and intracellular AKT activity. To further demonstrate the stability of free radicals on cytocompatibility, cell culture medium was mixed with eosin Y to reach a final concentration of 25 μ l/ml, and this mixture was exposed to UV light for 30 minutes. The mixture was kept in the dark prior to exposure to the cells. The results illustrate that the free radicals can be stable up to 48 hours, and HN4 cells failed to maintain cell viability and intracellular AKT activity in the eosin Y photoinitiating system after UV exposure. In summary, these results suggest that eosin Y is able to stabilize intracellular AKT activity and cell viability in a wider range than Irgacure 2959 and DMPA. However, the free radicals introduced by UV light significantly inhibit intracellular AKT activation and induce cytotoxicity. Future studies will aim to overcome the cruciality of removing from or significantly limiting free radicals within the photopolymer before biomedical applications.

54. The Effects of Disasters on Youth Education and Development in Chichicastenango

Festus Boateng, Dept. of Forensic Science, with Swarna Chowdhuri, Christopher Harding, Ekta Patel, and Dillan St. Clair, with Dr. Jason Levy, Wilder School of Government and Public Affairs

Natural disasters impacting Chichicastenango have a significant impact on the education and development of youth. For example, landslides and earthquakes may damage schools and roads, thus creating unsafe conditions which prevent students from acquiring the expected schooling. This can have severe psychological impacts on students and may restrict their education opportunities. This was the case in 1976, where the students were given therapy to help them accommodate after the earthquake. Natural disasters may also lead to negative health outcomes in young people including malnutrition, infectious disease, and physical impairments. We will examine the role of NGOs, the private sector and government agencies in helping at risk students to become more resilient in the face of disaster.

After a disaster damages the local infrastructure and impact its residents, NGOs, the private sector, government agencies and international organizations such as the Red Cross may

provide emergency relief and help students return to their studies in school. One major source of aid are churches which provide shelter, food, clothing and good wishes to those in need. For example, Compassion Services International (CSI), provides relief to the disaster-stricken by distributing many necessary supplies such as water, medicines, and some luxuries.

Schools are an important vehicle for reducing disaster risk. For example, if Disaster Risk Reduction (DRR) principles are mainstreamed into the Kindergarten-6th grade curriculum then students can teach the lessons about vulnerability, threats, hazards and risk to their peers, family members, youth organizations, the lessons learned. This is extremely important since there are no vocational schools available. However, there is a practical program that is part of the standard educational system which can be taken advantaged off. Students from the ages 16- 19 for the last three years of their high school career can be involved in an internship, where the years are divided into the informational sections of the internships and the practical/ experience part of the internships. Students can get involved/intern in the many available organizations that deals with disaster management such as the Red Cross.

One solution is to reduce disaster risk in schools is to retrofit schools and the transportation network so that they are fortified against earthquakes and other natural disasters. Another solution would be setting up a backup area in which school can continue if the main buildings are damaged. Finally, the Red Cross can provide many types of training outside of the normal curriculum to supplement the students' knowledge in emergency preparedness, including triage, search & rescue, rappelling, debris removal, CPR, etc. The Red Cross can also offer informational classes to the families of the students in order "drive the point home".

55. "It'll Be OK": The Effects of Supportive Talk on Patient Perceptions of Physicians in Racially Discordant Medical Interactions

Grace Deniog, Psychology, with Dr. Nao Hagiwara, Dept. of Psychology

Background: In recent years there has been hopeful interest in using a patient-centered communication style to optimize medical visits. Patient-centered communication is associated with patients' positive views of their physicians. As a result, having patient-centered communication can influence the degree of patient adherence, which in turn can affect health outcomes. One of several styles that characterize patient-centered communication is for physicians to engage in supportive talk that legitimizes the patient's perspective and concerns.

Objectives: The main goal of the study was to explore whether supportive talk is associated with patients' positive views of their physician (i.e., warmth) and the interaction (i.e., patient-centered care, "being on the same team") in racially discordant medical interactions between Black patients and non-Black physicians.

Methods: 133 transcripts of patient-physician interactions from an existing longitudinal study of Black patients who interacted with non-Black physicians at a primary care clinic were coded for supportive talk (reassurance, encouragement, comfort) in the current study.

Results: Supportive talk was significantly and positively associated with perceived physician warmth, patient-centered care, and teamness, such that Black patients whose non-Black physicians engaged in more supportive talk reported greater perceived warmth, patient-centered care, and teamness, as compared to patients whose physicians engaged in less supportive talk.

Conclusion: The findings from the current study suggest that physicians may be able to improve patients' perceptions of them even in racially discordant medical interactions (which is often characterized as less positive than the racially concordant ones) by reassuring, encouraging, and comforting the patients. Thus, the findings further support the importance of training medical students on incorporating patient-centered communication in their practice.

56. The Effects of "Small Talk" on Patients' Perceptions of Physicians in Racially Discordant Medical Interactions

Katherine Kulick, Psychology, with Dr. Nao Hagiwara, Dept. of Psychology

Prior research has shown that patients who have positive perceptions of their physicians are more likely to adhere to the physicians' medical recommendations, as compared to those who have negative perceptions of the physicians. Importantly, these differences in adherence in turn can affect health outcomes. Thus, ensuring that patients perceive their physicians in a positive manner is critical for better health outcomes for them. However, unfortunately, research has consistently shown that Black patients who participate in racially discordant medical interactions with nonBlack physicians often report poorer perceptions of their physicians than those participating in racially concordant medical interactions. The current study examined whether the presence/absence of conversation unrelated to medical topics (small talk) is associated with Black patients' perceptions of the nonBlack physicians. The secondary analysis of 133 transcripts of Black patient-nonBlack physician interactions revealed that patients who engaged in small talk during the interactions, as compared to those who did not engaged in any small talk, reported more positive perceptions of their physicians. The implications for potential interventions that aim to improve Black patients' perceptions of nonblack physicians will be discussed.

57. The Viability of Craft as Career: Shoemaking in the 21st Century

Madeline Vaiden, UROP Fellow, Dept. of Fashion Design, with Prof. Henry Swartz, Dept. of Fashion Design

Hand shoemaking, like many other trades, has largely died out due to the widespread mechanization of the process. However, there are still individuals who practice the craft as a hobby and, increasingly, those who pursue it as a career. In this landscape of mass production, why have such a surprising number of makers been compelled to return to traditional techniques? Is it possible to build a career in footwear while forsaking faster machines and cheaper offshore labor?

To answer these questions, I traveled to Melbourne, Australia, a city with a remarkably large and diverse shoemaking community. While there, I apprenticed with a shoemaker in order to research the craft itself, while also interviewing a number of other shoemakers and craftsmen in the city about their craft and business.

Combining information gleaned from these interviews with analysis of wider trends in fashion merchandising and consumer behaviors, I came to the primary conclusion that the modern customer, while desiring apparel and accessories with a somewhat old-fashioned "heritage" aesthetic, is generally reluctant to pay the full asking price of something that is

handmade from start to finish. This makes it extremely difficult to build a career on shoemaking alone, especially in women's footwear. However, with ingenuity and given the right consumer atmosphere, it is possible to supplement a business based on hand shoemaking with other elements - and many young artisans in Melbourne are doing just that. Their methods and business philosophies are as varied as one would expect for an industry that is, in its own way, being reborn. In this paper, I explore and draw parallels between these shoemakers and attempt to draw practical insights from their experiences.

58. Hurricane Stan: Rebuilding in Xeabaj II after Disaster

Llewellyn Salgado, Homeland Security and Emergency Preparedness, with Dr. Jason Levy, Wilder School of Government and Public Affairs

Communities such as Xeabaj II suffer greatly from natural disasters, because of the location of the land and the income level of the community we must teach and aid them in providing for themselves through preparedness. Natural disasters can strike any location at any time causing massive damage to cities and people. A natural disaster's impact is much worse on a small community such as the Xeabaj II village in Guatemala. Due to the small size of the village and low land levels are always in danger from flood waters and mud slides. On October 2, 2005 Hurricane Stan tore through the community and left hundreds of villagers stranded without food, water or shelter. There is no way to prevent a natural disaster, but we can better prepare individuals and communities in case one happens. Teaching people to keep emergency supplies of water and non perishable foods such as canned food and items like MRE's, that the military uses, could potentially save lives in a future disaster. Technological advances are also another great way to prepare for a disaster. If you visit your local camping store you will find water purifying tablets that can turn almost any dirty water into drinkable liquid in case of emergency. Villagers from Xeabaj II recall the flooding and large quantities of sinking mud: "On Wednesday [October 5,2005] we left with our children barley wrapped in sheets and a few belongings that we could carry" (Xeabaj II women's group, 2010). They were left without adequate shelter, food and supplies for days before outside communities were able to provide aid. Having your own emergency kit with some life saving supplies could have really made a difference in that time of need.

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59. Pathways to Prevention: The potential of utilizing predictive analytics and pathways research in policy framework for homeless prevention.

Samuel Wojcicki, Chemical and Life Sciences Engineering, with Faye Prichard, VCU Honors College

Homelessness is a continuum through which individuals follow a set of complex, nonlinear pathways as they move in and out of non-domicile life. While, in detail, an individual's experience in this continuum will be unique, a set of general pathways may be delineated forming successive and segmented trends. Although these pathways are not yet understood in their entirety, the trend of research in various fields concerned with

homelessness suggest that they will soon be developed. These findings are in the process of changing the type of homeless prevention and intervention utilized in policy. Thus as this new research is incorporated into policy-making decisions, a framework must be established for its implementation. This paper addresses the findings of recent dynamic analysis in terms of demographics, definition, and suggested pathways of homelessness and provides a discussion of future policy in terms of a framework centered on predictive analytics. Sixteen academic studies and articles on homeless pathways and modern background on homelessness as well as the use of predictive analytics were examined and the field of sources was narrowed to eight articles of significance to these aspects of homeless and analytic study. The research concludes that as the pathways surrounding homelessness are successively delineated, the trends which emerge should be utilized to create policies of intervention and prevention based on an individual's position relative to one of the determined pathways. This is because a framework like this would allow the principles of predictive analytics to be utilized and as a result creates an increased ability of practitioners to quickly assess and address the issues unique to an individual. This increases their ability to intervene in and prevent homeless spells. And while increased awareness and attention of policy makers has been given to homelessness in the United States since the 1980s, the best figures on the populations now and then show little decrease in the size and scope of homelessness (Lee et al. 2010). Homelessness is a state of severe disenfranchisement where enormous wealth and potential are lost by society as well as a condition where human rights are often violated. The almost total disenfranchisement associated with homelessness as well as the associated stigma result in feelings of inadequacy, diminished efficacy, increasing health and mental health issues, and often victimization and crime over time (Lee et al., 2010, p.8). When coupled with the costs of emergency health treatment, loss of potential workforce, and other necessary benefits and programs which provide aid to this population, the need for more effective homeless prevention and intervention policies is evident.

60. Evaluating Novel Drug Education Programming at VCU

Rose Bono, Psychology, with Kristen Kidd Donovan, MPH, VCU Wellness Center

Emerging adults in college often face significant risks in the development of substance abuse problems, in large part because of the preeminence of peer influences over familial restrictions and because of the immaturity of the brain during this time. Drug education in public primary and secondary schools does a poor job of preparing students for encounters with drugs in their lives, and drug and alcohol education in college is often limited to programs imposed by university sanctions. Thus, there is a significant gap in drug education for college students that is honest, unbiased, street relevant, research-based, and voluntary. Just Say Know is a student-led monthly seminar series on specific drugs of interest to the VCU community, and utilizes classroom clicker data to determine general rates of knowledge of and use intention toward the drug being discussed before and after the presentation. This allows for the evaluation of certain learning outcomes, and the current project seeks to take these simple informal measures to assess the relative success of this developing drug education program. The evaluation of this program has implications for future drug education program development, here at VCU and elsewhere.

61. A Study of Haptic Perceptual Organization

Nathan Veilleux, UROP Fellow, Biomedical Engineering, with Dr. Dianne Pawluk, Biomedical Engineering

The overall goal of the study was to identify how haptic perceptual organization comes about. Perceptual organization is the progression from unconnected and incomplete information coming from the senses being formed into a complete and accurate perception of the real world. The objective of the study was to build a device that could move pins beneath the index finger and thumb, with the subjects' hands in two different positions: one being a pinch grip and the other with the hand laid flat. The pins would move beneath the subjects' fingertips in one of two ways: either they would move in the same direction or in different directions. The subjects would then have to determine whether the sensation felt like a single object moving or two different objects. The device is currently being designed and will incorporate several linear actuators to provide precise control over the movement of the pins. It will also include a hand constraint that will prevent subjects' fingers from moving while over the pins. If the subjects' manage to consistently perceive the two pins moving in the same direction as a single object even in different hand positions, it will provide insight into the nature of haptic perceptual organization.

62. Device Concept for Passive Ocular Drug Delivery

Jonathan Marsh, Mechanical Engineering and Physics, with Dr. Ramana Pidaparti, Dept. of Mechanical and Nuclear Engineering

Ocular diseases including, glaucoma, diabetic retinopathy, and age-related macular degeneration affect millions of individuals in the United States, as well as other countries. These diseases require regulated ocular drug delivery to prevent blindness, through regular intravitreal injections. Repeated intravitreal injections can cause significant problems, such as: ocular infections, hemorrhage, and retinal detachment; while only providing the minimum dosages required. The scope of this work is to research into design and methodology of an implantable, biodegradable drug delivery device concept that would provide the precise dosages required to treat these diseases over a time period up to two years, as well as eliminate the need for frequent and risky ocular injections. The design concept uses a biodegradable drug delivery device that will consist of a polydimethylsiloxane (PDMS) shell with a fluid reservoir and micro-fluidic channels that allow the drug to be stored and delivered at the necessary rate. The results from this simulation studies revealed information related to drug transport with varying designs which might be useful in determining the ways in which a specific rate of drug can be delivered. Simulation results obtained will be presented.

Acknowledgement

The authors thank the U. S. National Science Foundation for sponsoring the research through a grant NSF-ECCS-1058067.

63. Using the Life Story to Promote Identity Formation and Career Decision-Making in an Undergraduate Population

Courtney Jane Belmonte, Psychology, with Dr. Jennifer Wartella, Dept. of Psychology

Career decision-making and related preparation can be problematic for undergraduates approaching graduation. Previous studies reveal lack of identity formation can be an important barrier that partially accounts for challenge. Accordingly, this study explores whether a class assignment (The Life Story exercise (LS), a written project that prompts

students to look at key experiences that shape identity) can strengthen identity formation and career-decision-making in this group. Students completed an LS paper as well as questionnaires before and after paper submission. It was expected that undergraduate identity formation and career decision-making would increase following paper completion. Results partially confirmed this hypothesis. Statistically significant differences were found in career decision making (students endorsed greater career decision-making upon LS completion), $t(19)=2.37$, $p<.05$ but not identity formation, although a trend toward increased identity formation emerged. Accordingly, the LS paper could be a viable activity for increasing career readiness in college undergraduates.

64. Coupled Simulations of Lung Bifurcations for Mechanical Environment

John Swanson, Mechanical Engineering, with Dr. Ramana Pidaparti, Dept. of Mechanical and Nuclear Engineering

Better understanding of the acute/chronic inflammation in airway tissues, especially for children and aged patients are very important in to order avoid lung injuries. Cellular inflammation is a complex and dynamic process triggered by many mechanisms within the lung and involves multiple scales starting from organ level to cellular level. The computational analysis results could help broaden the understanding of how ventilator associated lung injuries occurs and prevents them from happening. In this study, the magnitudes and locations of stresses/strains in various lung bifurcations were investigated for a range of flow rates and tidal volumes relevant to the use of a mechanical ventilator for the actuation of the human lung. These results were pursued by means of a computational analysis of the interaction between the fluid and solid forces acting on lung bifurcations. The results from this study revealed information useful in determining the ways in which a mechanical ventilator can induce or exacerbate lung injury. Specifically, airway stress and strain were explored as functions of flow rate, tidal volume and ventilator waveform. Additionally, the waveforms and flow rates are ranked by the stress and strain they induce in the lung airways and thus their potential to cause damage. More specific results will be presented during the poster presentation.

Acknowledgement

The authors thank the NSF (CMMI-0969062) and the NIH (R01AG041823) for their support.

65. Enhanced Electronics Cooling using a Nanofluid System

Moshe Naftaly, UROP Fellow, Mechanical Engineering, with Dr. Manu Mital, Dept. of Mechanical and Nuclear Engineering

Electronic systems find widespread application in residential, commercial, military and space environments. In everyday life, these systems are commonly used in televisions, automobiles, telephones, computers, etc. Due to their widespread use, electronics chips need to operate reliably under a wide variety of environmental conditions. One of the key factors that affects reliability is thermal management. We investigated a *nanofluid cooling system* to efficiently cool electronic circuitry. Use of nanometer sized particles (called *nanoparticles*) in liquids is a topic

of hot research due to the enhanced heat removal effects reported in literature. They show promise as efficient coolants for not only the electronics industry, but also other industries such as automobiles and power plants. The solid-particle mixture is termed *nanofluid*. When the dispersed solid particles are magnetic in nature, the mixture can also be called a *ferrofluid*. The overall goal of the proposed research is to better understand and numerically model the heat removal improvements provided by nanofluids. The specific aims of this work are the following:

1. Gain a better understanding of the fundamental mechanisms and the physics responsible for the abrupt increase in heat transfer in nanofluids / ferrofluids.
2. Use semi-empirical numerical models/equations, and computer simulations, to accurately predict the heat transfer behavior and pumping power requirements of nanofluid coolant flowing through a typical micro-electronic chip.
3. Identify and investigate the effect of important parameters (such as size and volume fraction of nanoparticles) on the heat transfer improvement and additional pumping power requirements of nanofluid coolants, and the trade-off between the two.
4. Use semi-empirical numerical models/equations from literature, and computer simulations to investigate the feasibility of ferrofluid pumping system that utilizes magnetic nature of the nanofluid coolant mixture to push the fluid through a typical micro-electronic chip without using mechanical pump..

66. The Intersection of Quantitative Reasoning and Genomics

Kavya Kommaraju, Genomic Bioinformatics, with Micol Hammick, University College

Quantitative Reasoning (QR) is defined as the habit of the mind to consider the power and limitations of quantitative evidence in the evaluation, construction and communication of arguments in personal, professional, and public life (Grawe et al 2010). QR, one of the skills tested in the University College Core (UCC) curriculum, is incorporated in a two-part Focused Inquiry class sequence required of most entering freshman at Virginia Commonwealth University. Creatively presenting and using QR methods in problem solving situations is an area that has been identified as needing further research. A novel, pedagogical framework for presenting QR as it relates to genomics and personalized medicine was developed in an effort to incorporate current STEM agenda into focused inquiry curriculum. A three-part module involving a preliminary survey, audio-visual presentation, and analysis questions associated with selected literature was created over a two-month duration. The preliminary survey was piloted to a class of 12. The module was presented to UCC faculty. Initial results show positive response to the QR Genomics module.

67. A collaborative national-scale analysis of land use and frog diversity

Shane Abinette, Uswa Arain, Blair Cousins, Christopher Crockett, Max Dichek, Jennifer Fjelsted, Sara Holtschneider, Arthur Kay, Sajan Moktan, Alessandro Molina, Juliana Rostan-Zimmer, Ryan Weaver and Dr. James Vonesh, PhD.

Amphibians are especially sensitive to land-use changes due to their complex life-stages which require both upland and wetland habitats. Land-use change such as urbanization and the associated increase of roads directly impact amphibian mortality by road kill and indirectly by fragmenting upland and wetland habitats. North American amphibian monitoring program (NAAMP) compiles data from standardized roadside surveys of calling frogs and toads across much of the contiguous United States to examine the impacts of human activity on amphibian populations over time. In this study we used NAAMP call data from 18 eastern U.S. states and National Land Cover Data to address the following research questions: (1) What landscape features promote amphibian diversity? (2) What aspect(s) of roads impact amphibian populations? We quantified landscape features (e.g., habitat types, wetland –forest connectivity, road density and arrangement) using a GIS program and calculated amphibian diversity estimates of each survey location to build a predictive model to answer our research questions. In Virginia: forest cover was the only significant predictor of frog diversity. The proportion of species present declined as forest cover increased. At the national-scale, proportional species richness increased with survey effort, and decreased with forest cover, surveys with noise, and road length. This project is supported by the National Science Foundation, Transforming Undergraduate Education in Science program coordinated by David Marsh and the National Center for Ecological Analysis and Synthesis.

68. An Examination of Tobacco Use Among College Students: A Mixed Methods Study

Lindsay Mitchiner, UROP Fellow, Psychology, with Dr. Aashir Nasim Psychology & African American Studies

Polytobacco use is defined as the concurrent use of cigarettes and other tobacco products such as cigars and hookah in the past 30 days. This study examined the sociodemographic characteristics associated with polytobacco use in a sample of 620 college students enrolled in Psychology 101 courses during spring and fall 2012. Consented students completed a web-based survey and provided information related to their background (i.e., age, gender, race / ethnicity, and discretionary income) and tobacco use history. Tests of proportions were used to assess differences between sociodemographic groups in cigarette, cigar, and hookah use prevalence. Binary logistic regression was used to determine sociodemographic characteristics associated with polytobacco use (versus cigarette use only). Results show that 36.0% of college students reported past month tobacco use. Cigarette use was the most prevalent form of tobacco consumed among all sampled students (21.8%) followed by hookah (16.3%) and cigar smoking (12.6%). A significantly greater proportion of White / European Americans (31.2%) than Black / African Americans (10.3%) and Multiple race / ethnic groups (16.0%) smoked cigarettes ($p < .05$); and, a greater proportion of college males (20.2%) than females (9.0%) reported cigar smoking ($p < .05$). In reference to polytobacco use, college males were significantly more likely than college females to engage in cigarette + cigar use than exclusive cigarette use, OR = 4.98, 95%CI (1.89, 12.95); and, White / European Americans were significantly more likely than Black / African Americans to engage in cigarette + hookah use than exclusive cigarette use, OR = 8.14, 95%CI (1.06, 16.99). Interaction effects were not computed in these models due to sample size limitations. Findings reveal that one-third of students have used some form of tobacco in the past month and that White / European American college males may be particularly susceptible to polytobacco use involving cigarettes

and other tobacco products. Tobacco prevention programs that target specific college demographic groups may be necessary to prevent and reduce polytobacco behaviors.

69. Comparative Genomics of Mycobacteriophages

Hasan Alkhairo, Swapna Bobbity, Shantel Brown, Tori Diesel, Travis Dunn, Dominique Grim, Catherine Halpern, Colin Headen, Alexandra Ii, Pegah Izadpanah, Lawangin Khan, Michael Kiflezghi, Jonathan Kindberg, Sue Parks, Switu Patel, Supriya Pokhrel, Saman Raftari, Winston Sanders, Mariam Sankoh, Marie-Isabelle Seydoux¹, Amara Syed, and Allison Johnson¹.

Students in BNFO/LFSC 252: Phage Discovery II. ¹Center for the Study of Biological Complexity, Virginia Commonwealth University, Richmond VA.

Mycobacteriophage are viruses that target and infect mycobacterium. The study of mycobacteriophages may allow the opportunity to harness these viruses for the treatment of clinically important bacterial infections that cause tuberculosis and leprosy. Over the past four years, the VCU Phage Lab has discovered, sequenced, and annotated the genomes of 19 mycobacteriophages. This year, we focused on two novel mycobacteriophages discovered at VCU: Et2Brutus and BruceB. Both viruses belong to the family siphoviridae, which is characterized by the presence of a double-stranded DNA genome and non-contractile tail. One notable feature of Et2Brutus phage particle morphology is its distinctively long tail of 311 nm. The genomes of Et2Brutus and BruceB were sequenced. Homology search determined Et2Brutus and BruceB to be most closely related to mycobacteriophage D29, a cluster A2 phage and BPs, a cluster G phage, respectively. The genome characteristics were typical of mycobacteriophages in these clusters. The genomes were auto-annotated and our class manually verified these computational predictions using a suite of bioinformatics tools. We applied a comparative genomics approach to compare features from the genomes of our collection of phages and to investigate some novel genome features. Projects include comparison of proteins and genome parts involved in regulation of gene expression, integration, and recombination. These comparisons help us begin to understand the immense amount of viral diversity and the factors that impact the evolution of mycobacteriophages.

70. Volcanic Eruptions and Disaster Mitigation in Guatemala

Michelle Brown and Tyler Smith, Homeland Security and Emergency Preparedness with Dr. Jason Levy, Wilder School of Government and Public Affairs

In September of 2012, a series of powerful eruptions of Guatemala's Volcano of Fire in Escuintla blanketed villages in dense clouds of ash. It sent columns of smoke and ash high into the sky and forced authorities to order a mass evacuation for over 33,000 people. However, many were reluctant to leave their homes and chose to stay at their own risk.

Seismologists determined this type of eruption is stronger than normal and reported an incident like this hasn't been seen in recent years. (Staff, 2012) In addition, ash from the eruption of the Pacaya Volcano on May 26, along with heavy rainfall from Tropical Storm Agatha the next day, combined to deal a disabling blow to much of Guatemala City and the surrounding areas. Approximately 180 people lost their lives. The purpose of this is to lessen the impact disasters have on people and property in Guatemala. (Monks, 2010).

Having a disaster mitigation plan would make it so that not as many people would be affected by natural disasters such as an erupting Volcano. We approached this project by doing research on Volcano disaster mitigation and by targeting some of the most common issues in Guatemala. We learned that it is important to have a before, during and after plan. The plan would consist of developing warning systems, creating evacuation plans, gathering supplies, developing an emergency communication plan, having people in charge to implement the plan, having shelters, and having specific directions for the members of the community to abide by. (McMillan, 1998) Once the disaster is over the plans would also allow for reconstruction.

71. Sorafenib in combination with HDAC inhibitors kill hepatocellular carcinoma cells

Jahangir Syed, Biology, with Dr. Sarah Golding, Dept. of Biology

Hepatocellular carcinoma is a common type of liver cancer, accounting for close to 700,000 deaths annually worldwide. The first line of treatment offered is surgical resection; however the prognosis of this procedure is poor, less than 20 percent of hepatocellular carcinomas can be effectively removed in patients but this can still result in reoccurrence. To overcome this problem, current research has implemented targeted therapies to decrease the potential of reoccurrence and to offer a more effective treatment to those patients with tumors that cannot be operated on. Targeted therapy involves the use of drugs to inhibit specific pathways directly associated with proliferation, metastasis, and angiogenesis. This study focused on the effect of Sorafenib, and HDAC inhibitors, specifically Vorinostat, to potentiate killing of human hepatocellular carcinoma cells (Hep 3B, HUH7, HepG2). These drugs were used together in various combinations and alone to assess synergistic killing of hepatocellular carcinoma cells and uncover the signaling pathways utilized. The results attained confirmed that the use of a combinational drug therapy enhances cell death in comparison to single agent treatments, via targeting a multitude of signaling pathways. When we used Sorafenib, Vorinostat, and TRAIL in combination we were able to determine that cell death was not only amplified from single and double agent but the cell death also corresponded with an up regulation of phosphorylated Akt, a serine/threonine-specific protein kinase that plays a key role in glucose metabolism, apoptosis, cell proliferation, transcription, and cell migration. There was also a significant increase in indicators of autophagy and apoptosis and a decrease in survival and proliferation pathways.

72. Discriminative stimulus properties of the atypical antipsychotic in C57BL/6 mice

T.J. Donahue^{*1}, B.L. Mason¹, K.A. Webster¹, T.M. Hillhouse¹, E.O. De Oliveira², and J.H. Porter¹

¹Department of Psychology, Virginia Commonwealth University, Richmond, VA

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First generation (typical) antipsychotic drugs (APDs) like haloperidol are effective for treatment of the positive symptoms of schizophrenia, but produce extrapyramidal motor side effects (EPS). Second generation (atypical) APDs like clozapine treat both positive and negative symptoms of schizophrenia and have reduced EPS side effects and other clinical advantages. While haloperidol preferentially blocks dopamine (DA) receptors, atypical APDs usually have a very diverse binding profile and it is assumed that receptor mechanisms other than DA

receptors may be important for the clinical advantage of these drugs - but ALL APDs share one property - antagonism of DA receptors. An interesting atypical APD that has a selective binding profile is amisulpride. It is approved in Europe and displays an atypical clinical profile with reduced EPS and reduction of negative symptoms. Like haloperidol, amisulpride is a relatively selective antagonist at DA D₂ and D₃ receptors, but not D₄. Unlike haloperidol, amisulpride blocks serotonin 5-HT_{2B} and 5-HT₇ receptors. To compare the subjective effects of these antipsychotic drugs and to study the *in vivo* receptor mechanisms that mediate their discriminative stimuli, the present study used the drug discrimination assay to allow a direct comparison between the atypical APD amisulpride and the typical APD haloperidol and other atypical APDs.

Mice were trained to discriminate 10 mg/kg (+)S isomer of amisulpride from vehicle in a two-lever drug discrimination task for food reinforcement in an average of 43.5 sessions (range 11 - 74). The amisulpride dose-response curve (0.15625 - 40 mg/kg) yielded an ED₅₀ = 1.4 mg/kg (95% confidence interval of .93 - 4.27 mg/kg). Haloperidol failed to substitute for amisulpride with a maximum percent drug lever responding (%DLR) of 45.4% at 0.10 mg/kg with a significant rate suppression. Clozapine produced partial substitution at 3.54 mg/kg (64.7% DLR) with significant rate suppression. Aripiprazole also failed to substitute with a maximum of 29.3% DLR at 0.3125 mg/kg. The (-)R isomer of amisulpride failed to substitute (43.6% DLR) for the (+)S isomer at doses up to 20 mg/kg. These findings suggest that antagonism of DA receptors does not mediate the discriminative stimulus properties of amisulpride as haloperidol did not substitute. Additional studies with selective ligands for 5-HT_{2B} and 5-HT₇ receptors are needed to delineate amisulpride's discriminative cue. Interestingly, the atypical APDs clozapine and aripiprazole also did not substitute, suggesting that amisulpride's discriminative stimulus properties are unique from other atypical APDs.

73. On the feasibility of coupling lipid nanotubes to a nanopore-based sensor

Kyle Brady, UROP Fellow, Physics and Chemistry, with Dr. Joseph Reiner, Dept. of Physics

One of the most important outcomes from the interdisciplinary merging of the physical and life sciences has been the development of single molecule measurements. In contrast to ensemble measurements, which measure the average value of a system's parameters, single molecule measurements can elucidate the complete statistical distribution of the system parameters. This proves useful when studying ensembles with a high degree of heterogeneity (i.e. proteins, polymers, etc.). One method for single molecule detection employs a single transmembrane nanopore that detects individual molecules as current blockades when they impede the flow of ions through the pore. One draw-back of this technique is that the nanopore detector is a small target for the molecules of interest and this leads to a low detection rate. In addition, the diffusive motion of molecules eliminates the possibility of measurement protocols relying on the capture and recapture of molecules by the nanopore. To address these diffusion related issues, we investigated the possibility of using lipid nanotubes as a means of directing analyte molecules towards an α -hemolysin nanopore for single molecule detection. We utilized the electroformation technique to optimize the liposome formation process, and we demonstrated the formation of lipid nanotubes by mechanically pulling on a liposome via a patch pipette tip. We discovered that to pull the nanotubes, the liposome membrane must be under significant stress, which has a deleterious effect on nanopore sensing. We will describe our methodology,

report our results and discuss the feasibility of nanotube/nanopore sensing along with future directions for the project.

74. Midwifery in Xaebaj, Guatemala

Emily Balint, Mass Communications, Kimberly Brown, Kristen Greene, Alexander Smith with Dr. Jason Levy, Wilder School of Government and Public Affairs

In the community Xaebaj, Guatemala healthcare is in the hands of two midwives who are severely outnumbered serving over five hundred residents. If the midwives of Xaebaj are provided with greater resources then care will be more efficiently provided to the community. Through our service- learning partners in Guatemala, we were able to gain information about the midwives and their practice. Research thus far has lead us to the discovery that the midwives do receive infrequent training in Chiquisis, a neighboring town. In conclusion, this new training helping, but greater and more frequent instruction will provide for better community health and allow for other people in the community to practice midwifery. It is up to Xaebaj to make improvements in its health system, although our group can devise hypothetical solutions to these issues.

75. Why did the frog cross the road? A collaborative analysis of how landscape features affect amphibian populations

Shane Abinette, Uswa Arain, Blair Cousins, Christopher Crockett, Max Dichek, Jennifer Fjelsted, Sara Holtschneider, Arthur Kay, Sajan Moktan, Alessandro Molina, Juliana Rostan-Zimmer, Ryan Weaver, Biology, with Dr. James Vonesh, Dept. of Biology

Amphibians are especially sensitive to land-use changes due to their complex life-stages which require both upland and wetland habitats. Changes in land-use, such as urbanization and the associated increase of roads, directly impact amphibian mortality by road kill and indirectly by fragmenting upland and wetland habitats. The North American Amphibian Monitoring Program (NAAMP) compiles data from standardized roadside surveys of calling frogs and toads across much of the contiguous United States to examine the impacts of human activity on amphibian populations over time. In this study we used NAAMP call data and landscape data from Virginia and National Land Cover Data (NLCD) to address the following research questions: (1) What landscape features promote anuran diversity and the presence/absence of individual species? (2) What aspect(s) of road presence impact amphibian populations? (3) Does habitat composition or habitat configuration have a greater impact on amphibians? We will quantify landscape features (e.g., habitat types, wetland –forest connectivity, road density and arrangement) using a GIS program and calculate amphibian diversity estimates of each survey location to build a predictive model to answer our research questions. Our results will inform a concurrent collaborative project involving 10 United States universities aiming to evaluate the effect of landscape characteristics on amphibian populations at different spatial scales (e.g., local, sub-regional, regional). This project is supported by the National Science Foundation, Transforming Undergraduate Education in Science program coordinated by David Marsh and the National Center for Ecological Analysis and Synthesis.

76. Enhancing Flood Disaster Resiliency in Chuicutama II

Kathryn DeBoard and Daniel Ward, Homeland Security and Emergency Preparedness, with Dr. Jason Levy, Wilder School of Government and Public Affairs, Homeland Security and Emergency Preparedness

The villages of the Western Highlands in Guatemala have suffered in recent years due to natural disasters such as hurricanes and tropical storms. These disasters triggered severe flooding, resulting in some small villages relocating and rebuilding their communities. The second village of Chuicutama remains in the re-establishment process, but with goals to provide a more resilient community. Preventing or mitigating the effects of floods is a crucial element in ensuring the community enhances their adaptability. Flooding affects their food resources as most rely on their own harvest or obtain Mexican imports from coastal areas over two hours away. In working with the Highland Support Project's Outreach and Communications Coordinator, the need for a plan to incorporate the concept of making and providing food for emergencies was established. To ensure this relocation was a success, critical infrastructure has to be protected and less prone to flooding disasters. This research includes ways to develop and improve Chuicutama's resiliency to flooding with concentration on protecting existing essential infrastructure and retaining prolonged food supply.

77. Sewage Treatment and Pollution Reduction in Chuicutama

Jonathan Berry, Bridget Crowley, Carly Edgcomb and Alexis France, Homeland Security and Emergency Preparedness, with Dr. Jason Levy, Wilder School of Government and Public Affairs, Homeland Security and Emergency Preparedness

This project will involve developing a culturally appropriate process for removing contaminants from wastewater and household sewage in Chuicutama, both runoff (effluents), and domestic pollution (physical, chemical and biological contaminants). While Chuicutama was rebuilt with new cylinder block houses and porcelain toilets there a complete drainage and sewage system is not currently in place. Accordingly "greywater" from bathing and washing dishes runs into crops and could potentially pollute the water supply. This also puts the livestock at risk which graze on the open areas in the community. We will consider cost-efficient physical, chemical, and biological processes to remove the aforementioned contaminants. It is hoped that after treatment the effluent and solid waste suitable for disposal or reuse (potentially as a crop fertilizer in the rural highlands of Guatemala). Using advanced technology we will examine whether it is feasible to re-use treated sewage effluent for drinking water.

78. Health issues within the Chiquisis community

John Choi and Clayton Colley, Homeland Security and Emergency Preparedness, with Dr. Jason Levy, Wilder School of Government and Public Affairs, Homeland Security and Emergency Preparedness

In Guatemala, the Chiquisis community was forced to relocate after the 2005 Hurricane Stan. The relocation of the Chiquisis community has reduced the risk of flood caused hazards such as mudslides that the community may face in the future. With the reduction of natural hazards, other hazards have been on the rise. Examples of the new issues that have arisen within the community are potential health issues for the population from the lack of running water and poor nutrition. Another issue is the poor education the population has as many do not learn more than an elementary student. The health issues that the Chiquisis community face now is caused due to their close proximity to mining facilities. Due to their close proximity to mining sites, the pollution has caused many members to become ill with acute respiratory infections. Also without running water within the community, the people must travel to acquire clean water for the population. Another issue the community faces is that they do not have a

clinic or a hospital within the community which forces individuals to travel very long distances to receive proper medical services. Also within the new location the population is not capable of producing enough produce for their diet, which forces people to shop at local stores and purchase unhealthy food. This can cause future health problems not seen before prior to relocation when the population was capable of producing enough food for yearly consumption.

79. Improving Health and Infrastructure to Promote Sustainable Livelihoods: A Chuicatama Case Study

Brendan Pengidore, F. Ferris, S. Scalsky and C. Young, Homeland Security and Emergency Preparedness, with Dr. Jason Levy, Wilder School of Government and Public Affairs, Homeland Security and Emergency Preparedness

Infrastructure, a key component to any society, is defined as, “basic physical and organizational structures needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function. (Oxford Dictionary)” This can be interpreted as anything from the physical roads to sewer systems, and even services such as education. A road provides transportation of anything from food to medical supplies and opens up room for great improvement for any location. The single road in Chuicutama sounds dangerous due to it being made of dirt and concrete. We’ve also been told it’s almost impossible to travel in the event of rain. There are several possible solutions, particularly adding layers of gravel to dangerous areas and areas that need major improvement. The gravel will add traction, is relatively cheap, and easy to install. This will also make travel a lot easier and safer, and it will allow for evacuation and transport in the event of an emergency. Sewage is defined as “liquid waste containing animal or vegetable matter in suspension or solution and may include liquids containing chemicals in solution.” (FDA Website) Sewage systems help to move water to make it more accessible and to prevent disease by alleviating the problems caused by sewage. It can be as simple or complex as necessary for the community. The pipe system to transport water that we’ve been told sounds perfect, but we understand that there is a dire need for a sewage system. We believe we could try to use a similar system to provide a sewage system, provided we could find an outlet point. If we use more PVC pipe, we could run a large pipe and a series of smaller pipes that can run from each house and away from the community. I’ve always been taught that, in the woods, a minimum of 50ft from a water source is required for safety. Since we don’t want to contaminate the drinking water or any crops that are necessary for life, we should probably set that as a base distance and move on from there. With a fully functioning sewage system, we could eliminate the need for the latrine-style system and replace it with a safer and cleaner system.

80. An Examination of Social Media with College Students

Lauren Oglesby, Psychology, with Dr. Elizabeth Cotter, Dept. of Psychology

In Guatemala, the Chiquisis community was forced to relocate after the 2005 Hurricane Stan. The relocation of the Chiquisis community has reduced the risk of flood caused hazards such

as mudslides that the community may face in the future. With the reduction of natural hazards, other hazards have been on the rise. Examples of the new issues that have arisen within the community are potential health issues for the population from the lack of running water and poor nutrition. Another issue is the poor education the population has as many do not learn more than an elementary student. The health issues that the Chiquisis community face now is caused due to their close proximity to mining facilities. Due to their close proximity to mining sites, the pollution has caused many members to become ill with acute respiratory infections. Also without running water within the community, the people must travel to acquire clean water for the population. Another issue the community faces is that they do not have a clinic or a hospital within the community which forces individuals to travel very long distances to receive proper medical services. Also within the new location the population is not capable of producing enough produce for their diet, which forces people to shop at local stores and purchase unhealthy food. This can cause future health problems not seen before prior to relocation when the population was capable of producing enough food for yearly consumption.

81. Offender experiences with non-secure attachment and relational victimization

Lorin Hoisington and Deeyna Velasquez, Psychology and Sociology, with Dr. Victoria Shivy, Dept. of Psychology

In the United States one in every 104 adults, or 2.2 million people, were incarcerated at year-end 2010 (Bureau of Justice Statistics [BJS], 2010). Most offenders will return to society after their sentences; and thus their experiences with relational victimization while incarcerated are important to understand. Relational victimization occurs when one's interpersonal relationships are deliberately threatened or damaged and when one's standing in a social hierarchy is damaged or threatened (Crick & Grotpeter, 1995) and can result in negative psychosocial outcomes for adults (Murray-Close, Ostrov, Nelson, Crick, & Coccaro, 2010). Goldstein, Chesir-Teran, & McFaul found an association between non-secure attachment styles in college students and experiencing relational victimization (2007). Furthermore, research has linked past abuse to non-secure attachment styles (Styron & Janoff-Bulman, 1997). Given offenders' disadvantaged backgrounds and likelihood of having experienced abuse before incarceration (McClellan et al., 1997), they may be at an even greater risk than the general population to experience non-secure attachment styles. Furthermore, the prison environment can produce a 'culture of violence' (Ireland & Ireland, 2003) in which offenders may be in jeopardy of experiencing relational victimization. Thus, it was hypothesized that non-secure attachment styles would be positively associated with experiencing relational victimization while incarcerated. Surveys were collected from 192 offenders housed in 8 different correctional facilities in the state of Virginia. The study consisted of male (59.9%) and female (40.1%) participants. The participants ranged in age from 21 to 75 ($M = 37.53$, $SD = 20.90$). The majority of participants (45.3%) self-reported as Caucasian, 43.2% as African American, 2.6% as Native American, and 1.0% as Latino/a (6.8% did not list their race/ethnicity). The hypothesis was supported. Non-secure attachment styles were significantly related to experiencing relational victimization while in prison. Implications will be discussed.

82. Stray Dog Epidemic in Thailand

Kadie Brigham, Psychology, with Prof. Mary Mullins, University College

Around 120,000 stray dogs are currently roaming the streets of Thailand compared to the 67,000,000 people that currently live there. Although the stray dog population doesn't outnumber the human population, it still should be a concern of the Thai government because

stray dogs have shown aggression towards people and, carry diseases and rabies that could be transferred to people causing them serious ailments. Chantapong Wasi and colleagues from the Medicine Siriraj Hospital at Mahidol University in Thailand estimate that within the stray dog population only about 20% of the dogs are vaccinated or sterilized. My research explores what type of diseases that the stray dogs carry that could be transferred to humans, the cost of rabies vaccinations and sterilization, pet ownership and Asian attitude towards animals, and the government debt. The sources that I looked at range in variety from epidemiological studies on rabies and diseases to studies that look at attitudes towards dogs to sources that discuss economic problems. By looking at these sources, I examined the psychological, sociological and medical outlooks that people have on stray dogs.

83. Characterization of Promoters in Cyanobacteria

Laura Hayward, Chemical and Life Sciences Engineering, with Dr. Stephen Fong, Dept. of Chemical and Life Sciences Engineering

Promoters are regions of DNA involved in the initiation of transcription, which is the process of creating messenger RNA from a DNA template. Therefore, promoters are directly involved in controlling the expression of their downstream genes. Due to the high variability of promoter sequences and their corresponding transcriptional efficiencies, it is necessary to directly test promoter behavior in order to establish a relationship between an individual promoter sequence and the resulting gene expression. Here we endeavor to characterize promoters in the cyanobacterial model organism of *Synechocystis* sp. 6803 utilizing Green Fluorescent Protein, as a reporter of gene expression. Establishing a promoter library in this photosynthetic bacterium will help future researchers by providing a reliable and accessible source of standard genetic parts for the forward design of controllable gene expression.

84. Implantable Drug Delivery Device

Geoffrey Oldland, Mechanical Engineering, with Dr. Ramana Pidaparti, Dept. of Mechanical and Nuclear Engineering

Our vision is one of the most valuable and functional tools the human body possess. The eye is the organ which reacts to light for several purposes, but mainly as a conscious sense organ to allow vision. There are rod and cone cells in the retina of the eye that allow conscious light perception and vision including color differentiation and the perception of depth. Although, when these cones and ultimately the retina are damaged or deteriorated by glaucoma, age-related macular degeneration (AMD), cataracts, and other affiliated diseases a severe loss of vision is inevitable. Therefore, many ocular diseases such as AMD are still being studied but have no found cure. These ocular diseases rely heavily on the use of current and future treatments to help prevent and restore vision loss. Current treatments consist mainly of vitamins, laser therapy, medications, and vision aids such as implantable device or injections. New treatments and vision aids for preventing vision loss have tremendously improved over the past decade. New drugs along with new instruments have been developed over the recent years to help treat each unique disease for the eye. AMD is the leading cause of severe vision loss in people over the age of 60. It occurs when there is a physical disturbance that affects the center of the retina called the macula. The retina is the light-sensing nerve tissue at the back of the

eye and therefore the macula is the part responsible for most of our acute vision. Although, macular degeneration is almost never a totally blinding condition it affects a significant component of the eye that impairs the ability of vision for basic daily routines of driving, reading, and performing activities for fine vision. Ultimately, our acute vision plays a key role in performing daily functions which make current drugs and treatment highly sought after.

85. Arab American Literatures, Immigration, and Gender

Adrien Creger, Dept. of English and Dept. of Gender, Sexuality, and Women's Studies, UROP Fellow 2012, with Dr. Cristina Stanciu, Assistant Professor, Dept. of English

Women writers and Arab American writers alike write from culturally ascribed locations outside of the dominant discourse. It follows that Arab American women writers also write from a distinct location outside of the dominant discourse—at a specific intersection of race, ethnicity, class, gender, religion, etcetera. In my research I have been primarily interested in the intersections of ethnicity and gender unique to Arab American women writers of poetry, novels, memoirs, and scholarly works. During my preliminary research I compiled a list of Arab American women writers (and a few Arab American men writers from the early 1900s for historical context), and chose works by these writers with an eye toward evenly representing the aforementioned literary genres. I read Edward Said's *Orientalism* and Gayatri Spivak's "Can the Subaltern Speak?" to develop a postcolonial framework on which to position my research. With this project I have tried to note themes and images that occur throughout and connect the chosen literary works. I am interested in issues of audience and of representation, and have referenced contemporary Arab American studies scholars to understand the reception of these works in the field. Scholarly interest in Arab American writing is increasing and with my project I have aimed to participate in and to facilitate this research. To this end I have been creating a bibliography of primary and secondary sources which I hope can be used and contributed to by Undergraduate scholars engaged in similar research. I believe that this research is important in its own right, but that it is critical in a post-9/11 world which is often particularly hostile to Arab and Arab American people.

86. From STEM to Entrepreneurship

Shane Diller, Biomedical Engineering, with Dr. Russel Jamison, Dept. of Biomedical Engineering

The Science, Technology, Engineering, and Mathematics (STEM) coalition is an effort to support and fund the teaching of Technologies and the Sciences in the U.S. Department of Education, the National Science Foundation, and other STEM furthering programs. The goal has been to increase the number of students graduating high school that go into STEM fields and become highly skilled professionals. This study will focus on middle school and high school students. One approach has been to shift the conception of STEM fields from that of a sterile, repetitive, elite society to a more creative, innovative, and artistic one. This has been through showing students unexpected, magical, and almost surreal results of experiments; however, this is not an accurate representation of an actual job they will someday hold. A new approach proposed by an interdisciplinary team is to educate the students on the realities of STEM schooling – a tough, tedious, and sometimes grueling four years of highly specialized courses. While this may seem counterproductive, the team will highlight a few outcomes– a

steady paycheck, job security, and entrepreneurial work. The objective is to stress the roles of creativity, social skills, and ingenuity in entrepreneurial work. A series of short educational modules will be developed during the summer of 2013 by an interdisciplinary team for use by teachers. The focus is low cost, short duration, interactive lessons that will not only interest, but educate all levels of students on STEM from a different standpoint. For 5 days during the summer, the team will meet with 7th graders to test these modules. The students will practice ideation, design, prototyping, business modeling, and risk assessment of a low cost product with a target market. For the final two days, students will have an opportunity to participate in a meeting with entrepreneurs and angel investors from the Richmond area to pitch their idea. The expected outcome is a community based shift towards promoting STEM in schools by different means, regardless of a teacher's pay or background experience, that will result in higher numbers of STEM students entering the workforce of the Richmond area.

87. Effects of Eastern Bluebird Nestling Mortality on the distribution of West Nile virus in Central Virginia

Wes Robertson, Biology, with Dr. Sarah Golding, Dept. of Biology

The geographic distribution of West Nile virus (WNV) transmission has been shown to be highly focal often occurring in areas with low biodiversity. Though there are multiple ways in which diversity may affect pathogen transmission, we hypothesize that juvenile avian predators (e.g. snake and hawks) in high diversity areas may decrease WNV transmission by reducing susceptible host populations. We monitored artificial eastern bluebird (*Sialis sialis*) nesting sites throughout the 2012 nesting season and compared the habitat characteristics conducive to nest predators among successful and unsuccessful nest sites. Nest survival models assessed the effects of temperature and snake predation on daily nest survival in relation to WNV geographic distribution. Nest predation was greater at nest sites with less impervious surfaces, larger forest patches and higher densities of vegetation.

88. The Relationship between Hiring Decisions and Impression Management

Jakira Brooks, Psychology, with Dr. Jennifer Joy-Gaba, Dept. of Psychology

The importance of egalitarian principles in business is evident: 71% of companies report engaging in some type of diversity training, with 68% requiring employee participation (SHRM, 2010). Despite this equal opportunity mindset, discrimination is still observed in the workplace. Indeed, previous research has demonstrated that employers may change the criteria in which applicants are judged to be in-line with the applicant they find appealing (Uhlmann & Cohen, 2005). The purpose of the current study was to examine the influence race had on hiring decisions. To test, participants were given a job description followed by information about the applicant, including the candidate's Facebook profile and photo. The accompanying photo showed either a Black or White female posed in either a neutral or party setting. Based on previous research, we expected that participants would be more likely to hire the White applicant. We also hypothesized this effect to be stronger in the party setting. Results revealed that the race of the applicant did not influence participants' ratings or decision to hire (all p 's >

0.52). However, participants rated the applicant in the neutral setting more positively and were more likely to hire them (all p 's ≤ 0.02).

89. Out-of-Class Assignments

Trish Stanley, Psychology, with Dr. Sandra Gramling, Dept. of Psychology

Professors are always looking for new ways to teach their students and to help them better learn the material. In Dr. Gramling's Introduction to Psychology class she does that by having Out-of Class Assignments (OOCA) due each week. The purpose is to give the student an assignment that will allow them to incorporate its application to everyday life in order to then enhance their learning of the material. The students complete a survey after they have completed their OOCA. The survey is comprised of four items; three ten point likert scales and one open ended question. The Likert questions include: 1) "How much did you enjoy the exercise?" 2) "To what extent did completing this exercise help you better learn the material?" and 3) "To what extent did the exercise help connect the material from the course to real life applications and/or relate to other fields of study (e.g., literature, physiology, history, sociology, art design, the performing arts, etc.)?" The free response question asks, "Please briefly indicate what you liked and what was helpful about this exercise. Please provide any suggestions on how we might improve this assignment." Quantitative and qualitative analysis are currently being conducted on these data. These data are then used to determine which assignments will be used in future courses to promote student engagement and increased learning.

90. Three Day Dietary Recalls is Equivalent to 5-day Dietary Recalls in Evaluating Caloric Intake and Macronutrients in Person with Spinal Cord Injury

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Background: The detrimental adaptations on body composition characterized by rapid loss in lean mass and accumulation of fat mass are associated with several non-communicable diseases similar to type II diabetes mellitus, dyslipidemia and cardiovascular diseases in persons with spinal cord injury (SCI). Accurately evaluating dietary intakes is an essential component in management of body composition adaptations following SCI. We have previously shown that 7 days of diary recalls is an accurate method of capturing weekly caloric intake and providing accurate estimates of macronutrients (% carbohydrate, % fat and % protein).

Purpose: The purpose of this pilot work is to examine whether three days are equivalent to five days of dietary recalls and whether it is more efficient than one day of dietary recall in evaluating caloric intake and the percent of macronutrients in persons with SCI.

Methods: Three persons with complete SCI were enrolled as a part of a federally funded study investigating the effects of exercise and testosterone on body composition and metabolic profile after SCI (<http://clinicaltrials.gov/ct2/show/NCT01652040>). Participants were asked to turn in a 5-day dietary recall on a weekly basis for 16 weeks. Data of the first 8 weeks were analyzed using the Nutrition Data System for Research (NDSR 2012) software. Basal metabolic rate was measured using indirect calorimeter and participants received feedback from the dietitian every

4 weeks. The averages of 5-day, 3-day and 1-day dietary recalls for caloric intake and percentage macronutrients (% carbohydrate, % fat and % protein) were calculated.

Results: One-way ANOVA revealed that the caloric intake of 5-day dietary recalls (1231 ± 66 kcal/day) was not different from 3-day (1228 ± 119 kcal/day) or 1-day dietary (1217 ± 166 kcal/day) recalls over 8 weeks ($P > 0.05$). However, the 1-day dietary recall did not show the same pattern, especially during the first 4 weeks. Percentage macronutrients were not different among 5-day, 3-day or 1-day dietary recalls.

Conclusions: Three-day dietary recalls provide an accurate estimate of caloric intake and macronutrients compared to 5-day dietary recalls. The results did not show a difference from a one-day dietary recall; the pattern, however, in caloric intake was clearly not similar to 3 or 5-day dietary recalls.

91. Improving Healthcare for Soldiers and Veterans through Holistic Medicine

Diana Duong, Biology, with Dr. Michael Rackett, University College

Holistic medicine originated over 6000 years ago, and it has been gaining a lot of popularity in the medical field. It is also known as alternative medicine, and is a form of treatment that is natural and does not involve pharmaceuticals. Examples of holistic treatments include yoga, acupuncture, massage therapy, meditation, etc. With holistic medicine being non-reliant on drugs, this could be beneficial to soldiers and veterans who may be at a high risk of addiction and substance abuse. With this in mind, I did research on the effectiveness of holistic medicine in treating soldiers with major injuries and post-traumatic stress disorder (PTSD) in contrast to contemporary medicine. Based on scholarly research, I concluded that holistic treatment is effective in decreasing drug addiction, promoting better health, and preventing emotional and physical breakdown among soldiers and veterans who may prefer these treatments instead of traditional medicine. RAND (Research and Development; a global, nonprofit organization) predicts that the government could save up to \$1.7 billion if an alternative method (such as holistic treatments) was used to treat PTSD. Acupuncture could be very effective in treating mental and physical injuries that have to do with traumatic brain injury (TBI) and PTSD. A holistic form of prevention for soldiers would be enhanced training courses to better prepare them mentally and emotionally when going out to combat. Although the issue of insurance coverage and long-term effectiveness exists, overall holistic treatment has been beneficial to soldiers whom have used it.

92. Impact of Black Identity on Campus Sexual Violence

Muhammad Attallah and Marwa Fadlalla, Psychology, with Dr. Sarah Javier, Health Psychology Doctoral Program

The purpose of this study was to examine the impact of race status on sexual violence among college students. Past research (e.g., Nguyen et al., 2012; Center for Disease Control, 2012) has supported that sexual violence in the U.S. differs based on race and about 38% of female rape victims are between ages of 18-24 (CDC GOV, 2012). Past research has not examined different factors that can be assessed when differentiating sexual victimization between Black students and students of other races. The main hypothesis of the current study is that there will be lower rates of sexual violence among Black students. Black students have lower rates across college campuses than other races (AHCA, 2011). Data was gathered from the 2012 National College Health Association survey at a public institution in the state of

Virginia. In the current study, there were 4,543 non-Black and 769 Black participants. An independent samples *t*-test showed that individuals who were Black experienced higher rates of sexual violence in the past 12 months compared with other racial groups for two categories: sexually touched without consent and sexually penetrated without consent. This study suggests the need for further research on assessing what is causing Black students to have higher rates of sexual violence compared to other racial groups. Other implications and related variables such as sexual orientation will be discussed.

93. Geographic variation in *Lymantria dispar* pupal mortality across Virginia

Stephanie Roddy, UROP Fellow, Biology, with Dr. Karen Kester and Dr. Derek Johnson, Dept. of Biology

The Eurasian gypsy moth (*Lymantria dispar*) is a serious forest defoliator in North America whose range has been expanding since its introduction to Massachusetts in 1869. While the gypsy moth's range has continued to move southward in the mountains of Virginia over the past 20 years, it has become static in the Piedmont (foothills) and has inexplicably regressed northward in the coastal plain. We hypothesized that the variable spread rates are caused by geographic variations in rates of predation and parasitism of gypsy moth pupae. To test this hypothesis, we established six study sites (two per region), three plots per site, at approximately the same latitude across Virginia. Treatment groups included: tree-caged, tree-uncaged, ground-caged, and ground-uncaged pupae. Uncaged pupae were available to vertebrate and invertebrate predators, whereas caged pupae were available only to invertebrates. After 7 days exposure, uneaten pupae were collected and reared to adulthood in the lab or scored as dead. Although overall gypsy moth survival did not differ across regions ($p > 0.05$), invertebrate predation differed by region ($p < 0.001$). Ground predation by invertebrates was higher in the mountains, ground predation by vertebrates was higher in the coastal plain, and tree predation by invertebrates was lower in the Piedmont. Overall, predation by vertebrates was 3-4 times greater than by invertebrates. "Other mortality" was lowest on the ground in the Piedmont ($p < 0.01$), tended to be highest in the coastal plain, and was lower ($p < 0.001$) in uncaged and tree treatments. No parasitoid emergence was observed, which supports the hypothesis that parasitoids do not play a major role in controlling low density gypsy moth populations. Results demonstrate that predation plays a role in limiting range expansion of the gypsy moth but are ambiguous with regard to explaining geographic variation in the rate of gypsy spread.

94. Collaboration of Art and Archaeology at Ferry Farm

Nancy Reid, UROP Fellow, Painting & Printmaking and Anthropology with Dr. Bernard Means, School of World Studies

The original goal of this project was to use art created in response to the archaeological excavation at Ferry Farm to reinterpret history and engage the community in an interaction with the art, the history and the archeology of the unique site. At first, the focus was on documentary and illustrative drawings, which evolved into etchings, screen prints, resin paintings, and sculpture, and the concept began to revolve more around the history and material culture than on the excavation. The installation of the art for public viewing will be a

future endeavor because the amount of time needed to create a varied and interesting body of art was longer than expected. Despite this setback in project deadline, the extended length of time for creation led to more research and reflection on the historical concepts being unearthed at Ferry Farm, such as British influence on the American consumer economy and global identity. This allowed for the creation of a more thought-provoking series to add to the purely documentary illustrations. The art asks questions about why this history is important to talk about and how it shapes a national identity.

95. Is Less More?: Exploring the Effects of Multiple versus Single Session Interventions on Condom Attitudes

Shalesha Majors, Ashley Everett, Miracle Allums, Brittini Trofort, and Jasmine Abrams, M.S. with Dr. Faye Belgrave, Psychology

Introduction: HIV disproportionately affects the lives of African Americans. Fortunately, infection rates have been progressing in a downward trend since HIV's appearance in the 1980's. This trend may be due to the Centers for Disease Control and Prevention's rigorous efforts in providing interventions to maximize awareness of and reduce risk for HIV infection. Examples of such interventions include the Sisters Informing Sisters on Topics about AIDS (SISTA) Project, Nia, and Safe in the City. The purpose of this study is to examine differences in condom attitudes, a predictor of condom use, across the three previous mentioned interventions. It is hypothesized that men and women who participate in multiple session interventions (SISTA Project and Nia) will have more positive condom attitudes than men and women who participate in the one session intervention (Safe in the City).

Method: A total of 156 African American college students participated in one of three interventions. Men participated in Nia, women participated in the SISTA Project, and both men and women participated in Safe in the City. Participants were recruited via awareness/promotion tables, flyers, and engaging educational forums.

Results: Results from two independent sample t-tests revealed that the men who participated in Nia reported more negative attitudes towards condoms than men who participated in Safe in the City, when comparing post –test and follow up data. In addition, there were no significant differences in condom attitudes for SISTA Project participants compared to women who participated in Safe in the City.

Discussion: The results did not confirm the stated hypothesis. Results suggest that multiple session interventions have greater or equal effects on condom attitudes when compared to single-session interventions. Implications for these findings are discussed. Future studies should explore this phenomenon among similar prevention programs for varying age group

96. THE ROLE OF THE SAX-7 GENE IN ETHANOL RESPONSES IN CAENORHABDITIS ELEGANS

Kalyann Kauv, Biology, with Jill C. Bettinger, PhD and Andrew G. Davies, PhD, Department of Pharmacology and Toxicology, Virginia Commonwealth University

The teratogenic effects of alcohol were first described by Jones and Smith in 1973, which have now become known as the hallmark signs of Fetal Alcohol Syndrome (FAS). Fetal Alcohol

Spectrum Disorders (FASD) is a new term to describe children prenatally exposed to alcohol displaying a wide range of symptoms. As a spectrum disorder, these symptoms can manifest in varying degrees, and the molecular mechanisms of alcohol's effects are not well understood. In humans, mutations affecting expression of the transmembrane adhesion receptor L1 Cell Adhesion Molecule (L1CAM) gene during development can produce many symptoms similar to FASD. L1CAM is involved in neural development and is conserved in vertebrates and invertebrates. Previous studies in rat and mice models show ethanol inhibits the L1CAM mediated outgrowth of neurites. We hypothesize that ethanol effects on L1CAM function could play a role in the developmental neurotoxicity leading to FASD. We are using *Caenorhabditis elegans* (*C. elegans*) as a model organism to test the effects of ethanol on sensory axon development. We hypothesize that the known L1CAM homologue in *C. elegans*, *sax-7*, will mediate ethanol effects on axon development. *sax-7* is known to be involved with the positioning and function of numerous chemosensing neuronal pathways. One class of neurons in particular that we are interested in is the *dat-1* expressing dopaminergic neurons. We would like to compare the relative anatomical locations of the *dat-1* expressing neurons in *sax-7* mutants and ethanol-treated wild-type animals to detect any similarities between those strains for abnormalities in the maintenance of position of those neurons. To further test the hypothesis that *sax-7* mediates behavioral effects of ethanol, we performed locomotion assays of *sax-7* mutants and wild-type animals exposed to ethanol. Our analysis and results are pending.

97. The Relationship between Quality of Life and Prenatal Behaviors in Low-Income Women

Alexandria Patterson, Psychology, with Adrienne Borschuk, M.S., and Dr. Heather Jones, Dept. of Psychology

Research indicates that pregnant women of low socioeconomic status are less likely to engage in health-conscious prenatal behaviors, such as abstinence from alcohol and smoking, as well use of vitamins during the earlier stages of their pregnancy (Zambrana, Scrimshaw, Collins, Dunkel-Schetter, 1997). Quality of life for women with low SES also is poorer than in women with higher SES (Govil, Weidner, Merritt-Worden, Ornish, 2009). The relationship between quality of life in pregnant women and prenatal behaviors has yet to be investigated.

The current study aimed to explore the relationship between quality of life and prenatal behaviors in a sample of 43 low SES pregnant women (age: $M=28$, $SD= 5.734$) participated. Participants were on average twenty five and a half weeks pregnant. Low income was defined as having a yearly income of \$25,000 or less. The participants were recruited at a women's health clinic after they were approached by a research assistant while waiting for their appointment. Participants completed the Adult ADHD Quality of Life Questionnaire (Brod, Johnston, Able, Swindle, 2006) and the Prenatal Health Behaviors Scale (Lobel, 1996). Data collection is currently ongoing; therefore, preliminarily data was used for data analyses.

Results indicated that proper nutrition had a positive relationship with life productivity ($r= 0.416$, $p= 0.009$), psychological health ($r=0.416$, $p=0.012$), life outlook ($r=0.387$, $p=0.018$), and relationship quality ($r=0.532$, $p= 0.001$). Also, prenatal behaviors was positively correlated with relationship quality ($r= 0.498$, $p= 0.002$). Finally, poor eating behaviors had a negative relationship with psychological health ($r= -0.425$, $p=0.10$) and relationship quality ($r=-0.397$, $p=0.018$).

Overall, several of the prenatal behaviors subscales evidenced a significant relationship to quality of life subscales. It may be that pregnant who eat better, have great amounts of energy and feel better throughout the day or those who have greater amounts of energy are more likely to have better nutrition. Prenatal behaviors, such as remembering to take your vitamins, showed to have a positive correlation with relationship quality; it may be that those who have satisfying relationships are more likely to have someone reminding them to take their vitamins. A possible explanation for poor eating behaviors' negative correlation regarding

psychological health and relationships could be that those who feel overwhelmed, anxious, depressed, or fatigued also may eat poorly as their mood is low. This is the first study to examine relationships between quality of life and prenatal behaviors. Thus, replication with larger samples is needed and future research should also explore whether screening and targeting pregnant women with poor quality of life for intervention results in improvements in prenatal behaviors.

98. Bringing the End to Mind: Dispositional Mindfulness Predicts the Recall of Future Behavioral Intentions.

James Hovermale and Robert J. Goodman, Psychology, with Dr. Kirk Warren Brown, Psychology

We all plan for the future. Often times this requires forming an intention to behave in a particular way at a future time or place. For example, we might form the behavioral intention to return a library book, but to succeed, this behavioral intention must be cued when we pass the library later in the day or we will forget. This ability to recall and act on our future intentions is known as prospective memory. Considerable research suggests prospective memory is influenced by attentional processes, and the present study examined whether a particular quality of present-focused attention called mindfulness would predict prospective memory accuracy. Participants completed a battery of individual difference measures that included mindfulness before completing a computerized prospective memory task. During the task different colored word pairs were presented, and participants determined whether each pair was semantically related. At random intervals participants received cues to press a special key when the words appeared in a special target color. Prospective memory performance was operationalized as the proportion of times participants pressed the special key in response to target colored words. Participants higher on dispositional mindfulness tended to score better on the prospective memory task after controlling for individual differences in self-reported memory errors. The present research links mindfulness with adaptive prospective memory function, which is broadly relevant for a scope of psychological problems that involve prospective memory, such as addictions and substance abuse problems. Future studies should leverage experimental manipulations to explore causal effects of mindfulness on prospective memory.

99. PERCUSSION AND VIBRATION AIRWAY CLEARANCE THERAPY INCREASES INFLAMMATORY FACTORS IN BRONCHIAL CELLS

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BACKGROUND: Ventilator associated pneumonia (VAP) is a preventable but common complication of mechanically ventilated (MV) patients due to oral secretions containing bacteria migrating to the lungs via the endotracheal tube. The development of VAP is associated with an increased risk of mortality, substantial increase in hospital stay and healthcare-associated costs. In order to prevent VAP, multiple pulmonary hygiene and airway and secretion clearance therapies (ASCT) have been utilized such as kinetic bed-delivered therapies which include: continuous lateral rotation (CLRT) and percussion/vibration (P/V) therapy. Currently, there is

insufficient empirical evidence to support that kinetic bed therapy reduces the onset of nosocomial pneumonia. The purpose of this study is to mimic the clinical scenario of a patient receiving kinetic bed therapy followed by a bacterial exposure in an *in vitro* model through quantification of IL-8, IL-10, TNF alpha, 8-isoprostane and nitric oxide.

METHODS: Human airway 3D normal human bronchial epithelial (NHBE) air-liquid interface (ALI) cell culture model were grown and followed with bacterial challenge through the application of lipopolysaccharide (LPS). Culture was subjected to three different kinetic conditions (1-Acute: 15 min P/V, 2-Intermittent: 15 min P/V per hour for 6 hours, 3-Continuous: 6 hour P/V). Trans-epithelial electric resistance values were taken before and after each condition. In this experiment, NHBE cells underwent submerged culture conditions for two weeks, and then transitioned to ALI for another two weeks. Cell supernatants were collected, stored at -80°C and batch processed via multiplex cytokine bead assay for IL-8, IL-10, TNF alpha and via enzyme immunoassay (EIA) for 8-isoprostane. Supernatant samples will also be analyzed for nitric oxide.

RESULTS: Percussion and vibration dramatically loosened the tight junctions between LPS- and LPS+ cells which is reflected by the decrease in resistance. 8-isoprostane levels increased in both LPS- and LPS+ cells during percussion/vibration. More results to follow.

DISCUSSION: Vibration and percussion therapy could exacerbate a patient's condition. Tight cell junction is compromised after 12 hours of continuous vibration. Intensity or duration of the therapy should be studied more to find the optimal setting to prevent the onset pneumonia.

100. The CNS stimulant D-Amphetamine causes locomotor hyperactivity in Vesicular Monoamine Transporter (VMAT)1 (-/-) Knockout Mice

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Schizophrenia is a mental disorder that is characterized by abnormal behaviors such as hallucinations, paranoia, and disordered thinking. The dopamine hypothesis states that behavioral deficits present in schizophrenics are due to an excess of dopamine or dopamine activity in the brain. Schizophrenia also has a strong genetic component, as concordance rates for monozygotic twins are approximately 50%. Linkage studies suggest that polymorphisms in the human VMAT1 (vesicular monoamine transporter) gene may play a role in the development of schizophrenic behavior. The VMAT gene has two isoforms (VMAT1 and VMAT2), with both isoforms responsible for the packaging of monoamines into vesicles. VMAT1 is primarily expressed systemically in endocrine and paracrine cells, while VMAT2 has its highest levels of concentration in the brain. Recently, however, VMAT1 expression has been reported in the human and mouse brain. In order to determine if VMAT1 plays a role in the development of schizophrenic-like behavior we investigated the behavioral phenotype of VMAT1 in a knockout mouse model. In order to examine the hyperdopaminergic theory of schizophrenia and its relationship to VMAT1, we examined amphetamine-induced hypersensitivity in a locomotor activity assay.

To conduct this study, we utilized VMAT1 knockout mice and wildtype C57BL/6 littermates. Locomotor activity was studied with the use of standard Med Associates locomotor activity chambers. Mice were placed in the activity chambers for a one hour habituation period and

measures of distance traveled were taken using photocell beam break. After the habituation period mice were removed from the chamber and given an injection of 0.5 mg/kg amphetamine and then placed back in the activity chamber for one hour - distance traveled was recorded via photocell beam breaks. Data for both the pre-amphetamine habituation and post-amphetamine test periods were recorded and analyzed in 5 minute bins.

Results from this study provided behavioral validation for the presence of VMAT1 in the central nervous system as administration of amphetamine caused a significant increase in locomotor activity in the VMAT1 knockout mice as has been previously reported in VMAT2 knockout mice. This study also provided support that VMAT1 plays a functional role in the development of schizophrenic-like behavior as VMAT1 knockout mice displayed a hyperactive phenotype relative to wildtype littermates.

Brian Joseph's home institution is Virginia Commonwealth University.

This research was supported by Commonwealth Health Research Board Award 34-10 to JKS and JHP.

101. Forensic Signatures of *Bacillus cereus* Spore Cultures Grown in Different Media Based on Cellular Fatty Acid Methyl Ester (FAME) Profiles

Donald Jessup, Forensic Science, with Dr. Christopher Ehrhardt, Dept. of Forensic Science

In this study, cellular Fatty Acid Methyl Ester (FAME) profiles were investigated as forensic signature for the species and the growth environment of an unknown organism recovered as evidence from a biocrime. Fatty acids are an integral component of the cell membrane. The diversity of fatty acid structures change as a function of bacterial taxonomy and environmental pressures. Our goal was to test whether variation in fatty acid profiles could be used to reverse engineer the taxonomic identity of an organism and the specific nutrients used during laboratory culturing. This information may be important in a biocrime investigation to provide investigative leads or exclude suspects.

To accomplish this, we built a culture library of two different *B. cereus* strains, str. 14579 and 'T-strain', each grown on four growth medium recipes. Medium formulations varied in the sources and concentrations of protein/amino acids, sugars, carbohydrates, and inorganic salts. Fatty acids were extracted from each culture and profiled using Gas Chromatography coupled to a Flame Ionization Detector (GC-FID). Results showed that FAME profile differences were most pronounced among spore cultures grown on media with varying sources of proteins and amino acids in their formulations (*i.e.* tryptone vs. peptone). Specifically, spores grown on tryptone were enriched in branched-odd fatty acids (15:0 iso, 17:0 iso) and depleted in straight-chained fatty acids (14:0, 16:0, 16:1 ω 7c) compared to spores grown on peptone. In addition, individual FAME biomarkers were found to differentiate *B. cereus* 14579 spores from *B. cereus* spores. These include 17:0 iso, 17:1 iso ω 5c, and 17:1 iso ω 10c. These results suggest that FAME profiling can detect individual biomarkers and multivariate differences among spore cultures grown in different media and that this technique may be a promising tool in microbial investigations.

102. The Effect of Traumatic Brain Injury on the integrity of the node Ranvier in Aged and young Adult Mice.

Afua Andoh, Biology, with Dr. Sarah Golding, Dept. of Biology

Myelinated axons establish protein domains that are critical in neuronal function. One of these domains is known as the node of Ranvier (NOR) and previous work from our lab and others has shown that both formation and maintenance of the NOR requires contact between the axon and non-neuronal cells, specifically the CNS myelin forming cells known as oligodendrocytes. The NOR is the site of ion channel clustering required for proper function of the CNS. In addition to the NOR, myelinated axons also establish and maintain other protein domains that are essential to neuronal function. One of these domains is the axonal initial segment, the site of initiation and modulation of nerve cell conduction. In Traumatic Brain Injury (TBI), the most common cause of neurologic pathology in young adults, the axonal initial segment and, to a lesser extent, the NOR have recently been shown to be structurally compromised, which would significantly impair axonal function. Since our lab has recently shown that the NOR is moderately structurally compromised with age, we hypothesize that the pathologic effects on the NOR induced by a secondary insult will be significantly exacerbated. To test this hypothesis, we have induced moderate TBI on aged mice and will quantitatively compare the extent of NOR on the pathology between aged and young TBI injured mice. We have chosen TBI since age is secondary only to severity of the initial injury as the leading prognostic indicator. For this study, I will employ a combination of immunocytochemistry for a NOR marker and confocal microscopic analysis on these injured animals to determine the consequence of aging on the integrity of the NOR following TBI.

103. Women and the Right to Information Act in India

Rachel Sine, UROP Fellow, Political Science and International Relations, with Dr. Jason Arnold, Dept. of Political Science

Following years of grassroots citizen mobilization against a heavily corrupted system, the Indian parliament enacted the Right to Information Act (RTI). Through the RTI, citizens are able to submit requests for unclassified government information from any department or agency, and within 30 days, applicants must receive a response. The legislation has been touted as a powerful tool for marginalized groups to enforce democratic accountability, including women and lower castes. While the government has implemented other schemes aimed to boost accountability, they have typically been ineffective, and have in some cases actually exacerbated government unresponsiveness to marginalized groups. This study seeks to contribute to the government's understanding of the scheme in place, and how the scheme can be improved in order to follow the commitment to marginalized groups, specifically women. This study is focused on urban, slum-dwelling women and their awareness of the RTI Act.

Over the course of ten weeks during the summer of 2012, information about RTI awareness was collected through interviews with women living the Kathputhli slum in Jaipur, Rajasthan. Each interview was approximately 11 questions, and was orally administered to 463 women and 87 men living in the community. The results showed an overwhelming percent of the population lacked basic understanding of RTI. These results to provide a clearer picture of RTI awareness among poor Indian women, in particular, slum dwelling women in Jaipur. In addition, the study will elucidates how information about RTI flows through Indian society. My

intent is to highlight the most successful means of creating RTI awareness so that we can begin to work towards a solution that is inclusive of women. Studying women and their use of RTI is the first step in developing a dialogue about how to advance women's political participation in India.

104. EFFECT OF SILDENAFIL IN REVERSING MULTIDRUG RESISTANCE IN MiaPaca2 PANCREATIC CANCER CELLS OVEREXPRESSING ABCB1 TRANSPORTER PROTEIN

Samya Dyer, Biology, David Durrant, and Dr. Rakesh Kukreja, Dept. of Cardiology

Due to enhanced expression of ATP binding cassette (ABC) transporters, which are responsible for removal of toxins from the cell, multidrug resistance (MDR) is one of the major causes for failure of chemotherapy in cancer. Previous studies have shown that the phosphodiesterase-5 inhibitor, sildenafil (Sild), enhances the chemotherapeutic efficacy of Doxorubicin (DOX). It's expected Sild will increase intracellular accumulation of DOX by inhibiting these transporters, including ABCB1. By examining the response of parental versus ABCB1 overexpressed MiaPaca2 cells (Mia-B1), we studied the effectiveness of Sild in reversing MDR. We transfected plasmids containing the ABCB1 gene into MiaPaca2 cells to obtain overexpressed clones. Positive ABCB1 overexpressed clones were selected using DOX and confirmed by Western blot. Western blots showed significant overexpression of ABCB1 in every clone. Drug resistance of Mia-B1 cells was tested by MTS cell viability assay after exposure to DOX for 48 hrs. DOX accumulation was measured after extraction and quantification on a fluorescence plate reader, as well as using flow cytometry. Dose response curves of DOX showed protection of Mia-B1 as compared to parental MiaPaca2 cells, while DOX accumulation studies showed an enhancement of efflux in Mia-B1 cells. Sild increased DOX accumulation in both parental and overexpressed cell lines. It also increased the damaging effects of DOX within the cells. This shows that ABCB1 is involved in the efflux of DOX, and that Sild is able to inhibit that efflux and re-sensitize ABCB1 overexpressed pancreatic cancer cells to DOX. With further research, Sild could become useful in reversing MDR seen in several cancers through its inhibition of ABC transporters. This work was supported by the IMSD Research Program.

105. Characterization of HIV-1 Integrase Interactions with Viral DNA

Joanna Kettlewell, UROP Fellow, Biology, with Dr. Allison Johnson and Dr. Vamsi Yadavalli, Center for the Study of Biological Complexity

HIV-1 integrase (integrase) catalyzes the insertion of viral DNA into human chromosomes and is a focus for development of anti-integrase inhibitors to combat HIV infection. Integrase catalyzes two steps, a DNA-end cleavage reaction (3'-processing), and a DNA-end joining reaction (strand transfer). Together, these steps result in viral DNA integration into the genome of the host cell, resulting in persistent infection. Better understanding of the mechanism of integration and interactions of the viral and host DNA with integrase are required for optimal inhibitor development. Recombinant integrase protein was purified and activity was evaluated in a biochemistry assay under bulk conditions to optimize 3'-processing and strand transfer activity. Integrase binding to DNA was then measured under these conditions, using quartz crystal microbalance. This technique will also be used to characterize the disruption of integrase binding to DNA by inhibitors. Finally, integrase/DNA complexes will be visualized by

atomic force microscopy to explore their interaction. This study addresses gaps in knowledge of viral DNA and HIV-1 integrase interactions as well as the effects of inhibitors on DNA binding.

106. Feather characteristics indicate reproductive success in female Prothonotary Warblers: no evidence of reproductive carry-over effect

Samantha Kay, UROP Fellow, Biology, with Dr. Lesley Bulluck, Dept. of Biology

Migratory songbirds undergo several energy expensive processes late in the breeding season (breeding, molting, migration), and the timing of these activities may occasionally overlap when parental care extends late into the breeding season. The tradeoffs between breeding activity and molting can influence plumage quality and reproductive success in the following breeding season, but this type of carry-over effect has only been assessed in a few species. Foraging ability can be reflected in an individual's feather carotenoid content because carotenoid pigments (red, yellow, orange) are derived solely from the diet. Therefore, yellow plumage can be an indicator of individual quality/fitness and could make females more attractive to potential mates (sexual selection). Our study was conducted using female Prothonotary warblers (*Protonotaria citrea*) by assessing their feather reflectance and reproductive effort in consecutive breeding seasons. We investigated whether or not reproductive effort in the previous breeding season might influence plumage reflectance and reproductive effort in the following year. We expected later breeding females to possess lower feather carotenoid content and lower reproductive success the following season. However, our data did not show any evidence of carry-over effects on either plumage or reproduction. Thus, there is no significant cost of late breeding within this species. The data did support correlations within a single breeding season, where females with higher feather carotenoid content fledged more young and arrived earlier to the breeding ground than females with lower carotenoid content. It appears that feather characteristics may be an honest indicator of a female's annual reproductive success and therefore influence female sexual selection.

107. Maternal age effect on gender ratios

Gretchen Wilson, Biology, with Dr. Lesley Bulluck, Dept. of Biology

Reproductive success leads to greater fitness returns, an individual's primary life goal. In female birds, reproductive success improves with age and experience, but shows an eventual decrease due to senescence. Male and female offspring offer different fitness returns due to their distinctive reproductive constraints, for example, males are only limited by the number of females that find them attractive, while females are limited by the number of eggs and lay and broods accomplished each season. Mothers of some species have been shown to manipulate gender ratios over the course of their lifetime in order to suit their current conditions and to

optimize fitness returns, breaking from Fisher's 50:50 model. A disparity in reproductive success among breeding mothers of varying ages could lead to younger females producing different gender ratios than middle aged, and older individuals. To test this hypothesis, data was collected from a population of prothonotary warblers. Maternal age was determined by plumage and/or date of previous capture. Hatchling gender type was determined by CHD gene intron comparison through PCR. Little is known about the factors that influence maternal sex ratio manipulation and the involvement of maternal age; the results of this study will shed light on that subject and allow avian ecologist to better understand this reproductive process.

108. Religiosity as a protective factor against the non-medical use of prescription drugs

McCauley, J.M., Bannerman, D., Balog, V., Granger, C., Snipes, D.J., with Dr. Eric Benotsch, Dept. of Psychology

Research suggests that religiosity may act as a protective factor for substance use. This study examined religiosity as a protective factor for the non-medical use of prescription drugs (NMUPD). A brief survey was administered to young adults (18-25) enrolled in undergraduate psychology classes at a large public university. Overall, 27.9% of participants reported lifetime NMUPD and 17.2% reported NMUPD in the past 3 months. Individuals who reported both lifetime and past 3 months NMUPD scored significantly lower in religiosity than individuals who did not report this behavior ($p < .001$). Multivariate logistic regression analyses were conducted controlling for age, gender, race/ethnicity, student status, employment status, year in school, and greek membership. Adjusted odds ratios showed that religiosity/spirituality was a protective factor for both 3-month (AOR=0.98, $p < .001$) and lifetime NMUPD (AOR=0.98, $p < .01$). This research expands on past literature by focusing specifically on prescription drugs and by utilizing a comprehensive quantitative measure of religiosity.

109. Yes, Really, Actually, it is Virtual!!!!

Courtney Bowles, Virtual Curation Laboratory, with Dr. Bernard Means, School of World Studies, Dept. of Anthropology

With the increased use and accessibility to 3D images and data, one question can be posed: Will aspiring archaeologists still be drawn into the field when studying virtual models instead of a real artifact? Rising generations are rapidly evolving into one whose understanding of the world is both shaped and experienced through virtual means. What is considered "real" to many is now what is depicted on screens through social media outlets such as Facebook, or avatars in alternate worlds. The concept of reality to which we are familiar with, is constantly active, "moving between reality as virtual and reality as actual." To a rising youth, virtual is just as real as the objects we live with and handle daily. Therefore, the topologic models of archaeological objects that are increasingly becoming available will hold the interest of prospective archaeologists because what has been created is in every sense a real object.

110. I'm Heating Up My Extruder!: 3D Printing Archaeological Materials at VCU

Allen Huber, Anthropology, with Dr. Bernard Means, Dept. of Anthropology and Archeology

The concept of 3D printing in Archaeology is quickly gaining attention and funding all over the world. The cost of owning a 3D printer, meanwhile, is plummeting. Not only does this drop in price facilitate access by universities and businesses, but also to interested members of the public. With this in mind, Archaeologists must consider the prospect of using new technology to increase the accessibility of sites and artifacts to the general public. By creating reproductions of artifacts, researchers can share sensitive physical information on a larger scale than ever before. The Virtual Curation Laboratory at VCU has already begun the process of printing artifacts from various sites in the Middle Atlantic region for display. Here the focus of 3D printing has been primarily on small finds, being the most detailed and intriguing artifacts available, and introducing the public to a wider array of these artifacts could help spark a newfound interest in the field of Archaeology.

111. Initial Analysis and Considerations for Burial Processing Indicators on Middle Atlantic American Indian Remains

Stephanie King, Virtual Curation Laboratory, with Dr. Bernard Means, School of World Studies, Dept. of Anthropology

Secondary ossuary interments are typical Native American burial features associated with the Late Woodland and Contact periods in coastal Virginia and southeastern Maryland, and early historic accounts provide glimpses of an extended burial process. Many questions remain, however, regarding the potential stages and activities associated with the extended burial process as well as the potential length of time between the death of an individual and final interment within an ossuary burial. Discrepancies in how these indicators are defined will also be addressed. This presentation will provide the initial observations from three ossuary sites (44SY5, 44PG51, and 18PR40), which aim to analyze and identify potential marks associated with mortuary processes in an extended burial sequence. Clagget Farm (18PR40), with an MNI of 281 from a single deposit, dates to the Late Woodland II period (AD 1250 to Contact). Ossuary 1 from Claremont (44SY5), with an MNI of 14, also dates to the Late Woodland II period. In contrast, the Hatch site (44PG51), with an MNI of 36, dates to the Late Woodland I period (AD 900 to 1250) and is comprised of primary interments. The analysis will focus upon how processing indicators are examined and where they are located on the proximal and distal ends of the major long bones.

112. From Paper Museums to Laser Movies: Archaeological Visualization, 3D Technology and Education

Ashley McCuistion, Virtual Curation Laboratory, with Dr. Bernard Means, School of World Studies, Dept. of Anthropology

Imagery and physical representations play a key role in the interpretation, analysis, and publication of archaeological data. Archaeological visualization has been created using a wide range of mediums throughout history, including drawings, photographs, reconstructions, diagrams, and now three-dimensional (3D) models generated using laser scanning technology. 3D scanning has tremendous potential to expand archaeology, offering solutions to curation issues, allowing new perspectives in artifact analysis and preservation, and creating numerous opportunities for public archaeology. This presentation will examine archaeological

visualization and its future in the rapidly expanding sphere of technology, focusing specifically on three-dimensional scanning and its great strength for public outreach and education.

113. It's a Small Finds World Afterall: Research in the Virtual Curation Laboratory

Bernard K. Means, Courtney Bowles, Crystal Castleberry, Allen Huber, Rachael Hulvey, Stephanie King, Ashley McCuiston, Natalie Petrizza, Jamie Pham, and Mariana Zechini (all Virtual Curation Laboratory @ Virginia Commonwealth University)

Over the last year and a half, team members associated with the Virtual Curation Laboratory have focused on creating virtual avatars of unique artifacts, including small finds from cultural heritage sites located throughout Pennsylvania and Virginia. We have created digital models of small finds artifacts that can be shared with researchers across the globe, and used in a variety of educational and public archaeology settings. Some digital models have been used to create tangible replicas in plastic of small finds artifacts—these accurately scaled objects can be handled in ways not possible for the actual small finds artifacts. Virtual Curation Laboratory team members will demonstrate digital scanning of small finds artifacts, have virtual models available for manipulation, and create replicas using our 3D printer.

114. Virtual Archaeology and African Americans: Research, Education, and Outreach

Jamie Pham and Crystal Castleberry, Virtual Curation Laboratory, with Dr. Bernard Means, School of World Studies, Dept. of Anthropology

Over the last semester, my partner and I have had the opportunity to work with Dr. Bernard Means and several classmates as interns in Virginia Commonwealth University's Virtual Curation Laboratory. During our internship, we began to explore the application of 3D technology to the field of archaeology. For our display, we plan to exhibit the research and curation potential that 3D technology holds for archaeology. We will be focusing on the application of this new technology to African American sites specifically, but hope to show that virtual curation is useful to all areas of archaeological interest. Our display will provide a dynamic view into the possibilities of 3D archaeology, along with some of the challenges that have been discovered along the way. Through our display, we hope to encourage interest in 3D archaeology and show the enormous research potential that this innovative technology can offer to the field of archaeology.

115. Baculum to the Future

Mariana Zechini, Virtual Curation Laboratory, with Dr. Bernard Means, School of World Studies, Dept. of Anthropology

In the fall of 2012, the Next Engine 3D scanner was used to create three-dimensional images from elements of a raccoon skeleton loaned from the Virginia Museum of Natural History with a skull loaned from California University of Pennsylvania. The scanning took place in the Virtual Curation Laboratory, housed in the School of World Studies at VCU. Three-dimensional images have many advantages such as the preservation of artifacts and ecofacts in danger and allowing archaeologists to study material they otherwise cannot access. However, there are

advantages and disadvantages of using 3D technology on faunal remains. This poster will outline the scanning and editing process of the raccoon skeleton as well as discuss the importance and application of three-dimensional technology on zooarchaeology and the growing field of the virtualization of archaeological data.

116. Incomplete Reflections: Addressing Potential Bias in Digital Curation

Rachael Hulvey, Virtual Curation Laboratory, with Dr. Bernard Means, School of World Studies, Dept. of Anthropology

Digital scanning technology offers many benefits to archaeology and curation in its ability to preserve virtual representations of artifacts in databases without harming the object. However, various selective pressures may limit which artifacts are digitally curated. The material of an artifact or details on an object's surface may prevent it from scanning properly. Scans which inaccurately portray the surface detail of an artifact may be ignored by those who edit and process the files in favor of a more attractive scan. Scanning efforts designed for public outreach may favor certain artifacts over others. These selective pressures may produce unintentional bias in the digital artifact databases, which could potentially limit the applicability to certain scopes of archaeological research.

117. Virtual Artifact Scanning and Environmental Archaeology

Natalie Petrizza, Anthropology, with Dr. Bernard Means, Dept. of Archeology

Background: Because of the limited laboratory space available to most undergraduate students in archaeology programs, hands-on curriculum is very difficult to incorporate into the classroom.

Research Purpose: I wish to identify the ways in which virtual artifact scanning and printing can help further the field of environmental archaeology.

Methods: Through access to the Virtual Scanning Laboratory, I will scan faunal and floral remains and explore the ways in which these digital 3D models and their printed replicas can help aid classroom training in environmental archaeology. I will explore the potential for 3D databases of faunal skeletal remains that can be used in the field for identification purposes as well as in the classroom for learning purposes. I will also determine the extent to which virtual scanning can aid paleoethnobotany and geoarchaeology. In conclusion, I will discuss how virtual scanning changes the way archaeology is conducted in the lab and its impact on the human-environment relationship.

118. The Effects of Music Therapy on Children with Autism

Amanda Montejano, Dept. of Biology, with Prof. Faye Prichard, VCU Honors College

Autism is a social disorder that is increasing by a government estimate of 10 to 17% each year in the United States (Guzic, 2011). With such an alarmingly high growth rate, there must be more effective treatments for individuals with autism. Music therapy, when used as an intervention, has been found particularly effective in the treatment of children with autism. Early intervention in treating a child with autism can lead to sooner improvement, and

therefore possibly less displayed symptoms of the disorder. With fewer symptoms, children can thrive in the social world and feel a sense of belonging. By reading peer-reviewed articles from scientific journals and magazines about the use of percussion, the use of singing songs, and the relationship with the music therapist and their roles in music therapy for autistic children, I have learned that music therapy has many social and behavioral effects on children with autism. However, there is some argument among scholars that the relationship with the music therapist cannot be generalized outside of therapy, due to the fact that children with autism usually have difficulty applying what they have learned in a different setting (Finnigan and Starr, 2010). Nonetheless, it is important to recognize that improvements in therapy are large steps, and with time, may translate to other social settings. Rhythm and song singing also have a substantial effect on the socialization improvements of children with autism. From these findings, we can implement music therapy programs for autistic children that incorporate all of these methods. Furthermore, additional research should be conducted to find out if generalization can occur outside of therapy. Knowing if generalization can occur may lead to further insight about its process, and would enhance health professionals' abilities in accommodating autistic children's specific needs.

119. Politics in the United States and the TVPA of 2000

Lakshmi Ravindra, Dept. of Biology, with Prof. Faye Prichard, VCU Honors College

Although slavery was banned in the United States through the Thirteenth Amendment to the Constitution during the 1800s, another form of slavery still plagues the United States today. This form of modern-day slavery is also known as human trafficking and is an extremely prevalent global issue. While there have been various efforts to prevent the prevalence of human trafficking, none such actions have successfully helped to see a significant decline in its presence. Even action taken by the United States, the Trafficking Victims Protection Act of 2000 (TVPA), has failed to yield positive results. Thus, the question remains as to why all moves working against human trafficking have been unsuccessful, specifically the TVPA. This study investigates how politics were involved with the passing of the United States' TVPA of 2000. In order to do so, I examined governmental documents, research by experts, and speeches written by experts on the topic to investigate the political atmosphere in the United States prior to and during the passing of the TVPA. As a result of this analysis, I found that the political motives behind the passing of the TVPA were the agendas of politicians, the government's need to respond to public outcry, and the political desires of the United States in regards to Russia after the fall of the Soviet Union. In essence, this implies that the United States has yet to solely try to combat human trafficking; rather, so far, it has combated human trafficking while simultaneously seeking self-benefit in terms of politics. The United States should use this knowledge to actually pass legislation in the future that, rather than moving the United States ahead in politics, will wholly make attempts to minimize the prevalence of human trafficking in the world. This legislation, while it cannot be imposed upon other nations, can set a standard of what to do in terms of combating human trafficking; this standard can then be passed on to other nations, either through other nations adopting similar legislature or the United Nations developing a similar universal act for member-nations to ratify.

120. Examining the Relationship between Particulate Matter, Nitrogen Oxide, Carbon Oxides and Hypertension in Urban Areas in India: A Review

Hiren Kolli, Dept. of Biology, with Prof. Mary Boyes, University College

Developing countries are notorious for their poor air quality, but India is reported to have the worst air pollution in the entire world, beating China, Pakistan, Nepal and Bangladesh. Air pollution and hypertension have been on the rise in India. The goal of this work is to determine

whether or not a correlation exists between air pollutants and hypertension by examining the effects of specific particles on blood. This review involves studying the pollutants that two-wheelers and auto rickshaws (vehicles that are prominent in India) emit and then determining the effect these particles have on blood pressure. To conduct this study, I analyzed articles on vehicular emissions in India and similar countries, articles on the cardiovascular effects of particulate matter—nitric oxides, sulfate and carbon—and studies that examined the relationship between air pollution and the number of deaths in a certain area. As a result of this review, I learned that certain pollutants that are found in abundance in urban areas are associated with a higher prevalence of cardiovascular disease and that an increase in traffic leads to an increase in suspended particulate matter such as carbon monoxide, nitric oxides and hydrocarbons. Hydrocarbons from fuel emissions tend to be quickly absorbed onto particles and to accumulate into sediments, which makes them highly dangerous when released into an environment. Future studies will need to focus on isolating hydrocarbons and determining their underlying effects. This work can help physicians become knowledgeable of environmental factors and direct them to advise their patients who are suffering from hypertension accordingly.

121. Human Waste Management in Chuicutama, Guatemala

Taryn Dollings, Cali Jackson, and Kaitlyn Donahue, Homeland Security and Emergency Preparedness, with Dr. Jason Levy, Wilder School of Government and Public Affairs, Homeland Security and Emergency Preparedness

Chuicutama is a small community in the mountains of Guatemala at 11,000 ft. elevation. It consists of 29 families of Mayan descent. The Mayan population of Guatemala was pushed into the highlands by the Spanish government, and has suffered poverty and poor environmental conditions as a result. Chuicutama in particular struggles with the management of human waste. The purpose of this study was to investigate causes and implications of Chuicutama's waste problem, and suggest solutions. The study was conducted by group members going in person to Chuicutama and interviewing community members and leaders on site, and touring the community and its facilities. Upon visiting the community, the study found that the community had been relocated and given government housing that was built in an urban style, with capacity for septic plumbing. The community was not given any access to the plumbing; the bathrooms were useless and community members disposed of waste in holes dug into the ground. This practice was detrimental to the stability of the land, because holes built close together would collapse during the rainy season, and also had the potential to contaminate water sources and the gardens that families used as a primary food source. In conclusion, the community decided to attempt to finance a communal septic system that would link all indoor bathrooms to a treatment apparatus. This solution would help keep human waste out of Chuicutama's groundwater and gardens, resulting in healthier families and better environmental conditions.

122. Overuse of Fluoride in Public Water Systems: Stimulating Fluorosis Rather Than Preventing Dental Caries

Kaixin Chen, Dept. of Biomedical Engineering, with Prof. Mary Boyes, University College

In the early 1940's, researchers sponsored by the Centers for Disease Control and Prevention (CDC) discovered an inverse correlation between the prevalence of dental caries and the

quantity of fluoride consumption and exposure. As a result of this finding, the Environmental Protection Agency under the advisement of the CDC instructed municipalities in the United States to fluoridate their public water systems in order to increase fluoride exposure. More recently though, other researchers have concluded that there is a positive correlation between another dental condition, dental fluorosis, and fluoride consumption and have made recommendations to decrease fluoride consumption due to the aesthetic and physical damage associated with dental fluorosis. The researchers also suggested that the African American population in municipalities with fluoridated water systems expressed significantly higher susceptibility to dental fluorosis due to biological susceptibility and cultural practices. A study was conducted on the concentrations of fluoride in public water systems of municipalities with large African American populations. Because the African American demographic is essentially being overdosed with fluoride, it can be suggested that communities with large African American populations ought to reduce the concentration of fluoride in their water systems or completely eliminate public water fluoridation and give residents the option of accessing fluoride in the form of dental products or fluoride supplements. Until fluoride reduction is achievable, public health officials need to inform and educate African Americans of the risks associated with dental fluorosis and the preventative measures that African Americans, as well as other individuals, can utilize to reduce their fluorosis susceptibility.

123. Girls Gone Wild: How arguments form between young, female fans of the UK band "One Direction"

Abigail Welch, Psychology and English, with Prof. Faye Prichard, VCU Honors College

Due to the rise of popularity of social networking sites and of the United Kingdom band "One Direction," more young people are using websites like Twitter to connect with fellow fans. The increase in these social network connections can lead to a rise in internet aggression. Internet aggression, in turn, can lead to a wide range of psychological and physical effects for the victims, such as depression, distress, anger, and in one case, threats of suicide (Romano, 2012). While many individuals view that these young people attack each other because of their immaturity, an alternative view states that jealousy is actually the cause for these aggressive behaviors. Studies of cyberbullying and online aggression define aggressive behaviors as behaviors that are "threats of violence or stalking, sexual acts, and insults about physical or social characteristics of individuals" (Moore, 2012 , p 863). This paper analyzes the potential causes of aggressive behavior in young, female fans of One Direction. This analysis of the causes of aggressive behavior breaks down into parasocial interaction theory, cyberbullying, defense mechanisms, social discrimination and self-categorization, and physical attractiveness. This paper uses five studies that analyze the types of cyberbullying, defense mechanisms, and physical attractiveness, as well as three articles that analyze parasocial interaction relationships and social discrimination as evidence. Tweets from individuals who express and receive aggressive behavior are also used as primary sources for this paper. Analyzing the influences of aggressive behavior among fans can help us better understand why young, female fans of One Direction argue amongst each other, and why young people in general express aggression over the internet.

124. Relationship of Caffeine Content in Energy Drinks to Health in High School and College-Aged Adolescents

Arti Alagappan, Dept. of Biology, with Prof. Mary Boyes, University College

Although energy drink consumption is not currently regulated by the Food and Drug Administration (FDA), the high concentrations of caffeine in energy drinks—especially in comparison to drinks such as sodas and coffee—pose a potential threat to cardiovascular, muscular and immune system health. Caffeine in these energy drinks, especially when consumed in quantities over 70 mg, can lead to problems such as atrial fibrillation, muscle contractions and tension, and myocardial infarction. The objective of this research is to examine caffeine and its amplified role due to the different synergistic ingredients contained in energy drinks (including taurine, vitamin B6, carbohydrates, amino acids, and herbal supplements) to determine if there is a significant relationship between consumption and degradation of cardiovascular, muscular, or immune system health in high school and college-aged adolescents. Though additives found in energy drinks may not be as harmful alone, they serve to enhance caffeine and increase health risks. This study suggests that physical health risks can be attributed to specific ingredients found in these energy drinks, namely caffeine. This research further suggests that the FDA should enact regulations that prohibit the sale of highly caffeinated energy drinks to individuals under the age of 18 and that the FDA should require explicit labeling of these products as is currently mandated for alcoholic beverages.

125. Compassion: An Evolutionary Trait in Humans Reshaping Human Interaction

Rishabh Khatri, Dept. of Biology, with Prof. Mary Boyes, University College

From the inception of humankind to the present, humans and the world they reside in have changed drastically and they continue to do so. From the very first humans, *Homo habilis*, to the present *Homo sapien*, humans have evolved to become highly developed and sophisticated organisms. They have adapted to the ever-changing world around them and found success as a species. Becoming a successful species depends on the traits one carries. Traits of dominance trump weaker, recessive traits and are the ones expressed. Most traits grant humans some advantage they would not have had if they did not have that trait. Depending on the trait expressed, the way humans function together changes as well. Among the many traits in humans, lies compassion -- an intrinsically beneficial trait present in all humans. Compassion, as a trait in humans, is a reaction, triggered by the empathy for others. It transcends modes of communication including, but not limited to, talking, signaling, or gesturing, yet it still fosters an ethereal connection between two beings leading to a heightened cooperation between the two.

126. A Color Film or Something Like That

Scott Duncan, UROP Fellow, Dept. of Sculpture and Extended Media, with Prof. Corin Hewitt, Sculpture and Extended Media, School of Arts

In the summer of 2012, Assistant Professor in the department of Sculpture + Extended Media, facilitated a two-week class on his family's land in rural Vermont. During the course, each student was assigned a section of the visible color spectrum to investigate through the

making of a short film. These individual segments - roughly five minutes in duration - accumulatively transverse the entire spectrum. A rough cut of the eclectic film was screened on a half-moon stage on the west-facing ridge of the property. Three trenches - roughly 20' long, 8' wide, and 6' deep - fanned out from the base of the stage; here each student staged and filmed a live portion for their act, which was integrated in real time into the screening and amidst the live audience. This publishing project aims to restage the spirit of the film and its making through text and image, as a quasi-screenplay made in hindsight reenacting, embellishing and distorting the original narratives and ephemera.

Similarly to the film, the book is divided into ten acts traversing the visible color spectrum, through the unique investigations of the participating artists. This includes but is not limited to, drawings, film stills, photographs, music notation and poetry. Through these media, we collaboratively investigated such diverse topics as ecology, landscape, music, folklore, identity politics, and beyond.

The books will be both a document of the project as well as a portable art object that reflects this unique educational experience.

127. Help is on the Way

Taylor Coombs, Dept. of Political Science, with Prof. Bonnie Boaz, University College

In the past few decades, the United States has made great strides in addressing and treating victims of heterosexual domestic violence. However, domestic violence victims who are in same-sex relationships have seen little to no improvement in policies and treatment by the same institutions that have served heterosexual victims. Unfortunately, negative cultural views of LGBT (Lesbian, Gay, Bisexual, Transsexual) people and couples continue to affect victims of violence by impacting the scope of assistance they receive. Research shows that traditional gender roles frame the quality of treatment victims receive, and biases held by many public officials lead many LGBT domestic abuse victims to avoid seeking help. By examining scholarship from the mental health, public policy, and gender studies disciplines, I have found overwhelming evidence that supports an ongoing bias against LGBT individuals who are in same-sex relationships, and this bias underlies the failures in providing resources for LGBT abuse victims. In order to make any changes to the current social agencies that address abuse, we must first educate those who handle abuse victims so that we can unveil and work to change the stigmas they hold about LGBT couples. Without first educating police officers, counselors, and mental health providers, we can do little to improve the quality of care and compassion LGBT victims of domestic violence receive.

128. The Importance of NASA Education Programs on Student/Teacher Education and the Future

Michael Johnson, Pre-Medical Sciences, with Prof. Leslie Cohen-Gee, University College

Though the space program is expensive, NASA missions and programs lend to student education by offering a different approach to learning, by inspiring curiosity, and by helping students gain mastery in science, technology, engineering, math, and geography (STEM-G). In addition these programs inform students and teachers about the role of NASA and help generate an interest in the aerospace field. In these times when NASA finds itself struggling to

obtain adequate funding, due to a wide spread ignorance of its functions, it is important to remind the public of NASA's many roles. This paper will focus on some of NASA's educational programs and their impact on teachers and students. If NASA continues to go unrecognized by the public, then it may face extinction as the result of a withering workforce.

129. Ethics and Self-Regulation in the Graffiti Subculture

Lindsey Mott, Art History, with Prof. Mary Boyes, University College

New York City, the birthplace of graffiti, is notorious for its initiatives to rid the city of the practice entirely. The NYPD's current policy pertaining to the regulation of graffiti is based on the assumption that it is created by individuals who are motivated by destruction, and the most effective way to deter graffiti is by removing it as quickly as possible. However, these views fail to take into account the subculture in which graffiti is created, and the social norms present in said community. By analyzing existing literature concerning graffiti, especially that of Australia where it is considered an integral part of the inner-city character, I found that the graffiti community is greatly based on the notion of respect for those both within and outside the graffiti subculture. This notion of respect has created a loose set of ethics, where the defacement of certain areas, such as private property, is generally avoided. Additionally, it creates an aesthetic hierarchy, which allows "pieces" to be written over only by those requiring progressively more skill. By removing graffiti as quickly as possible, authorities are only deterring the graffiti that takes time and effort to produce, instead of allowing the aesthetic hierarchy to produce aesthetically pleasing graffiti which the greater community would be appreciative of. Furthermore, a very distinct divide exists within the subculture between what is viewed as "tagging" and "graffiti", as tagging is seen as an act which requires very little skill. This general disdain for tagging is reflected by the views of the greater public, which has voiced an appreciation for other types of graffiti. The embracement of graffiti by the greater culture in Australia proves that it is possible for the subculture to exist within the bounds of society. To be truly effective, policy pertaining to graffiti in New York City must be based on the concept that graffiti is ubiquitous to urban culture, and serve to work towards coexistence between the graffiti subculture and the greater urban culture, rather than attempting to eradicate the subculture entirely.

130. Women Stand Up

Diego Flores, University College, with Prof. Bonnie Boaz, University College

Modern stand-up comedy started in the seventies with men like Richard Pryor and George Carlin using humor as powerful forms of social critique. Despite the great wave of women comedians after the rise of cable television, and the consequential demand for more stand-up comedians, the art form has continued to be male-dominated, solidifying the nature of stand-up comedy as masculine and confrontational. This research study examines women in stand-up comedy and the way which in social constraints, gender norms and stereotypes, and cultural acceptance of misogyny have kept women from becoming prominent in the art form. By reviewing the research on gender differences in how humor is constructed and delivered, and by analyzing specific comedic routines of current male and female comedians, this study attempts to identify the gendered political, social, and internal factors that keep women and their voices from being a prominent force in comedy.

131. Causes of suicidal ideation in patients with Huntington's disease

Sindhu Marampudi, Biomedical Engineering, with Prof. Mary Boyes, University College

The aim of this research problem was to understand the causes of suicidal ideation in patients with Huntington's disease. Understanding the causes would allow clinicians to develop effective treatment methods. Information regarding depression and suicidal ideation was gathered from 18 sources. This information was analyzed to find common causes and gaps regarding the understanding of suicidal ideation in Huntington's disease. Many psychological and physiological factors contributing to suicidal ideation were discussed in the sources. Some of the psychological factors were depression, mood disorders, and substance abuse. Damage to basal ganglia and chemical imbalance in the brain were the main physiological causes. However, there was no agreement on what the main causes of suicidal ideation are. Thus, more research is required to isolate the main causes and ultimately create effective treatment plans for patients.

132. Measuring the Impact of Privatization on Prison Quality of Life and Incarceration Outcomes

Isaac Ramsey, University College, with Prof. Mary Mullins, University College

In the last few decades, the US prison system has grown to crisis-level proportions. According to the Bureau of Justice Statistics, more than 2.2 million adults were incarcerated in the US as of 2009, with almost 7 million adults under the supervision of some form of correctional authority as of 2011. About \$40 billion per year or more is spent on incarceration in the US (Perrone and Pratt; Weinstein). Maintaining the high costs of prison operations has proven burdensome on state budgets and simultaneously led to a growth in private management and ownership of correctional facilities. Filings to the Securities and Exchange Commission show that the two largest private prison companies in the US – Corrections Corporation of America and the GEO Group – reported over \$3 billion in revenue for the fiscal year 2012. In response to claims of improved quality of services from the private sector, some researchers have contended that the nature of the prison industry leaves little room for innovation while reducing operating costs (Lukemeyer and McCorkle). Since educational programs and health care such as counseling and drug treatment programs have been linked to improved quality of life for inmates and reduced recidivism rates, it is necessary to examine the impact of privatization in these specific areas. However, comparative research has produced inconclusive findings due in part to methodological inconsistencies and difficulties in matching inmate populations and facilities for comparison. In addition, it appears that insufficient data can be contributed to already existing issues of non-transparency in the prison system, which may be exacerbated in some cases by privatization (Blakely and Bumphus; Perrone and Pratt). To be sure, private management of correctional facilities in the US has led to financial relief for state budgets and increased managerial decision-making power in the absence of bureaucratic complexities associated with public administration. Despite these differences, current research cannot confirm private sector claims that privatization can or will lead to increased quality of care for inmates because empirical evidence does not support this claim. Furthermore, private prison companies remain dependent on third parties such as the state or private contractors for the provision of educational and health services.

133. Changing the Game: A Study of the Gender Gap in Collegiate Athletics

Alison Bragaw-Butler, Social Work, with Prof. Bonnie Boaz, University College

Over the past couple of years the excitement regarding Virginia Commonwealth University's men's basketball team has skyrocketed; but even before the bandwagon fans jumped on board, the men's basketball team received far more support than the women's basketball team simply because they are male. Since the passing of Title IX in 1972, young women's participation in college athletics, as well as their performance in sports has significantly improved. Yet even with these improvements, women's college sports continue to take a back seat to men's sports. This study reviews the scholarship on women in sports and determines the primary hindrances that continue to plague women's college athletics. Research clearly shows the statistical significance in the disparity between media coverage, the unwillingness of mainstream culture to let go of rigid gender stereotypes, and the distorted consumption motives of our current culture, which all contribute to the marginalization of women's sports. Until our society can break out away from traditional views of gender, which are deeply rooted in privileging male athletes and objectifying women, women's sports will not receive equal treatment to men's sports.

134. Empowerment through Violence

Janeal Downs, Mass Communications, with Prof. Bonnie Boaz, University College

Most people associate gangs with their ability to destroy communities by engaging in drug use, drug distribution and violence, and they have been studied for decades. Researchers are interested in defining gangs, understanding how they work, and finding reasons why the members join and stay in the gangs. However, when researchers study gangs, they invariably focus on male members. When and if these studies mention women, most of the research solely references their roles as sexual objects or girlfriends of gang members. Only recently have a small percentage of researchers begun to include females as a part of the demographics of their studies. While examining research in Gender Studies, I have found evidence that women's role in gangs and violent acts have become more 'masculine' over time. Granted, women's roles in mixed gangs continue to be sexualized, but this is rapidly changing, especially within all girl gangs. By including organized crime, these women are transforming the boundaries of gaining gender equality. Although gangs can be dangerous, many operate much like organized businesses. Females' growing rate of gang involvement in such "masculine" structures offers the potential for building status in all male communities and female empowerment.

135. Lean In; Back Out?

Kristyn Goff, Dept. of Biology, with Prof. Bonnie Boaz, University College

Sheryl Sandberg, the current COO of Facebook, recently stirred debate in her TED Talk, "Why We Have So Few Woman Leaders", and a book that grew from that lecture entitled, *Lean In*. Sandberg's argument about why women continue to lag behind in promotions to high level positions in corporations has sparked an outcry among many women, some who praise her for using her position to speak out about women's struggle in the work force, and others who criticize her for blaming women for their own failure to lead. Sandberg, a Harvard graduate and current Chief Operating Officer of Facebook, bases her argument on three simple

premises: women should "sit at the table," they should "make their partner their real partner," and they should "not leave before they leave." This study examines Gender Studies research, as well as current work-place legislation and policies, to challenge the principles of Sandberg's claims. While others have challenged Sandberg and her reasoning, some have failed to examine the elitist assumptions underlying her argument. While Sandberg's audience is corporate America, her call to women ultimately follows in the footsteps of the failures of early feminists, who did not include poor, working-class women in their theories. Aside from neglecting the average working woman, Sandberg does not acknowledge prohibiting workplace policies and long-standing workplace cultures based on men's views of success. This specific study suggests that while women often try to make advancements in the workplace and a few succeed, the three premises underlying Sandberg's theory are elitist because they fail to acknowledge the larger oppressive systems in workplace policies that continue to keep the average woman from progressing in her career.

136. Game Off: Why Women play Video Games less than Men

Peter Carrico, International Studies, with Prof. Bonnie Boaz, University College

Research on video games is almost as old as the gaming industry itself. Most early research focused exclusively on the violence found in video games. While there have been numerous recent studies demonstrating how video games perpetuate existing gender norms, few researchers have asked why there is a proportional disparity between male and female gamers, other than the fact that big budget, AAA games are marketed to men. Through examination of online forum discussions, gaming websites, and blogs by gamers, I identify a number of gendered trends in gaming culture. By reviewing literature on Gender Studies and applying theories to these trends, this study examines some of the sociological and psychological reasons that more men tend to play big budget video games than women. Unless game developers take into account a variety of isolating, gendered factors, women will continue to be a large minority of the gaming community.

137. The evolving relationship between photography and technology

Alvalia Pemberton, School of Arts, with Prof. Mary Boyes, University College

The rise of social media has changed the way people present themselves through photography. People are now more willing to share their most intimate and personal moments on the World Wide Web. Photography today is being used more as a tool for social bonding and identity than for the purposes of preserving memories. Social media contributes to this by providing a place to host the excessive amount of images people are now taking. Social networking sites encourage: photosharing, an emphasis on the individual and a reevaluation of memory. To examine these ideas, scientific studies on social media usage and behaviors on social networks along with studies by academic scholars on digital photography and social media were used. This study will contribute to a better understanding of the evolving relationship between photography and technology.

138. Analysis of, Adalimumab, electro-acupuncture, and pulsatile dry cupping on reducing joint inflammation in patients with Rheumatoid Arthritis

Natalie Noll, VCU Honors College, with Prof. Mary Boyes, University College

Adalimumab, an anti-TNF drug aimed at decreasing inflammation in Rheumatoid Arthritis patients, can cause skin diseases in patients that it is prescribed to from a rash to skin cancer. Adalimumab works by blocking the chemical receptor RANKL, which therefore halts the production of osteoclasts, which attack and eat bone and cartilage, causing inflammation in arthritis patient's joints. By analyzing how Adalimumab works, it can be compared against other treatments such as electro-acupuncture and pulsatile dry cupping to see if these alternative treatments can decrease inflammation in Rheumatoid Arthritis patients through blocking RANKL, and if they are safer methods for carrying out this treatment. My work consisted of analyzing scientific journals written on studies where patients and animals were treated with Adalimumab, acupuncture, and cupping for inflammation due to arthritis. The data that I collected suggests that Adalimumab, electro-acupuncture, and pulsatile dry cupping all decrease inflammation in the joints of Rheumatoid Arthritis patients. However, acupuncture patients overall have the least harmful side-effects. Therefore, electro-acupuncture should be used as a viable safer alternative to Adalimumab in treatment of inflammation in Rheumatoid Arthritis patients. Further studies on the safety of pulsatile dry cupping need to be done before it can be considered a safer alternative treatment.

139. Examining the relationship between high school deviant behavior and substance use in college students.

Amanda Ndemo, Dept. of Anthropology, with Dr. Danielle Dick, Department of Psychiatry, Psychology and Human and Molecular Genetics/VIPBG

The main purpose of the study was to determine the relationship between deviant high school behavior and substance use, as limited to alcohol and cigarette use. Deviant behavior as analyzed was defined by symptoms of conduct disorder and alcohol and cigarette use was limited to the past 30 days of the individual's college career. The Conduct Disorder (CD) symptoms queried in the survey included setting fires, fights etc. Deviant behavior sum scores were created based on a pattern of related behaviors and the frequency at which each occurred. Data from 2022 VCU freshman who completed the Spit for Science survey were included in the study. Our results displayed a positive correlation ($r=0.231$) between deviant high school behavior and frequency of alcohol consumption which was statistically significant ($p<0.05$). There was also a positive correlation ($r=.219$) between deviant high school behavior and frequency of cigarette use which was also statistically significant ($p<0.05$). The results showed a significant relationship between deviant high school behavior and substance use. The prevalence of deviant behavior in high school students may serve as an indicator of patterns of substance use in these individuals in college. This could serve as an effective targeting method in preventive interventions.

140. Spit for Science: The VCU Student Survey.

Farrah Hermes, with Dr. Danielle Dick, Department of Psychiatry, Psychology and Human and Molecular Genetics/VIPBG

This study examines the changes in peer deviance in freshmen at Virginia Commonwealth University between Fall 2011 and Spring 2012 semesters to see if these changes correlate to changes in illicit drug use. The Spit for Science project survey started when the freshmen were new to the college environment, and followed up in the spring with another survey. The survey asked about the participants to see how many engaged in certain behaviors such as underage

drinking and drug use and also asked about the participant's illicit drug and alcohol use. The sum scores were created for peer deviance by adding up the question responses and subtracting the sum scores from the fall semester from the spring semester sum scores. Linear regression was used to see if the changes in peer deviance are indicators for change in drug use. Peer deviance was a very significant indicator for illicit drug use for females. For males, peer deviance was not a significant indicator, however changes in alcohol use were a significant indicator for illicit drug use in males. These results suggest there are potential sex differences in factors that contribute to illicit drug use and with further studies, we could plan better prevention and intervention strategies to prevent the use of illicit drugs.

141. Investigating the relationship between Deviant High School Behavior and the frequencies of Alcohol and Nicotine Use.

Flora Achiko, Dept. of Biology, with Dr. Danielle Dick, Department of Psychiatry, Psychology and Human and Molecular Genetics/VIPBG

This study examined the relationship between deviant high school behavior as defined by symptoms of conduct disorder and the frequencies of alcohol and nicotine use in the last 30 days among freshmen who participated in VCU's Spit for Science Fall 2011 survey. The sample sizes for items corresponding to alcohol and nicotine use were $n=1184$ and $n=689$ freshmen, respectively. Correlation analyses revealed significant statistical evidence for a positive relationship between deviant high school behavior and frequency of alcohol use ($r=.231$, significant at $p=0.01$ level) and deviant high school behavior and the frequency of nicotine use ($r=.219$, significant at $p=0.01$ level). There was also a significant correlation between the frequencies of alcohol and nicotine use ($r=.197$, significant at $p=0.01$ level). These findings suggest there is a relationship between deviant behavior in high school and increased alcohol and nicotine use in college. Establishment of a positive correlation allows for further testing on risk factors for substance use and could lead to preventive strategies.

142. Spit for Science: The VCU Student Survey.

Ijeoma Akabalu, Dept. of Biology, with Dr. Danielle Dick, Department of Psychiatry, Psychology and Human and Molecular Genetics/VIPBG

Family history of alcohol dependency is an indication of a person's susceptibility to alcohol problems. The purpose of this study is to examine the relationship between neuroticism, family history and alcohol use, and to determine if neuroticism moderates the link between family history and alcohol use. Data from 782 people from the Spit for Science survey were collected regarding the number of drinks consumed in the past thirty days, and whether or not there was a family history of alcohol problems. All participants were from the year 2011 freshmen class of Virginia Commonwealth University. Neuroticism was measured through a number of relevant queries from the Big Five Inventory Personality test, which also tests for levels of other personality traits—conscientiousness, agreeableness, openness to experience, and extraversion. The results from a linear regression model showed that family history of drinking and level of neuroticism were associated with the subjects' number of drinks in thirty days. For those with positive family history of alcohol problems, the number of drinks was higher. For individuals with high levels of neuroticism, the number of drinks was increased. Analyses continue to determine if and how neuroticism affects the relationship between family history

and alcohol use. Once the conclusion is made, we hope that the awareness of a person's susceptibility of alcohol problems will increase and that this research will serve as a model for future experiments using other Big Five Inventory personality traits as moderators for other ailments.

143. Spit for Science: The VCU Student Survey.

Logan Wilder, Dept. of Chemistry, with Dr. Danielle Dick, Department of Psychiatry, Psychology and Human and Molecular Genetics/VIPBG

Freshmen year of college is often the first time students are solely responsible for their life choices, including decisions about illicit drug use and underage drinking, as well as the adoption of a new social circle. With this responsibility comes a degree of risk. Data from the VCU Spit for Science Survey were analyzed in order to understand the relationship between changes in peer deviance and changes in illicit drug use. Peer deviance was defined as the percentage of friends who smoked cigarettes, got drunk, had problems with alcohol, had been in trouble with the law, or smoked marijuana. All survey subjects were freshman of VCU who completed the Spit for Science survey during both fall 2011 and spring 2012 data collection (n=1439). Scores were constructed for the Fall-Spring change in peer deviance and illicit drug use, and linear regression was used to test the effect of peer deviance change score on the drug use change score. Analyses for females and males were run separately. Results showed that when controlling for age, race, parenting (defined as parental involvement and autonomy granting) and alcohol use, there was a significant association for females between changes in peer deviance and illicit drug use and underage drinking, but not for males. For females, increased peer deviance was associated with increased illicit drug use. These results point towards a more significant impact on drug use of peers for females than for males. This could inform university drug prevention programs in the future, and help tailor gender targeted prevention efforts.

144. Spit for Science: The influence of deviant high school behavior on college substance use.

Preetha Palasuberniam, Dept. of Biology, with Dr. Danielle Dick, Department of Psychiatry, Psychology and Human and Molecular Genetics/VIPBG

This study examined the relationship between deviant high school behavior, as defined by symptoms of conduct disorder, and frequency of alcohol and cigarette use in the past 30 days in college freshman at Virginia Commonwealth University. Deviant high school behaviors included skipping school, running away, stealing, starting a fire, destroying property, hurting animals or people, using weapons, fighting, and lying. The sample included a total of 1187 first year freshmen at VCU who participated in the Spit for Science study. The software SPSS was used to calculate the significance of the correlations between deviant high school behavior and frequency of alcohol and cigarette use. A sum score was created for each individual based on their endorsement and frequency of each deviant behavior. There was a positive, significant correlation between deviant high school behavior and frequency of alcohol and cigarette use ($p=.0001$ and $p=.0001$, respectively). This suggested that there is a relationship between high school students' deviant behavior, as defined by symptoms of conduct disorder, and the use of

alcohol and cigarettes once they attend college. This study suggests risk factors for substance use in the VCU student body.

145. Neuroticism as a Moderator of the Relationship Between Family History and Alcohol Dependence.

Pahul Hanjra, Depts. of Chemistry and Philosophy, with Dr. Danielle Dick, Department of Psychiatry, Psychology and Human and Molecular Genetics/VIPBG

Literature has long suggested a correlation between family history and alcohol dependence; heredity plays a role in risk for alcohol dependence. To investigate the influence of the personality trait neuroticism as a moderating factor of the relationship between family history of alcohol dependence, and an individual's alcohol consumption, analyses were conducted in the Fall 2011 Spit for Science cohort. Survey questions examined the binary variable of whether participants reported a family history of drinking problems, as well as the continuous variable measuring the number of alcoholic drinks participants had consumed in the past 30 days. There were a total of 779 responses that included answers to both questions about family history as well as drinking scores in the data. On these responses, a linear regression and ANOVA was performed. Results show that reports of family history and high levels of neuroticism are both correlated with increased frequency of alcohol use. Analyses continue to examine the moderating effect of neuroticism on the relationship between family history of alcohol use and an individual's alcohol consumption. These results add more basic information to the literature on alcohol use in college students.

146. Paper or Plastic? Product or Lifestyle? What Organic and Processed Food Brands tell us About Ourselves.

Anna Webb, Fashion Merchandising, with Prof. Faye Prichard, VCU Honors College

Why do the majority of American consumers view the organic lifestyle as an exclusive club, where members think they are cooler, wealthier, smarter, and more environmentally friendly than everyone else? The key to understanding the way shoppers feel about organic food consumers, and where stereotypes like the example above originate, is to look at the sources of shoppers' information, the brands themselves. This paper examines the traditional and modern marketing techniques of snack foods employed by USDA certified organic companies and processed food conglomerates to better understand the ways branding affects consumers' opinions of themselves, and consequently, each other. After assessing design elements and statements made by packaging, promotional advertising, and campaigns that cross multiple social media platforms, I found that processed snack food companies build their brands entirely around products, while organic companies are able to sell both products and a lifestyle. *Lifestyle* is the branding element that causes consumers to separate into two groups; those who value convenience and price or consumers that do the research, develop convictions and value peace of mind. This realization changes the way we understand both organic and non-organic consumers' attitudes towards trust, price value, intelligent shopping and each other. The discussion of consumer and brand behavior may benefit organic food brands in developing a strategy for reaching a larger audience and shedding their exclusive image.

147. The Relationship between Sex and Drug Trafficking in Southeast Asia

Tiffany Wong, Dept. of Biomedical Engineering, with Prof. Mary Boyes, University College

Sex trafficking is a eminent phenomenon that still exists and is even increasing in modern culture despite multiple approaches from non-profit organizations and government intervention to try and curb the illegal activity. Sex trafficking has multiple negative consequences such as higher risk of disease for the victim and their community and increased violence and criminal activity. It is known that drugs are commonly used to increase sex work and make trafficked victims in debt and addicted. Case studies have shown that victims who are “rescued” commonly return to their brothel or pimps because of their addiction. This study examines the regions in Southeast Asia that are high in sex trafficking in relation to the regions in Southeast Asia that are also high in drug trafficking. Under close examination, it was concluded that areas with high sex trafficking also had increased drug trafficking as well as increased drug use among citizens and sex workers. However, data concludes that direct action to decrease the supply of drugs by raiding or killing major drug traffickers will cause increased violence, prices, and risk. Instead, prevention measures should focus on education of the influences and consequences of drugs, which will decrease the likelihood of dependence on drugs, and thus decrease addiction that binds trafficking victims.

148. Domestication and the Russian Silver Fox: Selecting for Aesthetics and the Consequently Altered Physiology

Lauren Rakes, Communication Arts, with Prof. Mary Boyes, University College

The recent domestication of silver foxes has yielded changes to the animal’s appearance and behavior when the selected foxes are chosen for a trait of “tameness.” After only a few generations of breeding, the resulting foxes are smaller, and have startling physical changes such as curled tails and floppy ears. For my research I have studied the data recorded about the domesticated silver foxes at the Institute of Cytology and Genetics in Russia, in search for the reasons behind the physiological changes to the domesticated fox. Connecting research about wolf and other animal domestication with first hand accounts from scientists at the Institute, I’ve worked to find a theory for the apparent neoteny (retention of juvenile traits in domesticated animals) in the silver foxes. I have found that human love for aesthetics may play a large role in the physical changes to these domesticated animals. A choice to breed for unique looks, in addition to favorable “baby-like” traits, such as wagging of the tail, leads to more submissive and younger behaving canines.

149. Is the SAT still fair?

Jeff Buck, School of Engineering, with Prof. Mary Boyes, University College

The SAT defines a lot about how many colleges view their prospective attendees. Since they play such a big role in the schools’ decisions, they should present an accurate picture of the student. These soon-to-be adults will be the world’s leaders in different ways, from politics to engineering to artists. They need to be judged evenly. There are many teachers from both high school and colleges that argue either side, that there should be adjustments or that it is great

as is. Many are just opinions, but there are people who use statistics to support their idea. High school GPA is more closely related to the first year college GPA than the college GPA is to SAT scores is one such statistic. And with some of the bonuses that the College Board provides, there are becoming bigger discrepancies between test takers. Most of my time was spent online, as much of the research I am using was generated in the past few years.

150. The Effectiveness of Ambient Scent Marketing and Societal Reaction

Douglas Fuchs, VCU Honors College, with Prof. Mary Boyes, University College

Upon entering the store environment, consumers are exposed to stimuli that marketers use to attempt to control their buying behaviors. One of the newer sensory marketing techniques is scent marketing, a tactic in which stores diffuse scents in the store environment in order to make customers stay in the store longer, buy more, maintain brand loyalty, and have a better attitude toward the store. However, there are many discrepancies as to the effectiveness and ethical integrity of scent marketing for the consumer and society as a whole. Scientific articles, marketing ethics literature, and recent news articles were used to complete this research. Scent marketing in the retail industry has become pervasive and accepted as a way to alter the moods and buying behaviors of consumers. These marketing techniques have also been proven as unpredictable and even detrimental to sales when used in the wrong ways. Although marketing ethics has very little bearing on the decisions of companies, marketers may become more cautious or invest in more research for self-interest purposes if consumers become skeptical or health risks are determined.

151. Eli Broad and Contemporary Art Patronage

Jessica Evans, Painting and Printmaking, with Prof. Mary Boyes, University College

The motivations behind contemporary art patronage are delineated very clearly between the different types of donors, but not for the instances where giving manifests itself in multiple forms. Eli Broad, an art patron living in Los Angeles, is an example of the multiple facets and complexity of modern day art patronage. I studied theories of contemporary art patronage from established researchers to develop a deep understanding of motivations behind donations before analyzing Broad's behavior with respect to those theories. Broad has been an individual philanthropist, head of a foundation with a museum base, and during the 90's, a CEO of a corporation with an art collection. Broad, the most notable patron of the arts in Los Angeles, represents a unifying factor between three opposing forms of donations, and shows that despite tendencies of these three factions to behave differently, ultimately the individual with the most power within the organization matters more than art patronage theory suggests.

152. Decreasing Bias in Forensic Fingerprint Analysis.

Amy Thurston, Dept. of Chemistry, with Prof. Mary Boyes, University College

In the United States, there have been an increasing number of DNA exonerations occurring where a convicted suspect is later proven innocent based on new DNA evidence. Some cases even involve suspects who were sentenced to death. In many of the cases, it is years before innocence is proven. I studied the case files of the Innocence Project, a non-profit firm based

out of the Cardozo School of Law in New York whose mission it is to exonerate the incorrectly convicted, in order to identify which forensic disciplines were most prevalent in these exoneration cases. One of the disciplines that came up most often was that of fingerprint analysis. After studying the procedure of forensic fingerprint analysis, it became evident that these rulings were susceptible to bias. As measures to combat this bias, I propose blind testing, blind verification, a baseline for identifying features, a self-admitted difficulty scale, and the decreased use of comparative exemplar prints in order to help decrease the influence of bias in this discipline, and give rise to more reliable, objective, and correct fingerprint rulings.

153. Interpretation of Gauguin's Tahitian Female Paintings as Representation of the Artist's Dual Identity as European and Savage

Minji Kim, Dept. of Graphic Design, with Prof. Mary Boyes, University College

Despite the many writings and letters that Gauguin had left concerning his artworks, paintings of Gauguin had always been the debate topic of many art scholars. Although his writings in some ways helped at deciphering his artistic mind, in many ways also caused confusion about the intent of his art because of the character of Gauguin was always dual and even chaotic. The debate had often been about Gauguin's self-identity and the influence of this on his works, as to whether Gauguin's artistic expression was founded upon his origins as the Frenchman, or the Savage he professed to be as a true believer of Primitivism. Understanding this as an art historian is critical, because Gauguin, as a symbolist and post-impressionist painter, relied heavily on his own thoughts and philosophy whenever he painted.

During his trips to Tahiti, Gauguin's most well-known paintings, those that truly reflect his inner self and his idealism of the Primitive "Savage," were created. *Noa Noa*, a published journal he wrote during his stay that often discusses his artworks, was also critical in learning about the artist's purposes behind the paintings. Thus through examining both his literary and visual self-expression, and studying numerous claims brought on by other art scholars, one can begin to see an interconnection among the Gauguins, as artist, writer, Frenchman and Savage to dissect the components that had created Paul Gauguin.

Indeed, Gauguin was an eccentric individual, even before his plight of becoming a painter. Of a mixed Peruvian ancestry, and having spent his childhood in Peru with his mother and uncle, Gauguin had a strong sense of uniqueness of himself. He often referred to himself as "Savage" or "Indian," and as he developed an idyllic vision of life in a form of Primitivism, came to revere the unsophisticated life of the Pacific Islands. Once learned about Tahiti, he journeyed there with the hopes of finding a simplistic, yet fulfilling and luscious life, which was inevitably tainted with disillusionment at his arrival. Surrounded by yet another Paris in Tahiti where the French colonists had destroyed Tahitian culture and tradition, Gauguin begun to paint what he wanted to see whether or not he saw it. However, modern scholars argue this, because the nature of his paintings and writings, although the subject may be Tahitian, is very much so European. Gauguin often claimed to have given up on his French origins and had been converted to the Primitive way of life, but to many historians nowadays those words are doubtful if not false. Paul Gauguin was French, whether he enjoyed it or not. The Eurocentric philosophies were deeply rooted within him, and although he may have struggled for a bit to escape it, the viewers see in his art an exhausted surrender to his origins. This is where he had created a dual identity for himself. But in the end, in its core the paintings were created for the European viewers, encased in European art history to be understood and interpreted by Europeans, depicting a European philosophy of Primitivism.

Thus, duality of Paul Gauguin is a valid argument, but his art shows that it was more of an artistic veneer of a French artist than actual "duality." Gauguin himself must have been aware of this, as he often used it to his own advantage to earn publicity in France. His art was

indeed sensational and influential, but Gauguin could not escape the fact that his artistic career was very much like Papeete of Tahiti; a city with artifacts of some traditional fascination, quite far away from Europe, yet completely consumed by it.

154. The Role of Social Media in the Perpetuation of a Rape Supportive Culture

Ashlee Wernimont, Communication Arts, with Prof. Mary Boyes, University College

American culture has proved itself to be a rape supportive culture through actions and opinions expressed daily in the media produced and consumed by U.S. citizens. As seen in the recent events surrounding Steubenville, OH, these rape supportive beliefs or “rape myths” have made their way into the psyche of trusted news officials further condoning and perpetuating the practice of victim blame in cases of rape. The phenomenon of victim blaming is explored via the survey of America’s college population, testing theories, personal beliefs, conventions, and personality types of the tested population in order to explain why the victims of rape are seen as deserving of the crime committed against them, while the rapists are pitied and exonerated. Findings indicate that the victim blaming mentality is caused by sexism, upholding gender roles, and misconceptions of how both men and women view sexual intercourse. People are stuck believing that bad things only happen to bad people, and in order for a young woman to be sexually assaulted; she must have been doing something wrong to deserve such a misfortune. There is this inconsistency in how America approaches rape, rape victims and rapists. Young women are taught to wear something different, go out at a different time, or behave a certain way in order to avoid rape. American culture teaches, “Don’t get raped” rather than “Don’t rape”.

155. The Fading Art of Natural Childbirth In America

Nicole Kuhn, Dept. of Chemistry, with Prof. Bonnie Boaz, University College

Unfortunately, in the last few decades, childbirth has become increasingly medicalized in America, so much so that women have been made to fear the very natural process of birthing a child. Currently, there are only a few, rarely questioned choices available to women who are having babies, most of which involve hospitalization. The male dominated medical model of obstetrics has slowly encroached upon the women- centered option of midwifery. This study examines the research on midwifery from a cultural and woman-centered perspective in order to make an argument that nurse midwives facilitate a partnership between woman and child-bearer that is based on a woman’s innate ability to birth a child. This partnership is empowering for all women involved, and rather than fearing their bodies, women learn to embrace and trust their bodies and one another. Without acknowledgement and support from our society and the medical establishment, women may lose this natural childbirth choice, and the male medical model will render the entire culture of midwifery obsolete.

156. Subjective well-being and the treatment of Wegener's disease

Michael Berger, Dept. of Biomedical Engineering, with Prof. Faye Prichard, VCU Honors College

Happiness and quality of life increases longevity and life expectancy in industrialized countries. There is also significant research into the measure of happiness in patients with intractable disease and its impact on treatments. Therefore determining factors which increase happiness

in patients with intractable diseases, such as Wegener's disease, and therefore aid in treatment is of great interest to society. The measurement of subjective well-being through a 36 question short form is a well-developed and valid measure for the study of subjective well-being and health related quality of life. The measurement of subjective well-being is the fundamental study involved with increasing happiness and determining the correlation with treatments of Wegener's and other intractable diseases. My research involves the analysis of 8 peer reviewed journal articles using the 36 question short form. The 36 question short form uses 8 subsections to measure vitality, physical functioning, bodily pain, general health perceptions, physical, emotional, social, and mental health and transforms each subsection to a 100 point scale. The purpose of this study is to determine the effect of intractable disease on a person's happiness, as well as accurately measuring a perception of a patient. The results of the analysis of the peer review journal articles showed that age, employment, social relations, self-transcendence, disease length, and remission status all impacted the subjective well-being of a patient in a positive way. Younger age showed to have a higher subjective well-being score as well as having a job and social obligations. Self-transcendence (spirituality or oneness with the universe) also increased subjective well-being. Disease length showed that it did not significantly impact the level of a person's subjective well-being, rather the method of treatment. The results also showed the importance of achieving remission in patients to increase subjective well-being. The overall trend of results showed that reducing the impact of a disease on the patient's routine, showed the greatest increase in subjective well-being. Research should be conducted on changes in hospital environment and treatment options for Wegener's to increase subjective well-being for patients with intractable diseases.

157. Golf photography: changing the look of the game

Edwin Leinbach, Dept. of Film, with Prof. Mary Boyes, University College

Golf is an ever-growing sport. Although there are stereotypes about golfers being white, wealthy males, slowly but surely minorities and people from the lower and middle class are making their way into the golfing world. As technology increases in the modern world, technology and media become huge parts of promoting sports. Golf photography has been around for almost a century and has evolved along with the game. This modern photography has different styles and techniques than what was used in the 1960's. As the photography has changed, so has the sport. Learning what about the modern photography is attracting a more diverse crowd would be very beneficial to Golf. Knowing this information will be helpful to the game of golf in attracting more diverse golfers. If this style of photography is bringing in a more diverse crowd, these techniques can be used to the photographers advantage. I researched several articles regarding photography, golf, and demographics. Eventually I picked eight that were of the most use to my research. I learned about the techniques that make the most compelling photographs, the history of golf, the current golf demographics, and how minorities have been introduced to the game over time. Using my research, I could spot the differences in today's photography compared to photography from the 1960's. My research offers techniques that photographers can highlight in order to attract more young, diverse golfers thus increasing the popularity and revenue in the game of golf.

158. Fixing After-School Mentorship Programs

Akash Patel, Dept. of Biomedical Engineering, with Prof. Mary Boyes, University College

Millions and millions of dollars are being poured into the area of after-school mentorship programs over the past couple of years; however, the way this money is being spent may not be

the most effective way possible. Many children across America are helped by numerous mentors on schoolwork alone, but that indeed may be the problem. Therefore I want to try and figure out what the best ways of implementing these mentorship programs would be so that all the money that is coming in is used in the most efficient way possible. Most of my research was done by looking at many individual studies that other researchers conducted on children that are a part of after-school programs. I also looked at many other psychological articles that also shed light on after-school mentorship programs. As a result of my research I was able to find that after-school programs that only focus on helping children academically are really not that successful. The larger implication of my finding is that there may be a way to fix this issue and that is by programming after school programs to focus on helping kids in a social and personal sense instead of an academic one. This implication can potentially help fix the gap of using all the money in the right way instead of an insufficient way.

159. Influence of Repeated Head Trauma on Brain Development in Adolescents

Gordon Clark, Dept. of Health, Human Performance and Exercise Science, with Prof. Mary Boyes, University College

Research Problem: I am studying the relationship between traumatic brain injuries and youth brain development in order to find out if concussions can lead to an increased rate of depression so that my reader may understand the connection between football and depression. Discipline: Biology, Psychology

Abstract:

The frequency of traumatic brain injuries has seen a sharp spike since the beginning of the second half of the 20th century, especially in the younger age groups. Alongside the rate of traumatic brain injuries, the rate of individuals clinically diagnosed with depression has also increased. The relationship between these two statistics is a very important medical inquiry that must be found. A compilation of 16 peer-reviewed articles were gathered with a variety of topics, focusing on the development of depression during early adulthood. A simple analysis was performed on each, narrowing the topic to 8 peer-reviewed articles. These 8 articles were analyzed in depth to discover trends and draw conclusions. The study found that the majority of these traumatic brain injuries are a result of younger athletes that are larger and faster than their predecessors learning improper form during sporting events. These young people that experience traumatic brain injury during youth and adolescence are up to twice as likely to develop some form of an anxiety disorder in adulthood, most notably depression. This data will potentially lead to an alteration of the rules in athletics. A revision of the treatment and return to play protocol is clearly becoming more of a necessity. These considerations are essential to improving the livelihood of our youth, and the youth of future generations.

160. Do the Benefits of Lawn Keeping Outweigh the Consequences?

Emma Taggart, Communication Arts, with Prof. Mary Boyes, University College

Since the mid nineteenth century, the turf grass lawn has become an icon of the unquestionably American landscape Spread over both rural and suburban areas, rolling green lawns originally signified social status and commitment to the community. Over the years the lawn has become less of an icon and more of a backdrop to every day life. As cities grow and nature recedes, it becomes more and more crucial to study human impact on the environment. Deeply rooted traditions should be revisited to accommodate modern ways of living. This study is a synthesis and analysis of over 15 articles, studies, and books that all explore the same

topic: has the lawn become an outdated and possibly harmful style of residential landscaping? Although turf grass areas have recreational use and can have positive effects on suburban life, they also create unnecessary chores, use mass amounts of water, and pollute the environment when treated with chemicals. The findings in this study could cause homeowners to rethink their habits when choosing a house or when caring for their yard; and could help create more ecologically effective and more efficient residential designs in the future.

161. Analysis of Foliage in the 18th Century French Paintings of Artist Jean-Honoré Fragonard in Connection with Visual Suggestions of Erotica and the French Governmental Shift from Monarchy to Republic

Michael Walker, Dept. of Art Foundation, with Prof. Mary Boyes, University College

The French Revolution invoked prejudice against the aristocracy and the Rococo works they purchased, including those by eighteenth century artist Jean-Honoré Fragonard whose compositions display erotic subject matter, fluid brushwork, and preference for the natural world. Today that stigma persists; Fragonard's works, though included in authoritative texts, are described as superficial and banal. This study examines a collection of four of Fragonard's paintings, *The Four Seasons*, and, through consideration of over twenty-one expertly written texts, shows that painted flora symbolically modifies the erotic themes of his works. Flowers, trees, and shrubs in the series recontextualize the erotic imagery of the works, suggesting that Fragonard's paintings contain conceits about the French aristocracy. This study calls for a reconsideration of Fragonard's work in general.

162. Putting the Comfort in Comfort Foods: How It Works

Nathan Wong, Dept. of Biology, with Prof. Faye Prichard, VCU Honors College

Comfort foods play imminent roles in our lives; we turn to them in times of struggle, in times of need, and even in times of celebration. However, little has been researched about the nature of comfort foods, and the implications and influence they have for us upon consumption of these foods. Thus, the objective of my research is to explore across the disciplines of biochemistry, psychology, behavioral science, and chemistry the origins of comfort food influence on the human body, and investigate the extent to which they stimulate us to come back for more. We analyzed ten different sources, all of which examine comfort foods through the lenses of a plethora of different fields of studies, and how they interact and cause the human body to act or behave a certain way. GC's, or Glucocorticoids, are found to be the primary motivators of comfort food consumption that stem from chronic stress. These hormones allow it to interact with the CRF network; this interaction stimulates the motivation it takes for an individual to want to eat comfort foods. In addition, comfort foods interactions as well as preferences differ for age and gender. In terms of the structure of ice cream, this popular dessert exhibits a particular structure called partial coalescence, an arrangement that allows ice cream to achieve optimal creaminess and consistent texture, characteristics that keep consumers wanting more. Further, this research provides encompassing information on essential aspects of comfort foods, and not only does this knowledge educate us about what we are *putting in* to our bodies, but also what we are *getting out of* all of this: maybe in some cases obesity, or just deterioration of our long term nourishment in our bodies.

163. Sense of Touch in Stop-Motion Animation and Audience Perception

Cindy Nguyen, Dept. of Psychology, with Prof. Mary Boyes, University College

Stop-motion is an animation technique that has been around for many decades. It is a method in which puppets and dolls are given the illusion of movement through a frame-by-frame process. Because real objects and materials are used in this process, stop-motion animation gives off a sense of touch and tactility that other forms of animation do not. This study examines this sense of touch/tactility that is present in stop-motion animation and compares it to other forms of animation, especially CG animation. It also examines how the use of puppets in stop-motion animation is perceived by children and adults in the United States opposed to the computer-generated images of CG animation in order to understand how the audience receives actual vs. virtual objects. After closely studying different research on the materiality of stop-motion animation, it can be concluded that the tactility present in stop-motion animation and the use of puppets/dolls, which resembles child's play, evokes strong tactile memories of childhood for the audience. The use of real objects in stop-motion also appeals to the audience, since people relate more to things that they are familiar with, which CG animation strives to replicate. Overall, stop-motion animation utilizes real objects and characters in order to portray fantasy worlds, while CG-animation tries to create more realistic portrayals of objects and characters, since the audience has a more emotional attachment to tactile animation.

164. The Effect of Genetics on Food Preference in Asian Americans

David Le, Dept. of Biomedical Engineering, with Prof. Faye Prichard, VCU Honors College

This study investigated the extent of the effect that genetics had on taste preference in Asian Americans (Western food or traditional culture), as it is not predominantly known there are differences in Asian American food preference. It is important to investigate the main causes of the differences in food choice, as Asian Americans are a growing population in American society, and in understanding their decisions, we can more effectively cater to their needs in a foreign environment. In this research, I analyzed 10 scientific and scholarly articles and compared them to the overall research question. There were three main categories of comparison, genetic effect, environmental effect, and health consciousness. These 10 articles were analyzed in regards to these categories, to see which one/s were the most predominant and why, with some overlap between articles and categories. In analyzing the sources and comparing them with each other based on the three categories, it was found that genetics played a very small role in determining Asian American food preference. Instead, the research showed that the environment in which an Asian American is in most greatly determines their food preference, with health consciousness being the second most influential reason. Genetics do indeed effect one's ability to taste (deciphering tastes, the minimum threshold of taste, etc.), but this ability, while varied from individual to individual, and even race to race, did not have a very large effect on food choice in comparison to environmental effects and health

consciousness. Because of these findings, I concluded that Asian Americans have differing food preferences based on their past and present environments. This environment extends to acculturation, upbringing, socio-economic standing, past experiences associated with the food, and even level of homesickness. Using these factors of environmental effects on Asian American food preference, nutritionists can more accurately determine why certain health problems exist in the Asian American community, which would stem from their food choices. Businesses and stores can use these to more effectively create markets for Asian Americans, including lowering prices, offering better/different food options.

165. The Effect of Absolute Pitch and Bilingualism on Neuroplasticity

Swetha Mannem, Depts. of Biology and Psychology, with Prof. Mary Boyes, University College

Neuroplasticity is a relatively new subject of study in the past few decades. One's genetic background and environmental adaptations, are known to lay the foundation for one's capacity for neuroplasticity. This study focuses on absolute pitch (AP), the ability to produce a specific pitch without reference, and bilingualism to examine the relative effects of genetic expression and environmental background on cognitive performance in those with AP and those who are bilingual. Peer-reviewed scientific journals and recent studies were referenced to understand these correlations. The current research indicated that genetic factors and environmental factors causing AP are in variant ratios across different ethnicities. At the same time, AP and bilingualism have been found to have physiological effects that leads to greater connectivity in the brain, and ultimately, greater ability for cognitive development. Although concrete ratios of the influences of genetics to environment on neuroplasticity have not been found, future research on academic performance in relation to genetics and environment could help bolster current research findings on fostering neuroplasticity.

166. Nutrition Education and the Development of Risk Factors for Eating Disorders in Elementary Age Children

Reva Joshi, Dept. of Biochemistry, with Prof. Mary Boyes, University College

Over the past few decades, the development of an 'ideal' body type, perpetuated by the media and fashion industries, that has led to widespread self-esteem and body image issues among young girls. These issues can develop into a number of serious problems in adolescence including eating disorders and other mental illnesses. After analyzing sixteen peer reviewed journals, I have found that the education system in America can be utilized to facilitate change in nutritional trends in our country. Current nutrition education in schools is either ineffective or nonexistent. Therefore, specific changes need to be made to this system to produce an efficient method of primary prevention of eating disorders, as well as a health conscious and nutrition literate society. These changes will reconstruct the administration, curriculum, and perception of nutrition education in schools.

167. Optimal Characteristics of a Prosthesis for a Lower Limb Amputee Snowboarder

Anthony Renninger, Dept. of Biomedical Engineering, with Prof. Mary Boyes, University College

The number of lower leg amputees has increased over recent years mainly because of the conflict in the Middle East and improvements in treating battlefield wounds, such as fighting infection. Also in this time span, snowboarding has emerged as a popular sport and the number of participants is increasing. There are very few options for an amputee in regards of finding a prosthesis for participating in snowboarding. This study examines the kinematics of snowboarding, looking closely at the lower leg, existing lower limb prostheses, such as the BiOM Powerfoot, and the ESAR (energy storage and return) prosthesis, and recent advances in adaptive prosthetics. Findings have shown that the most economical and convenient way to approach designing a lower limb prosthesis for amputee snowboarders is to develop an everyday prosthesis with some adaptations that are well suited for snowboarding and everyday activity. Snowboarders need both ankle support to protect their legs from injury, while having an increased range of motion in all directions of rotation for better control of the snowboard. Aspects of an existing snowboarding prosthesis that has found success in its design allowing a greater range of motion will be part of the approach. Snowboarders also need to generate power from their legs while they ride. This leads to looking at powered lower limb prostheses, such as the Powerfoot BiOM, that can generate more power than a common prosthesis, as well as a microcontroller processor to control the movement of the leg based on the intact leg's activity.

168. Women's Rights and Ancient Indian Texts

Virali Bhagat, Dept. of Biology, with Prof. Mary Boyes, University College

Research Problem: I am studying the women's rights movement in India and its foundations because I want to find out how ancient texts such as the *Vedas* have influenced the view of women in poor, rural areas in order to help my reader understand how deeply rooted Indian society is in traditional practices of religion and how influential those roots can be even in the 21st century.

Discipline: Women's Studies

Women hold an important role in Indian society. There are goddesses which without whom the gods would be powerless and there are many important female figures throughout Indian history that play a pivotal role in politics. The importance of women in society and the importance of being equal to men are well outlined in texts such as the *Vedas* and *Manusmriti* which are crucial to the functioning of Indian society. These texts greatly influence how society functions but both hold contrasting views. The *Vedas* holds women in high esteem and gives women the same rights as men and sees both man and woman as equals in society while the *Manusmriti* promotes the subjugation of women and claims that women need to be controlled at all parts of their lives and must never be independent. Since Indian society is so influenced by ancient texts such as this, it is interesting to see why the *Manusmriti* has more influence than the *Vedas* when it comes to how society currently functions. Women are denied many basic rights and they do not enjoy the same freedoms that they had in Vedic times. Women often do not have access to higher education and this prevents them from getting a successful career and they also are often forced into abusive marriages. It is a goal of this paper to find out why the *Manusmriti* has more influence than the *Vedas* and in what ways that has influenced the view of women today.

169. Are some individuals predisposed to be more fearful or anxious than others?

Kasha Killingsworth, Dept. of Interior Design, with Prof. Faye Prichard, VCU Honors College

Being a fan of horror movies and the occasional adrenaline rush, I have always questioned why some people find sensations like these so enjoyable, while others find them terrifying. Some individuals are much more squeamish than others and have a tendency to be fearful or shy, even to the point of having a clinical disorder, while others are not afflicted by these inhibitions. In order to explore this topic, I asked “Are some individuals predisposed to be more fearful or anxious than others?” I am investigating several areas of knowledge in order to answer this question, including biology, psychology, and pathopsychology, which is the study of mental disorder and abnormal behavior. In order to get my results, I analyzed two online sources, six scientific articles that were experiment-based, and a book focusing on social phobias which addressed key information on neural processing and the circuitry involved in the fear process. In doing so, I have discovered the concept of predisposition to fearfulness and/or anxiousness is divided into three major categories: physical processes in the brain, early influences on individual temperament, and psychological influences on the behavioral inhibition of an individual. I have found that predisposition to fearfulness is not something that can function as a result of one of these components, but rather is a combination of all three. Although there is not extensive research demonstrating direct causes for difference in fear reactivity from person to person, there is a solid body of studies demonstrating that neural activity in the brain such as amygdala stimulation, early influences on individual temperament such as stress during pregnancy, and psychological influences such as traumatic experiences can vary from individual to individual and significantly impact their level of fear reactivity. Many of the studies I encountered in my research that were performed in order to obtain these results could have used more longitudinal methods in order to affirm that their conclusions stayed true over time, which does weaken the strength of some of their arguments. Nevertheless, there is still considerable evidence that can be used to demonstrate the probability of a predisposition to fearfulness, which could have significant implications for the relationship between biology and psychology in further research on behavioral tendencies and inhibitions in humans.

170. The Use of the Unisex and Female Figures in Anatomical Texts

Hannah Huddle, Dept. of Communication Arts, with Prof. Mary Boyes, University College

This paper examines the use of the female and unisex figure in anatomical and medical textbooks. The most recent studies of gender gap in anatomical illustration found that females made up 11% of illustrations (1986) and 21% (1994), and that about half of the illustrations were concerning the reproductive system. Females are therefore portrayed as being important when it comes to reproduction primarily in the books used to educate medical students from this time. I hypothesize that women are more frequently represented in anatomical textbooks than they were in the late 20th century because of improvements to women’s health and continuing advocacy from feminist groups and growing concern for sex specific medical care. However, further research is needed, because this depends on if the gender neutral figure has become a solution to having less illustrations of the male figure, as it seemed was happening in the most recent study.

171. Cats, cats, cats: an examination of the culture and the ailurophiles

Miranda Leung, Dept. of Graphic Design, with Prof. Faye Prichard, VCU Honors College

Dogs and cats exist as a binary: the former is a firm fixture in mainstream culture, and the latter has achieved a rather subcultural status. Why is it that certain groups of people tend to like cats so much, and why does loving cats often come with a stigma? Take the classic, stereotypical “crazy cat lady” for example, and as of more recently, hipsters. There’s something to be said for the connection between women, hipsters, and cats, but how did that come about and why? Through analysis of psychological studies, sociological studies, and a series of web-based paraphernalia (memes, blog posts, YouTube videos), I examined what (if any) psychological similarities cat lovers shared, why women and cats seem inextricably related, how the tenets of hipsterdom might have some bearing on hipsters’ affinity for cats, and how the perceptions and portrayals of cats have shaped cat culture. Based on my research, psychologically, I have found that cat owners tend to have higher levels of openness, and lower levels of extraversion, conscientiousness, and agreeableness. My research suggests that cats may be the pet of choice for hipsters and single, elderly women (those who tend to fall into the “crazy cat lady” category) since they are more suited for urban living and require lower levels of maintenance compared to dogs. Also, comparisons can be drawn between the personalities of women (mysterious, feminine), hipsters (pretentious, snobby), and cats (or at least the way they are perceived). Cats are often perceived and portrayed as aloof and difficult characters—these particular qualities are especially amplified in mainstream media and pop culture—but studies have strongly suggested that these qualities are the result of domestication. Furthermore, it should be noted that cats are portrayed in completely different ways on the Internet, which seems to have become the default forum for cat culture. On the Internet, cats are celebrated and satirized (albeit endearingly) for qualities that mainstream culture criticizes while also being depicted as sill, adorable, and loveable characters. Overall, within the past few years, the perception of cats has taken a more positive direction, and cat ownership seems to be viewed more acceptably. Further research is needed to examine the relationship between cats, hipsters, and women—it would be interesting, for instance, to gather empirical evidence (e.g. percentages) on cat owners or cat lovers who identify as hipsters.

172. Impact of Anti-inflammatory and Painkilling Drugs on National Football League Players

Akhil Kolluri, Dept. of Biomedical Engineering, with Prof. Faye Prichard, VCU Honors College

The NFL is one of the most watched sporting leagues in the country, and thus it has to cater to the many expectations of fans, players, coaches, and analysts alike. Violence is such a fundamental part of the sport that many fans expect and even enjoy watching it. This violence leads to severe injuries and pain for the players, creating a culture within the sport of treating pain with the temporary solution of painkillers in order to avoid missing playing time. Therefore, research was conducted to understand how this use of painkillers and anti-inflammatory drugs can affect the health of the NFL players, both during their career and after retirement. Multiple primary and secondary sources, including scholarly articles, original research, comprehensive secondary articles and interviews, were analyzed to draw conclusions about the use of these drugs in the NFL. Due to the high prevalence of anti-inflammatory drug and painkiller use in the NFL, drugs like NSAIDs and corticosteroids cause many problems for the players, both during their careers and after their retirement. NSAIDs can cause negative effects on muscle regeneration and inhibit normal muscle growth after exercise, are harmful to healing of fractures, and cause a risk of hemorrhage and renal failure. Corticosteroids can cause avascular necrosis (AVN) and weakening of joints, tendons, and ligaments. Both of these

anti-inflammatory and painkiller drugs can create pain medication addiction in players, and might allow them to unknowingly cause further injury to their body. These findings indicate that more caution should be taken in the NFL to reduce the use of these drugs, either by changing the rules of the sport to reduce player injury and pain, or by changing the culture in the NFL to value player safety over playing time.

173. Performance Art: The Role of the Gendered Body of the Artist

Katherine Boehm, VCU Honors College, with Prof. Mary Boyes, University College

In the 1970s, performance art came into the public eye as a medium ideal for expressing ideas about controversial contemporary issues. Performance art was tied closely with conceptual art, and drew many radical thinkers of the decade, such as members of the feminist movement. The vast majority of early female performance artists chose to investigate feminist issues. These female performance artists often employed their bodies in their work, as did male artists, in a subgenre of performance art called “body art.” However, the gendered body of the artist often influenced how the work was received and perceived. This essay attempts to examine the history of body art, investigating the disparities between male and female artists, by focusing on the works of notable artists of the time period, all of whom have had retrospectives at a major public institution. Analysis has revealed that critiques of a female body artist’s work often focus on her gender, whereas critiques of male artists do not address gender unless the work is gender related. This bias can still cause problems for today’s female-bodied performance artist by distracting from or obscuring non-gender-related themes the artist wishes to discuss, especially in works where the artist’s body is on prominent display. There are several factors contributing to the phenomenon, such as the first generation of female performance artists incorporating feminism as an integral part of their work, or the inescapability of noticing genderedness in a body, or the universally acknowledged and ingrained symbolisms of the female or male body. However, this occurrence raises troubling issues about sexism still present today in the art community. Can female performance artists today achieve the same acclaim as their male counterparts? Can they use their bodies in their work without being pushed into a feminist niche?

174. Film Education As The Means of Creating Ideal Media Absorption In Teenagers, Enabling Future Empowerment

Mariel Andersen, Cinema Dept., with Prof. Faye Prichard, VCU Honors College

Every student enters a middle or high school classroom with a vault of passively absorbed knowledge. Youth are constantly exposed to video advertising and entertainment media. Social norms, patterns, history, and storytelling modes are accrued from the passive watching of film and video. The intellectual potential of this residual media information can be unlocked through education in film theory and filmmaking, which results in a fundamental awakening of how the student approaches media of all kinds, deepening their understanding of sociocultural and socioeconomic concepts. With the transformational teaching style of workshop mentorship, teenagers can become conscious of patterns of representation and modes of concept translation, leading to increased cognitive and communicative abilities that will strengthen their futures in multidisciplinary fields. Pulling from current articles on modern transformational education, research in the cognitive science of media absorption and creation, and primary sources displaying filmmaking education at work in a community, the author supports that learning film theory and filmmaking in the teenaged years supports the individual’s communication skills, ability to conceptualize in long-form, and ability to challenge

and analyse the media given to them. The author argues that such analytical artistic abilities are crucial in an age of both long and short form manipulative media immersion, where miniature music videos pulse at the bottom of most corporate websites and even highwayside billboards are plasma screen TVs. The recontextualization of filmmaking education explored here has profound and practical implication for educators struggling to relate intellectual ideas with the elements of entertainment and mass culture systems, and holds interesting possibilities for the future of creative cognitive therapy.

175. Consistency and Relevancy of Physical Education in Middle Schools

Lindsay LaFratta, Health, Physical Education and Exercise Science, with Prof. Mary Boyes, University College

The increased level of obesity amongst children has alarmed researchers in recent years. School has been identified as a crucial opportunity to instill lifelong physical activity behaviors in individuals. It is after the transition from elementary school to middle school in which a noted decrease in interest and motivation towards physical education has been observed. It was of interest to investigate the consistency and relevancy of the current physical education curriculum in middle schools in the United States to understand the roots of the increased dissatisfaction amongst students. This study analyzed current research to obtain strengths and weaknesses of the physical education system in order to construct an ideal physical education curriculum that promotes positive attitudes towards physical education amongst all students. Research that showcased various case studies, self-assessments, interviews, field observations, theories on attitude and interest, and physical activity measurements were utilized.

176. Are sexual preferences biologically determined or does the environment rear an individual?

Jagteshwer Singh, International Business, with Prof. Faye Prichard, VCU Honors College

Homophobia, a term often thrown around the media to describe hostile reactions towards the homosexual population, infers a one-dimensional construct of arrogances channeled due to irrational fears. Through various (ten) peer-reviewed articles, it was ruled that a multifaceted view is needed towards the derivation of sexual orientation. Previous empirical research proposed that sexual preferences are biologically and environmentally determined. Further research proposed a model indicating five types of factors: (1) *fertility*, Genes that are beneficial to females increase the fertility rates that may partially cause homosexuality in males; (2) *Loci Xq28*, the specific location of the chromosome in which the “gay gene” may exist; (3) *Twin studies*, suggests that there may be evidence for sexual orientation among monozygotic compared to dizygotic twins ;(4) *Hormonal*, any form of prenatal or postnatal hormonal activities that may dictate one’s orientation; (5) *Evolutionary*, psychological and sexual selection theory which show that heterosexual men prefer younger mating partners than heterosexual women in order to ensure reproductive success.

Based on these findings, it is reasonable to conclude that homosexuality is mostly dictated by genetic factors. However, in an environmental perspective, hormonal and evolutionary elements indicate that there are a few reasons that may respectively rear an individual to his or her sexual preference. These findings are only based on theories because the meticulous gene that can stipulate conclusive evidence has not been found. Therefore, the notion dictating the differences between nature and nurture will remain in controversy. Future studies may help researchers locate the Xq28 loci, which has been hypothesized to exist. This may end many religious and political debates; if someone is biologically attracted to the same gender, then there isn't anything that can be done to change that. This may limit the hostility showcased towards the gay and lesbian community.

177. Boxed In: The lack of creative thinking in engineering students

Rachel Wilbur, VCU Honors College, with Prof. Faye Prichard, VCU Honors College

The lack of creativity coming from recently graduated engineering students seems to be apparent through my observations of students, standard social stigma, as well as research conducted at the University of Massachusetts, Dartmouth. However, little is known about the reason behind this vastly growing problem. Without a better understanding of the issues, universities will continue to produce engineers lacking innovative abilities and creative motivation. Seven scholarly articles and studies as well as three primary sources were reviewed and analyzed in order to better understand what difficulties universities face within the engineering community. It has come to my realization that not only is the lack-luster curriculum leading to student disengagement, but the professors also have difficulty expressing the value of creativity, as they cannot clearly define what creativity entails in their specific courses and disciplines. Other problems arise when professors who are proficient with the idea of creative teaching are not incorporating it into their classrooms because the courses are material heavy and time-limited. Several solutions such as project-based introductory courses, interdisciplinary study programs, and professor training have been suggested to solve these faults in the engineering curricula. If changes do not begin to occur within the university environment, engineering students may find it difficult to exhibit the main characteristics of a "good" engineer that companies are searching for—becoming an innovator and a thinker.

178. The Evolution and Suppression of Goddess Worship

Jahnnavi Madiraju, Dept. of Biology, with Prof. Faye Prichard, VCU Honors College

Despite religion being a significant aspect of humanity and history, it is still not entirely clear as to why ancient religions had female deities and more modern religions do not. There is still uncertainty about why a transition took place, with early civilizations like the Indic and Greek worshipping goddesses, but relatively recent religions such as Christianity and Judaism being male-centered. Understanding why this took place can help us better understand how our views on women have changed over time and if we are becoming a more patriarchal society, because religion reflects the values of society. To answer this question, I analyzed ten articles in order to better understand what might have happened. So far, I have found that a major aspect of goddess worship the Indic and Greek cultures was the fact that the goddess was all-

pervading and this was why goddess worship endured in these cultures. There are also theories as to how male-centered religions were introduced, including that men started suppressing women after realizing their reproductive importance, and that invaders brought with them violence and male dominance, which influenced the ancient Old European religions. I have not drawn conclusions yet, but these findings show that there was methodic suppression of goddess worship in a few cultures, due to invasions as well as leaders of male-centered religions. This is significant because it can help us understand how and why our world religions have evolved over time, and how patriarchy worked to suppress goddess worship.

179. Workplace Environments Best Suited to Foster Creativity and Productivity

Zhina Kamali, Dept. of Marketing, with Prof. Faye Prichard, VCU Honors College

As economies struggle in a recession, organizations and businesses also struggle to increase productivity as they work with what they have. By analyzing both creativity and productivity in the workplace, organizations and businesses can improve their performance as well as reduce costs that can be otherwise allocated. The research in this paper aims to target this problem from varying perspectives including but not limited to improving communication, improving environmental factors, improving employee moral, and improving leadership within the organizations. This paper analyzes a series of sources so that a greater overall and comprehensive analysis of the best possible workplace could be created. The sources ranged from research done by psychologists and economists as well as first hand accounts from business owners and leaders within a range of industries, from software development to advertising. This research indicated that the most creative and productive work environments were those that made accommodations based on the individual. Although businesses and organizations are reluctant to change their workplace environments to fit the individuals working in them because of preconceived notions that this will drive up costs, doing this significantly increases both creativity and productivity and the initial costs will be paid back within a reasonable period. This study shows that such investments could significantly improve organizations that would otherwise be afraid to risk the time and money. In a time where money is everything as the economy struggles to regain its previous momentum, businesses and organizations need to look to new and innovative ways such as those discussed in this study so that they can increase their productivity and creativity in order to stay competitive.

180. "Give Me Some Time to Think": A look into the psychology and sociology of a post-high school gap year and the benefits it could provide for American students.

Katiana Slaton, Dept. of Mechanical Engineering, with Prof. Faye Prichard, VCU Honors College

For almost 50 years, a small population of students in Europe have been taking a break between high school and university. This time out is commonly known as a gap year and in most cases is used as a time for students to gain maturity, improve academics, and establish their identities as functioning adults before entering the rigors of higher education. The gap year has become increasingly popular in European and Middle Eastern countries in recent years. When comparing their university graduation rates with those of students from the

United States, the difference is clear. Their students are more likely to continue on past their first year, and more likely to graduate within the projected time frame for their majors. This paper looks into the reasons for their better performance, analyzing the developmental changes that occur during young adulthood and the psychological and sociological benefits that a gap year would provide. After reading papers from psychologists in psychoeducational and developmental fields, along with examining the retention and persistence-to-degree statistics for universities in the United States and Australia, I have come to the conclusion that American students who are undecided about their futures or who performed poorly in high school would benefit from the additional maturity, neurological development, and academic advancement that a gap year could provide.

Being able to identify problem signals in students, such as a low GPA and a lack of direction, and then being able to give them an option that could help them considerably, i.e. a gap year, high schools could help struggling students and universities could raise their freshmen retention and persistence-to-degree rates, thus raising America's academic standards overall.

181. Perpetuated Racial Segregation in Richmond, Virginia

Manon Loustaunau, Depts. of Sculpture+Extended Media and Fashion Design, with Prof. Faye Prichard, VCU Honors College

When I moved to Richmond about a year ago, I began to notice lines of racial separation within the layout of the city; I could not fathom why this could still be the case, so many years after the Civil War. After reading census and sociological research on metropolitan segregation and why these patterns of urban settlement have been allowed to continue, it became apparent that the de facto segregation currently present in Richmond is the result of a complex failure of government structure. Many researchers, through primary source government documents, attribute the perpetuation of metropolitan segregation to poor urban planning decisions and the lack of legislated integration policies. While this is certainly the case, as Richmond carries the burden of historically being the center of the Confederacy, census studies, zoning and city council documents, and comparative analyses between analogous cities suggest that there are deeper causes for the continuing segregation. These causes include the failure of school district integration, African-American displacement from urban renewal projects, "white flight," paralyzing socioeconomic disparities, lack of institutional aid and cultural capital for African-Americans, and annexations of nearby counties by the city of Richmond. These factors have led to deeply engrained segregation and racial aversions within established Richmond communities. Further research of similar cities that have managed to break the cycle of perpetuating racial segregation could reveal ways to improve and integrate Richmond communities and school systems as well as preserving Richmond's legacy and the history of individual neighborhoods. As well, further investigation could replicate studies from both the 1940's and 1980's tracing block-by-block racial and socioeconomic composition to determine if the situation of Richmond's segregation is improving or stagnating.

182. Don't Be a Drag, Just Be a Queen! : Assessing the Popularity of Drag Queens as Opposed to Levels of Anti-Transgender Prejudice in Modern American Society

Neha Jadhav, Dept. of Psychology, with Prof. Faye Prichard, VCU Honors College

Over the past few decades, drag queen shows have become a popular sensation among men and women, homosexuals and heterosexuals alike. On the other hand, transgender individuals

are confronted with more prejudice than gays, lesbians, or bisexuals are. What about drag queens sets them apart from the stigma directed toward transgenders? For this study, I attended a drag brunch in a gay bar and observed how each performance compelled audience members to question perceptions of gender and sexuality. In addition, I analyzed several scholarly journal articles for research on the practices of drag queens during their performances and their appeal, or on the treatment of transgenders in heterosexual-dominant communities. From this research, I have concluded that what sets drag queens apart from most of the anti-transgender prejudice is the emphasis on hyper-femininity; in fact, the exaggerated feminine appearances and mannerisms are what usually draw audience members to a drag queen. Through this exuberant female impersonation, drag queens blur barriers between different social identifications and create a new form of entertainment that both overturns and asserts cultural ideals of masculine power. The study of their performances implies that despite the progression of women's and LGBT rights, true equality in our society will not be realized until we find new ways of identifying and relating to others.

183. Sex differences in the oxygen uptake kinetic response to moderate intensity exercise in obese adolescence.

Cheresse Montford, UROP Fellow, with Dr. Lee Franco, Department of Health and Human Performance: Health, Physical Education and Exercise Science

On the onset of exercise, the demand of energy is met by an increase in oxygen consumption resulting from an increase in breathing and heart rate. Steady state is the point in exercise at a constant workload, where energy demands are met by aerobic energy systems and heart and breathing rate plateau. The purpose of this study is to differentiate pulmonary oxygen consumption on-kinetics between males and female adolescents after 12 weeks of moderate intensity exercise, and determine if 12 weeks of physical activity can annul adverse effects of cardiovascular and metabolic disease brought on by obesity. Examining dynamic responses in pulmonary oxygen consumption ($\dot{V}O_2$) gives insight on the rate of gas exchange on the capillary-myocyte level. Through studying the $\dot{V}O_2$ on-kinetics, using the phase II time constant (τ_2), aerobic conditioning and work capacity of an individual can be evaluated.

Methods: Overweight male and female adolescents, ages 11-16, with a BMI in the 85th percentile or above where recruited to the T.E.E.N.S program, a weight management program through VCU. Upon entrance into the program the participants undergo full anthropometric and metabolic assessment at the VCU Health System. Maximal graded exercise test were preformed to assess $\dot{V}O_2$ till volitional exhaustion. Following the $\dot{V}O_{2\max}$ test, phase II time constants were evaluated and compared with the baseline data using t-test for each subject.

Results: There was no change in the phase II time constant from baseline to 12 week data post exercise intervention. There was also no difference between males and females. A considerable decrease in sample size throughout the study could attribute to the insignificance of the research conducted.

Conclusion: Research has shown that the phase II time constant is unaltered at a constant work rate, accelerated with training, and slowed by age, inactivity, and certain diseases. There is also variability between males and females, where males reach steady faster than females. A prolonged oxygen deficit would produce an increase accumulation of lactic acid, which results

in early fatigue and can lead to cessation of physical activity. Significant delay in pVO₂ may discourage engagement in exercise, which would further hinder the ability to make healthy life style choices. Nevertheless, cardiovascular risk factors decrease with involvement in physical activity.

184. Extent of Social Media as a Powerful Tool on the Egyptian Revolution

Suraj Kandalam, Dept. of Biomedical Engineering, with Prof. Faye Prichard, VCU Honors College

On February 11, 2011, Hosni Mubarak resigned as the President of Egypt due to the overwhelming oppression created by the citizens of Egypt. The Egyptian Revolution began on January 25, 2011 as mainly a campaign of non-violent civil resistance towards the regime of then President Hosni Mubarak. My research question is, "To what extent did social media (Facebook, Twitter, Instagram, etc) become a powerful tool for political change in Egypt". The conceptual contexts that this question will be analyzed through are sociological interactions, the use of social media during the Revolution, and the result of the Revolution. I analyzed my research question through many sociological and political science studies. All of the studies that I analyzed consisted of how social media aided in the interaction of the citizens of Egypt, how the regime tried to counteract the power of social media, and the overall result of the revolution. Some of the results that I found ranged from how social media such as Twitter and social networking sites such as Facebook functioned as different facets in the revolution. For example, Twitter functioned as an area where information could be passed along very quickly, while Facebook functioned as a site where people can plan events and rallies in order to produce the largest mass possible. The main function of social media/networking was to pass information and obtain information. Through this exchange, citizens from all over the country were able to receive information about the revolution whereas previously, some parts of Egypt, wouldn't even realize that a revolution was occurring. It is through this exchange of communication that the masses of the revolution increases and thus affects the political outcome of the revolution. As technology increases throughout the world, it can be inferred that technology will shape the interactions between people. As governments have always states, the people are the government. If the people change how they live and interact, the government will change with them.

185. How has the religious significance of facial hair in Islam led to a predominately patriarchal Muslim culture?

Austin Gonzalez, Dept. of Biology, with Prof. Faye Prichard, VCU Honors College

The Muslim culture that has stemmed from the Islamic religion has long been identified by the prevalence of patriarchal behavior. Although the social structure and the religion themselves have been intensely studied over the years, the causes of this patriarchy have seldom been identified, if at all. By studying how the prevalence of facial hair in Muslim societies has led to this patriarchal characteristic, we can identify one of these unknown causes. This study relies on the aid of peer-reviewed scholarly articles and books that illustrate the importance of beards in the development of this culture. In targeting sociological and anthropological sources, with the aid of one psychology article, we can illustrate the separation of gender in Muslim culture and how patriarchy developed as a result. A person who wears a beard envelopes a display of

authority and religious piety, allowing men to obtain greater power and position within the social structure of the society. Through analyzing the significance of facial hair, in particular beards, and how it affects the social construction in the Islamic demographic, we can see how a seemingly superficial practice can have major implications for the development of patriarchy within religious culture.

186. Multinational seed companies environmental and economic effects due to genetically modified seeds.

Ashley Grupenhoff, Life Sciences Engineering and Biology, with Prof. Faye Prichard, VCU Honors College

Despite multi-national seed companies taking over the majority of food production power, there is little acknowledgment of the effects of genetically modified foods economically and on the environment. Although there are many positive attributes to the reasons for GM foods, the negative ones need to be weighed accordingly. As this is a new and more common technology, there are still unknown detriments to the long term outlook on the environment and economy. For my research I found credible sources in four categories: legislation, positive views, negative outlooks due to environment, negative outlooks due to economic control by corporations, and views stating there is still not enough information to make a viable statement. This array of outlooks allows for a more rounded understanding of the views and positions of the topic, which can further lead to an actual presentation on the issues at hand. An analysis of these sources give an understanding of the how genetically modified foods and corporations, such as Monsanto, DuPont, and Syngenta, yield negative long term effects on the environment and on farmers themselves. Although there are reasons this technology is viable, such as increasing food production and benefiting societies with issues such as famine and malnutrition, there is still unknown consequences of this technology and proven negative consequences on the environment. GM crops prove to be a risk on the ecosystem and affect biodiversity, organisms, and the environment. The unequal distribution of power the seed companies have over farmers leads to negative economic factors on the farmers and middle class for the time being and the future. On top of the proven negative consequences, the fact that there is still missing understanding in this technology is unsettling. This society bases most of its food production on genetically modified crops and having gaps of unidentified consequences does not allow for a successful future. These sources add an understanding of what is going on in the genetic modification world. It has slipped past society that only three companies have taken over a vast majority of seed distribution. There are still quite a few gaps in this research, including a better understanding of the legislation going on. There is no one right answer to the question of whether or not these seed companies have too much power and proving detrimental to society. In this position it is only possible to analyze the issues and weigh them accordingly. In our society we only focus on making the largest technological advancement and making the greatest profit. My hope is to open the eyes and conversation of how the effects of these exponentially increasing technologies can be detrimental to the environment and to future generations.

187. An analysis of the link between HPV and Head and Neck Cancers

Sierra Smith, Dept. of Chemistry, with Prof. Faye Prichard, VCU Honors College

The human papillomavirus is largely known for causing cervical cancer in women. However, research now points to a relationship developing between the human papillomavirus and oropharyngeal squamous cell carcinoma, a subtype of head and neck cancer. Therefore, it is important to understand the biological mechanisms behind the virus as well as the implications of the human papillomavirus in its relation to oropharyngeal squamous cell carcinomas. In order to determine the strength of the role the human papillomavirus plays in the development of oropharyngeal cancer, I focused my research on articles that present statistical information on the change in the number of HPV positive oropharyngeal squamous cell carcinomas in both males and females over time. In order to understand the role the virus plays in developing this specific type of cancer I researched the modes of transmission, as well as the biological mechanisms behind the virus. It can be concluded that the human papillomavirus does play a role in developing oropharyngeal squamous cell carcinoma and this role has strengthened throughout the last decade worldwide. As a result, not only should females receive the HPV vaccination, males should as well. Throughout the world there is a lack of knowledge of the human papillomavirus and its link to oropharyngeal squamous cell carcinoma. It is necessary for society to become educated about the virus so that each person can be aware of the option to become vaccinated.

188. Female leadership in Powhatan Indian tribes: Changes from first contact with the Europeans to present day

Brittany Allen, Dept. of Biomedical Engineering, with Prof. Faye Prichard, VCU Honors College

The negative effects of European colonization on Native American groups have long been observed and studied, but little attention has been given to the impact those negative effects had on the roles of women in the leadership of tribes. All Native American groups faced disease, warfare, and limitations of their rights after the arrival of European settlers in their land, but women in particular were affected by hardships that resulted from colonization. By analyzing records of women acting as chiefs in the century immediately following the Powhatan tribes' first contact with the Europeans and comparing the high number of women chiefs in the early years with the complete lack of women chiefs in Powhatan tribes from the eighteenth century until 1998, I found that the number of women in east coast Algonquian tribes wielding political power initially increased for several decades, but then decreased dramatically after the tribes were forced to enter treaties with the government of Virginia which limited the rights they had previously experienced. The number of women serving as chiefs, on tribal councils, and in intertribal groups increased as the Powhatan tribes began to strive to be more politically active in response to even further limitations to their rights in the form of segregation and race restrictions throughout the twentieth century. The increase in the number of Powhatan women involved with tribal and extra-tribal politics in recent decades indicates that Powhatan tribes are steadily overcoming the race-related obstacles before them and finally obtaining the legal and social equality that has eluded them since Europeans first began settling in the Powhatans' native land in the seventeenth century. The correlation of the increase in the number of Powhatan women in leadership positions with the removal of race-related obstacles suggests that similar trends may be present in other cultures that have experienced significant race-related struggles.

189. Changes in Clarinet Music of the Nineteenth Century

Lydia Newlon, Musical Performance-Clarinet, with Prof. Faye Prichard, VCU Honors College

It is helpful to musicians to learn about why their repertoire has been composed the way it has. This can help them know how to interpret the music they are performing correctly. For clarinetists, there is a wealth of music written during the nineteenth century. Often performers need help as to how to interpret it, depending on the time it was written. Because of this, it would be helpful for performers of nineteenth century clarinet music to understand how and why the repertoire has changed. To answer this question, I have looked into several articles written by experts on clarinet and music, concerning music history, the changes in the clarinet, as well as biographies of composers and clarinetists of the era. Based on the research I have done, I have found that the clarinet music of the nineteenth century has been affected by the composers of the time, the clarinetists of the time, the changes the clarinet underwent, and the Romantic Movement in music. I have found that it has become more technically difficult, yet also more emotionally intense. The sonata form also became very popular among clarinet music during the nineteenth century, as were concertos at the beginning and end of the nineteenth century. This points to even greater technical demands that occur in twentieth-century music, as well as showing part of the scope of evolving complicated emotional and intellectual ideas in music.

190. An Analysis of Global Warming's Impact on the Future Depletion of Coral Reefs

Lauren Crow, Dept. of Mathematical Sciences-Statistics, with Prof. Faye Prichard, VCU Honors College

The negative effects of global warming and climate change are becoming more prominent every year yet human activities that worsen global warming are only increasing. One of the many species that is affected is coral, whose survival is key to maintaining the life of many species, including humans. Coral is key to sustaining the life of a number of ocean-dwelling organisms that live near them. Therefore, this issue has to be addressed. The objective of this study was to examine this question: What role does global warming have in future depletion of coral reefs? This research includes the experimental studies of seven different researchers that used a variety of techniques to measure the extent of adaptation abilities and predict how coral reefs will be able to survive the expected climatic changes. Some of the research techniques include measuring aerobic scope to assess the species' ability to adapt to temperature fluctuations, remote sensing data to explore the climate warming disease outbreak, and studying past adapting methods implemented by coral as a reference to predicting what they'll do in the future. One researcher, perhaps the most important of all, used a new dataset developed from high-resolution satellites and was able to define the relationship between temperature anomalies and disease outbreaks. From this research when the more modern technological techniques were implemented, it was concluded that coral will be able to survive through their symbiotic relationship with algae and adapting skills acquired from past global changes. While some of the researchers included believed that coral may in fact become extinct from the projected climate change, I have concluded that they will be able to adapt in time to survive. However, if human activity does not become more controlled, the climate changes could be even more dramatic than predicted. If the changes become too extreme, it won't be possible for many species, including coral, to adapt in time to survive.

191. Evaluation of Approaches to Medication-assisted Treatment for Heroin Addicts

Logan Wilder, Dept. of Chemistry, with Prof. Faye Prichard, VCU Honors College

Research Question: Should medication-assisted treatment for heroin addicts be indefinite and focus on stabilizing the patient or limited to a time frame and focus completing opioid drug abstinence?

Abstract: In medication-assisted therapy, patients addicted to heroin, a drug which affects the opioid receptors of the brain, are given legally prescribed opioid drugs. These drugs, which include Methadone, Buprenorphine and others, allow heroin users to quit without experiencing the painful symptoms of withdrawal. Patients in medication-assisted therapy become “stabilized” and escape from the lifestyle associated with supporting an illegal addiction. Medication-assisted therapy aims to decrease dosage over time until recovering users are completely drug free, but this can take months to years- and sometimes becomes a lifelong program. Approaches to medication-assisted therapy are split based on the desired result. The Palliative approach attempts to reduce the harm of heroin use through indefinite medication-assisted therapy, while the curative approach attempts to help patients discontinue all opioid drug use. Methadone and Suboxone are so addictive that that recovering users may seem to be trading one addiction for another. Duration of treatment often relies on each patient’s attitude, as well as that of the treatment provider. This has led to a controversy concerning methadone treatment, also known as the “Harm Reduction Debate”. This research paper is an examination of quantitative and qualitative data concerning medication-assisted therapy. The examination included the data of several studies reporting on the efficacy of short and long term medication-assisted therapy. Additionally, the examination included analysis of the reported attitude trends and interview data of medication-assisted therapy recipients in qualitative studies. During examination of the quantitative and qualitative data, Long term medication assisted therapy was found to be associated with higher efficacy of treatment. Additionally, Patient inclination for the curative or the palliative approach was a major factor in the potential success of both long and short term treatment. This finding suggests that medication-assisted treatment providers need to give more weight to the variable of patient attitude when creating the treatment regimen. This finding can be presented as an argument for the need of case by case based methadone treatment, regardless of the policy of individual clinical providers.

192. Pixels of Pain, Do Violent Video Games Cause Players to Become More Violent?

Ciara Reynolds, VCU Honors College, with Prof. Faye Prichard, VCU Honors College

For many, video games are an important outlet and large part of their daily lives. As this form of media has grown and changed, some people have raised concerns about the effect exposure to the themes in these games may have on players, particularly young children. The main concern addressed in this paper is violence, specifically how viewing or partaking in video game violence changes the thoughts and actions of those involved. A vast number of studies have looked at the effects of game violence on desensitization, views of your own actions or the actions of others, and arousal. However, most of these studies were conducted using video games such as Mortal Kombat or Grand Theft Auto, games known for their gratuitous and unjustified violence. I believe that more research should be done using games that have restrictions when you can fight and who you can attack, as well as reasons for the violence present. For this research I read and analyzed several scholarly articles discussing studies on players’ reactions during and after violent gameplay, as well as restricted violence video games like Assassins Creed as primary sources. Over the course of this research I found that though

video games do cause desensitization to violence there is little to no evidence showing that players become more violent in their real world actions. This knowledge could help calm many who are concerned about the effects of such games, as well as encourage further studies using different types of violent video games, such as restricted violence.

193. Paramedic Airway Management

Hugh Cline, Interdisciplinary Studies, with Prof. Jessica Gordon, University College

Airway management is an integral part of a paramedic's scope of practice and when done correctly can save lives. Endotracheal intubation is one of the tools in the paramedics box for airway management. In recent years endotracheal intubation has come under the microscope for its effectiveness. Is paramedic endotracheal intubation effective? Through my evaluation of dozens of published medical studies combined with my 10 years as a paramedic with 6 of them as a flight paramedic I have come to the conclusion that paramedics can provide effective airway management via endotracheal intubation.

194. Of Monsters and Men: A Comparison of Greek and Norse Myth in the Western Canon

Auverin Morrow, Depts. of English and World Studies, with Prof. Faye Prichard, VCU Honors College

Classicism and the literary canon have been a part of academia since ancient Greece. Greek literature has long been considered the most valuable, and it has been held up through the ages as an exemplary model of literary perfection. While the western literary canon has often been revised and added to, we have never truly questioned the place of Greek mythology in it, nor have we considered that other mythologies may deserve a place in our canon alongside their Greco-Roman peers. The Anglo-Saxon epic *Beowulf* has recently been given a place in our canon, but this is just a small step in the right direction. If the function of a canon is to highlight the great literary works to date and provide a framework for where we turn for knowledge, we must strive to build the most holistic and well-rounded canon possible. In order to do this, we must look outside Greek culture and open ourselves to the wisdom of other parts of the world – for example, the mythology of Norse peoples. I will be examining and consolidating several different types of sources: analyses of the value of Norse myth, critiques of the nature of Greek myth, and examinations of the literary canon and the idea of classicism. Once coalesced, these sources show that Greek myth is not the only way to the knowledge and answers we hope to achieve. In comparing the reality of Greek myth to the expectations of classical perfection, we see that it is not the near perfection we believe it to be. In some areas where Greek myth lacks or utterly fails, Norse myth is strong and intricate. Norse myth, and other mythologies from around the world, are not less valuable than Greek; they offer their own wisdom, and deserve to be recognized as valuable. In giving them this recognition, there is potential for widening and improving our canon to create a more holistic understanding of ourselves and the culture that has been passed down to us through the ages.

195. Red Light Rush Hour

Nicholas Grubb, Dept. of Biology, with Prof. Faye Prichard, VCU Honors College

For many, sex trafficking is only a burden that citizens of the Far East must carry and few are aware of its presence in the United States. Even fewer still are aware that this lucrative business is not only growing in the heart of America's largest cities, but infesting the suburbs of the nation's capital. To raise awareness of sex trafficking in the Virginia and Washington DC area, and to promote prevention, research was done into national sex trafficking trends and legislation, local nonprofit efforts, recent Virginian media coverage, and judicial records of sex trafficking in Virginia. This research displayed frequent domestic minor sex trafficking in gang organized and operated prostitution rings that were advertised on social media. It also showed that, until recently, prosecutors did not bring forth "sex trafficking" charges, creating unreliable trafficking statistics, and the children were often charged with prostitution. From this, it was gathered that there was a general ignorance to the presence and functioning of trafficking organizations in Virginia. Observing changes in the prosecution methods and the success that traffickers have using social media shows that in order to eliminate trafficking in Virginia, judicial reform, continued education for law enforcement and youth, and awareness campaigns are the key to eliminating sex trafficking in Virginia.

196. The Effect of Cancer on Family Caregiver

Rukhsar Chughtai, Dept. of Political Science, with Prof. Faye Prichard, VCU Honors College

Cancer affects not just individuals who have the disease, but also their families, specifically the caregivers. Despite the immense research on the impact of cancer, little is known about its positive implications on improving the quality of life for both the cancer patient and family caregiver. The main ideas that emerge from the research are the negative implications on both the cancer patient and family caregiver: emotional, financial, educational, shift in caregiver role, and the changes in the relationship between the caregiver and cancer patient. This research results from the analysis of ten peer-reviewed journal articles under subjects involving oncology, psychology, communication, and health care. Notable authors performed various studies, surveys, and interviews of both cancer patients and family caregivers. The interviews conducted by the researchers are primary sources demonstrating the impact of cancer from both the caregiver and cancer patients' perspective. The various methods used further guides our understanding of the impact of cancer from the perspective of both the cancer patient and family caregiver. Number of coping mechanisms such as spirituality, religion, and support groups encourages a positive outlook on living with cancer. Reliance on these coping mechanisms encourage both the cancer patient and family caregivers to be more pleasant, happier, and less distressed when dealing with the cancer experience. This research will contribute to future studies regarding changes in the relationship between the cancer patient and family members.

197. Understanding Homosexuality: Ancient Greece to the 21st Century

William Gilbert, Dept. of Broadcast Journalism, with Prof. Faye Prichard, VCU Honors College

Now that the study of sexuality is becoming a more accepted field of research, the ambiguous history of homosexuality is in the process of being better understood. The lack of known information in the field of homosexuality has created a feeling of exclusion in the LGBT community from the rest of the world. I wanted to know the reason for this stigmatization. The original goal of this research was to pinpoint the period of time when a tolerance of same-sex tendencies in Ancient Greece shifted to intolerance, and why the shift occurred. I analyzed the works of multiple sexual theologians and what they believe to be the reasons for the shift, but there is no specific time period they all agree on. This gives the impression that the change took place over a long period of time. But, by doing my research, I learned more about the meaning of homosexuality and about the changes that it has undergone through history. I now have a better understanding of homosexuality and the connotations it holds and the components that make homosexuality what it is. This understanding is important and needs to be spread to the masses to abolish the stigma that surrounds homosexuality. People need to be better educated in the history of homosexuality; they need to know that it has been a part of people's lives dating all the way back to Ancient Greece. This education could increase acceptance of homosexuals in the workplace, at the altar, or just on the street. The understanding of homosexuality's past could be helpful to future adolescents or adults grappling with the questions of sexuality.

198. The Prevalence of Isolated Sleep Paralysis Among African Americans

Michaela Crutsinger, Dept. of Psychology, with Prof. Faye Prichard, VCU Honors College

Isolated sleep paralysis (ISP) is a phenomenon that occurs just before waking, or when one is falling asleep, and often results in a terrifying experience characterized by an inability to move the limbs, despite the consciousness of the individual. Although the condition is well known in various cultures around the world, it is often described in culturally specific terms, such as, "a witch riding your back" in some African American groups. Isolated sleep paralysis occurs more frequently among African Americans than Caucasians, although the reasons for this disparity are unclear. This is an examination of the results and analysis found in recent studies regarding the relationship between race and the prevalence of sleep paralysis, particularly in Africans and African Americans. Subsequently, the relationship between anxiety disorders, race, and ISP is identified as a risk factor. Other risk factors discussed include life stresses, possible genetic predispositions, and aspects of paranormal belief. Thus far, the research gathered points toward a biopsychosocial model: the risk factors and causes of the higher prevalence of ISP in African Americans cannot be attributed solely to one cause. Rather, there is a combination of biological, sociocultural, and cognitive factors that result in this higher prevalence. Most, if not all of the studies emphasize the need for further research on ISP. While a specific cause will likely not be found, exploring connections between panic, hypertension, and other factors related to ISP could provide insight into the prevention of ISP among African Americans as well as other groups. With a better understanding of the risk factors and the link between ISP and psychiatric illness, health professionals could better educate patients on ISP as an experience in a meaningful way.

199. The Black Performer

Olivia Phillips, Theatre-Scenic Design and Technical Direction, with Prof. Faye Prichard, VCU Honors College

There is a lot of concern among Black activists and scholars in the United States about whether the contemporary Black American's cultural idiosyncrasies and values have any connection to the values of their African predecessors. One of the great signifiers of culture is the artistic practices of that culture. Therefore, my research focuses on the features of traditional African artistic practices and contemporary Black American artistic practices, more specifically the oral storytelling traditions of West Africa and Black dramatic performance in the US. To do this, I have analyzed several articles that deal with the question of exactly what Black Drama is in the U.S. and what the most important features of oral storytelling in West Africa are. Though the subject requires more research, my findings thus far have been that Black drama in the U.S. consists of three elements: The Black church, various modes of performed poetry, and musical performance. I have also found strong evidence that these elements of contemporary Black drama celebrate the same core customs that make up the oral storytelling tradition of the griots in West Africa. This is not only an affirmation that Black Americans haven't completely lost touch with the core of their heritage, but a new way of looking at what is an often criticized, mocked, and devalued element of Black culture.

200. Mental Insanity: Criminal Neurology

Kathleen Vermillera, Dept. of Biomedical Engineering, with Prof. Faye Prichard, VCU Honors College

The relationship between the anatomical structure of the brain and psychopathic criminal behavior has recently been a main focus in forensic research. Alterations in neurological connections and/or functional deficits can result in a variety of behavioral and personality changes in an individual. Neuroimaging is the most accurate way to test for termed "mental insanity" in criminal suspects, however the most accepted method to qualify for an insanity plea is simple self-report. The objective of this study was to determine what specific regions of the brain should be used as indicators of psychopathic traits in individuals that have been accused of a violent crime by reviewing previous research studies focusing on identifying affected regions of the brain in clinically diagnose psychopathic offenders. The prefrontal cortex, orbitofrontal cortex, and amygdala regions of the brain showed the highest rates of anatomical differences in violent offenders when compared to healthy controls. This research study provides further evidence supporting neuroimaging for suspected psychopathic criminal offenders when attempting to plea mental insanity in court.



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