Eighth Annual

Undergraduate Research and Creative Achievement Day
April 28, 2004

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Schedule of Events

9:00 a.m.-9:15 a.m.	**Welcome** Arthur T. Johnson, Provost Room 767, Albin O. Kuhn Library & Gallery
9:15 a.m. -1:00 p.m.	**Concurrent Sessions** Oral Presentations, Room 767, Albin O. Kuhn Library & Gallery Poster Sessions, 7th Floor, Albin O. Kuhn Library & Gallery Musical Performances, Room 767, Albin O. Kuhn Library & Gallery Fine Arts Exhibits, 7thFloor, Albin O. Kuhn Library & Gallery
1:00 p.m. - 2:00 p.m.	**Formal Program, Room 767** Remarks by: Arthur T. Johnson, Provost Diane M. Lee, Vice Provost for Undergraduate and Professional Education and Chair, URCAD and URA Committees **Faculty Guest Speakers:** Professor Christoph Irmscher, Department of English Professor Rouben Rostamian, Department of Mathematics & Statistics **Introduction of the 2004-2005 Undergraduate Research Award Recipients** Diane M. Lee, Vice Provost for Undergraduate and Professional Education and Chair, URCAD and URA Committees Victor Wexler, Associate Dean, College of Arts & Sciences
2:00 pm - 3:00 pm	**Reception** Seventh Floor, Albin O. Kuhn Library & Gallery

April 28, 2004

Dear Participants and Visitors:

I am pleased to welcome you to UMBC's eighth annual Undergraduate Research & Creative Achievement Day. This year we showcase some of the most diverse and timely presentations we have seen. Whether focusing on the minimum wage in Costa Rica, transgenic mice, Jackie Chan cinema, Catholic voting behavior, or trauma in humans, you will be sure to find subjects of interest.

It will be our pleasure today to introduce our largest class of Undergraduate Research Award recipients - thirty talented students who will share in approximately $30,000 funding. The increase in applications this year's attests to a vibrant campus where undergraduates - not just graduate students - are fully engaged in research and creative endeavors.

In conjunction with President Hrabowski's commitment to increasing the number of prestigious scholarship awards for UMBC students, we are seeing the additional rewards of undergraduate research in successfully competing for major awards such as the Fulbright, Truman, and Goldwater fellowships. Don't be surprised if a future Rhodes or Marshall Scholar is among the students you will be meeting today.

A special note to our participants, especially to those who will be graduating next month. Stay in touch! Let us know of the continuation of your research as graduate students and as professionals. We are proud and confident that the research and creative achievement that you recount, exhibit, and perform for us today will give you the foundation to be highly successful in future endeavors. Alunmi who participated in this program in years past tell us that the experience has had lasting and meaningful value.

Thank you for being here today. We appreciate the support of the faculty who have mentored you and of the family and friends who have supported you. We are proud of your accomplishments and look forward to this day of celebration.
Sincerely,

Arthur T. Johnson
Provost

Presenters

Presenters are listed in alphabetical order by type of presentation. The number in the right-hand column refers to the page on which the abstract is found. An asterisk notes that the student is a 2003-2004 Undergraduate Research Award Scholar.

Oral Presentations

Poster Presentations

The 2003 - 2004 Provost's
Undergraduate Research & Creative Achievement Day Committee

Diane Lee, Chair
Vice Provost for Undergraduate and Professional Education
Associate Professor of Education

Guenet Abraham
Assistant Professor, Visual Arts

R. Scott Cost
Research Assistant Professor, Computer Science and Electrical Engineering

Nessly C. Craig
Associate Professor, Biological Sciences

Julie Fette
Assistant Professor, Modem Languages & Linguistics

Stephen M. Miller
Assistant Professor, Biological Sciences

Joseph Morin
Assistant Professor, Music

Beth Pennington
Assistant to the Provost

Manil Suri
Professor, Mathematics & Statistics

Anna Rubin
Director, Linehan Artist Scholars Program & InterArts Studies Program

Kathy Sutphin
Coordinator of Special Projects
Biological Sciences

Tim Topoleski
Professor, Mechanical Engineering

Victor Wexler
Associate Dean of Arts & Sciences
Associate Professor, History

Acknowledgements

The organizing committee would like to express its gratitude to the many people who helped make this day possible. First and foremost, we thank the student participants and faculty advisors whose talent and dedication inspire the entire event. Provost Art Johnson, whose support continues to make this event and other initiatives an annual testimony to UMBC's commitment to undergraduate research, deserves our special appreciation. We are grateful for the continuous support of Marilyn Demorest, Vice Provost for Faculty Affairs, Antonio Moreira, Vice Provost for Academic Affairs, Lynn Zimmerman, Vice Provost for Academic Initiatives, and Jill Randles, Assistant Vice Provost for Undergraduate Education. Provost's Office staff members Linda Hatmaker, Sue McMillian, Susan Mocko, Barbara Smith, and Andrea DeSantis have provided essential administrative support to this event, as has student assistant Katya Trubitsyna .

Each year we are indebted to the faculty advisors, whose support of the participating students is essential and yet often unsung. The tremendous effort made by members of the Undergraduate Research Awards Committee to screen applications and identify many of the talented students featured in each year's event should be acknowledged. We thank the members of last year's URA committee, whose reviews have contributed to selecting today's participants: Thomas Armstrong, Jere Cohen, Robert Deluty, Linda Dusman, Tony Farquhar, Thomas Field, Vin Grabill, Jim Grubb, Doug Hamby, Brad Humphreys, Prenlinda Jacob, Lisa Kelly, Willie Lamouse-Snuth, Claudia Lawrence-Webb, Wallace McMillan, Tim Topoleski, LYill1 Watson, and Victor Wexler.

For their assistance in moderating the oral presentations, we thank Professors Manil Suri (Mathematics & Statistics), Teresa Viancour (Biological Sciences), Thomas Schaller (Political Science), and Raphael Falco (English). We look forward to the remarks of guest speakers Professor Christoph Irmscher (English) and Professor Rouben Rostanuan (Mathematics & Statistics) and thank them for their continuous support for undergraduate research.

Our gratitude is always owed to Larry Wilt, Linda Durkos, Tom Beck, and Cynthia Wayne for their annual efforts to facilitate our use of the Albin O. Kuhn Library & Gallery. Among the many individuals who have assisted in the publicity and planning for this event are Lisa Akchin, Sara Sommerville, Jim Lord, Julie Gilless, Chip Rose, Eleanor Lewis, Helen Garland, Laura Matteoni, Ramona Arthur, and Stacie Walker. All have provided assistance that we sincerely appreciate.

We are grateful for key support provided by Tim Sparklin (seeing that all projects have followed guidelines of the Institutional Review Board [IRB]) and to the staff of the Registrar's Office in providing required transcripts for URA applications. For several years a faithful volunteer with our registration who is overdue credit and thanks is Sandy Tabler of Biological Sciences. Bev Bickel and the staff of the English Language Center helped assemble the application packets for committee review, for which we thank them all.

This event has marked the annual debut of our undergraduate research journal, UMBC Review. We salute student editors Keith Lin and Rachel Lucke, designers Jennifer and Stacy Ross, faculty advisor Marjoleine Kars, and faculty graphic arts consultant Guenet Abraham for their long hours and hard work on this fifth edition.

We appreciate the support and cooperation of the Graduate School and Graduate Student Association in promoting this event and the achievements of their undergraduate colleagues.

Rita Webster and the staff of Wood Food Service have worked hard to provide an enjoyable reception, and Ron Hamilton and the Student Workforce staff provide unseen but essential support to this event. The help of Audio-Visual Services is always essential to our presentations, and we thank Steve Anderson and his staff for their reassuring assistance for the technical aspects of today's presentations. Signage is always important to our events - thanks to Rick Stanford, Mike Ohelers, and Troy White for their great help in getting up the banners and signs throughout campus.

It is a special honor to have members of the President's Advisory Council extending their meeting on campus this morning to hear presentations and meet student researchers and artists. We appreciate the advocacy that Chairman Gino Gemignani and the entire PAC membership provide for UMBC. Thanks also to Janet McGlynn for facilitating the group's attendance of our event.

Members of the President's staff, Doug Pear, Greg Simmons, Karen Wensch, Kathy Raab, Sue Bosley, and Susan McGuire, "sooner or later" always provide assistance for this event. They have also facilitated the participation of President Freeman Hrabowski, whose spirited leadership continually inspires our celebration of student achievement.

A heartfelt word of appreciation goes to the family and friends who, with loyal pride and support, come to hear their special presenter each and every year. Your encouragement is often unacknowledged, though not unnoticed or unappreciated.

Lengthy though our list, we can never include the entire cast of individuals who help with this event. To all who have assisted in any way (even as the day progresses), we are most grateful.

ORAL PRESENTATIONS

Biological Sciences

TESTING MITOCHONDIUAL PHYLOGENIES - NUCLEAR INTRON SEQUENCING FOR NEW WORLD ORIOLES

Roland Y. Cheung
Dr. Kevin E. Omland, Assistant Professor, Department of Biological Sciences

New World orioles (Icterus) exhibit a wide range of colors and patterns. Several species can be grouped based on two overall plumage types. However, mitochondrial DNA suggests different groupings. Mitochondrial DNA phylogenies (evolutionary trees) have been used to study plumage evolution and speciation in New World orioles. The mitochondrial DNA phylogeny suggests three main groups of orioles. However, because the mitochondrial genome is inherited as a single linkage group, mitochondrial data only represent a single gene tree. Independent nuclear characters can be used to assess the reliability of the mitochondrial tree. Two nuclear introns, chromohelicase DNA-binding protein (CHD) and ornithine decarboxylase (ODC) were analyzed separately and combined. Trees based on individual introns are consistent with the mitochondrial tree. The combined intron data generates even stronger statistical support for the inferred phylogeny. Resulting nuclear trees support the three major groups inferred from the mitochondrial data and confirm that similar plumage patterns can result from evolutionary convergence.

English

MISS MARPLE'S LITERARY GODDAUGHTERS TAKE THE FEMALE SLEUTH TO NEW HEIGHTS.

Nina N. Haeckel
Dr. Kenneth H. Baldwin, Chair, Department of English

Agatha Christie developed the prototypical female sleuth in the 1930s in the persona of Miss Jane Marple, an elderly, wealthy, upper-class spinster. Using her knowledge of people gained from observing the residents of her village, she solves mysteries intelligently but passively. Today, women writers have developed female protagonists in this genre who are women from different socioeconomic backgrounds, race, and sexual orientation. These amateur sleuths actively pursue solving mysteries. Complicating their sleuthing efforts are relationship dynamics that Miss Marple never needed to confront. The personal and familial issues range from developing a romantic life to rai sing children to caring for aging parents. The basis of comparison with Christie's Miss Marple is women authors of the 1980s and 1990s who have developed female characters in serial works. Comparing works of Agatha Christie's Miss Marple with representatives writing traditional mysteries in the 1980s and 1990s will illustrate how the authors use their voice to depict the attitudes, capabilities, problems and choices of modern women through fictional characters.

Chemistry & Biochemistry

EXOCYCLIC ALKYLATION OF 2'-DEOXYADENOSINE, 2'-DEOXYGUANOSINE, AND DNA BY 1-PROPYL DIAZONIUM ION

Jacqueline M. Heilman
Dr. James C. Fishbein, Professor, Depaliment of Chemistry and Biochemistry

Nitrosamines are carcinogens of interest, as they are encountered both environmentally and endogenously. Nitrosamines effect carcinogenicity through metabolism to diazonium ions which form adducts on DNA bases.[1] The location on DNA of diazonium ion-deposited alkyl fragments, and structural aspects which may control this location are of importance, as some lesions are relatively harmless, and others mutagenically potent.[2] In direct contrast with the dogma concerning DNA and nucleoside alkylation, it has recently been shown that carbocations formed from secondary diazonium ions, form isopropyl lesions at exocyclic nitrogens of guanine, adenine and DNA, placing the accepted model for site selectivity in question.[3] The research presented here examines patterns of 1-propylation and isopropylation of 2' -deoxyadenosine, 2' -deoxyguanosine and DNA by a I-propyl diazonium ion for the purpose of elucidating factors affecting site selectivity. The I-propyl diazonium ion may react directly with the DNA base forming a I-propyl adduct, or undergo rearrangement leading to a secondary carbocation, with subsequent formation of isopropyl adducts. These two pathways available for alkylation, along with the array of four possible alkylation sites, yield eight possible products. The distribution of these eight products assists in site selectivity evaluation by allowing comparison of I-propyl diazonium ion reacting directly at certain sites versus its propensity toward rearrangement with subsequent reaction at other sites.

1. Searle, CE. (1984) Chemical Carcinogens, Second Edition, Washington, D.C Loeppky, R.N. and Michejda, CJ. (1994) Nitrosamines and Related N-Nitroso Compounds. ACS, Washington, D.C Lijinsky, W. (1992) ChemistlY and biology of N-nitroso compounds. Cambridge University Press, Cambridge, U.K.
2. Loveless, A. (1969) Possible Relevance of 06-Alkylation of Deoxyguanosine to the Mutagenicity and Carcinogenicity of Nitro sa mines and Nitrosamides. Nature, 223,206-207.
3. Blans, P. and Fishbein, J.C (2000) Predicted Exocyc1ic Amino Group Alkylation of 2'-Deoxyadenosine and 2'Deoxyguanosine by the Isopropyl Cation. Chem. Res. Tox. , 13, 431-5.

Modern Languages & Linguistics

CUBA: MOVEMENTS & MUSIC

Justin D. Lee
Beverly Bickel, Director, English Language Center and AMST 356 Instructor

The purpose of my study is to reintroduce Cuban culture and bypass historical misconceptions we maintain today. This is achieved by taking a unique approach working collaboratively with Cuban students via the Internet about music, specifically the Nueva Trova movement led by Silvio Rodriquez. I am comparing and contra sting different sentiments revealed in the music with information found in various written texts. As a reference point, I interviewed representatives from four different U.S. communities and analyzed how people come to know what they know and their sources of knowledge. Then I began an investigation based on what information seemed to be missing and what I was interested in learning. Through email, I have been connecting with Cuban students to talk about different topics and to ask for their help with my research. Since artistic expression is often a sign of the times, I have chosen specifically to examine certain Cuban music as a common human language and means to comprehending Cuban culture and society as well as relations with U.S. peoples. Maintaining a dialogue with Cuban students is a crucial element in developing my field notes and discovering aspects of Cuban culture that would otherwise be impossible with today's U.S.-Cuban situation.

Mathematics & Statistics

INTERPRETING MICROARRAYS USING SUPPORT VECTOR MACHINES

Maria C. Llewellyn
Dr. Franyoise Seillier-Moiseiwitsch, Associate Professor, Department of Mathematics and Statistics

Microarray data offer the 0ppOltunity to map complex traits and to categorize diseases. The arguments for mapping the human genome have been discussed in many forums. One such concern is the predication of a person's propensity for a specific ailment. Identifying specific genes responsible for a disease could emphasize the differences within one class of disease; consequently, leading doctors to prescribe only the treatments that best affect that sickness, to anticipate the mutations and symptoms, and assign a prognosis with better accuracy. The question arises as to how to interpret the gathered microarray data. How do we learn from previous patients' genetic makeup and the seen consequences of the makeup, ie. the form of cancer developed, the prescribed drug failures, and the recovery process?

American Studies

RACE AND ETHNICITY IN THE CONSTRUCTION OF NEIGHBORHOOD IDENTITIES: REEXAMINING THE BALTIMORE NEIGHBORHOOD HERITAGE PROJECT

Lindsey Loeper
W. Edward Orser, Professor, American Studies

The Baltimore Neighborhood Heritage Project (BNHP) provides a unique opportunity to study how a major publicly funded program constructed "authentic" community histories in several Baltimore City neighborhoods. The segregated and racially homogeneous neighborhoods of Baltimore at the time of the project (1978-1981) allow us to study how race relations, and the inherent power of race, affects the construction and perception of community histories. Drawing from critical community identity theory, I will study how neighborhood identity has the power to unite the community, yet at the same time form boundaries of who belongs and who does not, particularly in reference to race and ethnic inclusion. We can find evidence of neighborhood racial understandings in the oral histories gathered by the BNHP, which documented conm1Unity life from the perspectives of people who lived in these neighborhoods. The BNHP resulted in several public history productions, including a play, Baltimore Voices, which drew from the oral history interviews to form a collective community history for public presentation around the greater Baltimore area. As a national model for community oral history focusing on race, diversity, and urban relations, the lasting legacy of the Baltimore Neighborhood Heritage Project and its productions deserve reexamination twenty-five years after it began.

Biochemistry

RAPID IDENTIFICATION OF HIV DRUG-RESISTANT STRAINS BY ELECTRO SPRAY IONIZA TION FOURIER TRANSFORM MASS SPECTROMETRY (ESI-FTMS)

Chad D. McCormick
Dr. Daniele Fabris, Assistant Professor, Department of Chemistry and Biochemistry

A novel approach is proposed for early detection of HIV and screening of possible drug-resistant strains, which involves PCR amplification of target genomic regions and identification of variants by electrospray ionization Fourier transform mass spectrometry (ESI-FTMS). Our strategy is based on the hypothesis that ESI-FTMS can differentiate very small mass differences in DNA samples larger than 25 kDa, when isotopically labeled dNTPs are incorporated in single stranded PCR products. Key targets were selected by performing a BLAST search for conserved regions in HIV -1 genomes of different known strains. Non-infectious DNA plasmids corresponding to these viral strains were obtained in competent cells from NIH. Amplification was performed using phosphorylated antisense primers and labeled dNTPs. Single-stranded isotopically enriched products were immediately analyzed by ESI-FTMS. The base composition of each product can be immediately inferred from ESI-FTMS data, thanks to the high resolution and accuracy offered by this technique. Each unique base composition can be correlated to the known compositions of the template strains, thus leading to its unambiguous identification. Future work will involve testing the clinical potential for HIV detection and strain screening in patient's only days after infection, as opposed to months required by current antibody technologies.

American Studies

FROM REASONABLE TO BLACK: CONSTRUCTIONS OF AUTHENTICITY IN THE TIMES AND LIFE OF SHAWN CARTER

Michael S. McLaurin
Dr. Jason Loviglio, Assistant Professor, Department of American Studies

This project is an investigation into urban authenticity and notions of realness and how they are constructed through the language of hip hop culture. Specifically, through a close study of the body of work of one of the most successful representatives of the genre, Shawn Carter (a.k.a. Jay-Z), the ways in which the language used within hip hop music, journalism, and social discourse is utilized in creating and negotiating the urban commercial landscape are examined. Emphasis is given to the malleability of these notions in the face of capitalist market pressures. Primarily using a quantitative and qualitative lyrical content analysis, the ways in which this language is used to negotiate themes of authenticity and realness, masculinity, competition, and success in the public arena are explored, particularly as they pertain to perceptions among participants in and consumers of the culture. Where feasible and appropriate, specific musical examples are used.

Political Science

VOTING IN THE NAME OF THE FATHER? A STUDY OF CATHOLIC VOTING BEHAVIOR

Erin A. 0 'Connell
Dr. Nicholas R. Miller, Professor, Department of Political Science

In the past, Catholics were seen as a solid Democratic voting bloc. Over the past few decades, it has become less clear how Catholics vote and whether or not they are even a cohesive voting bloc. Data gathered from American National Election Studies, which has collected data on voting behavior and public opinion for the past half century, were analyzed in order to document the evolution of Catholic voting behavior, party identification, and opinions on issues. Results of this analysis show that while Catholics are straying from the Democratic Party, they have not shifted as a group towards the Republican Party. It is concluded that Catholics are not as cohesive a group as they used to be, largely because of the assimilation of the European immigrant Catholics into American society and the ethnic diversity within the religion.

History

KEYSTONE PATRIOTS: WOMEN SOLDIERS IN PENNSYLVANIA REGIMENTS DURING THE AMERICAN CIVIL WAR

Elefteria M. Papavasilis
Dr. Anne Sarah Rubin, Assistant Professor of History

Even though women responded to the outbreak of the American Civil War as citizens, they were constrained to perform as women. However, nineteen women from Pennsylvania were able to transcend their traditional roles in society to join the military. These women averaged 22 years of age when they enlisted for love, patriotism, adventure, and money. On average these women remained in the military for several months until they were discharged. The most common method of discovery was confession, followed by medical treatments, and recognition by others. Women who were discovered in uniform were allowed to remain in camp in the more traditional roles of laundresses and cooks. Other women were dismissed from the military after being forced to wear female attire. When women returned home from the battlefields, many were afraid to relate their military experiences for a fear of rejection by society. These women were discovered through the use of military records, pension records, newspapers, and other sources. In many respects, these women were ahead of their time in that they experienced combat as infantrymen, an occupation still prohibited for servicewomen today. In addition, the military provided these women with an opportunity to vote in elections, learn to defend themselves, and advance themselves economically by receiving military pay. The experiences of these women have provided historians with a newer interpretation and more comprehensive understanding of the American Civil War.

American Studies

DOUBLE DRAGONS AND DUAL LANDSCAPES: THE ICONOGRAPY OF JACKIE CHAN AND JET LI IN MARTIAL ARTS CINEMA

Phuong X. Pham
Dr. Warren Belasco, Associate Professor, Department of American Studies

An in-depth analysis was conducted on Jackie Chan and Jet Li and their roles in martial arts cinema. The study combines a popular culture and film theory approach to understanding these actors as recognizable icons in a genre with dual landscapes. Formulas of performance, image, and characters are investigated to determine what is consistent with two seemingly different figures and how these traits compare to each other. In addition, the study examines the patterns across each actor's body of work, observes how the actor is engineered- both on screen and off screen, and determines what social meanings are associated with the actors and their films. Studying Jackie Chan and Jet Li as symbols of culture and film provides a thorough exploration into the icons that have crafted an important artifact of our times.

Economics

MUTUAL FUND SCANDALS - IMPACT AND REGULATORY ENVIRONMENT

John M. Williams
Dr. Douglas J. Lamdin, Associate Professor, Department of Economics

More than 95 million Americans have invested $7 trillion in mutual funds as a means of facilitating retirement preparation, estate planning, educational funding, and compensation for other long-term expenses. Despite the incredible fiduciary responsibility held by mutual funds, the fund industry has come under attack amidst allegations by New York Attorney General Eliot Spitzer and the Securities and Exchange Commission regarding fraudulent practices that dilute the value of fund holdings for average investors. Late trading, market timing, and fee overcharges are illegal practices that clearly have not been an isolated phenomenon within the mutual fund industry during recent years. The market response, however, appears rather muted; this is likely due to the relatively diminutive effect of the scandals on the average investor. Despite the minimal impact on most investors, however, the cumulative effect of the scandals has been trumpeted as one of the largest in history. Developing an appropriate regulatory environment that discourages fraudulent practices without stifling the investment process is critical to ensuring the long-term success of our financial system.

Political Science

THE JUST WAR THEORY AND THE GULF WARS: AN EV ALUA TION THROUGH CONTEMPORARY CASE STUDY

Joshua D. Winger
Dr. Geoffrey M. Vaughan, Assistant Professor, Department of Political Science

Recent times have seen a resurgence in claimed adherence by the world's leaders to the Just War Theory, a moral system of requirements for evaluating whether a nation's war efforts are right and proper. Although the theory has Christian origins dating 1500 years ago, it has evolved into a secular means of evaluating a nation's military action. Today, in order to stir up support from their constituents, create a feeling of validation, and elicit assistance from international allies, political leaders increasingly invoke the idea of the Just War. However, are these hue instances of Just Wars? Do these leaders even understand what a Just War is? Focusing on Jus ad bellum, the portion of the theory dealing with reasons for deciding to engage in war, the Gulf Wars of 1991 and 2003 provide an intriguing comparison of the range of such reasons. Through a striking abundance of similar background facts, in addition to a number of differing ones, the opportunity is present to both evaluate recent U.S. adherence to the Just War as well as determine the course of action any nation must follow to meet these standards in our contemporary world.

POSTER PRESENTATIONS

American Studies

US AND CUBA: BRIDGING THE BLOCKADE

Marco A. Alva and **Justin D. Lee**
Class members who will also contribute to the poster presentation:
Tamzyn Bell, Kristen Bennett, Dalton Cramer, Ed Kapuscinski, Suezette Parkinson, Tara Thomas, Marci Villa, Tim Williams
Beverly Bickel, AMST 356 Instructor and Director, English Language Center

Students in AMST 356 during spring 2004 are working collaboratively with each other and students in Cuba to conduct research about Cuba, Cuban culture, and specifically Cuban music. The purpose of this study is to reintroduce Cuban culture to US students bypassing historical misconceptions we maintain today. After discussing our current knowledge about Cuba and the sources from which it comes, we interviewed people in our surrounding communities. We analyzed how people come to know what they know, their sources of knowledge and then began investigating based on what seemed to be missing and what we were interested in learning. Through email, we have connected with Cuban students to talk about different topics and to ask for their help with our investigations. Since artistic expression is often a sign of the times we have chosen specifically to examine Cuban music as a conU110n human language and means to comprehending the Cuban culture and society as well as relations with U.S. peoples. Our discussions in class and on-line using email and Blackboard, our field notes and our papers are helping us to develop new understandings of what constitutes knowledge and how it is socially constructed and shared.

Chemistry & Biochemistry

GENERATION AND CHARACTERIZATION OF TRANSGENIC MICE WITH CRE RECOMBINASE ACTIVITY IN THE PROSTATE

Fiyinfolu O. Balogun, May Khalili,
Dr. Charles J. Bieberich, Associate Professor, Department of Biological Sciences.

It has been observed in Prostate cancer patients that prostate cells contain excessive amounts of certain proteins like STAT-3, lL-IB, and IL-6. The effect these proteins have on tumor development is yet to be determined. My project aims to create a mechanism whereby similar conditions of excessive protein expression can be induced in the prostate of mice. This will make it possible to better understand the effects of these proteins when over expressed.
The project entails the generation of transgenic mice that contain the CRE/LoxP system. The LoxP are a pair of 34 base pair sequences that the bacteriophage protein, CRE recognizes. When expressed, CRE locates the LoxP sequences and excises one of sequences and the DNA between the two sequences. With this system, we can control the expression of genes. A stop of transcription signal with flanked LoxP sites is inserted upstream of the gene of interest. Upon expression within the same cell, one LoxP site-along with the stop signal is excised, thus allowing downstream transcription of the gene of interest. Analysis of our CRE transgenic mice is being facilitated through the use of the ROSA26 reporter strain.

Upon CRE excision of an upstream stop of transcription signal, Lac-Z is expressed and therefore organs of interest stain blue.

Psychology

THE INFLUENCE OF DEPRESSION ON RELATIONSHIP SATISFACTION

Talya D. Belchatovski, Stanley Feldstein, and Bogdan Damian
Dr. Stanley Feldstein, Professor, Department of Psychology

The purpose of this study was to examine the impact of depression on relationship satisfaction. Thirteen couples (13 males and 13 females) participated in the current study as part of a larger study to investigate aspects of relationships that determine their outcome. Their ages ranged from 18-22 years and at least one partner was currently enrolled in University of Maryland Baltimore County (UMBC). Each couple was involved in a serious romantic relationship for a minimum of three months and both partners volunteered to participate in the study. The partners of each couple completed the CES-D Scale, which measures depression, the Perceived Stress Scale (PSS), and the Relationship Report Card (RRC), which measures relationship satisfaction.
Multiple regression analysis, using the RRC as the dependent variable, yielded a significant F ratio for the CES-D [F(I,24) = 22.52, p = .00, r = -.70] and nonsignificant F ratios for the PSS and the interaction of the two. Neither stress nor its interaction with depression affected relationship satisfaction. However, the negative relation of the CES-D to the RRC indicates that, for our small sample, as depression increased, relationship satisfaction decreased.

Biological Sciences

CROWDING IN EARLY LIFE CAUSES DEFORMITIES IN INSECTS

Alex Bohorquez, Christopher Wells
Dr. Frank Hanson, Professor, Biological Sciences

Our research animal is the tobacco hornworm, larval *Manduca sexta*, a phytophagous insect that feeds primarily on Solanaceous plants (tomato, potato, tobacco, peppers, etc.). Over the past few years we have observed that thirty to forty percent of the caterpillars in our laboratory culture have developmental abnormalities. These include the loss of several appendages and the feeding apparatus responsible for the animal's ability to taste and smell food items, which is critical to the organism's survival. Loss of these organs may impact research focusing on their feeding behavior, as it is dependent on functional taste organs.
In nature, insects like these are typically found one animal per plant, however in the research laboratory, animals are reared in high densities. The increased population density and interaction may play a role in causing the abnormalities in the culture. Indeed, early studies have shown that insects reared individually in containers develop without problems. The original hypothesis was stated that the frequency of abnormalities is proportional to population density, which present data supports. Our current hypothesis has been expanded to include that the abnormalities also increase as duration of

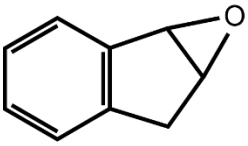
exposure to crowd population's increases. Experiments to test these hypotheses will be the subject of our presentation.
The above raises the questions of whether these animals have population density control mechanisms, such as secreted chemicals to repel others from their' feeding territory'. Another possibility is that interactions exist that prevent the animals from feeding continuously, and cause malnourislm1ent which could result in abnormalities. Future studies of this problem will include attempts to elucidate these problems.

Chemistry & Biochemistry

BORIC ACID-CATALYZED EPOXIDE HYROLYSIS

Akua Bonsra and Dale Whalen
Dr. Dale Whalen, Professor, Chemistry & Biochemistry

Polycyclic aromatic hydrocarbons (PAHs) are widespread environmental pollutants that are metabolized to reactive diol epoxides, which react with DNA to form covalent adducts. Among the most tumorigenic and carcinogenic of the PAHs is benzo[a]pyrene. We studied the reaction of several model epoxides with boric acid, B(OH)3, to determine if the proposed mechanism for boric acid-catalyzed hydrolysis might be observed with epoxides 8-11. All of these epoxides undergo acid-catalyzed hydrolysis to give mainly trans diols. If boric acid-catalyzed hydrolysis of the epoxides also yield cis diols, then this reaction may represent an important synthetic methodology. Rates of reaction as a function of the concentration of boric acid were determined using spectrophotometry. High performance liquid chromatography was used to determine the products and their ratios from the reaction of the epoxide with boric acid. Through experimentation, we observe that boric acid-catalyzed hydrolysis of indene epoxide (8) results in the same cis/trans ratio as acid hydrolysis. The boric acid hydrolysis of naphthalene tetrahydroepoxide (10) complexes with boric acid to form fairly stable boric ester. The rates for 9 and 11 both increase with increasing [B(OH)3].



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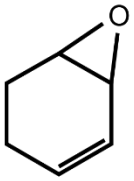

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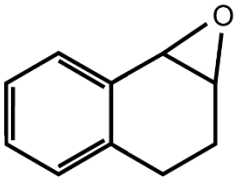

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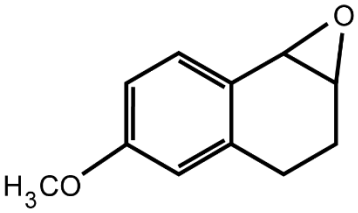

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Biological Sciences

IDENTIFICA TION OF TRAUMA IN HUMANS

Robert D. Daber
Dr. Brian P. Bradley, Professor, Department of Biological Sciences

The main purpose of this project is to classify trauma in humans using protein expression signatures. These signatures, when compared to protein signatures of the individuals when they are not in trauma as well as to other control signatures, will allow for identification of key proteins specific to severe, mild or minor trauma. These key proteins will be used to make more accurate decisions on the level of care needed (triage).

Psychology

AFFECT RECOGNITION AND DYADIC ADJUSTMENT IN ROMANTICALLY INVOLVED COUPLES: A PRELIMINARY NOTE

Bogdan D. Damian, Stanley Feldstein, Talya Belchatovski
Dr. Stanley Feldstein, Professor, Department of Psychology

The purpose of this ongoing study was to examine the influence of affect recognition on dyadic adjustment. It was expected that affect recognition is positively related to the adequacy of dyadic adjustment in romantic relationships. It seems likely that if a partner cannot "read" the emotional states of the significant other, the relationship is in trouble, but research is limited on this subject. Thirteen couples were recruited through advertisements at UMBC, (ages 18 to 22). Participants completed the Dyadic Adjustment Scale, which measures overall adjustment to each other that couples need to make. Immediately after, the couple was given 20 minutes to discuss the questionnaire. They then listened to an affect tape consisting of 32 repetitions of the same speech segment in 8 different simulated emotions. The participants were instructed to identify the correct emotion expressed by each segment. A multiple regression analysis yielded F ratios of less than I for the three IVs. Apparently, the partners view their adjustment as a couple similarly. Moreover, affect recognition does not appear to influence the dyadic adjustment of the couples. The mean affect recognition was 16.04 (SD = 3.00) suggesting that the partners were not accurate in their judgments of emotional expression.

Biological Sciences

FEEDING BEHAVIOR IN A MODEL LEPIDOPTERAN

Ian C. Hall and **Leah S. Her**
Dr. Frank Hanson, Professor, Department of Biological Sciences

Plants have developed a variety of bitter chemicals to prevent herbivory. While this is a common defensive strategy that has developed many times in evolutionary history, the effectiveness of each chemical varies. The tobacco plant, for example, contains nicotine that prevents most insects from feeding on its leaves. The tobacco hornworm, however, is undeterred by nicotine and feeds ravenously on tobacco foliage. While the tobacco hornworm is able to ignore the nicotine in tobacco, other plants produce compounds that are strong feeding deterrents for this insect.
The tobacco hornworm is a model system for studying caterpillar feeding behavior. Our research attempts to both quantify the behavioral deterrence of many plant chemicals and, using the same chemicals as stimuli, record electrophysiologically from the insect's taste receptor organs. By correlating the feeding behavior of the tobacco hornworm with its chemosensory responses, we hope to better understand the neural mechanisms responsible for insect feeding.

Physics

THE USE OF CHARGE BLOCKING LAYERS IN CONTACT POLING TO PRODUCE HIGH ELECTRO-OPTIC COEFFICIENTS IN POLYMER FILMS

Anthony J. Hoffman
L. Michael Hayden, Professor, Physics

In our laboratory, polymers with large electro-optic coefficients are needed for the generation and detection of terahertz radiation. To create such materials, we apply an electric field across the polymer which results in a measurable electro-optic coefficient that is proportional to the applied field. Undesirably however, at large poling fields the probability of a catastrophic breakdown increases and places a practical limit on the maximum field we can apply. In my research I examine the use of charge barrier layers during poling. I prepare polymer samples between two glass slides coated with indium tin oxide electrodes that have thin charge blocking layers (.5/lm - 2/lm) of SiOz deposited on top. I apply an electric field to the sample and then calculate the electro-optic coefficient of the poled film using the results of an ellipsometric measurement and a theoretical description of the contact poling arrangement that I developed. I have successfully poled polymers with electric fields as high as 85 V //lm and the corresponding r33 values are within 4% of the known quantity. This agreement with known results serves as a verification of my theoretical model. Using my model, I am able to predict that electric fields above 200 V //lm are realizable.

Music

COMPOSING SOUND SURGERY I AND II: A CREATIVE PROCESS

Colin K. Holter
Dr. Linda Dusman, Professor and Chair, Department of Music

When I applied for an Undergraduate Research Award in the spring of 2003, I mentioned in the proposal my desire to attain a microtonal harmonic vocabulary. I studied microtonal pieces at the UC Davis Summer Arts program and composed a relatively small piece of my own, Sound Surgery I, using microtonal material. However, when I heard the pieces written by my fellow composers and, later, resumed my composition studies here at UMBC, it became increasingly evident to me that my grasp on conventional twelve-tone, non-microtonal harmony was unsatisfactory. (Composers began to freely use all twelve tones in the chromatic scale at the beginning of the twentieth century; this collection of tones has been the harmonic lingua franca until the present day.) I began work on a larger piece through which I could further explore the thematic ideas of Sound Surgery I and at the same time refine my command of chromatic harmony. Thus, Sound Surgery II, for five musicians, forgoes micro tonality in favor of a (hopefully, a well-constructed) twelve-tone harmonic language. In composing it, my intent has been to better prepare myself for adopting less-conventional systems of harmony by developing a firmer understanding of more conventional ones.

Biochemical Engineering

PHOSPHATE ION SENSING FOR BIOLOGICAL REACTION STUDIES IN ATPase ACTIVITY

Thomas C. Hsu
Dr. Leah Tolosa, Assistant Professor, Chemical and Biochemical Engineering

Adenosine Tri-Phosphate (ATP) undergoes a simple reaction by breaking down to Adenosine Diphosphate (ADP) and inorganic phosphate (PJ One third of the proteins present in a typical mammalian cell is covalently bound to phosphate and is considered as key regulators of cellular life. We are proposing to develop a generic sensor for phosphate detection in ATPase activity in any model A TP-binding cassette (ABC) transporters. Several potential substrates from ABC transporter system present useful screening of drug candidates for infectious diseases, cancer and genetic disorder. The isolation of Phosphate Binding Protein (PBP) is purified and transformed into Escherichia coli as a wild type for the project. Genetic engineering and Cell and Molecular Biology techniques are used to conduct site-directed mutagensis such that a fluorescent dye could be attached. To verify a reliable PBP, SDS-P AGE technique is conducted. By obtaining the raw mutated PBP with an attached dye, joint expertise in chemistry, molecular biology, spectroscopy, chemical and electrical engineering would strengthen further studies in ATPase activity by developing low cost instrumentation.

Biological Sciences

PARENTAL CARE IN TWO NORTHERN MIGRATORY BIRD SPECIES, THE BALTIMORE (ICTERUS GALBULA) AND ORCHARD ORIOLE (I. SPUR/US)

Elizabeth M Humphries, Roxann S. Brooks
Dr. Kevin E. Omland, Assistant Professor, Department of Biological Sciences

Sexual dimorphism occurs when the male and female of a species look different. It is commonly believed that sexual dimorphism (that is, dull females and bright males) is linked with the division of parental care dull females are harder to see and thus spend more time caring for nestlings. Two sexually dimorphic species of orioles come to the Baltimore area every spring, the Baltimore (*I. galbula*) and Orchard Oriole (*I. spurius*) . In order to further understand mating and parental behavior, nests were observed 1 – 3 mornings for one hour. The data were compiled to see if there was any significant difference between the time spent at the nest and frequency of visits that each parent made. These data were then compared between the two species. In both species, males and females each made 50% of the trips to the nest during the study hour; however, females spent more time at the nest than males. These data suggest that an equal division of parental care is common in northern migratory orioles. This upcoming summer similar work will be done on a southern non-migratory oriole species in Mexico to examine whether sexual dimorphism and migratory behavior are linked via parental behavior.

Social Work/Health Administration & Policy

LAUSANNE & BALTIMORE: A COMPARATIVE STUDY OF DRUG TREATMENT SERVICES

Emily M. Junod
Claudia Lawrence-Webb, DSW, Assistant Professor, Department of Social Work

Many cities in America and Switzerland wrestle with issues stemming from substance abuse. Treatment, funding and perceptions of substance abuse continue to be challenging for policy developers (Collin, 2002) (SAMHSA, 1999). A limited exploratory comparison of substance abuse treatment models, funding and perceptions of drug abuse in Lausanne, Switzerland and Baltimore, Maryland is conducted using expert interviews, and opinion surveys employing a convenience sample of citizens. Memoing and content analysis were employed as methods in analyzing the interviews conducted. Three main factors are explored as possibly contributing to failure or success with substance abuse: treatment options; federal support and cultural attitudes toward drug abuse and rehabilitation. Results indicate that Baltimore regarded drug use as a criminal issue. Lausanne perceived it as a health concern. Each locale implemented policies reflective of their philosophy while incorporating the three main factors. The holistic Swiss rehabilitative model of intervention utilized in Lausanne appears to be more successful than the fragmented intervention models implemented in Baltimore.

Computer Science

PREDICTING THE DIFFICULTY OF CONSTRAINT SATISFACTION PROBLEMS

Neeraj R Kashyap
Dr. Marie desJardins, Assistant Professor, Computer Science

A constraint satisfaction problem (CSP) consists of a set of variables along with relations between them. We consider CSPs with finite domains and finitely many variables. A simple example of a CSP is the map-coloring problem in which the variables represent the regions to be colored and a typical constraint is that neighboring regions shouldn't have the same color. Another nice (and relevant) example of such a problem is task scheduling -- for example, making a schedule of classes offered at UMBC in a given semester. In general, these problems have associated with them a constraint network, which is a graph with a finite number of points and a set of edges between them, which represent the constraints. The motivation behind our research is that we can use the rich theory of graphs to predict how difficult it will be to find a solution to a given constraint network. We provide a theoretical analysis of graph-theoretic properties that affect the difficulty of a constraint satisfaction problem as well as data supporting our claims.

Mathematics & Statistics

MATHEMATICAL IMAGE ANALYSIS: SPHERE DETECTION

Tomasz J. Macura
Dr. Matthias K. Gobbert, Associate Professor, Department of Mathematics and Statistics

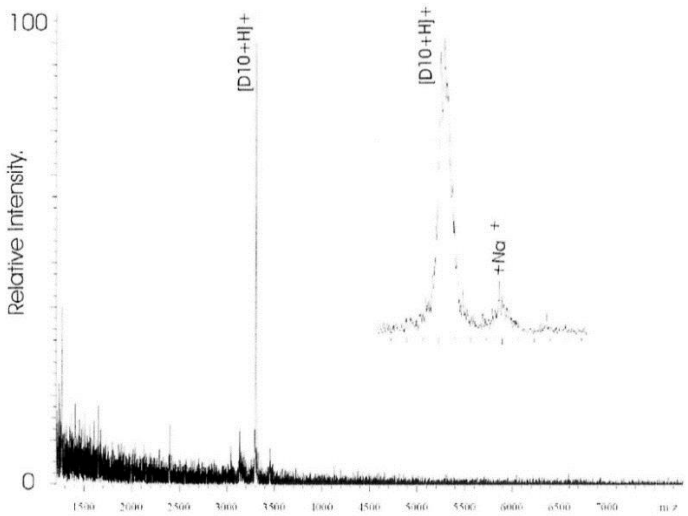
Digital images are typically represented as a lattice of quantized values called pixels. This representation facilitates computer operations and has become the de-facto standard for acquiring, storing, and displaying images. However, the application of mathematical operators, e.g. nonzero order derivatives, to images represented in this way is ill-posed in the notion of J. Hadamard. Due to J.J. Koenderink's method of multiscale image analysis, there exists an alternative image representation for which such mathematical operations are well posed. Automation in industry has long motivated circle detection algorithms. This is an ongoing topic of research and papers have been published in journals since 1963. The natural generalization of circle detection, sphere detection, has only been very lightly investigated. Most algorithms proposed for circle detection exploit very specific properties of circles. Therefore such algorithms are inapplicable to other shapes. This is a significant handicap as all "circles" encountered are, in fact, ellipses. Our approach for detecting circles, by finding points at which both principal curvatures have the same sign and magnitude, easily extends to sphere detection. Principal curvatures are the eigenvectors of the Hessian matrix. We use J.J. Koenderink 's method to compute the Hessian matrix.

Chemistry & Biochemistry

SEPARATION AND IDENTIFICATION OF HIV-I RNA PRODUCTS USING HIGHPERFORMANCE LIQUID CHROMATOGRAPHY (HPLC) AND MATRIX-ASSISTED LASER DESORPTION IONIZATION TIME-OF-FLIGHT MASS SPECTROMETRY (MALDI-TOF MS)

Samuel Merenbloom

Daniele Fabris, Assistant Professor, Department of Chemistry and Biochemistry Genetic information in HIV -1 and other retroviruses is carried by two identical copies of RNA, which dimerize during the assembly of the viral particle within the host cell. The crucial processes of genome recognition, dimerization and packaging, are mediated by a highly conserved region of RNA, called q'-RNA, which constitutes a potential target for the development of therapeutic agents aimed at disrupting viral assembly. Because the structure of q'-RNA camlot be elucidated using conventional means, we are developing a novel strategy, which includes mass spectrometric detection, to reveal the three-dimensional arrangement of the q'-RNA. Key for the success of this strategy is the development of separation techniques to fractionate the complex mixtures of probed RNA, as well as remove interferants (namely alkaline cations), making samples more readily amenable to mass spectrometric analysis.
We have shown that high performance liquid chromatography (HPLC) can be successfully used to achieve the purification of nucleic acids samples. Using gradients of acetonitrile and trimethylamine ammonium acetate (TEAA), separation of oligonucleotide mixtures has been accomplished on a reversed-phase column. Subsequent characterization of purified oligonucleotides was accomplished by a novel MALDI-TOF mass spectrometry procedure, utilizing the quaternary ammonium copolymer poly (diallyldimethylammonium chloride) (PADMAC) in conjunction with the organic matrices 3-hydroxy picolinic acid (3HPA) and 6-aza-2-thiothymine (ATT).



MALDI-TOF mass spectrum of D 1 0 oligonucleotide (5' -ATC GGC TAC AC-3 '; 3300.603 Da) obtained using PADMAC and ATT (25 mg/mL) as matrix. The inset shows a close-up of the molecular ion with only a weak signal for the interfering sodium adduct.

American Studies

THIS IS WHERE I LIVE: DOCUMENTARY WORK AND ITS IMPACT ON YOUTH DEVELOPMENT

Mariam Rahman
Dr. Dabrina Taylor, Visiting Lecturer, Department of American Studies

This research project investigates the role of photography, video, and radio self-documentary programs in the social development of young people. A Department of Education study presents evidence that afterschool art programs have a positive impact on students ' self-esteem, social awareness, and community involvement, showing that active learning, especially through an art form, can enhance students' understanding of their world and the role they play within it. The project's cultural analysis places youth documentary programs within the context of arts education and social activism perspectives, and interprets the ways combining these two perspectives can foster youth identity. Additionally, this project uses the ethnographic method of participant observation to analyze the learning culture of a local after-school documentary photography program, revealing the importance of teaching youth the tools for representation as well as the processes through which self-documentation can help young people develop a stronger sense of self and community.

American Studies

MODELING SUCCESS: A CASE STUDY OF THE UMBC MEYERHOFF PROGRAM

Leah M. Sanford
Dr. Kendra R. Wallace, Assistant Professor, Department of American Studies

This project will explore the academic, professional and social dimensions of UMBC's Meyerhoff Program. It will look at the explicit and implicit goals of the program. It will describe how a sense of community and common identity is fostered within the program, if at all, and try to determine the nature of this identity if it is to be found. The project will place the program within the broader context of those higher education programs which promote the advancement of groups who have been historically underrepresented in certain fields. It will also explore how it fits within UMBC's community by noting both internal and external perceptions of the program.
Such information could be important in understanding how individuals benefit from being in groups or in particular programs, and the implications of such programs in general. It also may provide a deeper, multifaceted understanding of the Meyerhoff Program, its goals, and implications for UMBC.

Psychology

EXTRACURRICULAR ACTIVITES AND SUBSTANCE USE AMONG ADOLESCENTS

Megan E. Smell
Dr. Lisa C. Jordan-Green, Assistant Professor, Department of Psychology

The relationship between extracurricular activities and substance use among adolescents was examined using the Adolescent Health Survey, a nationally representative sample of 6,496 youth. It was hypothesized that involvement in school, academic, and performance art activities would be protective and result in decreased alcohol and drug consumption. In contrast, involvement in sports was predicted to be a risk factor, increasing alcohol consumption. In regard to drug use, however, sports involvement was expected to be protective, leading to decreased use. Future aspirations and social support were investigated as possible mediators or moderators for the relationship between substance use and involvement.
Finding: Involvement in academics, performance arts, and school activities was not related to substance use. However, sports involvement was associated with higher alcohol consumption. The relationship between sports involvement and drug use was not significant. Future aspirations did not affect the relationship between involvement and substance abuse. On the other hand, social support was related to sports involvement and alcohol use but only in boys. More specifically, for boys who reported high levels of sports involvement, family support was negatively correlated with alcohol use while support from others (i.e. friends, adults, and teachers) was found to be positively correlated with alcohol consumption.

Political Science

CHINA AND TAIWAN: ECONOMIC INTERDEPENDENCE DESPITE POLITICAL TENSION

Jaclyn D. Streitfeld
Dr. Devin T. Hagerty, Assistant Professor, Political Science

In 1949 a civil war occurred in China, and the Nationalist government fled to Taiwan. The Nationalists then claimed sovereignty over China under the title of the "Republic of China" (ROC) while the Chinese Communist Party (CCP), led by Mao Zedong, governed on the mainland, calling themselves the "People's Republic of China" (PRC). Since that time, both the ROC and the PRC have claimed to be the legitimate government for all of China. In more recent years, Taiwan has become a democratic country and has taken tentative steps towards declaring independence from China. Despite the political tensions between them, China and Taiwan are economically interdependent. By researching the dynamics of their economic relationship, as well as the role the United States plays in their region, these economic considerations can be weighed against the heightening mutual security concerns between Taiwan and China. When comparing these factors against each other the rationale to continue trading becomes clearer, as it is visible that to the two governments, and to the businesses and people of Taiwan and China, the risks of terminating their economic relationship outweigh the security issues.

Economics

MINIMUM WAGES IN COSTA RICA

Justine D. Wagner
Dr. T.H. Gindling, Associate Professor, Department of Economics

Models of economic dualism in developing countries are used to simplify labor markets. In assuming these dualistic models, legal minimum wages are hypothesized to be enforced only in larger firms in the formal sector, and not enforced in the informal sector. To examine this hypothesis, the legal minimum wage legislation in Costa Rica from 1987-2000 was compared to the actual wages received by workers as indicated in the Household Survey of Employment and Unemployment. If legal minimum wages are a cause of dualism we would expect to find that higher legal minimum wages do not affect the wages of workers in the rural or small firm sector even though they are legally applicable to these workers. However, if legal minimum wages are enforced in Costa Rica, we would expect to find that higher legal minimum wages result in higher actual wages for all types of workers in any sector. Results indicate that legal minimum wages do affect the wages of some workers in all labor market sectors. This evidence is especially useful in supporting Costa Rica's recent willingness to participate in the Central American Free Trade Act. However, for the significant percentage of workers whose wage is not affected by the minimum wage, we examined their characteristics.

Biological Sciences

CROWDING IN EARLY LIFE CAUSES DEFORMITIES IN INSECTS

Christopher Wells, Alex Bohorquez
Dr.Frank Hanson, Professor, Biological Sciences

Our research animal is the tobacco hornworm, larval *Manduca sexta*, a phytophagous insect that feeds primarily on Solanaceous plants (tomato, potato, tobacco, peppers, etc.). Over the past few years we have observed that thirty to forty percent of the caterpillars in our laboratory culture have developmental abnormalities. These include the loss of several appendages and the feeding apparatus responsible for the animal's ability to taste and smell food items, which is critical to the organism's survival. Loss of these organs may impact research focusing on their feeding behavior, as it is dependent on functional taste organs. In nature, insects like these are typically found one animal per plant, however in the research laboratory, animals are reared in high densities. The increased population density and interaction may play a role in causing the abnormalities in the culture. Indeed, early studies have shown that insects reared individually in containers develop without problems. The original hypothesis was stated that the frequency of abnormalities is proportional to population density, which present data supports. Our current hypothesis has been expanded to include that the abnormalities also increase as duration of exposure to crowd population’s increases. Experiments to test these hypotheses will be the subject of our presentation.
The above raises the questions of whether these animals have population density control mechanisms, such as secreted chemicals to repel others from their 'feeding territory ' . Another possibility is that interactions exist that prevent the animals from feeding continuously, and cause malnourishment which

could result in abnormalities. Future studies of this problem will include attempts to elucidate these problems.

FINE ARTS EXHIBITS

Dance

DANCING AT THE SOURCE: THE PAUL TAYLOR SUMMER DANCE INTENSIVE

Mandi Brown
Doug Hamby, Associate Professor, Department of Dance

On November 14th and 15th of 2003 I presented LaGuardia in UMBC's annual Senior Dance Concert. LaGuardia, an II-minute dance, was the creative expression resulting from my participation in the 2003 Paul Taylor Sunm1er Workshop, held in New York City. During the workshop I was able to learn first-hand about the intricate workings of Paul Taylor's Choreography. How Taylor moves dancers through time and space in relationship to the music was of particular interest to me. I learned, rehearsed and performed segments of Taylor's Aureole, The Word, Airs, and Runes under the direction of Susan McGuire, Francie Huber and Lila York. Susan McGuire is the director of Taylor 2 and the Taylor School. My daily technique classes were taken with the Taylor 2 company members. I also had the opportunity to meet Paul Taylor and observed a company rehearsal. LaGuardia was created through the incorporation of the choreographic and technical skills learned at the Paul Taylor Summer Workshop.

I received professional critique by presenting LaGuardia at the 2004 Maryland Choreographers' Showcase. Adjudicator and choreographer Kevin Wynn stated the work was well rehearsed, nicely constructed and performed by very dynamic and energetically charged dancers.

Music

DYNAMIC FUNCTIONAL HARMONY

Samuel R. Hedemann
Dr. Anna Rubin, Director, Linehan Artist Scholars Program & InterArts Studies Program

Dynamic Functional Harmony is a general method of taking the scales that are familiar to modem western music and re-mapping them into a mathematically pure domain. The reason for doing this is simple; to make music that is alien, and yet entirely beautiful to the ear. Basing the scales on mathematical curves allows the symmetry of the functions to give order to the sound while the relationship caused by the mapping gives the music a haunting and expressive quality. The word dynamic is used because the system allows for an infinite number of mathematical functions to be applied. The traditional term, Functional Harmony, is retained because, in spite of the drastic changes caused by the re-mapping, the element of syntax, normally provided by chord progressions, is retained through ideological analogy in the context of the new mathematical relationship. For instance, in the

Parabolic Scale Family, there is no V - I cadence as is found in Western Functional Harmony, yet because of its mathematical similarity to a physical projectile, a psychological sense of movement is established that mimics the traditional idea of cadence on another level. Another psycho-acoustic effect of the Parabolic Scale Family is that a listener often feels as if the tempo is accelerating when in fact it is not. This new system has already produced some amazing results, and it is certain that Dynamic Functional Harmony has tremendous potential to change the way we create and experience music.

Visual Arts - Film/Video

GRAFFITI PARISIEN: THE EFFECTS OF HIP-HOP CULTURE ON THE PARISIAN LANDSCAPE

Justin Plakas
Vin Grabill, Associate Professor, Department of Visual Arts

Hip-Hop culture started in the United States over 20 years ago. Once believed to be a fad, the four main aspects of Hip-Hop culture (break dancing, dee jaying, rapping and graffiti) have flourished, not just in the U.S. , but throughout the world. In January 2004, I traveled to Paris to document, with photography and video, the effects of Hip-Hop culture on the Parisian landscape. My primary focus was on graffiti or street art. Once in Paris I found far more graffiti than is seen in even the majority of large American cities. Shopkeepers and cafe owners all over the city hire graffiti artists to decorate the steel gates they use after they close at night, panel trucks that can produce to the open air markets advertise with Hip-Hop graffiti murals. Not all of the graffiti I documented was done legally; some of it has been made by artists who have obviously broken the law in making their art (climbing buildings, subway tunnels, and train cars). As a whole, a large portion of these artists have been compensated for their art, a further example of the fact that Hip-Hop has become a visibly accepted part of French culture.

MUSICAL PERFORMANCES

UMBC Department of Music Collegium musicum: Italian Madrigal Ensemble

Madonna, io ben vorrei	Carlo Gesualdo (c. 1560-1613)
"Io parto" e non pill dissi	C. Gesualdo

Megan Cunningham, soprano
Christie Finn, soprano
James Dorsey IV, tenor
Colin Holter, baritone
Mike Dunbar, bass

Advisor: Joseph C. Morin, Assistant Professor, Department of Music

Along with Claudio Monteverdi and Luca Marenzio, Carlo Gesualdo (The Prince of Vendosa) ranks as a member of the third generation of Italian madrigal composers, whose work moves this genre into the domain of experimental music, making it the most advanced Renaissance musical realm with respect to

chromatic harmony and textual expression. Originating as a genre of courtly secular song in the early sixteenth century, the madrigal becomes the chief musical-poetic form for setting secular verse, rising to become the most popular form of vocal polyphony during the late 1500s. Appearing in print in six volumes published between 1594 and 1611, nearly all of Gesualdo's madrigals are composed for five solo voices, as customary for their time. These works reflect the intense interest in classical antiquity that is central to the Italian Renaissance in general: efforts to recover and assimilate the values and sensibilities thought to be inherent in ancient Greek musical composition and performance led progressive Renaissance composers to experimentation with chromaticism and the careful coordination between music and the sentiment of the poetic text. Both of the madrigals performed today, "Madonna, io ben vorrei" and "'I0 parto' e non pili dissi", vividly display Gesualdo 's 'hallmark' traits: highly contrasting elements in short space of time, fragmented texture, striking harmonic and melodic writing through increased use of chromaticism, and striking chromatic progressions, all resulting in extreme expressivity.

Translations

Madonna, io ben vorrei

Madonna, for as much as there is beauty in you
Would that there were as much pity
Or even as much cruelty.
So that the one would give me my heart's desire
Or else that the other would end my life.

"Io parto" e non piu dissi

"I depart." I said no more, for grief
robbed my heart of life.
Then Clori broke out in tears and said,
with interrupted cries of" Alas":
"Hence I remain in pain, Ah, may I never
cease to pine away in painful ways."
Dead I was, now I am alive, for my spent spirits
returned to life at the sound of such pitiable accents.

Translation by James Grossmith.

Artistic Statement:
The vocal literature of the Renaissance poses a number of difficulties to modem performers. Because the conventions of tonality that governed harmonic practice until the beginning of the twentieth century had not yet become entirely prevalent, the harmonic surface of Renaissance music (and, in particular, the music of Carlo Gesualdo) is often difficult to negotiate. Furthermore, the issue of rhythmic corrections between speech and music had begun to occupy composers' minds during this era, and ascertaining historical rhythmic performance practice - let alone exercising such performance practice - is a challenge. Above all, however, the problems of intonation and blending that inevitably appear when five unaccompanied voices are singing are the most vexing hurdles of the madrigal repertoire. Maintaining precise intonation is a feat requiring both physical and mental exertion.

Likewise, equal parts concentration, vocal control, and good taste are needed to blend an ensemble comprising five soloists. The rewards of pursuing this music are, nevertheless, well worth the effort; the study and realization of Renaissance madrigals can yield great insights into complex counterpoint, expressive composition, and the art of ensemble singing.

UMBC Department of Music *Collegium musicum*: Baroque Ensemble

Les Delices champestres — Michel Pignolet de Monteclair (1667 -1737)
Cantata for two sopranos and continuo

Christie Finn, soprano
Melanie Lardiero, soprano
Yoonsook Nam, harpsichord
Patricia Blanchard, cello

Advisor: Joseph C. Morin, Assistant Professor, Department of Music

Monteclair's cantata Les Delices champestres or 'The Pastoral Delights' (1728) is one of the many examples of his work with vocal music during the early eighteenth century. The cantata, which was first developed in Italy, is a genre of chamber music for voice(s) supported by a small instrumental ensemble; its text usually features a narrative on such topics as religion, love, and/or the pastoral life. There are two main ways in which the text is set musically for the singer: recitative and aria. The recitative is usually sung in a way that approximates spoken language. This provides an opportunity for the singer to bring out the text (which conveys the story line) through rendering it with special attention to rhetorical aspects and nuances of the language itself. The aria, which goes hand in hand with recitative, focuses on the emotional reaction to the events described in the story.
As found in many other contemporary cantatas, Monteclair explores the pastoral setting through the use of two vocalists, here labeled as Premier Bergere (F irst Shepherdess) and Deuxieme Bergere (Second Shepherdess). In styling this piece, Monteclair sets text in the recitative sections for successive appearances of each shepherdess. In the aria sections, however, while each shepherdess has well defined solo sections, Monteclair has crafted out lengthy passages where both shepherdesses sing together, displaying his skill for composing in the duet style of singing. As an introduction to the Aria sections, the bass continuo (comprising harpsichord and cello) is charged with providing an instrumental introduction; here the harpsichord must "create" a right-hand melody based on the figured bass provided by the composer. Therefore, this allows the keyboardist to incorporate creativity within the context of the piece (as the vocalists do with their rendering of ornaments).

Text

Recitative:
Premier Bergere: In these happy climes where divine Peace has established her empire, we propose only to laugh beneath this thick foliage.

Deuxieme Bergere: Here, the son of Venus wounds us with his arms: sheltered from foolish alarms, we rejoice in this charming fort. Nothing disturbs our games and love; fickleness changes to constancy in these agreeable retreats.

Air:

Premier Bergere and Deuxieme Bergere: To the sound of oboes and pipes we sing, we dance, we tell tales of love. The shepherdess, Chloris, smitten by Tircis, amuses herself on the grass. The birds of our woods, by their voices, revive the shepherdess, Lisette. Even Pan, playing on the chalumeau beneath the elms begins to enhance the celebration.

Recitative:
Deuxieme Bergere: The rocks, heeding our tender expressions, repeat a thousand times the names of our mistresses. The running brooks that course through our fields, Love, are witness to the arrows by which you wound us.

Premier Bergere:
You, Bacchus! Enemy of vain cares, protector of the cask, you know how to anticipate your needs by a fertile autumn.

Air:
Premier Bergere and Deuxieme Bergere: Your juice enchants us, your liquor satisfies our ardent desires. If Love presses us in our fondness, we enjoy the pleasures of one or the other intoxication. Happy drinkers/lovers, this is how our years slip by. Translation by James R. Anthony and Diran Akmajian.

Notes on the Process of Performance:
In approaching and performing any piece of music, there are many aspects that the musicians, both vocal and instrumental, must consider in order to perform the piece beautifully and correctly. Obviously, the style of the piece and the era in which the piece was composed affect the interpretation of the music, But much more detailed study is required to achieve a successful performance. To take one aspect in point: in this specific piece, the vocalists must research the style of ornamentation conm10n to French vocal practice of the period. As a typical 'hallmark' of French Baroque composition, many composers, Monteclair included, simply used the + symbol over the top of notes to indicate that it is a note that should be ornamented. The + symbol does not indicate one single interpretation, but suggests the possible application of a number of interpretations, anyone of which might be preferable to others based on specific stylistic criteria. This is one of the areas of research and scholarship into which singers of Baroque music must delve in order to be fully conversant with its musical style. Fortunately for us, Monteclair addresses this 'conundrum' of ornamental interpretation in his treatise *Principes se musique*, Divisez en quarte parties,' while its instruction greatly aids the performer in making decisions regarding which ornament might be sung on a specific note, matters of musical taste, style and the singer's partiality for certain ornamental gestures also greatly influence which and how ornaments might be selected and applied. Needless to say, the singer is allowed a certain amount of freedom in interpreting ornaments, but only in accordance with the guidelines set out by conventions of style and practice. This notion of creative research, as seen through French ornamentation practice, is also operative in a number of other aspects of musical performance in this piece. While we cannot discuss in depth such features here, this type of investigation extends to matters of text and language; translating and researching the text is of key importance, for the vocalist must be aware of every word sung and what kind of emphasis should be placed on that word. This notion further extends to the instrumental

accompanists, where creative musical interpretation comes into play in fleshing out the skeletal accompaniment provided to the harpsichord and cello players. The instrumentalists must work with the vocalists to achieve the best intonation possible. The harpsichordist especially has to research her part, as the only part provided for the harpsichordist is a bass line and a figured bass notation. All in all, one learns when attempting to perform Baroque music, just playing the note is simply not enough.

SCHOLARLY ORGANIZATIONS REPRESENTED AMONG TODAY'S PARTICIPANTS[2]:

GOLDEN KEY
Justine Wagner
Megan Smell
Erin O'Connell
Phoung Pham
Lindsey Loeper
Colin Holter
Samuel Hedemann
Nina Nell Haeckel
Chad McCormick
Sam Merenbloom
Liz Humphries
Anthony Hoffman
Ian Hall
Robert Daber
Akua Bonsra
Fiyinfolu Balogun
Tomasz MaClura
Johm Williams

PHI KAPPA PHI
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Chad McCormick
Anthony Hoffman
Fiyinfolu Balogun
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[2] *Based on participants' responses on their event applications*

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