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Summer Research and Creativity Grants

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How Much Can Positive Media Affect People's Opinions of Biotechnology?

Abstract By Georgina Anderson
Agricultural Biotechnology

In recent years, agricultural biotechnology has been viewed in a very negative light by the general public. A lack of education about important advances in this field is partially responsible for the public's opinions. How easily are people reassured of the safety of agricultural biotechnology's contribution to the nation's food supply? This research project is trying to answer this question. By measuring volunteers' attitudes toward agricultural biotechnology. The volunteers will have access to a series of readings about agricultural biotechnology in the nation's food supply, and then the volunteers will take a second survey measuring their opinions of agricultural biotechnology after being educated in the basic ideas of agricultural biotechnology and how it relates to the nation's food supply.

Readers of the *Advocate-Messenger* newspaper in Danville, KY are being asked to take part in an internet survey about their opinions toward biotechnology. The survey utilizes Likert-like questions as well as open-ended qualitative questions to assess participants' positive or negative opinions of biotechnology, their perceived current knowledge of biotechnology, as well as standard demographic questions such as age, education level and occupation. Volunteers are then being directed to a series of four articles that will be published in the newspaper. These articles focus on historical and recent advances in biotechnology, as well as some of the major debates about biotechnology. A post-test will be given. The post-test's questions will be identical to those asked on the pre-test, with the addition of questions pertaining to how many of the published articles the volunteers read.

The quantitative data collected will be analyzed using the SPSS Data Analysis Software. The qualitative data collected will be analyzed to determine the major themes and concerns of the participants relating to the study.

A follow-up article will be published in the *Advocate-Messenger* Newspaper to inform volunteers and other newspaper readers of the results of the study. A scholarly paper based on this study will be submitted to the Anthropologists and Sociologists of KY 2003 Annual Meeting. The information gathered in this study could be used to create programs to educate the public so that people understand what biotechnology is really about and what major advances have been made in this field resulting in more and higher quality food being available to consumers world wide.

Developmental Changes in Media Use in ADHD and Comparison Children

Abstract By Rebecca Dayle Ashby
Psychology and Education
June 15, 2004

Many parents and professionals are confronting the challenges of raising and educating children who have been diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). The role of media habits in the lives of these children is a particularly controversial issue that has recently incurred much debate. While many parents report that television is one of the few activities that can sustain their child's attention, some experts postulate that the rapid pace of television may worsen, if not cause, ADHD symptomatology. Although the media habits of these children may pose a significant concern, little empirical research on this subject exists. This current study recognizes that in order to aptly report about the media habits of children with ADHD and those without the disorder, a few central questions must be answered. First, are the media habits of children with ADHD significantly different than those of comparison children? For instance, does television viewing replace reading among children with ADHD? Second, do parental beliefs about reading and television differ between these groups and are those parental beliefs manifested in their child's media use? Third, are the media habits of children with ADHD and non-referred children different across age groups? In addition to examining these questions, the longitudinal design of this study also allows us to investigate the ways in which media habits change and develop in specific groups over time. Participants in this study include the families of approximately ninety-five children diagnosed with ADHD and the families of approximately one hundred and fifty comparison children. When parents initially brought their children to the lab to participate in the ongoing television viewing and language development research project, they completed a "media habits questionnaire" that assessed a number of variables relevant to their child's reading and television habits and environment. The current study primarily seeks to examine the relation between that questionnaire and a new but similar "home habits questionnaire." Data have already been collected and entered for the majority of the participants and those data are being analyzed. Preliminary results obtained from this study are currently being developed into a poster that will be submitted for presentation to the Society for Research in Child Development biennial conference.

The Effects of stress on the Liverwort, *Marchantia Injlexa*

Abstract By Jacob Ball

Biology

During the summer of 2003, work began on an experiment to determine the growth patterns of the bryophyte, *Marchantia injlexa*. *M. injlexa* is found along streams, ranging from Tennessee to Northern Venezuela. This plant produces offspring via sexual reproduction (by spores) and via asexual reproduction (by gemmae within cupules).

When the experiment to determine the growth patterns of *M. injlexa* began, a sub-culture of the plant was also set-up in a growth chamber to further examine growth patterns. While growing this sub-culture in July of 2003, the observation was made that when *M. injlexa* encounters cold stress it responds by producing gemmae. Due to a malfunction in the growth chamber, the plants were subjected to a temperature of 0° Celsius for a period of approximately 12 hours. After the malfunction was corrected, and a period of time had passed, the plants had all produced cupules containing gemmae. Before the plants were exposed to the freezing temperature, none of them had gemmae producing structures. The objectives of the proposed study are to specifically test if cold and other relevant stressors induce plants to reproduce asexually. Other stressors that will be tested are breaking and drought.

Current Progress and Future Plans

Currently, over 300 sample plants chosen from various random genotypes are growing in the greenhouse space provided by the University of Kentucky and Dr. N. Mcletchie. The results of a preliminary experiment on a greatly reduced sample size have thus far been promising, with cupules produced in a number of the plants. Once the plants have had adequate time to grow and recover from the initial stress of being relocated for this study, testing will begin on a much larger sample consisting of over 250 plants.

Study of the Electronic, Structural, and Bonding Characteristics of Arsenic Thiolates

Abstract By Ronald Bakus, II and Taimur Shaikh

Chemistry

As part of the chemistry proposal for a grant received from the University of Kentucky to study ways to achieve removal of oxo-arsenic species from water, several experiments were planned and performed during the past semester. Through the course of these experiments, it became obvious that the current knowledge available in the literature in regard to chelation of arsenic species is lacking in research into how different substituents on the arsenic center affect the bonding, structural, and electronic characteristics of arsenic. Therefore, a more fundamental approach is required

for the study of ways to remove oxo-arsenic species from water. Several experiments have been planned to study the electronic, structural, and bonding properties of arsenic in response to different substituents on the arsenic center. Based on previous research conducted in the Atwood group, and a strong literature precedent for arsenic sulfur bonding in nature, the focus of this research is turning toward a more fundamental study of arsenic thiolates. As part of this research, several novel ring compounds have been synthesized to study the effect of these substituents. Continued work on these compounds is planned this summer, with the end goal being a better understanding of the properties of arsenic, leading to more fruitful attempts at synthesizing a ligand capable of removing oxo-arsenic species from water.

Effects of Direct-to-Consumer Advertising on Physician Prescription Intention

Abstract By Adam W. Craig

Psychology

Spending on direct-to-consumer advertising (DTCA) tripled from 1996 to 2000 and shows the change in pharmaceutical marketing, a \$259 billion industry. Proponents claim this advertising facilitates the communication between physicians and their patients, but it may in fact be harming this relationship by exploiting it for marketing purposes and higher profits. With patients presenting persuasive messages from the drug companies, physician resistance may increase and result in an intention to prescribe generic drugs. This study evaluates the effect of DTCA on the patient-physician relationship by interviewing physicians and predicting their prescription behavior. Intention to prescribe alternatives is directly related to irritation and negative attitudes toward DTCA.

Eleven physicians ranging in specialties and years of practice have been interviewed in a semi-structured process to determine their perceptions and intentions toward the pharmaceutical industry. The participants were gathered based on convenience sampling procedures due to the impossibility of randomly sampling a group that is under very heavy time demands. Responses were examined by correlating attitude toward persuasive messages with intent to prescribe generic drugs in order to evaluate levels of resistance.

Among those sampled, physicians with more negative attitudes toward DTCA have report a greater likelihood to prescribe alternative pharmaceuticals in reaction to the pharmaceutical marketing efforts. Results of the study should provide a direction for further academic research regarding the processes involved in persuasion that DTCA promotes. Indications for future advertising and marketing efforts in the medical field will also be provided.

Cuban Religious Folkloric Music Abstract

Abstract By Kyle Forsthoff

Music

My proposed research project for the Summer of 2004 will be to perform an intensive study of Cuban religious folkloric music. Santeria, the principal religious community, is primarily derived from the religious ceremonies of the Yoruba tribe of West Africa, who were transplanted to Cuba due to the growing colonial slave trade. One of the primary methods of musical expression in Santeria is Bata drumming. The African influence on the music creates an incredibly intricate musical language that, although very different from Western classical music, betrays an enormous amount compositional complexity and maturity. The Bata musical tradition has been passed down through a long history of oral transmission and very little of the vast catalogue of music has been recorded or transcribed. As a way to keep the music sacred, only trained Bata priests were allowed to study and inherit the music of their religion. At this time, there are only 25 certified Bata priests living in the US. Due to the changing social atmosphere, recording and learning Bata without the religious connotation is not necessarily frowned upon.

During the last week of July, I plan to attend the annual Cuban Folkloric Workshop held by Humboldt State University in Arcata, California. I will be able to study intensively with several members of the Cuban community, including several Bata priests such as Michael Spiro, with whom I have had some prior training. While at the workshop, I will be able to videotape and make audio recordings, which will be significantly helpful in making transcriptions of the music. During the course of the summer, my faculty sponsor, Professor Jim Campbell, will be available for questioning, guidance, and proofreading/editing.

The expected benefits will be two-fold. The transcriptions and recordings will be available to students of the UK Percussion Studio for their use and study. Also, the process of studying, recording, and transcribing the music will allow me to gain insight into the Bata compositional process, which will culminate in me composing an original piece of music for Bata drums, with the goal that it be performed at my Senior Recital in the Fall of 2004.

Piracy, Privacy and P2P: The Future of Copyright in the Digital Age

Abstract By Keith L. Hautala

Journalism

The emergence of peer-to-peer file-sharing technology (P2P) has prompted a global controversy that pits the entertainment industry against software developers, librarians, academics, civil libertarians, and tens of millions of its own consumers. The technology, which allows computer users to share digital media through decentralized ad hoc networks, has come under fire by the entertainment industry

in general, and the recording industry in particular, because it allows users to access copyrighted works without purchasing licensed copies.

The industry has sought more stringent protection for copyrighted works through legislation, litigation and regulation. The Recording Industry Association of America, having secured an early win with the Napster decision in 2000, is now pursuing infringement cases against hundreds of individual P2P users directly. Pending legislation in both houses of Congress would regulate or restrict the use of P2P technology, diminish the privacy rights of online media consumers, and provide criminal penalties for online copyright infringement.

Software developers, Internet service providers, and "digital freedom" advocates complain that the measures demanded by the industry infringe on legitimate usage and hinder technological progress. Librarians, archivists, and academics express concern that these same restrictions may render "fair use" provisions obsolete. Civil libertarians say the industry's actions intrude on users' First Amendment and privacy rights. Consumer rights advocates allege that the industry overcharges consumers and seeks to maintain its oligopoly by stifling competition in the digital arena.

My research will consist of a comprehensive review of recent and pending litigation and legislation, as well as interviews with experts and interested parties. My report will provide a thorough overview of the issues, an explanation of relevant law and policy changes, and an examination of the merits of some proposed alternative solutions, such as copyright reform and compulsory licensing. Through this study, I hope to identify and advance policy objectives to safeguard fair use and free expression, while promoting the preservation and growth of the store of creative works in the public domain.

Pinning the President: Political Cartoons of the Lyndon Johnson Administration

Abstract By John Knadler

History

When we think of the landmark events in post World War II America, we naturally think of, among other things, the Vietnam War, the Civil Rights Movement, and the Kennedy assassination. One man who was at the vantage point of all of these events and many others was President Lyndon Baines Johnson, the flamboyant Texan and self proclaimed heir to the New Deal. His administration began with the most laudable ambitions for a better America; indeed, the ultimate goal was a Great Society. However, the best laid plans began to go increasingly awry with the escalation of the Vietnam War to the point of Johnson's decision not to seek the Democratic nomination in 1968.

Because so many Americans formed their impressions of the Johnson administration and its policies from newspapers, it is significant that we understand the message that they presented to the American people each day. If a picture is worth 1000 words, as the old maxim states, one of the most attention grabbing feature's of the newspaper is the daily political cartoon. It will be the goal of this thesis to

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investigate how various political cartoonists depicted President Johnson and his policies, in order to gain an understanding of how these views progressed or remained constant over time. Once we understand this, my goal will be to compare these views to those of the American public in order to evaluate whether political cartoonists were representative of the public as a whole.

Development of a Whole-Cell-Based Biosensor for Detectin2 Histamine as a Model Toxin

Abstract By Samantha Meenach

Chemical Engineering

Recently, in Dr. Kimberly Ward Anderson's laboratory, a whole-cell potentiometric biosensor for screening of toxins has been developed. This biosensor consists of a monolayer of human umbilical vein endothelial cells (HUVECs) attached to the membrane of an ion-selective electrode (ISE). When the HUVECs are attached to the surface and form the monolayer, tight junctions form between the cells, inhibiting the response of the ISE to ions in solution. When the monolayer is exposed to agents that affect the permeability of the endothelial cells, the ions can diffuse through the membrane and a potential response on the ISE is achieved. The measured potential on the electrode depends on the concentration of the permeability-modifying agent and a relationship between the potential value and concentration can be achieved. For the development of this biosensor, histamine has been used as the model toxin, because it increases the permeability of HUVEC mono layers.

My role in this project will be to continue the testing of this biosensor with histamine to obtain more data points to further our progress. This data will then be used to model the cell behavior on the biosensor as well as show more results. My personal progress to date includes my training in the techniques used and obtaining a number of the data points needed. Upon the completion of this testing, the possibility of using this biosensor in the early detection of breast cancer will be explored. There are various agents from breast cells including growth factors VEGF, IGF-1, BFGF; binding proteins to growth factors, IGFBP-3, cytokines, and TNF that may be detected. Although this was to be the original nature of my research project, there was not enough histamine data to continue with this new testing. For the summer, my goal is to complete the data needed for this portion of the project so that the breast cancer research may continue.

The Intersection of Female Voice and ARETE: An investigation into the creation of the Amazonian Other

Abstract By Hope Catherine Meisinger

Classics and English

"The nudity of the virgins was not shameful, for modesty was present and intemperance was absent, but it implanted plain habits and an eager rivalry for high good health in them, and it imbued them with a noble frame of mind as having a share in arete and in pride." Plutarch, *Lykourgos* 14.2-15.1

"In ancient times were the Amazons, daughters of Ares, dwelling beside the river Thermodon; they alone of the people round about were armed with iron, and they were the first of all to mount horses..." Lysias, *Speeches*, Speech 2 section 4 (2.16)

As I stepped off of the Pullman bus at the entrance to the Metropolitan Museum of Art I, could smell the comforting aroma of American hot dogs and hear the vendors crying out to the tourists. I marched up the marble stairs with a walk of solemn decorum. I took the first left into the Greek and Roman Galleries and walked down the main corridor. I passed colossal kraters with the labors of Herakles and amphoras of weaving wives. Suddenly I stopped, like a frog on a pond about to be impaled on a miniature trident. She stood proudly, her right arm draped over her head while she leaned heavily upon the pillar beneath her left elbow. Her pain was undeniable, and her fierce independence was unshakable. I looked closer and read the description plate: Amazon, Berlin/Lansdowne/Sciarra type, a Roman copy of the Greek original, New York 32.II.4.H.2.04. I was transfixed by this woman warrior and I rummaged through my tattered research bag for a notepad and pencil.

My first encounter with these female warriors was intense and the inspiring Amazon statue compelled me to travel to Athens, Rome, London, and Egypt to discover the meaning of their existence to the ancients and explain why the Amazonian 'Other' is such a persistent motif in Western literature. Whether or not this matriarchal tribe of fighting nomads actually existed has no affect on their literary and artistic analysis. Herodotus, Lysias and Diodorus certainly believed them to be a historical reality. Homer includes the Amazons, peers of men, in his epic of Achilles' rage (*The Iliad*). They were represented with overwhelming insistence in the sculptural programs of the Periclean Parthenon, the Mausoleum of Halikarnassos, the Hephastion, and the Temple of Artemis at Ephesos. Such central positioning in the most sacred and renown sites of the Ancient World certainly demands a close investigation into the cultural subtext that Amazonian mythology implies.

Throughout the course of Western literature, writers have returned to the literary creations of the Greeks. The archetypal Amazon is present in William Shakespeare's *A Midsummer Night's Dream*, and the forgotten epics of Renaissance poet George Baker. Baker's poetry chronicles the coming of the Amazons to Troy to aid the utterly depressed and disenfranchised King Priam. When the people of Troy see the glorious mounted warriors riding into their down-trodden town, hope wells up in their hearts and they begin to believe that they may be able to escape their imminent demise. Queen Hippolyta graces them with her stately diplomacy and shatters their preconceived notions of a static, home-based, wifely femininity. Her bravery inspires the Trojans to bear arms and fight once more, and the battle-ready masses were in utter awe of her heavy labrys, far-shooting arrows, and sheer power.

Amazon is also included in the Pulp Fiction of 1950s America. She appears here as an oversexed dominatrix. Here she is one who will destroy any man who is attracted to her swiftly and skillfully like Uma Thurman in the recently released film of Quentin Tarantino: *Kill Bill*. Her fiercely independent nature is always present, bubbling just beneath the surface, and the Amazon is always prepared for a fight to the death. Steven Pressfield has just written a book entitled *The Last of the Amazons* that centers around a domesticated Amazon named Selene who must be reclaimed by her owner/master after she flees her place of employment and security to save her ailing lover Eluthera. The novel is a bestseller and it seems that this literary figure is consistently intriguing even to casual readers of Western literature and amateur audiences of Art History.

Volumes of interpretation have been published on this tribe of women. One needs only to walk into the Blegen Library of the American School of Classical Studies in Athens, Greece to have a close encounter of the Amazonian kind. Yet the Amazon remains an enigmatic figure and more research must be conducted and more archeological digs must be funded before many of these questions can be sufficiently addressed. Until then, the irrepressible Femme warriors will live through their epithets as the first Feminists: living without men, man subduing, man-destroying, man-killing, man-slaying, murderous, hurtful to men, bearers of pain to men, striving against men, man-murdering, flesh-devouring, dauntless and forever fearless.

History: What a Novel Idea

Abstract By Kevin Moser

Classics and English

The focus of my project is an examination of historical novels as a genre and as an informational instrument that is rapidly emerging as a new form of scholarship that purveys intellectual contributions with the added benefit of being highly accessible to all historians, amateur, professional, or anywhere between. Due to my field of interest and knowledge, this project will focus on historical novels that deal with antiquity — with Greece and Rome at their heights. The historical novels written in modern times about this period are present in great number, and several of them have achieved a great deal of respect among the faculty members I will be working with. A short list of authors to be read will include Mary Renault, Robert Graves, Steven Saylor, Colleen McCullough, Steven Press Field, and Robert Harris, among others. Several contemporary sources exist among ancient writers, and will help tremendously in determining the accuracy of these novels. Thus, I will also include works of ancients such as Suetonius, Caesar, Cicero, Seneca, Plutarch, Thucydides, Xenophon, and some Plato on my reading list. Traditional historical works, such as the texts of Chester Starr and Edward Gibbons will also find a place in my reading. Finally, I have recently begun to assemble a bibliography of scholarly works dealing specifically with historical novels, allowing my project to explore not only content, but the form and the ideal of the novel.

The final result of my research will be in one of two forms. The first will be to assemble a chronology of a certain period, such as the Late Roman Republic, entirely by using historical novels. After the chronology is established, it will then be my intent to scrutinize it from an academic perspective to see how it stands up as historiography of the period, and whether or not it retains sufficient historicity to be considered as an alternative to a traditional textbook. The second possibility will be for me to construct a biography of a historical figure using ancient, modern, and historically fictional sources. This possibility will allow for me to explore and express my encounter with a historical entity in a complete way that examines both the individual and the historical actor, with a result that might loosely be called "Finding Julius Caesar," or something similar.

Progress on this project has begun in earnest, but is still in the early stages. Currently, I am reading ancient sources, Suetonius, Plutarch, and Caesar, in order to both refresh my knowledge and gain a bit of solid historical ground on which to base further research. After these works, I plan on reading several of Mary Renault's novels on Ancient Greece, and then going ahead to Rome with Colleen McCullough's cycle about the Late Republic. After this, I will be headed to Europe to do my research into German language historical sources, several of which are works of theory about historical novels. In addition, I plan on bringing several English language works with me to continue my research. The result of this is that I hope to have a solid footing in the autumn on which to begin some preliminary writing on my project.

Reassigning Values: The Evolution of the Rock Fence in Kentucky's Cultural Landscape

Abstract By Jason Richards

Architecture

The built environment of Central Kentucky is comprised of many elements that together define and give form to the cultural landscape of the Bluegrass. One of the most enduring (yet rapidly disappearing) symbols of this region is the rock fence, particularly the dry stone masonry fences of the horse farms of Kentucky. Though it is estimated that fewer than 5 percent of those fences in existence at the turn of the 20th century still stand today, the stone walls of the Bluegrass have found a new home in retail centers, public parks, and institutions of learning across the Bluegrass. These post facto stone walls of the Bluegrass are always mortared or "wet" walls, and vary in form from the "dry-laid look" of Thoroughbred Park's 400 foot wall to the ashlar blocks of the new Courthouse Plaza in Lexington.

Though Thoroughbred Park and the Courthouse Plaza may provide the most recent examples of post facto mortared stone wall construction, their beginnings lie at the turn of the 20th century. Around that time, just as the fences of the previous century were being pulled down to clear land for bigger farms, several large Bluegrass estates began to revive rock fence construction. Estates such as Coldstream Farm and Elmendorf Farm incorporated elegant formal entrances of cut and mortared stone. Yet, perhaps most significant, was John Keene's construction of the ashlar stone walls and barn that became Keeneland Racetrack. His stone walls, built from 1914-36 not only reinforced the relationship between horse racing and stone walls celebrated in the recent construction of Thoroughbred Park, but for one of the first times set the stone wall in a public context, providing a precedent for the construction of stone walls in public places from civic parks to commercial districts.

The legacy of the rock fence at the University of Kentucky has taken a slightly different path, and has only recently recalled the formal elegance of turn-of-the-century Bluegrass horse farms. From its beginnings in 1865 as the Agricultural and Mechanical College of Kentucky, the University has been long associated with horse farms surrounding Lexington. An article from the 1934 *Kentucky Kernel* describes the then State College campus of 1905 as having "a white post-rail fence that extends around the front part of the campus. . . [and resembles] a fence around a race horse farm." If such a fence reflected the rural austerity of the campus 100 years ago, then, perhaps, the stone campus gateways built in the 1990s indicate the growth of the campus financially and physically in the last century.

What research has been completed thus far has revealed much of the changing values (particularly regarding the University of Kentucky) that can be read from the cultural landscape through stone walls. The remainder of my research will focus on the analysis of contemporary stone wall construction in its public and civic context. Further emphasis will be placed on the evolution of stone wall form from the horse farm to current dominant methods of construction. The ultimate goal of my research is to shed light upon the dichotomy inherent in the cultural landscape of the Bluegrass; in other words, to discover why public support for the construction of contemporary stone walls is not matched by an equally zealous attempt to preserve what historic examples are left in the Kentucky Bluegrass.

Catholic Reactions to Evangelism in a Highland Maya Town

By Andrew Schuhmann

Anthropology

Following the Spanish colonization of Central America, Roman Catholicism has converted and maintained strong influence among the rural indigenous populations of Guatemala through fervent and numerous missionary efforts into the area. Within the past thirty years however, this dominance has been, and continues to be challenged by the emergence of Protestant churches propagating a very different message and way of life to the native people, which is profoundly affecting these rural communities both positively and negatively. An opening history of the ways in which the Guatemalan Maya community of Santiago Atitlan assimilated their traditional Maya beliefs with the conquering Catholic doctrines will open up discussion for how these cultural assimilations are now being challenged by the Protestant evangelization occurring in Santiago today. A new wave of religious syncretism is emerging in Santiago, this time between the Catholic Church and the growing number of Evangelical churches sprouting up practically on its front doorstep, and I will attempt to show that the flexibility maintained by both the Catholic Church and the Mayan people in the blending of their two religious traditions during the Conquest period is again being played out today in response to the new and divergent religious values of the Evangelical churches.