



20 YEARS

# M McNAIR

AT ILLINOIS



*Fulfilling the Dream...*

• 1990 • 2010 •

Ronald E. McNair Scholars  
SUMMER RESEARCH INSTITUTE  
20<sup>th</sup> Annual Research Symposium  
University of Illinois at Urbana-Champaign

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## July 2010 Research Abstracts

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- Research presentation schedule for McNair, SROP and SPI
- McNair Scholar abstracts
- McNair program accomplishments



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**LETTER FROM THE DIRECTOR**

July 19, 2010

We welcome you to the 20th anniversary summer of Illinois' McNair Scholars Program! For twenty years the program has provided the opportunity for academically promising juniors and seniors to spend an amazing summer pursuing an intensive research experience while learning about how and why they should pursue a career as a university faculty member.

Funded by the U.S. Department of Education, the McNair Program encourages and empowers undergraduates who are members of groups underrepresented in the ranks of the American faculty to pursue careers in academia. This goal is supported by all components of the summer experience. In addition to conducting their own research project, students have attended motivational and informational workshops and symposia on this campus, as well as at the University of Wisconsin-Madison, the Ohio State University, and the University of Illinois at Chicago. Eighteen scholars attended and presented their research in Atlanta at the Southeastern Association of Educational Opportunity Program Personnel's national McNair conference in late June.

During the past 20 years, our McNair Program would not be nearly as successful, nor even possible, without the support of many individuals and departments across this campus. In particular, we would like to thank the faculty mentors, the administrative staff of the library, the Office of Sponsored Programs and Research Administration, the Graduate College, Educational Testing Services, the Kaplan Center, the U.S. Department of Education, and the Council for Opportunity in Education. We especially wish to thank the following professors and professionals (as well as the many graduate students in various labs and offices) who provided direct assistance to the McNair Scholars and/or rendered special technical assistance, which enabled us to achieve the goals set forth by the Program:

Ave Alvarado  
Bright Agindotan  
Flavia Andrade  
Jovita R. Baber  
Kenneth Ballom  
Howard Berenbaum  
William Berry  
Carl Bradley  
Timothy Bretl  
K. Brown-Riley  
John Caughlin  
Amira Davis  
John Erdman  
Dorothy Espelage  
Susan Farner

Andrew Fortier  
John Gerlt  
Michael Gray  
Diana Grigsby  
Jennifer Hamer  
Charles Hillman  
Tamara Hoff  
Matthew Hudson  
Robin Jarrett  
Michael Jeffries  
Rose Julius  
Rhonda Kirts  
Gary J. Kling  
Phoebe Lenear

Shondra Loggins  
Steve Long  
Emily Love  
Susan McKenna  
Stephen Moose  
Michael Murphy  
Phillip Newmark  
Stephen Notaro  
Ed Ofori  
Tim Pauketat  
Wayne Pitard  
William Qualls  
Teresa Ramos  
Brent Roberts

Glenn Roisman  
Gilberto Rosas  
Dana Rush  
Jose Solbiati  
Jacob Sosnoff  
Chris Span  
K. Swaminathan  
Kelly Swanson  
M. Teran-Garcia  
William Trent  
Celina Trujillo  
Angela Wiley  
Andrea Winter  
Assata Zerai

We are very proud of our 2010 scholars and invite you to read through their abstracts and our Summer 2010 accomplishments.

Sincerely,

Priscilla Fortier  
Associate Director, Minority Student Affairs  
Director, McNair Scholars Program

## 20th Annual Ronald E. McNair Scholars Research Institute Symposium

University of Illinois Urbana-Champaign

July 19, 2010

### S C H E D U L E

9:30-10:30 a.m.

#### **EBI/Crop Science** (Room 403)

Tahir Ibrahim: *Which Poplar Clone Produces the Most Biomass?* (McNair)

Juliette Morris: *Analysis of Miscanthus BAC and Fosmid End Sequences* (McNair)

Chanell Davis: *Making Big Corn Bigger: Genetic Variation at the TAS3 Loci* (McNair)

#### **Kinesiology and Community Health** (Room 404)

Jilber Jerman: *Body Mass Index and Validity of Self-Reported Body Size among Mexican Young Adults* (McNair)

Kierra Barnett: *Efficacy of HIV Prevention Interventions Targeting Black Women* (McNair)

Higgins Durand: *Aging, Isometric Force Control: The Role of Feedback Modality and Effector* (McNair)

#### **Communications** (Room 405)

Brittney Potier: *Unlocking Secrets in Dating Relationships* (McNair)

Erin Watley: *What Are the Effects that Small Group, Intercultural Discussion or Dialogue Programs Have on the Actions and Feelings of Undergraduate Students Regarding Issues of Culture and Diversity?* (SPI)

Jasmine Roberts: *Online News Media Representations of Race and Gender: The Case of Michelle Obama* (SPI)

#### **Counseling Psychology** (Room 406)

Michelle Martinez: *The Paternal Influence on Daughters' Attitudes towards Sexual Harassment* (McNair)

Lilyana Ortega: *Victimization and Psychosocial Adjustment in Underrepresented Adolescents* (SPI)

Tyrone Rivers: *Bullying: A Comparative Study of Inner City and Suburban Youth* (SPI)

#### **Anthropology/Ethnic Studies** (Room 407)

Rigoberto Robles: *Urban Scriptures: Mexican-American Graffiti Resistance in Chicago* (SROP)

Victoria Briones: *Gendered Violence on the U.S.-Mexico-Border: Femicide in Ciudad Juárez* (McNair)

Sydney Stoudmire: *Faces/Voices/Histories: Legacies of Champaign's Historic African-American Community* (McNair)

#### **Educational Policy Studies** (Room 210)

Chanee Anderson: *African-American Achievement in Predominantly White Institutions: The New Labor Movement* (SPI)

Christopher Barnes: *Concrete Roses: An Evaluation of Low Matriculation Rates among Black and Latino Students at the Seven City Colleges of Chicago* (SPI)

Kimberly Watson: *Show Me the Money: Teachers' Responses to Merit Pay in the Chicago Public Schools* (SPI)

**Engineering** (Room 215)

Brantly Sturgeon: *Comparison of Analytical Probe Feed Models for Rectangular Microstrip Patch Antennas* (SROP)

Jose Rivera: *Analysis of Charge Permeation in Ion Channels Using Boundary Force* (SROP)

Rasheed Ibrahim: *Deforming a Buckled Elastic Strip of Rod* (McNair)

10:30-10:40 a.m. B R E A K

10:45-11:45 a.m. **EBI/Crop Science** (Room 403)

Emzi Clemons: *The Identification of Lignocellulose Degradative Enzyme* (McNair)

Ngozi Okanu: *Real-time RT-PCR Detection and Quantification of Viruses of Switchgrass* (McNair)

Angela Holliday: *Identification of Pathogens Specific to Biofuel Grasses* (McNair)

**Kinesiology and Community Health** (Room 404)

Diana Arellano: *India's Baby Paradox:*

*Examining the Disparity of Infant Mortality Rates throughout India* (McNair)

Daniela Mitchem: *Comparative Analysis of Quality Measures of Not-For Profit and For Profit Nursing Homes in Cook County* (McNair)

Natalie Bradford: *Food Environments, Physical Activity Resources, and Obesity in the United States* (McNair)

**Speech/Hearing Science** (Room 405)

Amanda Ward: *A Direct Comparison of Short-Term Audiomotor and Visuomotor Memory* (SROP)

Amy Nelloms: *Psychological Factors Affecting Adjustment to Tinnitus* (SPI)

**Clinical Psychology** (Room 406)

Maria Pinos: *Effects of Amphetamine Exposure during Adolescence on Impulsive Behavior in Adulthood in Male Rats* (McNair)

Chantell Strong: *The Relationship between Emotional Awareness and Psychological Distress* (McNair)

Leslie Mendoza: *Discomfort with Emotion and Psychological Distress* (McNair)

**Anthropology/Ethnic Studies** (Room 407)

Erin Hayes: *Documenting Early Dynastic Cylinder Seals of Ancient Mesopotamia* (McNair)

Irene Jaramillo: *Orendorf, The Native American Archeological Site that Emerged from Ashes* (McNair)

Sara Bordowitz: *Through the Writings of Edith Wharton and Charlotte Perkins Gilman: Understanding Gender and Social Geography* (SROP)

**Educational Policy Studies** (Room 210)

Janine Franklin: *The Impact of Incentivized Programs on Attendance for Special Education Students in High School* (SPI)

Royel Johnson: *An Examination of the No Child Left Behind Act and Its Deprivation of Artistic Expression* (SPI)

Taylor-Imani Linear: *Writing For Liberation: How Black Girls Navigate Life through Reflective-based Writing* (SPI)



**Math/Chemistry** (Room 215)

- Kwadwo Opoku-Nsiah: *Total Chemical Synthesis of Lantibiotics with Overlapping Polycyclic Lanthionines using Orthogonal Protecting Groups* (SROP)  
 Robert Walker: *Investigating q-analogs of Binomial Coefficient Identities* (SROP)

11:45 a.m. - 1:00 p.m. LUNCH BREAK

1:15-2:15 p.m. **Biology** (Room 403)

- Maribel Arteaga: *Function of Post-transcriptional Regulators Vasa and Pumilio in Regeneration and Germline Formation of the Flatworm Schmidtea mediterranea* (McNair)  
 Lauren Rosales: *Alterations in mRNA Expression of Hepatic Carotenoid Cleavage Enzymes in Mice* (McNair)  
 Hazel Ozuna: *What regulates the hildD promoter to allow Salmonella enterica serovar Typhimurium to Invade Intestinal epithelium* (SPI)

1:15-2:15 p.m. **Human and Community Development** (Room 404)

- Kenly Brown: *"I Only Want the Best for You": Gender Differences in Low-Income African-American Mothers' Parenting Techniques* (SROP)  
 Benie Bakala: *Eating Right: African-American Mother's Strategies to Promote Healthy Eating Habits for Their Preschool-age Children* (McNair)  
 Tolulope Olorode: *Spatial Landscape and Physical Activity among Inner-City Preschool Children* (McNair)

**Business** (Room 405)

- Taiwo Adebowale: *Don't Ask Questions, Just Eat! - An Examination of How Quick-Service Restaurants Communicate Nutritional Information to Consumers* (McNair)  
 Alfredo Gonzalez: *Crowdsourcing: The Future of Marketing Innovation in the Corporate World* (McNair)

**History** (Room 406)

- Aquiles Damiron: *Defining Dominicanness: The Ideas of Progreso and Cultura through the Eye of Dominican Intellectuals and Culture* (SROP)  
 Courtney Pierre: *The Impact of Activism: How the Black Panther Party Affected Kathleen and Eldridge Cleaver's Marriage* (SPI)  
 Ricardo Colon: *Literacy, Orality and Polity in Early Medieval East-Central Europe* (SPI)

**Social Science** (Room 407)

- Omar Perez Figueroa: *Impacts of Humans in the Activated-Sludge Treatment Plant* (SROP)  
 Tonisha Daniel: *The Forgotten Women: Health Disparities Concerning Minority Women* (McNair)  
 Antoine Jackson: *"If They Can't Use Your Comb": How African-American Men's Interracial Partnerships Impact the Lives of African-American Women: The Perspective of African-American Women* (SPI)

**Educational Policy Studies** (Room 210)

- Terrance Range: *I Am My Brother's Keeper: A Preliminary Examination of the "Best Practices" Surrounding the All-Male Academy* (SPI)  
 Alicia Robinson: *I Hate School! Academic Self-Motivation in African-American Children* (SPI)  
 Cecilia Suarez: *Degrees vs. Disrespect: Navigating the Balance between Cultural Respect and Educational Goals of Mexican-American Young Women Pursuing Higher Education Degrees* (SPI)



**Animal Science** (Room 215)

- Mayra Lopez: *Association between Coat Color and Behavior in Cats* (McNair)  
 Sierra Burrell: *Metabolic Adaptations of Bovine Adipose Tissue in the Periparturient Period* (SROP)  
 Tanisha Taylor: *Potential Relationship between Maternal Body Condition at Conception and Ratio of Male to Female Calves in Dairy Cattle* (McNair)

2:15-2:30 p.m. B R E A K

2:30-3:30 p.m. **Counseling Psychology** (Room 403)

- Elizabeth Gonzalez: *Childhood Experiences, Personality and Health: Does Personality Mediate the Relationship between Trauma and Health* (McNair)  
 Sharday Love: *The Implications of Attachment Style for Relationship Quality: The Role of Compatibility* (McNair)  
 Stephanie Aghahowa: *White Counseling Psychologists and Their Construction of a White Racial Identity* (McNair)

**Kinesiology and Community Health** (Room 404)

- Linda Salgado: *The Effect of Acculturation on Satisfaction with Life, General Stress, and Acculturative Stress in Latina Immigrant Women Residing in Illinois* (McNair)  
 Melissa Morales: *Impact of Acculturation on Dietary Habits and Stress Levels of Latina Immigrants in Central Illinois* (McNair)  
 Karah Bush: *The Effects of a Nine-Month Physical Activity Afterschool Program on Verbal Fluency in Preadolescent Children* (McNair)

**Curriculum and Instruction** (Room 405)

- Elizabeth Clark: *The Truth About Education: Overcoming the Lack of Diversity in K-12 Curriculum* (McNair)  
 Derrick Rhodes: *Attitudes and Perceptions of High School Administrators in Urban Communities about Career and Technical Education Programs* (McNair)  
 Juan Gerardo: *A Critical Analysis of the National Mathematics Advisory Panel Final Report: An Analysis Elucidating the Assumptions of the Final Report and Implications for Educators and Marginalized Students* (SPI)  
 Brittney Walker: *The Usage of Personal Diaries as a Language Research Tool* (SPI)

**History** (Room 406)

- Isabel Lara: *Race and Gender in Colonial Mexico through Caste Painting* (McNair)  
 Van Hong Nguyen: *Zazen - The Core Teaching of Dogen: How and Why Did Dogen Promote and Protect This Core Value Throughout Different Stages of His Zen Teaching Career?* (SPI)  
 Kyle Mays: *Black, Red, and Resistance: A Comparative Analysis between African-American and Native-American Activism during the Black and Red Power Eras, 1966-1974* (SPI)

**Social Science** (Room 407)

- Alisa Shockley: *Spatial Accessibility of Health Care and Cancer in African Americans* (SPI)  
 Bryana Mantilla: *Social Medicine in Action - The Opportunities and Challenges of Community-Based Healthcare Models in Latin America* (SPI)  
 Lhea Randle: *Social Identities' Effect on Policy Preferences* (SPI)



**Educational Policy Studies** (Room 210)

Marla Mojica: *Household Wealth in the Latina/o Community* (SROP)

Ronald Threadgill: *Diversity in Higher Education: The Story of SEOP and ATEP* (McNair)

Darnell Leatherwood: *Children From Low-Income Families: A Success Story* (McNair)

Regina Sierra Carter: *A Study of Elementary School Students' Perceptions of African-American Children's Literature* (SPI)

**Neuroscience** (Room 215)

Nilmarie Ayala-Fontanez: *Effects of Amphetamine on Inhibitory Control in Rats Exposed during Adolescence or Adulthood* (SROP)

Gloria Mayowa Faboyede: *Constructing Assessments for Neonatal Cognitive Ability* (SPI)

Franklyn Rocha Cabrero: *The Effects of Pesticide-induced Parkinson's Disease across Multiple Learning and Memory Systems in Rats* (SPI)



## 20th Annual Ronald E. McNair Scholars

### Research Institute Symposium

#### RESEARCH ABSTRACTS



Author: **Taiwo Adebawale**  
 Faculty Mentor: **Dr. William E. Berry**  
 Research Department: **Advertising**

*Don't Ask Questions, Just Eat! - An Examination of How Quick-Service Restaurants Communicate Nutritional Information to Consumers*

The prevalence of obesity has steadily increased to an epidemic level in the United States. The increasing lack of accessibility of nutritional information from quick-service restaurants plays an important role in the rise of this epidemic. This study investigates how quick-service restaurants (QSR) communicate nutritional information to consumers. QSR is the designated term used by industry professionals to refer to what generally is called "fast-food" sites. Online strategies that QSR companies use to merchandise and promote their products were observed to determine the extent to which they include or omit messages concerning health and wellness. A content and context analysis of QSR websites was conducted to examine expressed and implied nutritional information. In addition, to determine how consumers become aware of the availability of online nutritional information, this study involved viewing television and print commercials produced by the QSR's, as well as visitations of various QSR's to investigate whether menu signs, ads, product packages or other areas of the establishment directed consumers to where nutritional guides can be obtained online. The findings of this study are beneficial to both the restaurant industry and consumers. The results point to opportunities for improving methods of providing nutrition information in public establishments, corporate websites and advertising campaigns. They also help to identify strategies that consumers can use to make informed decisions concerning health and nutrition when making purchases at QSR locations.



Author: **Stephanie Aghahowa**  
 Faculty Mentor: **Dr. Lisa Beth Spanierman**  
 Research Department: **Educational Psychology**

*White Counseling Psychologists and Their Construction of a White Racial Identity*

This research will attempt to gauge the process by which white counseling psychologists come to construct their white racial identity. By examining six interviews conducted with white individuals enrolled in psychology graduate programs on their views of race and racism, I intend to identify the primary themes and domains that the interviewees cite as contributors to the construction of their racial identity. The implications are significant as America grows more diverse and its psychologists tend to provide services to increasing numbers of minorities. White clinicians should acknowledge and critique their whiteness and privileged location in the racial hierarchy, which will in turn equip them to provide the best care for minority clientele.





Author: **Diana Arellano**

Faculty Mentor: **Dr. Stephen John Notaro**

Research Department: **Kinesiology and Community Health**

*India's Baby Paradox: Examining the Disparity of Infant Mortality Rates Throughout India*

**Background:** The rate of infant deaths in India varies greatly from state to state. Kerala, a state in India, has the lowest IMR (infant mortality rate) with 12 per 1000 live births, while Madhya Pradesh has the highest IMR with 70 per 1000 live births.

**Objective:** The aim of this project is to understand and examine why this disparity exists between Kerala and two states that have the highest IMR — Madhya Pradesh and

Orissa — by analyzing indicators and government policies that affect infant deaths.

**Methods:** Analysis of secondary data of state reports from the National Family Health Survey were obtained.

A meta-analysis of information from the Indian government website and literature on maternal and infant health in India was conducted.

**Results:** Initial findings suggest that disparities in infant mortality rates may be related to: health infrastructure, including the availability of obstetricians; maternal determinants, such as institutional births; and educational factors, including female literacy rates.

**Conclusion:** To effectively reduce IMR, state and central government policies in Madhya Pradesh and Orissa appear to be in need of increased resources related to health infrastructure, maternal determinants and education factors that approach levels similar to that of Kerala.



Author: **Maribel Arteaga**

Faculty Mentor: **Dr. Phillip A. Newmark**

Research Department: **Cell and Developmental Biology**

*Function of Vasa and Pumilio, Post-transcriptional Regulators, in Regeneration and Germ-Line Formation of the Flatworm Schmidtea mediterranea*

As research in the field of stem cell biology becomes more and more popular, so does the need for a model organism for its study. One such organism that has increased in popularity due to its ability to regenerate, as well as change in response to its environment, is the flatworm (planarian) *Schmidtea mediterranea*. Vasa and Pumilio, two post-transcriptional regulators of germline mRNAs in most metazoans, are required for regeneration in planaria. Pumilio is required for maintenance of planarian stem cells, whereas Vasa is likely required for their differentiation. In this study, we compared expression of these genes by in situ hybridization in sexual and asexual planaria. Additionally, we analyzed the regeneration ability of asexual planaria after disrupting Smed-vas-1 and Smed-pum gene expression through RNA interference (RNAi), as well as germline maintenance in sexual animals. This research has implications for regulation of gene expression during regeneration, and in germline and somatic stem cell population in metazoans.



Author: **Benie Bakala**

Faculty Mentor: **Dr. Robin L. Jarrett**

Research Department: **Human and Community Development**

*Eating Right: African-American Mothers' Strategies to Promote Healthy Eating Habits for Their Preschool-age Children*

The rate of childhood obesity has tremendously increased during the past decade, becoming a global epidemic. In the United States, African-American children in low-income households have the highest rates for obesity. That rate is attributed to the fact that children living in poverty have less access to healthier foods, such as fresh vegetables and fruits, and have more access to foods high in sugar and fat and those

cooked in grease. Quality of food choice is mainly due to a communities' availability of fast-food restaurants, convenience stores, and cheaper pricing of "junk foods," as well as of availability of healthy food options and supermarkets. This study examines the diet of poor African-American children and the factors that increase their risk for obesity. For this study, interviews were conducted in several inner-city communities across Chicago. Mothers and grandmothers, depending on who takes care of the child, were questioned about their children's or grandchildren's food intake. Data from this study shows that mothers and grandmothers fed children according to what they perceived as healthy choices. Additionally, guardians experience some struggle with controlling the diet of the child when children were at school or outside of their care. The study suggests new nutritional practices for both mothers and grandmothers to adopt.



Author: **Kierra Barnett**

Faculty Mentor: **Dr. Susan M. Farner**

Research Department: **Kinesiology and Community Health**

*Efficacy of HIV Prevention Interventions Targeting Black Women*

**Introduction:** Since 1986, African Americans have been recognized as being disproportionately affected by the HIV/AIDS epidemic. From 1981 to 1988, African Americans represented only 12% of the U.S. population and accounted for 26% of the AIDS cases. According to the Centers for Disease Control, African Americans account for 49% of HIV/AIDS cases in 2007 while representing 13% of the U.S. population. Within the black

community, black females are at the highest risk of contracting HIV.

**Objective:** The purpose of this paper is to evaluate the factors that put Black women at a disadvantage of contracting HIV in their lifetime and formulate useable programs that will effectively address these factors.

**Methods:** Literature that examines the social and interpersonal factors that increase the likelihood of African-American women engaging in risky sexual behaviors was reviewed. Past sexual health programs that focus on minorities and HIV infection were also reviewed.

**Results:** Review of literature revealed three major CDC-funded HIV prevention interventions that have been implemented for Black women: Real Aids Prevention Project (RAPP), Sisters Informing Sisters on Topics About AIDS (SISTA), and Voices/Voces. Each program has positive aspects that, if combined, could form an intervention that would be highly effective.

**Conclusion:** There are many features of a program that contribute to its effectiveness. The important features of an intervention include the theory used to structure the intervention, whether it is a multi-session intervention, and if it has an intervention that is both gender- and cultural-specific.



Author: **Natalie Bradford**

Faculty Mentor: **Dr. Diana S. Grigsby**

Research Department: **Kinesiology and Community Health**

*Food Environments, Physical Activity Resources, and Obesity in the United States*

There is growing evidence that socio-environmental factors influence dietary and physical activity behaviors, and as a consequence, the risk of chronic conditions such as obesity. However, few studies exploring food environments in the United States examine both food environments and physical activity environments. To explore the relationship between the food environment, physical activity resources and obesity, an ecological analysis was performed using county-level data from the U.S. Department of Agriculture (USDA). Specifically, food environment characteristics (e.g., availability of supermarkets) and physical activity resources (e.g. fitness facilities) were examined across the four Census-designated regions (i.e., Northeast, Midwest, South, and West) in the United States, to determine whether differences in distribution influence obesity risk. The study also looked at the distribution and relationship of socio-demographic factors such as racial composition. The Statistical Package for the Social Sciences (SPSS) version 17.0 was used to perform all analyses. Results indicate that there are differences in the distribution of food and physical activity resources by region. Several of these differences represent disparities in access to quality food and physical activity resources that disadvantage racial minorities. Results of these analyses can be used to identify areas in the United States that may make it difficult for individuals to meet recommended CDC dietary and physical activity guidelines. Furthermore, results may help guide the development of policies and targeted interventions to improve food environments and physical activity environments, thus increasing access to quality sources of food and physical activity resources.



Author: **Victoria Briones**

Faculty Mentor: **Dr. Gilberto Rosas**

Research Department: **Anthropology and Latina/o Studies**

*Gendered Violence on the U.S.-Mexico Border: Femicide in Ciudad Juárez*

This research project investigates the mass murders of women in Juárez, Chihuahua, on the U.S.-Mexico border. More specifically, I focus on the factors that contribute to the murders, such as circumstances in which women are forced to live. Because of the lack of scholarship and media attention on this topic, many people are not thoroughly informed about this issue. Using qualitative research methods such as social analysis and using mainly secondary sources, this approach will provide a better understanding of the underlying reasons the violence began and continues to occur.



Author: **Karah Bush**

Faculty Mentor: **Dr. Charles H. Hillman**

Research Department: **Kinesiology and Community Health**

*The Effects of a Nine-Month Physical Activity Afterschool Program on Verbal Fluency in Preadolescent Children*

Physical activity has been related to cognitive health and effective functioning of individuals during childhood and across the human lifespan. However, the specific cognitive processes influenced by physical activity remain largely unknown, leading researchers to investigate a number of different aspects of cognition. One aspect of cognition that has been found to be sensitive to maturation is verbal fluency. In particular, switching

and clustering are two processes used in fluency word production that reflect mental flexibility as well as maturation of retrieval processes in children. Interestingly, mental flexibility is one aspect of cognition found to benefit from physical activity. Thus, the purpose of the present study was to uncover the relationship between physical activity and verbal fluency in children. Sixty-eight preadolescent children (36 intervention, 32 waitlist) engaged in three verbal fluency and three category fluency tasks, each 60 seconds in length. Total number of words produced, numbers of switches, and number of clusters were recorded for each trial. Results demonstrated greater increases in verbal and category fluency in the intervention group relative to the waitlist group. Total number of switches and mean cluster size was greater for high-fit children than low-fit children. These findings demonstrate that physical activity positively effects fluency in children by improving mental flexibility and retrieval processes. Such a finding adds to the growing literature-base, demonstrating the importance of physical activity to brain health and cognition.



Author: **Elizabeth Clark**

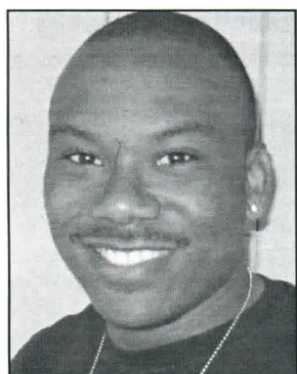
Faculty Mentor: **Dr. Jennifer F. Hamer**

Research Department: **African American Studies**

*The Truth about Education: Overcoming the Lack of Diversity in K-12 Curriculum*

Minority students have historically had lower success rates in the U.S. educational system than white students. It is queried whether the lack of culturally relevant curriculum or pedagogical practices is a key factor in this lag. Except for cultural immersion schools or culturally ethnic-based Saturday programs, youth have little opportunity to gain academic and cultural knowledge outside of the Eurocentric model. This ethnographic study inquires whether participants had been exposed to a multicultural education (if so,

what were the perceived advantages; if not, what are the perceived disadvantages), what the lack of multiculturalism entails for African Americans, and the alternatives communities can practice to ensure children receive an education that is relevant to the richness of society. The participant group is composed of seven African Americans and one Caucasian individual. The group consists of college students, a parent, a teacher, and two school administrators. This study uses a theoretical framework of Black scholars, such as Mwalimu Shujaa, Asa Hilliard, James A. Banks, Wade Nobels and Nah Dove, who have researched and written on the subject of multiculturalism, curricular infusion, and African-centered educational perspectives. This research seeks to determine the effectiveness of multicultural curriculum in the academic performance of African-American students and the relevance of pursuing multicultural educational practices in the creation of a truly just, democratic society.



Author: **Emzi Clemons**

Faculty Mentor: **Dr. John Alan Gerlt**

Research Department: **Energy and Biosciences Institute**

*The Identification of Lignocellulose Degradative Enzyme*

The goal of my research is to purify an enzyme that degrades hemicellulose in plant biomass material. Hemicellulose is a polysaccharide composed of hexose and pentose monomers such as xylose and galactose. Biological approaches such as enzymatic activities of known soil bacteria and fungi will be used to yield a better production of carbohydrates, instead of chemical approaches that are toxic to the environment. Techniques such as protein purification by column affinity, protein gel electrophoresis, western blot,

and protein assay will be used to identify and isolate the encoding enzyme xylanase, which are involved in hemicellulose degradation. The activity of the enzyme xylanase will be tested on a hemicellulose model substrate in the final step of the research experiment.





Author: **Tonisha Daniel**  
 Faculty Mentor: **Dr. Assata Zerai**  
 Research Department: **Sociology**

*The Forgotten Women: Health Disparities Concerning Minority Women*

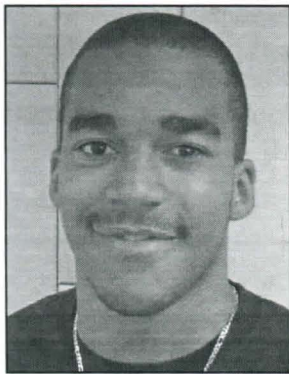
This study addresses factors that contribute to the overall health of minority women. In comparison to the U.S population as a whole, minority women (African Americans, Hispanic Americans, Asian Americans/Pacific Islanders, and American Indians/Alaska Natives) face continuing disparities in the burden of illnesses and healthy dietary habits, such as eating healthy foods, exercising regularly, or being able to see a physician on a regular basis. To perform the necessary research, a literature review on the dietary habits of minority women was conducted. The National Health and Nutrition Examination Survey (NHANES) conducted in 2007 was analyzed using SPSS. Variables analyzed in this study that contribute to minority women's health include: alcohol use, cardiovascular disease, diabetes, early childhood characteristics, health insurance, hospital utilization, physical activity, economic status, level of education, etc. Statistical surveys of the disproportionate toll of certain diseases and other life-threatening health defects on racial and ethnic populations highlight the need for prevention, treatment and more available resources toward reducing the loss of life.



Author: **Chanell Davis**  
 Faculty Mentor: **Dr. Matthew Hudson**  
 Research Department: **Crop Science**

*Making Big Corn Bigger: Genetic Variation at the TAS3 Loci*

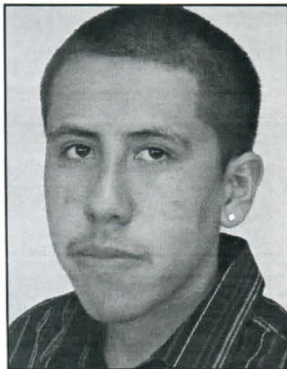
Heterosis describes the enhanced characteristics of the offspring that result from crossing two distantly related parents. However, the science of why these offspring tend to grow much larger than their parents is not fully understood. Trans-acting small interfering RNAs (tasiRNAs), which are generated from tasiRNA loci known as TAS genes, are thought to play a role in this phenomenon. They function by first recognizing their target site by non-perfect complementarity and then cleaving target mRNAs. The TAS3b locus in particular is known to control establishment of leaf polarity and proper timing of vegetative shoot development. Because tasiRNAs use sequence homology to recognize their targets, our interest is in finding out if there is genetic variation within the TAS3 loci of maize. We began by extracting genomic DNA from leaf material and then designing primers to amplify the TAS3 loci of 12 maize lines using PCR (polymerase chain reaction). We then used gel electrophoresis to separate the DNA fragments and determine how well the PCR amplification worked. For those lines that showed strong bands of the appropriate length in base pairs, we continued with either PCR or gel purification and then sequencing of the products. For those lines that did not give strong bands, we plan to optimize the experimental parameters of PCR. Once completed, the sequences of the 12 lines will be compared, and the anticipated variation at this locus will be analyzed.



Author: **Higgins Durand**  
 Faculty Mentor: **Dr. Jacob J. Sosnoff**  
 Research Department: **Kinesiology and Community Health**

*Aging, Isometric Force Control: The Role of Feedback Modality and Effector*

It is well known that with advanced age there is a decline in the precision of fine movements. The purpose of this investigation is to examine the role of feedback modality across manual and oral effectors in fine isometric force control in older adults. Old and young adult participants were asked to produce constant isometric force via their lower lip and their index finger. Ten and 20% of their maximal voluntary contraction (MVC) was used in a visual task that used a compensatory display and an audio task that used tone-matching via headphones. It is hypothesized that younger adults will have less force variability in all the tasks compared to the older adults. It is also believed that all manual force variability will be lower than oral force variability because of the amount of practice and control the index finger gets in force production during everyday tasks for both visual and audio feedback. It is expected that force variability measured during visual tasks will be lower because the clearness to the participant during the trial of hitting the target force in the visual task was much more apparent for both older and younger adults than in the audio feedback task. Decrements in hearing and seeing are associated with old age, but a comparison of these feedbacks in terms of force control has not yet been previously studied.



Author: **Alfredo Gonzalez**  
 Faculty Mentor: **Dr. William J. Qualls**  
 Research Department: **Business Administration**

*Crowdsourcing: The Future of Marketing Innovation in the Corporate World*

With the rise of the Internet and the growth in popularity of social networking websites, information can now be exchanged at rapid speeds. A marketing practice that attempts to take advantage of the accessibility of information is crowdsourcing. Crowdsourcing is the process of taking a job performed internally and outsourcing it to a population outside of the corporation. As a practice, crowdsourcing is fairly new. Thus, there is a lack of evidence to determine the effectiveness and efficacy of this practice. Previous applications of crowdsourcing show conflicting results. This case study focuses on evaluating recent applications of crowdsourcing in order to determine its effectiveness.



Author: **Elizabeth Gonzalez**  
 Faculty Mentor: **Dr. Brent Roberts**  
 Research Department: **Psychology**

*Childhood Experiences, Personality and Health:  
 Does Personality Mediate the Relationship between Trauma and Health*

Experiencing traumatic events, sexual abuse, or physical abuse in childhood leads to poor health in adulthood. Children who have experienced adversity are more likely to participate in negative health behaviors that predict illness and mortality. In the same way, certain personality characteristics are known to be associated with these behaviors. The present paper examines personality as a mediator for understanding the link between childhood trauma and adult physical health. Data from a nationwide sample of adults (N = 2136, M age = 51

years) who completed measures of personality, health, and childhood events were used to examine the hypothesized model. Childhood experiences of physical and sexual abuse, traumatic events, and family conflict were examined. Results show that personality traits, especially neuroticism and conscientiousness, partially mediate the relation between childhood traumatic events and health.



Author: **Erin Hayes**  
Faculty Mentor: **Dr. Wayne T. Pitard**  
Research Department: **Religion**

*Documenting Early Dynastic Cylinder Seals of Ancient Mesopotamia*

The aim of this project was to create a comprehensive account of three Ancient Mesopotamian cylinder seals from the collection of the Spurlock Museum. These seals — small stones engraved with images — originate from the Early Dynastic period and were photographed in novel ways. Researchers used 360-degree imaging and computerized lighting to depict scenes as they appear directly on the seal, rather than relying on seal impressions, as has been done traditionally. Furthermore, comparative techniques were used to document and analyze the seals in terms of origin, style, function, and iconography. Perfunctory evaluations of the Spurlock seals were performed in the middle of the last century by renowned expert Edith Porada (author of the classic “Corpus of Ancient Near Eastern Seals in North American Collections”); the current research is expanding upon her analysis. Ultimately, the documentation of the cylinder seals that this project produced will be published, making these masterpieces of ancient art available to the public eye for the very first time.



Author: **Angela Holliday**  
Faculty Mentor: **Dr. Carl Bradley**  
Research Department: **Crop Science**

*Identification of Pathogens Specific to Biofuel Grasses*

The focus of the project is the identification of fungal pathogens responsible for diseases on two biofuel grasses, *Miscanthus x giganteus* and switchgrass (*Panicum virgatum*) in Dudley Smith Farm, Illinois, in 2009. Following DNA extraction from the fungal isolates, polymerase chain reaction assays were conducted to amplify the internal transcribed spacer (ITS) region of the nuclear rDNA. The nucleotide sequence of the amplification products was determined by direct sequencing. Nucleotide Basic Alignment Search Tool (BLASTn) of the National Center for Biotechnology Information was used to search for similar sequences in the GenBank to identify the fungal species. Microscopic observations of fungal morphological features were used in conjunction with the ITS sequence analysis and homology search to confirm identification. Further, information about the species from the USDA-ARS Fungal Databases was searched to access the pathogenic status of each of the fungal species, the type of disease caused, the plant species affected, and the distribution of the disease. Some of the identified pathogens associated with diseases of *M. x giganteus* and switchgrass in Dudley Smith Farm were: *Epicoccum nigrum*, *Alternaria alternata*, *Phaeosporaria sp.*, *Fusarium sp.*, *Phoma glomerata*, *Colletotrichum spp.* and *Bipolaris spp.*



Author: **Rasheed Ibrahim**  
Faculty Mentor: **Dr. Timothy Wolfe Bretl**  
Research Department: **Aerospace Engineering**

*Deforming a Buckled Elastic Strip of Rod*

This paper studies the deformation and stability of a slender elastic rod (also known as a planar elastica). It considers the problem of finding the optimal energy minimizing path for a planar elastica that has one end point clamped to the end effector of a robot manipulator and its other end point clamped to a mounted end effector in the robot's workspace. We introduce a new planning algorithm that allows the robot to find stable paths through its workspace for the configuration space of the planar elastica subject to manipulation constraints. In order to find the optimal path for the planar elastica, the planner is restricted to a bounded region. The planner that was implemented computes paths from one configuration to another and finds stable, unstable, self-intersecting and undetermined configurations in the bounded region. This makes computing a roadmap of the entire shape space and decreasing the area covered by the undetermined configurations of the planar elastica achievable. With the aid of computer vision techniques and models for obstacle avoidance, we can find optimal energy minimizing curves along the path to a given end configuration of the planar elastica. The planner was tested in simulation to achieve various configurations of minimal energy. This work has applications in motion planning for space manipulators, snake-like robots, mobile robots, humanoid robots, molecular biology, and cable routing.



Author: **Tahir Ibrahim**  
Faculty Mentor: **Dr. Gary J. Kling**  
Research Department: **Crop Science**

*Which Poplar Clone Produces the Most Biomass?*

As our society has progressed, the demand for energy has constantly increased in order to operate our electronics. Presently, the leading source of energy is fossil fuels, which have a limited supply. The depletion of these fossil fuels has raised the issue of maintaining our lifestyles by alternative energy sources. There are many forms of alternative energy sources, but the area that still needs the most research is with woody feedstock production for bio-energy. To determine which species will be the most efficient, we look at their physiology. By making physiological measurements, we will be able to keep track of their individual growth rates and mass accumulation. The results will include calculations of the ratio in which the tree is able to coppice (rapid re-growth after being cut back). This data provides us with the information needed to conclude which woody tree species will be the best specimen as a feedstock. Based on previous knowledge on the selected woody trees, it is anticipated that [(P. trichocarpa x P. deltoides) x P. Deltoides] will perform the best based on three factors: (1) its culture and ability to withstand extreme conditions, (2) its ability to take advantage of the available nutrients in a permissible environment, and (3) its ability to produce more mass depending on the exposure to light.





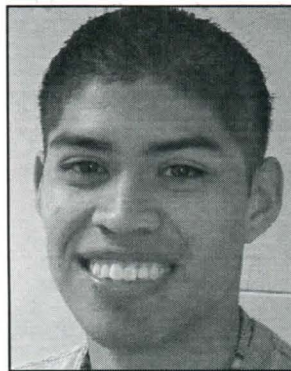
Author: **Irene Jaramillo**

Faculty Mentor: **Dr. Andrew C. Fortier and Dr. Timothy R. Pauketat**

Research Department: **Anthropology**

*Orendorf, the Native American Archeological Site that Emerged from Ashes*

Orendorf, a large palisaded middle-Mississippian era settlement (c.a. 1150-1250 AD), is a unique find for Illinois because its artifacts are perfectly preserved under a layer of ash in their original context. The settlement suffered from a catastrophic fire within the context of warfare. Houses were abandoned, leaving behind intact artifacts, allowing us to examine byproducts of possible activity patterns within the house, including craft production, ceremonial behavior, gender differences, and ordinary domestic activities. This paper presents evidence of activity spaces in structures based on comparative analysis of lithic assemblages in a sample of burned structures. Such research will contribute to a better understanding of the Central Illinois River Valley and get one step closer to unmasking the reasons for the catastrophic burning of this site and its successors. I intend to use lithic analysis techniques, as well as the archaeological literature on the use of space, in order to interpret the role of this site in relation to other North American sites.



Author: **Jilber Jerman**

Faculty Mentor: **Dr. Flavia Andrade**

Research Department: **Kinesiology and Community Health**

*Body Mass Index and Validity of Self-Reported Body Size among Mexican Young Adults*

**Background:** There are important health consequences for individuals who misperceive their own body size. Lack of knowledge of own body mass index (BMI) could lead to eating disorders.

**Objective:** The goals of this study are to 1) assess level of agreement between perceived (self-reported) and measured BMI among a population in Mexico, and 2) evaluate whether differences of agreement correlate with age, gender, and socioeconomic status.

**Methods:** Applicants to the Universidad Autonoma de San Luis Potosí, Mexico, in 2009 aged 18 to 20 (n=2,926). Participants self-reported their BMI categories, and measured BMI was obtained during medical physical screenings.

**Results:** Men are heavier than women ( $p=0.0001$ ). Among men, 33.1% are overweight or obese, but only 16.7% self-reported being in these categories. Among women, 28.3% were overweight or obese, while 21.4% self-reported these categories. More men than women described themselves as underweight. Agreement between perceived and measured BMI was lower among men ( $Kappa=0.22$ ) than among women ( $Kappa=0.45$ ). Women were less likely to underreport than men ( $p<0.001$ ), but they were 1.4 times more likely to overreport ( $p=0.052$ ).

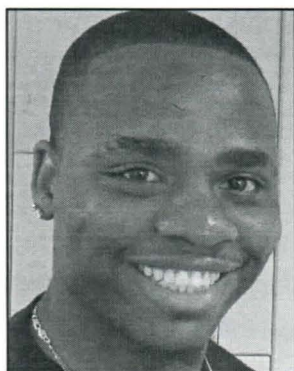
**Conclusion:** Women in the United States and other Western societies have a high rate of overreporting BMI when compared with males. In this sample, women reported their BMI categories generally more accurately than men. However, women were more likely to overreport their BMI category. As a result, Mexican women may be at risk of developing risky health behaviors to control their body size.



Author: **Isabel Lara**  
 Faculty Mentor: **Dr. R. Jovita Baber**  
 Research Department: **History**

*Race and Gender in Colonial Mexico through Caste Painting*

The society of castes in colonial Mexico, combined with obsessive Enlightenment categorizations of race, led to the creation of the genre of caste painting. Caste paintings and the society of castes had a minimal impact on the quotidian lives of women and people of color. Nativity and race-specific colonial laws were implemented formally, as well as informally, by a society keen to appearances. Despite these laws, many persevered and achieved upward mobility as seen through vignettes that have been preserved in colonial literature and legal documents. A selection of caste paintings, as well as the written histories of women and people of color for the time period of 1519 through 1810, will be analyzed. Through these analytical findings, the caste paintings themselves did not have an impact on plebeians, and the images in the caste paintings were an imprecise reflection of society at the time.



Author: **Darnell Leatherwood**  
 Faculty Mentor: **Dr. William T. Trent**  
 Research Department: **Educational Policy Studies**

*Children from Low-Income Families: A Success Story*

Drawing from the significant bodies of literature that address the resilience of low-income African-American students, this study examines the factors identified by researchers that contribute to the success of low-income African-American students from poverty-stricken areas. In particular, this study focuses on analyzing first-person accounts of low-income African-American college students to identify themes across the literature. Interviews were conducted at the University of Illinois at Urbana-Champaign with participants of the 2010 Ronald E. McNair Scholars Summer Research Institute, a research institute designed to target low-income underrepresented students. The results from this study show that mentorship, parental involvement, and teacher expectation are significant factors structuring the success of low-income African-American students. Educational success is the key to developing individuals who create value and merit in society. Understanding the factors that lead to the success of low-income African-American students will allow for the implementation of resources that allow for individuals from these circumstances to be better prepared for academic success.



Author: **Mayra Lopez**  
 Faculty Mentor: **Dr. Kelly S. Swanson**  
 Research Department: **Animal Sciences**

*Association between Coat Color and Behavior in Cats*

A number of myths have circulated throughout the years regarding the connection between coat color and behavior of domestic cats. The discussion to date is based largely on anecdotal information and lacks a scientific approach to disprove or confirm the myths. The current project was performed to explore the relationship between feline coat color and observable behavioral traits. The behavioral observations and coat colors analyzed are based on data collected from cats entering the American Society for the

Prevention of Cruelty to Animals (ASPCA) shelter in New York City, using the “Feline-ality” adoption matching program. Feline-ality records contain a variety of test scores attributed to cats entering the shelter. Behavior scores termed independent-gregarious scores and valiance scores are derived from the tests conducted and are used to define cats into one to nine different Feline-ality categories. The independent-gregarious and valiance scores of each cat were compared for orange (26), calico (25), tortoiseshell (17) or black-and-white (132) cats to those of the cats of all other colors. In the first set of nearly 600 records, no significant relationship between coat color and Feline-ality scores was observed; however, 500 more records will be added to the current dataset. This research may ultimately help shelters match cats and adopters, leading to fewer cat returns, incidents of abandonment, and possibly a decrease in euthanasia numbers.



Author: **Sharday Love**  
 Faculty Mentor: **Dr. Glenn Ian Roisman**  
 Research Department: **Psychology**

*The Implications of Attachment Style for Relationship Quality:  
 The Role of Compatibility*

Few studies of adult romantic relationships show how attachment styles interact on the dyadic level and affect the compatibility of the relationship. In this longitudinal study of 112 dating couples tracked during one year, compatibility is examined in terms of relationship satisfaction and durability (i.e., which dyads broke up by T2). Participants were given a self-report measure of relationship satisfaction (the Dyadic Adjustment Scale), and observations of positive affect were made. In line with expectations, secure dyads had the highest levels of relational satisfaction and observed positive affect. With the exception of avoidant-avoidant dyads, all couples with at least one partner who displayed one or both dimensions of insecurity (anxiety or avoidance) had lower levels of reported satisfaction and observed affect. However, it is expected that an insecure dyad, such as the anxious-avoidant, will be more durable than secure-insecure dyads. This study will be one of the first to use longitudinal data of this nature and can set the stage for future studies of adult attachment compatibility.



Author: **Michelle Martinez**  
 Faculty Mentor: **Dr. Dorothy Espelage**  
 Research Department: **Educational Psychology**

*The Paternal Influence on Daughters’ Attitudes Toward Sexual Harassment*

Sexual harassment and the quality of father-daughter relationships both can have a major impact on young girls’ lives. Current studies have investigated both phenomena separately but have failed to focus on how both relate for adolescent girls. This study aims to address the gap by investigating the quality of father-daughter relationships and how those relationships affect middle school girls’ attitudes toward sexual harassment. This study included 891 middle school girls from Grades Five through Eight from four Central Illinois middle schools. The students completed a self-report survey, which included the American Association of University Women’s (AAUW) sexual harassment measures, a dismissive of sexual harassment scale, and a quality of father-daughter relationship measure. It is hypothesized that a stronger father-daughter relationship will be associated with greater challenging attitudes of sexual harassment. This then will lead to less sexual harassment victimization and perpetration of the daughters.





Author: **Leslie Mendoza**

Faculty Mentor: **Dr. Howard Berenbaum**

Research Department: **Psychology**

*Discomfort with Emotion and Psychological Distress*

The present study investigated the relationship between discomfort with emotion and different facets of distress. Participants were 15 adults seeking clinical psychology services from an outpatient clinic. Discomfort with emotion was measured using the Affect Control Scale (ACS). Three facets of distress were examined: anhedonic depression, anxious arousal, and worry. Anhedonic depression and anxious arousal were measured using the Mood and Anxiety Symptom Questionnaire (MASQ). Worry was measured using the Penn State Worry Questionnaire (PSWQ). There were large positive correlations between discomfort with emotion and all three facets of psychological distress. Clinical implications and limitations of the research are discussed.



Author: **Daniela Mitchem**

Faculty Mentor: **Dr. Stephen John Notaro**

Research Department: **Kinesiology and Community Health**

*Comparative Analysis of Quality Measures of Not-for-Profit and For-Profit Nursing Homes in Cook County*

With a steady increase of the elderly population, nursing homes are on the rise in the United States. This expanding nursing population has brought issues of the quality of care received in the facilities to the forefront. Previous studies have found that long-term care facilities provide insufficient care to patients and are typically accountable for elder abuse. In addition, not-for-profit nursing homes appear to provide a higher level of care than their for-profit counterparts. The purpose of this research is to compare quality indicators of not-for-profit and for-profit homes in the Cook County area. This study was a comparative analysis using four relevant indicators of quality. The relevant indicators of quality that were used for this study are nursing home deficiencies, nursing home staff, level CMS quality measures, and nursing home fire inspections. Findings revealed that not-for-profit organizations had a better overall rating than for-profit organizations in most indicators studied, including nursing staffing levels. These findings suggest that the not-for-profit organizations may have better quality facilities that are suited for elder care.



Author: **Melissa Morales**

Faculty Mentor: **Dr. Margarita De L Teran-Garcia**

Research Department: **Food Science and Human Nutrition**

*Impact of Acculturation on Dietary Habits and Stress Levels of Latina Immigrants in Central Illinois*

Latinos, the largest ethnic minority in the United States, exhibit a significant high percentage of chronic health conditions. Almost 40% of this population is foreign born, thus, there is a large interest to understand the influence of acculturation on the health outcomes of Latinos. The purpose of this study is to explore the relationship between acculturation, acculturative stress, and dietary practices of a less-explored population



of Latino immigrants. Data previously collected through the Latino Families in Central Illinois project from 112 Latinas living in five Central Illinois counties will be explored through descriptive statistics and analysis of variance. Dietary quality will be assessed based on fruit, vegetable, whole grain, milk, and fast-food consumption reported by the participants and will be compared to the USDA's Dietary Guidelines and Food Environment Atlas. Ultimately this study will result in the development of culturally relevant interventions to reduce the incidence of health disparities among the studied population.



Author: **Juliette Morris**

Faculty Mentor: **Dr. Stephen Patrick Moose**

Research Department: **Crop Science and Energy and Biosciences Institute**

*Analysis of Miscanthus BAC and Fosmid End Sequences*

Miscanthus is a tall perennial grass with a C<sub>4</sub> photosynthetic pathway. Miscanthus has become a keen interest as a biomass crop due to its many attributes, such as rapid growth and the ability to grow in cooler climates. The purpose of this experiment is to enhance the knowledge of Miscanthus by using information from a large insert clone library and comparing its similarities and synteny to sorghum genome. Single colonies were randomly picked, grown, and end-sequenced from a large insert clone library. The data from the end sequences was analyzed for transposable elements (TEs), simple sequence repeats (SSRs), and centromeric satellite repeats. The large insert clone end sequences were compared to the sequenced genome of sorghum for similarities. This information could aid in the development of sequencing the whole genome of Miscanthus and a better understanding of the crop.



Author: **Ngozi Okanu**

Faculty Mentor: **Dr. Michael Gray**

Research Department: **Crop Science and Energy and Biosciences Institute**

*Real-time RT-PCR Detection and Quantification of Viruses of Switchgrass*

*Panicum virgatum L.* (switchgrass) is a biomass crop that harbors a considerable amount of energy, which makes it a potential source of biofuel. Switchgrass is common to the prairie lands of North America, grows very rapidly, and can survive the harshness of winter. Viruses have the potential to reduce the biomass of infected crops. Five viruses that have been reported infecting the grass are: Sugarcane mosaic virus (SCMV), Panicum mosaic virus (PMV), Barley yellow dwarf virus-PAV (BYDV-PAV), Soil-borne wheat mosaic virus (SBWMV), and a possibly new marafivirus most related to Maize rayado fino virus (MRFV). With the increase of switchgrass production, the risk of an outbreak increases significantly. Control of these viruses and their diseases through breeding for virus-resistant varieties and planting virus-free plantlets involves the development of diagnostic tools. The purpose of this research is to develop sensitive and reliable realtime RT-PCR (based on SYBR green chemistry) for the detection and quantification of the viruses. The detection and amplification of BYDV-PAV, SBWMV, and PMV have been successfully observed.



Author: **Tolulope Olorode**

Faculty Mentor: **Dr. Robin L. Jarrett**

Research Department: **Human and Community Development**

*Spatial Landscape and Physical Activity among Inner-City Preschool Children*

This study is an ethnographic research project that investigates the places children use to become physically active. In this study, the inner-city setting is analyzed to create awareness of how that physical environment hinders or combats obesity. The participants, African-American mothers of children in Chicago's inner city, were interviewed. Additionally, they were asked to capture relevant images of their environment through photography. The findings suggest that the major barriers and challenges to children

having outdoor activities are neighborhood violence, inadequate or absent spatial environments for play, and pre-existing health conditions for both mother and child. To address the issue of child inactivity, research suggests several maternal management strategies that could provide avenues for physical activity to occur. Recommendations for these findings include advocating to community developers and leaders for creation of an adequate space of children to be physically active.



Author: **Maria Piñeros**

Faculty Mentor: **Dr. Joshua M. Gulley**

Research Department: **Psychology**

*Effects of Amphetamine Exposure during Adolescence on Impulsive Behavior in Adulthood in Male Rats*

During adolescence, individuals are prone to engage in risky behaviors, including the consumption of alcohol and other drugs. Moreover, brain areas such as the prefrontal cortex are undergoing significant changes in structure and function. Thus, drug exposure during developmental time periods may have adverse consequences that persist into adulthood. The goal of this study was to investigate whether adolescent amphetamine

exposure had adverse effects on impulsive behavior that persisted into adulthood. This was investigated using differential reinforcement of low rates of responding (DRL), which assess the animal's ability to withhold responding in order to increase its chances of obtaining food (reward). Before the experiment, rats were exposed to either saline or 3 mg/kg of amphetamine during adolescence (postnatal days 27-45) or adulthood (postnatal days 85-103). After they reached adulthood (postnatal day 125), rats were trained to press a lever in order to obtain a food pellet and to withhold responding for 5, 10, 15, or 30 seconds (i.e., DRL 5-30) in order to receive a food pellet. After responding stabilized at DRL 30, rats were given an injection of saline or amphetamine (0.25, 0.5, or 1.0 mg/kg) to test the effects of drug challenges on inhibitory control. Our preliminary results suggest that rats exposed to amphetamine during adolescence exhibit less impulse control compared to saline-exposed controls and to those exposed to amphetamine as adults. In summary, these results suggest that adolescent amphetamine exposure has detrimental consequences on behavior. This relationship may be mediated by the effects of amphetamine exposure on the prefrontal cortex as a result of amphetamine exposure during adolescent development.



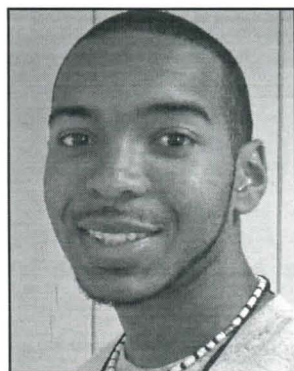


Author: **Brittney Potier**  
 Faculty Mentor: **Dr. John Patrick Caughlin**  
 Research Department: **Communication**

*Unlocking Secrets in Dating Relationships*

This research investigates secrets within romantic relationships, specifically those that occur in college. Research shows that couples have trouble communicating certain activities, concerns, or thoughts for various reasons. Thus far, research on secret-keeping has not investigated secrets in romantic relationships specifically. This study investigates which sex tends to keep more secrets and the types and topics each sex usually keeps from the other. Further analysis will be conducted to examine why couples choose not to

reveal their secrets to one another. Preliminary results suggest that men and women differ in the kinds of secrets they keep, as well as their reasons for keeping those secrets.



Author: **Derrick Rhodes**  
 Faculty Mentor: **Dr. Robert Hughes**  
 Research Department: **Human and Community Development**

*Attitudes and Perceptions of High School Administrators in Urban Communities about Career and Technical Education Programs*

The purpose of this study is to explore the issues of Career and Technical Education (CTE) by investigating the attitudes and perceptions of urban/suburban area high school administrators. Data collection was done via two means, an online survey and personal interviews. In total, 10 administrators participated in the online survey, and eight volunteered for personal interviews. When survey results were conjoined with interview

responses, the reality of CTE programs did not match the administrators' positive perceptions. With regard to the rigor of CTE courses compared to core courses, the comparison of survey results to interview results suggests that, even though CTE courses may be viewed as preparing students for postsecondary education, the reality is the rigor of these courses does not compete with core academic/college preparatory classes. In addition, when administrators were asked about the type of careers available for CTE students, not one administrator suggested a career that specifically required a postsecondary degree. Research suggests even though administrators say CTE courses prepare and encourage students for postsecondary education, the career options that administrators considered available for CTE students demonstrate they do not envision the students in CTE courses will pursue postsecondary education.



Author: **Lauren Rosales**  
 Faculty Mentor: **Dr. John W. Erdman**  
 Research Department: **Food Science and Human Nutrition**

*Alterations in mRNA Expression of Hepatic Carotenoid Cleavage Enzymes in Mice*

Epidemiological studies suggest that there is a reduced risk of certain cancers, including prostate cancer, associated with increased intake of tomato products and higher blood levels of the carotenoid, lycopene. The principle cleavage enzymes that metabolize carotenoids are 15,15'-carotenoid monooxygenase (CMO-I) and 9',10'-carotenoid monooxygenase (CMO-II). We hypothesized that CMO-I and CMO-II gene expression decreases with age, therefore reducing tissue concentrations of bioactive retinoid

and lycopene produced through CMO-I and CMO-II cleavage. To measure alterations in expression of CMO-I and CMO-II, we fed an AIN-93 G diet with reduced vitamin A content to CMO-I knock-out, CMO-II knock-out, and wild-type mice and allowed them to age to 5, 9, 31, 51, and 71 weeks. Liver tissue contains one of the highest expressions of CMO-I and CMO-II. Expression levels in the liver tissue were measured using RT-PCR, Trizol extraction, and SYBR-Green analysis. Preliminary results do not suggest a correlation between age and CMO-I or CMO-II expression in liver tissue.



Author: **Linda Salgado**

Faculty Mentor: **Dr. Angela R. Wiley**

Research Department: **Human and Community Development**

*The Effect of Acculturation on Satisfaction with Life, General Stress, and Acculturative Stress in Latina Immigrant Women Residing in Illinois*

In recent years we have seen a rapid growth in the Latino population emigrating to the United States. This growth has led to interest in researching the effects of acculturation on stress levels and satisfaction with life. My research will consist of analyzing data collected in the Latino Needs Assessment, in which 112 Latina immigrant mothers (mean age of 34.5 years, 93% of Mexican origin) living in Champaign County were administered

structured interviews pertaining to their experiences in the rural community. Comparisons will be made with the data gathered in the Latino Needs Assessment and other research focusing on the level of satisfaction Latina immigrant women feel with their current life. In addition, research collected in the Latino Needs Assessment will be compared to past research focusing on the general stress and acculturative stress Latin American immigrant women face during their acculturation.



Author: **Sydney Stoudmire**

Faculty Mentor: **Dr. Dana Rush**

Research Department: **Art and Design**

*Faces/Voices/Histories:*

*Legacies of Champaign's Historic African-American Community*

In October 1983, artist photographer Raymond Bial of Urbana, Illinois, began working on a photograph exhibition to celebrate the accomplishments and contributions of African Americans in the Champaign-Urbana community. The exhibition, titled "In All My Years: Portraits of Older Blacks in Urbana Champaign," featured black-and-white portraits of 55 elderly African Americans, accompanied by vignettes that offered glimpses of

the individuals portrayed. Although it was created to spur interest in documenting African-American history, nearly 30 years later, it remains one of the few efforts made to examine Black history in the two cities. This fact illustrates that there is need for research and publishing on Black history in academia. In contribution to increasing critical discussions about African-American history, this study examines "In All My Years" from two perspectives. It is first analyzed for its aesthetic and visual elements, and then socio-cultural function of the photographs is explored. The conventions of fine art photography are then discussed and challenged in relation to Raymond Bial's photographs, along with the works of well-known African-American artist photographers. Published research on African-American photography from an art historical and social perspective is very rare, and the goal of this study is to encourage further research on African-American contributions to art and history. More broadly, the objective of this examination is to continue increasing interest in the research, critical discussion, and documentation of Black history, not only in Champaign-Urbana, but throughout the country.







Author: **Chantell Strong**  
 Faculty Mentor: **Dr. Howard Berenbaum**  
 Research Department: **Psychology**

*The Relationship between Emotional Awareness and Psychological Distress*

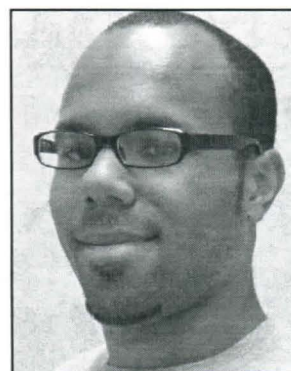
This study examined how attention to emotion is associated with worry and depression. Participants were 15 adults who sought professional services at a clinic that specializes in the psychological treatment of anxiety. Participants completed a battery of assessment instruments, including: (a) the attention to emotion subscale of the Trait Meta-Mood Scale (TMMS); (b) the anhedonic depression subscale of the Mood and Anxiety Symptom Questionnaire (MASQ); and (c) the Penn State Worry Questionnaire (PSWQ). The correlation between worry and attention to emotion was .39, whereas the correlation between anhedonic depression and attention was .02. These results are discussed in terms of clinical implications and directions for future research.



Author: **Tanisha Taylor**  
 Faculty Mentor: **Dr. Michael Murphy**  
 Research Department: **Animal Sciences**

*Potential Relationship between Maternal Body Condition at Conception and Ratio of Male to Female Calves in Dairy Cattle*

The classic model of Trivers and Willard (1973) predicted that, as maternal condition declines in polygynous species, the adult female tends to produce a lower ratio of male to female offspring (i.e., secondary sex ratio which we have defined as the proportion of males at birth). Analysis of data for 2,851 calvings by 979 Holsteins at the University of Illinois dairy farm suggested that cows in better body condition (i.e., conceiving later in lactation) tended to produce more bull than heifer calves. Additional research, using more data, was needed to confirm this correlation of body condition and sex ratio. Variables included in this experiment were cow birth date, date of first breeding, date of last breeding, number of artificial inseminations, calving date, and number and sex of offspring. The objective was to combine previous data with data from the University of New Hampshire (for 486 calvings by 181 Holsteins) to re-examine whether indices of body condition in dairy cattle were related to calf sex ratio. Results from analyses again indicated that calf sex ratio tended to be related to maternal body condition at conception; this supports the hypothesis of Trivers and Willard (1973). Natural variation in calf sex ratio and maternal body condition, especially in early lactation, make detection of a relationship between them difficult and apparently require even larger amounts of data.



Author: **Ronald Threadgill**  
 Faculty Mentor: **Dr. Christopher Span**  
 Research Department: **Educational Policy Studies**

*Diversity in Higher Education: The Story of SEOP and ATEP*

This research illustrates the history of African Americans at the University of Illinois during the 1960s and 1970s. It primarily focuses on the Special Educational Opportunities Program (SEOP) and the Alternative Teacher Educational Program (ATEP) that developed during this time period. It utilizes archival and secondary sources on the subject to document this history. The goal of this research is to explain how SEOP and ATEP were established and maintained, and to illustrate the significance each had in providing minority students greater opportunities on a majority white college campus.

## 20th Annual Ronald E. McNair Scholars Research Institute Symposium

University of Illinois Urbana-Champaign

Summer 2010

### M c N A I R P R O G R A M A C C O M P L I S H M E N T S

Priscilla Fortier, Director of McNair Scholars Program

Celina Trujillo, Assistant Director of McNair Scholars Program

The Ronald E. McNair Scholars Program, located in the Office of Minority Student Affairs (OMSA) at the University of Illinois at Urbana-Champaign, provides opportunities for low-income and minority undergraduates by encouraging them to excel academically and to pursue doctoral programs at the University of Illinois and elsewhere. In addition to the use of U.S. Department of Education funds, the McNair Program's staff utilizes a number of campus resources and networks with TRIO and graduate programs around the country in order to place the Illinois McNair Scholars into programs leading to doctoral degrees. We would not have accomplished our goals without the generous financial support received from the Graduate College and the Office of the Vice Chancellor for Research.

Strategies used by the McNair staff to place students into programs leading to doctoral study include:

#### • **The Summer Research Institute**

The Summer Research Institute is the "capstone" activity for motivating and preparing highly qualified students for doctoral study. McNair Summer Research scholars are matched with faculty members within their major field of study. Faculty mentors guide each scholar's research project and prepare students for more advanced study. Thirty-seven faculty members have mentored 42 students during the 2010 McNair Summer Research Institute. The scholars enrolled in the Institute receive college credit, attend weekly seminars, and work more than 30 hours each week on their research projects. Students also attend seminars each week on motivational and informational topics that include: The Life of Ronald E. McNair; Graduate Library Resources and Research Databases; Introduction to Statistics; Writing an Abstract; How to Write a Research Paper; The Life of a Graduate Student; Faculty Expectations and Funding; Graduate School and the Academy; The Road to Tenure; Successful Graduate School and Financial Aid Applications; Effective Research Presentations; What Do Faculty Really Do?, and How to Write a Curriculum Vitae.

#### • **Research Methodologies Course**

Each spring semester, about one-third of summer participants completed a credit-bearing course sponsored by OMSA and the UI Department of Educational Policy Studies. The main objective was to introduce aspiring summer research participants to different methods of research inquiry. Students explored both qualitative and quantitative methods and honed their skills in reading academic journal articles and writing abstracts.

#### • **Referrals to the Educational Equity Programs Office of the Graduate College**

The Graduate College's Educational Equity Programs Office has been an invaluable gateway to graduate school for McNair Scholars, EOP, President's Award Program participants, and other students. The Graduate



College has helped McNair Scholars to identify graduate programs within the Committee on Institutional Cooperation (CIC) and around the country. Underrepresented students, including McNair academic year participants, are strongly encouraged to apply for the McNair Summer Research Institute, as well as to the Summer Research Opportunities Program, which is administered by the Graduate College. In addition to offering various forms of financial aid, the Graduate College has made a McNair fellowship available each fall to one or more incoming graduate students who were undergraduate McNair scholars.

#### • **Campus Visits**

In May, McNair Scholars visited the University of Wisconsin-Madison and in June, attended a McNair graduate visitation day at The Ohio State University. Representatives from these graduate schools provided seminars on admissions and financial aid. In addition, students met with representatives from graduate admissions and various academic departments for the purpose of discussing student life and meeting faculty and graduate students. In July, students were hosted by the University of Illinois at Chicago's Graduate College.

#### • **Conferences**

Seventeen Illinois McNair Scholars presented their research at the Southeastern Association of Educational Opportunity Program Personnel (SAEOPP)'s McNair Conference that was held in Atlanta in late June 2010. Four Illinois McNair Scholars won first or second prizes for their presentations. In addition, from 1992 until 2008, the Illinois McNair program under the direction of retired director Michael Jeffries, sponsored 17 annual National McNair Research Conferences in Delavan, Wisconsin. More than 600 students and staff from McNair programs around the nation annually attend this conference, which is traditionally held in early November under the sponsorship of the University of Illinois as well as the Mid-America Association of Educational Opportunity Program Personnel.

#### • **Bridging the Financial Aid/Admissions Gap**

Graduate Admissions staff from Illinois, as well as the universities visited by the program, provided important information on securing admission at competitive colleges and universities. Staff from each institution were enthusiastic about meeting with the McNair Scholars and expressed the hope that their recruiting efforts would be successful.

#### • **Reaching Out**

The McNair staff provides eligible and interested students with information about McNair incentives at other institutions. Currently more than 200 colleges and universities offer application fee waivers for McNair Scholars. In addition, efforts are made to bond McNair fellows with a TRIO or other minority support program, as well as to the host graduate college, when students matriculate in graduate school. Staff use the Mid-America Association of Educational Opportunity Program Personnel (MAEOPP), the Council for Opportunity in Education (COE), and the Council of Graduate School (CGS) directories as resources. The director and retired director of the McNair Scholars Program at Illinois continue to serve on the joint national committee of the Council of Graduate Schools and the Council for Opportunity in Education.

#### • **Using Campus Events**

The Career Center at Illinois hosts an annual graduate school conference at the Illini Union. The OMSA staff encourages McNair participants and other underrepresented students to visit the fair to collect materials and meet graduate college representatives from across the nation. In addition, the OMSA staff works closely with the other campus resources to identify opportunities for students who are considering professional school preparation



programs. Through many such initiatives, OMSA's career development unit and staff help students achieve their goals.

- **Graduate School Library Materials**

The McNair Program and OMSA encourage students to identify programs of interest while networking directly with faculty and admissions representatives. The office has developed a library of information about graduate schools, including the addresses of appropriate websites.

- **GRE Preparation**

During the 2010 McNair Summer Research Institute, participants completed a GRE preparation course, which included pre- and post-tests, as well as individually tailored followup exercises.

We are very pleased with the University of Illinois' McNair Program's placement record. Currently we have alumni who have attended the University of Illinois at Chicago, University of Chicago, Cornell, Indiana University, the University of Wisconsin-Madison, Duke, Harvard, Maryland at College Park, Minnesota, Ohio State, Loyola, Michigan, Indiana, the University of Pennsylvania, Penn State, Iowa, Stanford, Georgia, Florida State, Southern Illinois, Eastern Illinois, Valparaiso, SUNY Binghamton, Columbia, Northwestern, Temple, New York University, Yale, Johns Hopkins, and the University of California. The Graduate College at the University of Illinois at Urbana-Champaign has been the major beneficiary of the McNair Program.

Five Illinois alumni are local campus administrators, and three members of our faculty are alumni of our McNair Scholars program. Other alumni are faculty at Illinois State University, Illinois Wesleyan, Michigan State University, Harvard, Syracuse, and Columbia, among others.





# McNAIR SCHOLARS PROGRAM



UNIVERSITY of ILLINOIS  
at  
URBANA-CHAMPAIGN



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