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COUNTDOWN



The University of Tennessee, Knoxville
McNair Scholars Journal

Volume 2, Number 1

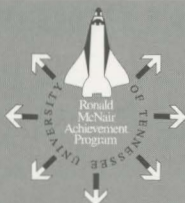


“You’re eagles! Stretch your wings to the sky.”

Ronald E. McNair, Ph.D.



Ronald Erwin McNair
1950–1986



McNair Scholars Journal

THE UNIVERSITY OF TENNESSEE RONALD MCNAIR POST-BACCALAUREATE ACHIEVEMENT PROGRAM

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Mark Cotter	Counselor
Jennifer Wright	Tutor Coordinator
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Jessica Lomax	Student Assistant

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A WORD FROM THE DIRECTOR

Higher education has increasingly been subject to the pressures of corporate America. The need to provide measurable and cost-effective services that result in quantifiable products has become common practice in higher education. At no other level than at the doctoral level has there been more of a need to demonstrate cost-effectiveness and accountability. We at the University of Tennessee's Ronald McNair Program are infinitely conscious of the great responsibility and awesome challenge that has been invested in us. Our commitment to helping replenish the academy and to diversifying the faculty is intricately linked to the mission of the University of Tennessee. We are proud of the support provided by the Dean of the College of Arts and Sciences, the Vice Chancellor for Academic Affairs, the Vice Chancellor for Business and Finance, and faculty in general.

Because many of our fine young scholars complete their undergraduate degrees at institutions other than the host institution—the University of Tennessee—follow-up and tracking becomes a more intricate and demanding challenge. This factor, coupled with the reality of a strong economy beckoning many of our best scholars to forego graduate education for the world of work, makes the McNair objective of producing Ph.D.'s even more difficult to achieve.

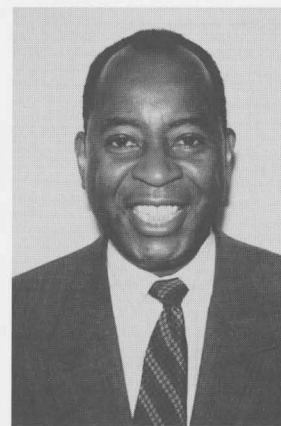
For the sake of financial utility, we have combined 1997 and 1998 research papers. The 34 abstracts of research papers produced by 1997 McNair fellows and the 34 abstracts of research

papers produced by 1998 McNair fellows represent the culmination of at least eight weeks of intensive reading, data gathering, critical thinking, technical writing, and introspective review. The work of the scholars presented in this journal also represents the efforts of instructors who labored to impart knowledge and skills in writing, research methods, the use of statistical packages, research presentation formatting, and oral presentation. We and they recognize that this is only the beginning of many a great journey into the world of research and publication. At least two of these papers have received wider publication in juried publications. We are immensely proud of the efforts of these young scholars and patiently await the production and publication of a number of well-written and salient master's theses and dissertations in the near future.

Peace,

Ronald B. McFadden

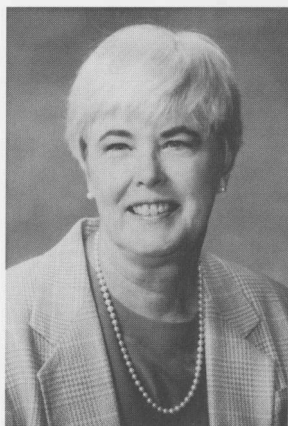
Ronald B. McFadden
Director, Ronald McNair
Post Baccalaureate
Achievement Program
The University of
Tennessee, Knoxville



A WORD FROM THE DEAN

On behalf of the faculty and staff of the College of Arts and Sciences at UTK, I am pleased to have this opportunity to congratulate the Ronald McNair Scholars on the superb quality of the research and scholarship reflected in this, the second edition of *Countdown*, the University of Tennessee McNair Scholars journal. Your diligence, insights, and innovative thinking—as reflected in these abstracts—have produced results that confirm the potential we knew you represented. Now you can be confident that you have rightfully earned a place in the scientific world of the future.

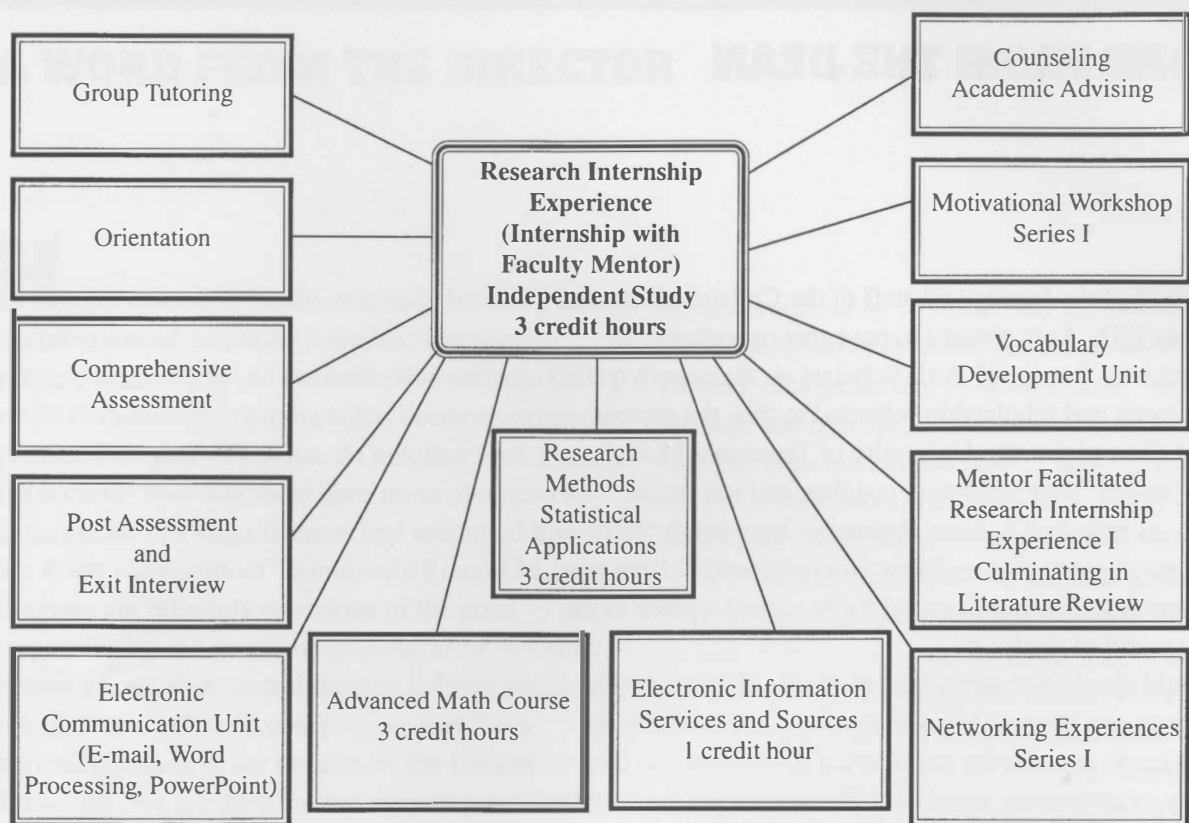
I should also like to add a note of thanks. The work you have done during the past two summers not only reflects on your own merit as a scholar but is also a direct credit to the University of Tennessee, Knoxville. We are among the very few Carnegie I Research Institutions in the Southeast, so that a major part of our mission is moving the results of research and creative thinking into the lives of ordinary citizens. Your work, then, is a direct contribution to the role this University plays in maintaining the economic and social well-being of Tennessee, the Southeast, and, indeed, of our nation as a whole. We are grateful that you have chosen to join our efforts in what we believe to be one of society's noblest enterprises.



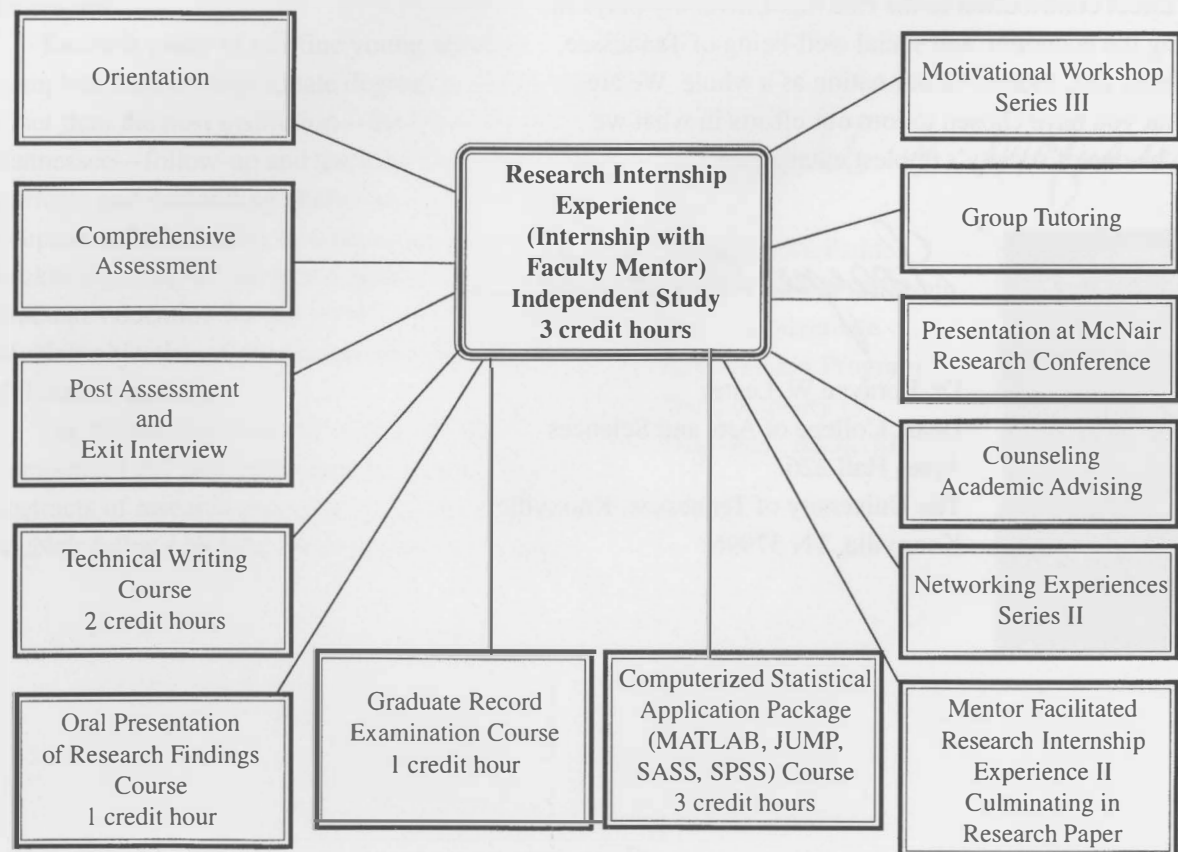
A handwritten signature in cursive script that reads "Lorayne W. Lester". The signature is written in dark ink on a light background.

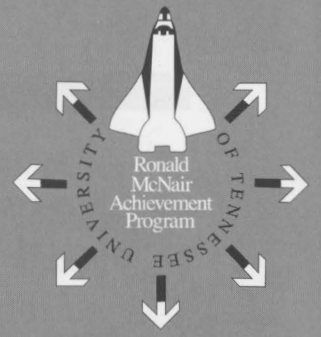
Dr. Lorayne W. Lester
Dean, College of Arts and Sciences
Ayres Hall 226
The University of Tennessee, Knoxville
Knoxville, TN 37996

SUMMER RESEARCH EXPERIENCE (LEVEL I) RISING JUNIOR



SUMMER RESEARCH EXPERIENCE (LEVEL II) RISING SENIOR

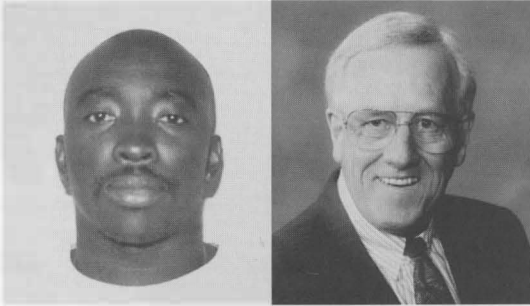




1998 SCHOLARS

abstracts

Murder for Hire— All Murderers Are Not Killers: Sentencing Disparity In Murder-for-Hire Crimes



Amancio Alicante

Dr. James Black

Amancio Alicante
Graduate
University of Tennessee, Knoxville
McNair Fellow
Summer 1998

Amancio Alicante graduated from the University of Tennessee, Knoxville in May 1998 with a B.A. degree in sociology and political science. He is currently a first-year law student at the University of Tennessee, Knoxville. In addition to his scholarly pursuits, Amancio is involved with student organizations that address cultural and international affairs.

Dr. James Black

Dr. Black is currently a Professor of Sociology and Chair of the Legal Studies Program at the University of Tennessee, Knoxville. Shortly after arriving at the University, he was named Head of the Department of Sociology and served from 1968 to 1977. His current research focus concerns the Murder-for-Hire Project, which began in the spring of 1997. The project is an in-depth study of individuals convicted of solicitation and/or conspiracy to commit murder or attempted murder with a murder-for-hire element, who are presently incarcerated in the Tennessee adult prison system.

Research was conducted on the sentences imposed on 60 individuals convicted of murder, of attempted murder, or of conspiracy and/or solicitation to commit murder with a murder-for-hire element—murder-for-hire crimes. Two objectives were pursued. The first relied upon the individual offender as the unit of analysis. The second examined the sentences of solicitors and hit men by murder-for-hire events to determine similarities and differences in their sentences.

A Comparative Analysis Between Mothers' Speech And a Speech-Language Pathologist's Speech to Young Children



Angel Green

Dr. Lori Ann Swanson

Angel Green
Junior
University of Tennessee, Knoxville
McNair Fellow
Summer 1998

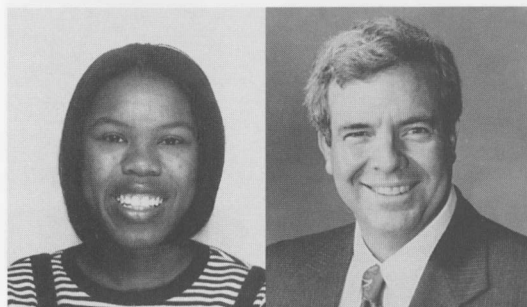
Angel Green is completing her junior year at the University of Tennessee, Knoxville, majoring in speech pathology. Angel's educational and career goals include pursuing a Ph.D. and researching youth communication disorders.

Dr. Lori Ann Swanson **Mentor**

Dr. Swanson is an associate professor in the Department of Audiology and Speech Pathology at the University of Tennessee, Knoxville. Dr. Swanson's research focus has centered on acoustic modification in mothers' speech to young children.

This study consisted of an investigation of the use of function words in one speech-language pathologist's speech to four typically developing young children. Specifically investigated variables were the overall mean length of utterance, frequency of function words, and the distribution of function words by phrase position.

Seeing Is, Unfortunately, Believing: An Examination Of Stereotypes in Advertising



Aisha Hall

Dr. David Schumann

Aisha Hall
Junior
Wittenberg University
McNair Fellow
Summer 1998

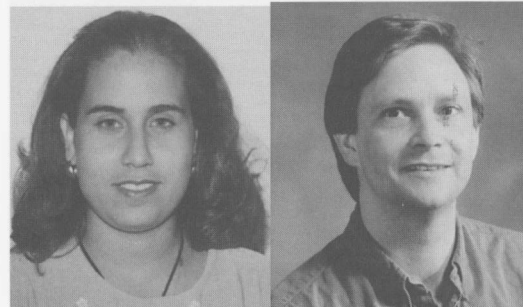
Aisha Hall is currently a junior at Wittenberg University in Springfield, Ohio, majoring in business management. Aisha is involved in a number of campus-based organizations, in most of which she holds some leadership position. Her goals are to complete her undergraduate degree, to enroll in a graduate business program, and ultimately to earn a Ph.D.

Dr. David Schumann
Mentor

Dr. Schumann is a professor and the associate dean of the Marketing Department at the University of Tennessee, Knoxville. Dr. Schumann's areas of research include consumer behavior, advertising management and marketing, and issues concerning marketing communication, with a specific focus on advertising and promotion.

Twenty-five studies were examined for evidence of stereotypical images in advertising. Stereotypes found were identified, analyzed, and categorized. The enforcement of stereotypes in society was also examined. The results suggested a change in presentation of stereotypes. It was suggested that more diversity training in the field of advertising should be mandatorily implemented. Ads should be required to come under scrutiny by a regulatory commission or governing body. Consumers should put forth efforts not to accept or support companies that use stereotypical images in their advertising. This can be accomplished by not purchasing certain products. These suggestions may not put an end to the use of stereotypical images, but they can begin the movement toward positive action in the depictions of societal groups.

The Role of the *SyrD* Gene In the Yield of Syringomycin



Cristine Heredia

Dr. Neil Quigley

Cristine Heredia
Senior
University of Puerto Rico
McNair Fellow
Summer 1998

Cristine Heredia is a native of Utado, Puerto Rico, and she currently attends the University of Puerto Rico's Rio Piedras campus. Cristine is a senior biology major, and upon completing her undergraduate studies, she plans to pursue a Ph.D. in molecular biology.

Dr. Neil Quigley
Mentor

Dr. Quigley is a research assistant professor in the Microbiology Department at the University of Tennessee, Knoxville. Dr. Quigley's research focus and/or specialty areas include bacterial molecular genetics, molecular plant-microbe interactions, and phytobacteriology.

Most strains of *Pseudomonas syringae* pathovar *syringae* (P.S. pv. *syringae*) produce the phytotoxin syringomycin (SR), which is necessary for pathogenicity. However, there is considerable variation in toxin yield among strains. It has been proposed that *SyrD*, the product of the *syrD* gene, is involved in SR secretion. Researchers introduced the *syrD* gene of a high-yield strain into a *syrD* low-yield strain. Toxin production by the resulting recombinant strain matched that of the *syrD* donor strain, not that of the parental recipient, suggesting that *SyrD* has a role in regulating SR yield, as well as in its secretion. Toxin production by the low-yield strain SY12 is unstable. The *syrD* gene of an alternative low-yield strain, JEL2000, was cloned, sequenced, and characterized to evaluate its similarity to other SR-production strains.

The Differentiation of the Pre-Adipocyte Cell Line 3T3-L1 Can Be Inhibited by Various Hormonal Treatments



Shay Hyman

Dr. Michael Zemel

Shay Hyman
Graduate
Philadelphia College of Textiles and Science
McNair Fellow
Summer 1998

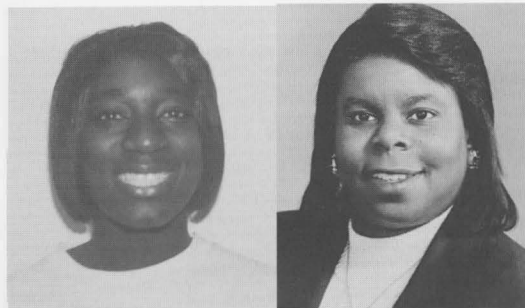
Shay Hyman received her bachelor's degree with honors from Philadelphia College of Textiles and Science in Philadelphia, Pennsylvania, in May 1998. Shay has participated in research in the areas of hormonal regulation of olfactory tissue regeneration and chemical treatments that affect adipocyte differentiation. Her long-term goals are to obtain an M.D./Ph.D degree and to focus her research efforts on nutrition and public health.

Dr. Michael Zemel
Mentor

Dr. Zemel is a professor of medicine and physiology and also head of the Nutrition Department in the College of Human Ecology at the University of Tennessee, Knoxville. Dr. Zemel's current research interest is alterations in intracellular calcium ($[Ca^{2+}]_i$) transport and metabolism that increase the susceptibility to obesity, diabetes, and hypertension.

The adipocyte is a cell that has many roles in the human body and functions as a site for energy storage and energy translation. It also helps to cushion organs and protect visceral organs that are prone to frequent impact. There are a few individuals who have an unusually high number of adipocytes. This condition, called obesity, leads to several medical problems, including heart disease and neuronal degenerative disease. Lipogenesis is the creation of fat, and the reduction of fat is called lipolysis. The balances of these two processes are negatively correlated with obesity. Hormonal treatments have been used to regulate these phenomena in genetically obese pre-adipocyte cells. Using the three treatments that were investigated, the use of statistical analyses has helped determine the best way of inhibiting the pre-adipocyte from maturing into a mature adipocyte.

Exercise, Mood, and Stress In a College Population



Tourette Jackson

Dr. Debora Baldwin

Tourette Jackson
Senior
University of Tennessee, Knoxville
McNair Fellow
Summer 1998

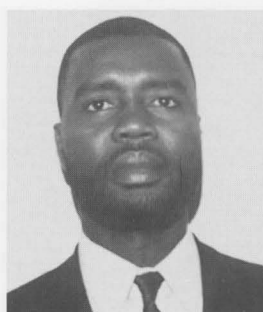
Tourette Jackson is a senior biology major at the University of Tennessee, Knoxville. After completing her undergraduate degree, Tourette plans to pursue graduate study in public health.

Dr. Debora Baldwin
Mentor

Dr. Baldwin is a professor in the Department of Psychology at the University of Tennessee, Knoxville. Dr. Baldwin's current research focus is in the interdisciplinary field of psychoneuroimmunology. Her research examines physical and psychological stressors and host susceptibility to disease.

The study investigated the effects of stress, exercise, and mood in a college population. The participants were 32 EAP/Ronald McNair students and staff members at UT. After obtaining informed consent, each participant was given a survey packet. The Student Life Events Survey was used to assess stress levels. The Exercise Profile Survey (EPS) was administered to determine a physical fitness index. The Profile of Moods Survey (POMS) was used to determine a total mood disturbance (TMD).

Fatigue Behavior on Ethylene-Octane Copolymers Produced by Constrained Geometry Catalyst



André Kipre



Dr. Roberto Benson

André Kipre
Senior
University of the District of Columbia
McNair Fellow
Summer 1997 and 1998

André Kipre is a native of the Ivory Coast, West Africa. He is currently a student at the University of the District of Columbia, in Maryland, where he is pursuing a B.S. degree in mechanical engineering. André plans to pursue a Ph.D. in mechanical engineering or biomedical engineering.

Dr. Roberto Benson
Mentor

Dr. Benson is a professor in the Department of Materials Science and Engineering at the University of Tennessee, Knoxville. Dr. Benson has conducted research on the development of artificial membranes for oxygenators, on polymers that have medical applications, on the development of bone analog, and on crack propagation in low-density polyethylene exposed to gamma-radiation.

Dynamic fatigue testing was performed on ethylene-octane copolymers prepared by the Dow Chemical Company. It was found that resistance of a material to fatigue is a function of composition, crystallinity, and molecular weight. The greater the comonomer content and the molecular weight and the smaller the crystallinity, the longer the material resists fatigue. It is important to note that the strain rate and the percent strain play a crucial role in the rate of crack growth.

Reported Sexual Behaviors And Alcohol and Other Drug Use Among Students Attending Historically Black Colleges and Universities



Judy Lubin



Dr. Susan Smith

Judy Lubin
Graduate
Emory University
McNair Fellow
Summer 1996 and 1998

Judy Lubin graduated from Florida State University with honors in May 1998 and received a B.A. degree in psychology. Judy is currently pursuing a master's degree in Public Health at Emory University, Atlanta. Goals and aspirations include obtaining a Ph. D. and focusing her research efforts on health issues affecting minority populations.

Dr. Susan Smith
Mentor

Dr. Smith is an assistant professor in the Department of Health, Leisure, and Safety Sciences at the University of Tennessee, Knoxville. Dr. Smith's research efforts to date include research on employee accident and injury reports at UTK, the incidence of carpal tunnel syndrome in sign-language interpreters, and emergency procedures and injury reporting systems at residential schools for the deaf.

The purpose of the study was to identify risk behaviors related to the use of alcohol and other drugs and sexual behaviors that may adversely effect the health and safety of African-American college students, particularly those attending historically black colleges and universities (HBCUs). The National College Health Risk Behavior Survey (NCHRBBS) was used to identify the aforementioned behavioral risk factors. Surveys were administered to a sample of 708 students enrolled in health education classes among a random sample of 11 historically black colleges and universities.

To Kill a Child: An Analysis Of Environmental Effects On Children with Asthma, Cancer, Endocrine Disruption, And Lead Poisoning



Lori Moore

Dr. Mary Ellen Rogge

Lori Moore
Junior
Alabama State University
McNair Fellow
Summer 1998

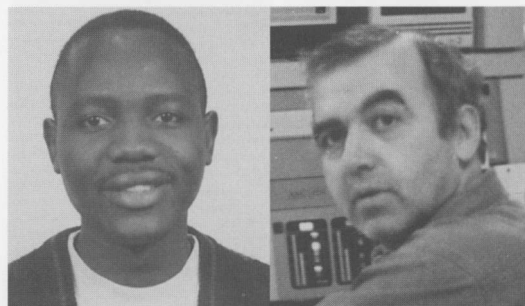
Lori Moore attends Alabama State University in Montgomery, Alabama, and her major is special education. Lori is active in a number of campus-based organizations. After completing her undergraduate studies, Lori plans to pursue a Ph.D. in audiology and speech pathology.

Dr. Mary Ellen Rogge
Mentor

Dr. Rogge is an assistant professor in the College of Social Work and a faculty associate for the Energy, Environment, and Resources Center at the University of Tennessee, Knoxville. Dr. Rogge's current research examines local, national, and international relationships among justice, social welfare, and technological and natural hazards.

Research was conducted examining chemical contaminants that drastically affect childhood diseases. By examining various forms of chemical contamination and chemical transmittal, means of controlling the spread of disease is created. The research was a qualitative literature review. Sources used included such journals as Environmental Monthly and Environmental Health Perspectives.

Proton NMR Assignment And Enzyme-Bound Structure Of the Aminoglycoside Antibiotic Paromomycin



Jules K. Mugemuzi

Dr. Engin Serpersu

Jules K. Mugemuzi
Graduate
University of Tennessee, Knoxville
McNair Fellow
Summer 1997 and 1998

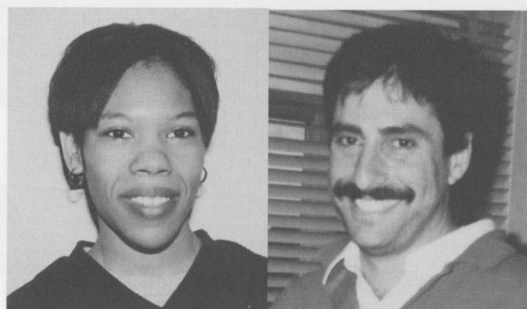
Jules Mugemuzi received a B.S. degree in biology and microbiology in May 1998. He was on honors graduate and plans to earn an M.D./Ph.D. Jules hopes to develop his skills as a researcher, focusing his attention in the area of prevention of infectious diseases.

Dr. Engin Serpersu
Mentor

Dr. Serpersu is an associate professor of biochemistry at the University of Tennessee, Knoxville. Dr. Serpersu's research focus centers on the study of the conformations of substrates and enzymes to determine the catalytic significance of the enzyme-substrate complex at a mechanistic and structural level. Dr. Serpersu's efforts are also concentrated on the understanding of enzymatic catalysis at the molecular and structural level by using NMR, computer modeling, and other biochemical/biophysical techniques, combined with site-specific mutations of the enzymes, to aid in studies of rational drug design.

Antibiotic-resistant bacteria have increased significantly in hospitals and community health settings, triggering the need for more microbiological and antibiotics research to aid in the design of new drugs and treatment strategies for bacterial infections. Aminoglycosides are a major class of antibiotics that have been used against deadly bacteria since the 1940s. Bacterial resistance through enzymatic modifications to aminoglycosides is an alarming public health problem. Nuclear magnetic resonance (NMR) is the best tool for structural studies of molecules in solution or molecules bound to an enzyme. Proton resonance assignments of the aminoglycoside antibiotic paromomycin were made using NMR methods to identify through-bond connectivities.

How Agreements Are Formed and Achieved in International Environmental Treaty- Making



Shauntynnee Penix Dr. Jeffrey D. Berejikian

Shauntynnee Penix
Senior
Fisk University
McNair Fellow
Summer 1998

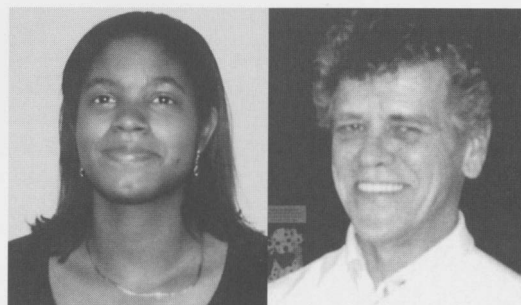
Shauntynnee Penix is a senior political science major at Fisk University in Nashville, Tennessee. Her focus area is public administration, and she plans ultimately to pursue a J.D./Ph.D. program.

Dr. Jeffrey D. Berejikian
Mentor

Dr. Berejikian is an assistant professor of political science at the University of Tennessee, Knoxville. In addition to his teaching duties, Dr. Berejikian is engaged in research on international environmental treaties and international politics.

Research was conducted to determine whether it is better to have contribution treaties or restraint treaties. The collective-action problem affects many types of environmental politics. The difference between contribution and restraint treaties was analyzed. The subjects of this research were countries currently abiding by environmental treaties. The analysis of contribution versus restraint attempted to determine whether restraint treaties were easier to negotiate than contribution treaties.

Do Male Red Pandas (*Ailurus Fulgens*) Exhibit More Inappropriate Behaviors than Female Red Pandas During Behavior Training?



Nikkiah Wyatt Dr. Richard Saudargas

Nikkiah Wyatt
Senior
University of Tennessee, Knoxville
McNair Fellow
Summer 1998

Nikkiah Wyatt is a senior psychology major at the University of Tennessee, Knoxville. Nikkiah is active in several campus-based organizations. Her ultimate educational and career goals include pursuing a graduate degree and conducting research in the field of child and family studies.

Dr. Richard Saudargas
Mentor

Dr. Saudargos is currently the director of undergraduate studies and a professor of experimental psychology in the Department of Psychology at the University of Tennessee, Knoxville. Dr. Saudargos's current research emphasis is on animal behavior training in zoos. This behavior analysis examines keeper-animal and visitor-animal interactions.

Five red pandas from Knoxville Zoological Gardens were studied to determine if male red pandas exhibit more inappropriate behaviors than female red pandas during behavior training. Behavior training is used at various zoo programs to regulate animal behavior. It is essential to the conservation of threatened species, such as the red panda. The male red pandas do not assist female red pandas in raising the offspring. The five subjects consisted of two males (one adult, one cub) and three females (one adult, two cubs).



SUMMER 1997

abstracts

Ethnic Perspectives Of Parental Attitudes and Beliefs Regarding Talking To Their Children About Cigarette-Smoking Behavior



Dee Lisa A. Cothran Dr. Eugene C. Fitzhugh

Dee Lisa A. Cothran
Senior
Tennessee State
University
McNair Fellow
Summer 1997

Dee Lisa Cothran is a senior psychology major at Tennessee State University (TSU) in Nashville, Tennessee. While attending TSU, Dee Lisa has participated in a research project devoted to studying the physiological responses of people to caffeine and other stressors. Upon graduating in May 1999, Dee Lisa plans to pursue a Ph.D. in psychology, ultimately teaching and conducting research at the collegiate level.

Dr. Eugene C. Fitzhugh
Mentor

Dr. Eugene C. Fitzhugh is an assistant professor of health, leisure, and safety sciences in the College of Human Ecology at the University of Tennessee, Knoxville. Dr. Fitzhugh's research focus area currently involves the identification of a comprehensive theoretical model of adolescent smoking acquisition, with particular emphasis on understudied populations. Dr. Fitzhugh also has ongoing research relative to work-site health promotions and school health education.

Smoking is a nationwide problem that plagues all ages. The tobacco use is responsible for many deaths in the United States and is the most preventable cause of disease in our society. Approximately one-third of all adults in the United States continue to smoke, with the prevalence being disproportionate among African-Americans, blue-collar workers, and people possessing lower levels of education. With the aforementioned knowledge that more African-American adults smoke than do European-American adults, this study aims to determine whether there are also differences in other nuances of the African-American versus European-American smoking platform. To date, no research has focused on parental perceptions of their children's smoking. This study assessed possible attitude and subjective norm differences between these two groups as they relate to adolescent smoking.

In this exploratory study, the stability of the theory of reasoned action (TRA) was exercised to assess ethnic differences of parental perceptions of their children's smoking. According to the TRA, intention to perform a behavior is defined as a function of two basic determinants, attitude and subjective norms. This attitude is the individual's positive or negative evaluation of performing the particular behavior of interest. The second determinant of intention, subjective norm, is the person's perception of social pressure to perform the behavior under consideration. This derived intention ultimately leads to the actual performance of the behavior.

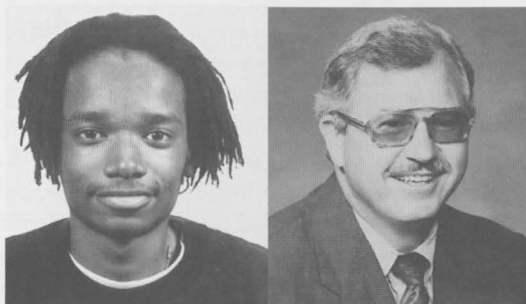
The questionnaire used nine of its questions in determining attitude beliefs and devoted five questions toward subjective norm beliefs. The questionnaire assessed the attitude beliefs and subjective norm beliefs of African-Americans and European-Americans related to talking to their children about smoking behavior in a sample of 402 parents in Knox County, Tennessee.

Data from the survey were analyzed by SAS. Variables were recorded into trichotomous levels reflecting a positive or negative belief, as opposed to the Likert-based "very likely," "somewhat likely," "not sure," etc.

The results show there is a significant difference between African-American and European-American parental attitudes and subjective norm beliefs regarding talking to their children about cigarette smoking. Two profound statements may now be made regarding this research: (1) African-Americans are slightly more than three times more likely to believe tar would not hurt and nicotine would not be addictive to their children; and (2) African-Americans are three times more likely than European-Americans to think their spouses, doctors, and children's teachers are not concerned with their talking to their children about smoking behavior. From these statements, the following graduated conclusions were made.

The overwhelming majority of research regarding youth, smoking, and parental influences on youth smoking has been done on European-American subjects. Therefore, present youth anti-smoking policies are designed according to and for European-Americans. It can now be deduced that these programs are not culturally sensitive, that they lack ethnic sensitivity, and that they are unresponsive to African-American parents and children. Perhaps blacks have not responded as positively as whites have to implemented programs that were designed by and for whites. Additional research should be done on this subject matter so that the next generation of black parents and children can have a better, more realistic perception of the actualities and consequences of youth cigarette smoking in America. The information gathered allowed us to base these results on data from the sample in Knox County. The information should be increased by additional research, due to the pertinence of this information with regard to designing effective school and community interventions that integrate positive parental influences specific to ethnicity.

Assessing Creative Potential Via the Jessup-McCallum Creativity Scale



Joseph Darnell

Dr. Steve McCallum

Joseph Darnell
Senior
Tennessee State University
McNair Fellow
Summer 1997

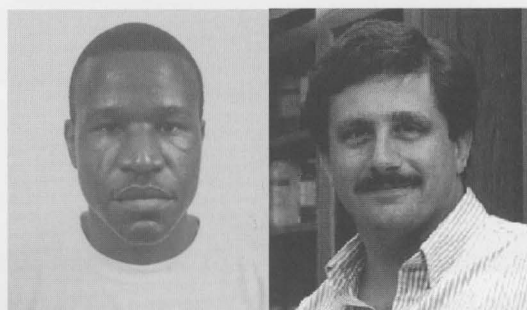
Joseph Darnell is currently completing his senior year at Tennessee State University in Nashville, Tennessee. A psychology major, Joseph has interest in pursuing graduate studies in social work or in clinical psychology. He has expressed a strong interest in becoming a college professor.

Dr. Steve McCallum
Mentor

Dr. Steve McCallum is a Professor and unit leader of psychoeducational studies in the College of Education at the University of Tennessee, Knoxville. He also serves as the director of the School Psychology Training Program in the Psychoeducational Studies Unit. Dr. McCallum's research focus involves assessment related issues and the relationship between assessment and intervention.

Creative individuals are essential in specific domains of our society, e.g., corporations seeking individuals with novel ideas to contribute toward company growth. The purpose of this study was to determine whether individuals can be identified as creative on the basis of a short self-report measurement scale developed to assess creative potential. The Jessup and McCallum Creativity Scale, a questionnaire with 60 Likert-typed items predicted to assess creativity, was given to 100 students in eighth-grade physical education classes (males and females) at a Knoxville-area middle school. For this study, creativity was defined on six subscales, each consisting of 10 items. Scores from the individual subscales were summed to produce the overall Creativity Composite Index. Correlational techniques were used to determine the validity of the subscales. It was found that the overall scale exhibited moderate to strong reliabilities; also, four of six subscales differentiated students who had produced creative products, as judged by experts, from those who had not.

Analyzing Transesterification And Mechanical Properties Of Poly(Ethyleneterephthalate)—Poly(Hydroxybenzoic Acid) And Polycarbonate Blends



Christopher Ford

Dr. Mark Dadmun

Christopher Ford
Tennessee State
University
McNair Fellow
Summer 1997

Christopher Ford is a senior chemistry major at Tennessee State University (TSU), in Nashville, Tennessee. Christopher will graduate in May 1999, and he is applying to a number of graduate schools, hoping to gain acceptance into a Ph.D. program in chemistry or pharmacology.

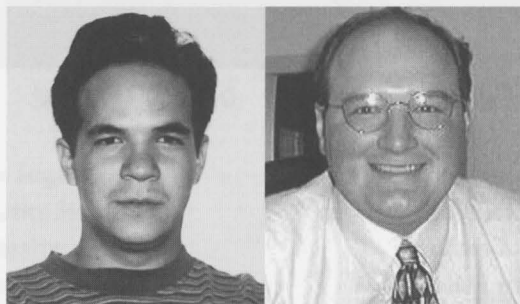
Dr. Mark Dadmun
Mentor

Dr. Mark Dadmun is an assistant professor of chemistry in the College of Arts and Sciences at the University of Tennessee, Knoxville. Dr. Dadmun's current research projects include studies of the miscible and immiscible polymer blends containing a liquid crystalline polymer; the interface between a small-molecule liquid crystal and a polymer; interfacial modification of polymer blends by addition of a copolymer; and structure and properties of chain-molecule systems under shear.

Polymer blending has been a major focus in the academic and industrial world. The primary reason for this interest is to develop polymer systems with desired properties. In particular, it would be useful to be able to produce a commercial melt-processed liquid crystal which is of high strength and light weight. There are already polymers known as thermotropic liquid crystalline polymers (TLCPs) that have these properties, but they can not be easily molded into tridimensional shapes. The current project will examine the feasibility of blending TLCPs with other flexible polymers through the process of transesterification. The process of transesterification in TLCPs such as poly(ethyleneterephthalate) poly(hydroxybenzoic acid) and polycarbonate are being studied to investigate the loss of liquid crystalline character in blends during the process of transesterification. Transesterification can be readily

facilitated, with the following possibilities: it can open a new route to compatibility and preparation of novel copolymers with degrees of randomness and composition; it can lead to a more uniform polymer by minimizing molecular-weight fluctuations in a melt stream during polymerization and process; and it can provide for chemical healing of polyester laminates. Studies show that the miscibility of the TLCs and other flexible polymers are not favorable. It was found that the miscibility between the two polymers increased with ester-ester exchange (transesterification) and temperature of annealing.

JAVA's Potential In Network Management



Roque Hernandez

Joe Gipson

Roque Hernandez University of North Carolina at Pembroke McNair Fellow Summer 1997

Roque Hernandez is a senior computer science major at the University of North Carolina—Pembroke. After graduating, Roque plans to pursue a Ph.D. in computer science. He has expressed a strong desire to be a researcher contributing to the development of new technology, and he would also like to be a college professor.

Joe Gipson Mentor

Mr. Joe Gipson currently serves as the acting director of Telecommunications and Network Services at the University of Tennessee, Knoxville. Mr. Gipson's current projects include the Internet II Initiative and the MIR Net Project, which is an international high-performance research and education network connection between the United States and Russia.

JAVA is a programming language that is being used in many areas because it has a characteristic that very few programming languages have. JAVA has portability across different platforms (e.g., IBM, Apple Mac, UNIX). Parallel to that, network managers and manufacturers of network management products have been trying to develop better ways to monitor and control the fast advancing technology of networking.

Because the JAVA programming language offers portability across different platforms, it brings about solutions to such problems as distribution of data,

remote monitoring of the network, and more graphic interactive display of information. Presently, enterprises like Sun Microsystems, Inc. (the creator of JAVA), Bay Network, Inc., Hewlett Packard, Inc., and many others are using JAVA in their network-management systems. On the other hand, this new technology can easily be misused. Therefore, it needs to be utilized with care, while keeping in mind its capabilities and limitations. Because JAVA may be misemployed, defining the areas where it should be utilized in network management is a key element in optimizing the efforts of programmers and developers who are experimenting with this new technology.

The JAVA language is highly reliable. It performs an extensive compile-time checking, followed by a second inspection of the script that is performed at the run-time level.

Programmers know that errors produced by pointers are very hard to debug. Instead of pointers, JAVA has an automatic garbage collection during run time. To achieve architecture neutrality, a programming language has to be able to run in different platforms (e.g., IBM, Macintosh, UNIX), and in different operating systems (DOS, Windows 95). To accomplish this neutrality, the JAVA compiler does not generate machine codes (like conventional languages), instead it generates bytecodes. These bytecodes are interpreted by the JAVA Virtual Machine. Furthermore, JAVA specifies the sizes of all its data types and the behavior of its arithmetic operators.

The overseeing of the health of the network must be accomplished. This is done using networking management. There have been many debates trying to define what exactly network management is responsible for. Today, the International Organization for Standardization (ISO) has defined the functional areas of network management that apply for most present systems. There are five typical functional areas of network management: configuration, fault, performance, accounting, and security. The main purpose of configuration is to monitor system configuration so that the effects on network operation of various versions of hardware and software elements can be tracked and managed. The goal of fault management is to detect, log, notify users of, and (to the extent possible) automatically fix networking problems in order to keep the network running effectively. The main objective of performance is to measure and make available various aspects of network performance so that the connectivity can be maintained at an acceptable level. Accounting, also known as distribution, is primarily concerned with measurement of the utilization of the network resources. Security involves controlling access to network resources according to local guidelines so that the network cannot be sabotaged and sensitive information cannot be accessed.

The utilization of both procedures to determine what areas of network management is JAVA most suitable for gives more confidence in the research results. Since the two methods had the same results that were the same areas of network management, the research has strong confidence in its findings. The impact that JAVA is having on network management is only enhancing some aspects of network management such as graphical interaction, data distribution, and remote monitoring of the net. Consequently, for the sole reason of being a new technology, JAVA is and will continue to be explored by programmers and manufacturers in the endless quest of enhancing their products and services.

Price Correlation in the Tomato Industry: A Comparison Of the Grower, Wholesale, And Retail Markets



Alexis Greer

Dr. Handy Williamson, Jr.

Alexis Greer
Senior
Livingstone College
McNair Fellow
Summer 1997

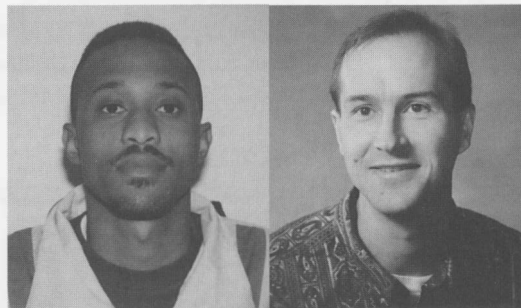
Alexis Greer attends Livingstone College in Salisbury, North Carolina, where she is majoring in business administration. After receiving her bachelor's degree, Alexis plans to pursue graduate studies in business administration.

Dr. Handy Williamson, Jr.
Mentor

Dr. Handy Williamson is a professor and head of the Department of Agricultural Economics and Rural Sociology in the College of Agricultural Sciences and Natural Resources. Dr. Williamson's research interest is in the area of international research and administration.

This research examined comparisons of prices of vine-ripened tomatoes on the shipping, wholesale, and retail levels for 1988–1996. These comparisons were examined because growers began to complain that, because retail prices don't run parallel, they may be receiving the smallest percentage of the final retail profit. Data was collected from the UTK Department of Agriculture for the average shipping level prices for October through June of the years 1988 to 1996, from the Florida Tomato Committee, from the average wholesale prices for the Market News Office for January 1988 through December 1993, and from the average retail prices from scanner data at Knoxville Kroger stores from May through December, 1988 through 1996. The data were entered on a Lotus 1–2–3 spreadsheet, and graphs were created to visually display the different price levels. Later, simple correlations were made to see exactly how the three levels corresponded. The results indicated that—although shipping and wholesale levels have an almost perfectly parallel relationship—retail prices, when compared with shipping and wholesale, tend to be non-parallel. Overall, the results indicated that retailers tend to hold prices higher longer and that growers may very well be receiving the smallest amount of profit.

Expressing Foreign Proteins Using Bacteria



Tyrus Lyles

Dr. David Hacker

Tyrus Lyles
University of
South Carolina
McNair Fellow
Summer 1997

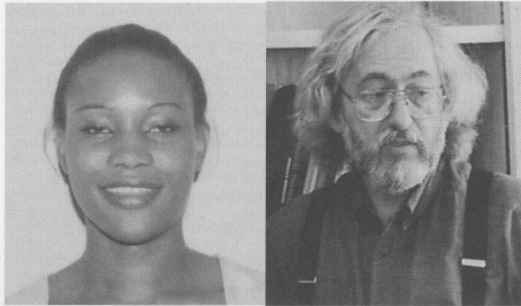
Tyrus Lyles is a 1997 graduate of the University of South Carolina, where he received a B.S. degree in biology. Tyrus is currently pursuing graduate studies in the field of health administration and public health. He has expressed interest in becoming a college professor.

Dr. David Hacker
Mentor

Dr. David Hacker is an assistant professor of microbiology at the University of Tennessee, Knoxville. Dr. Hacker received his Ph.D. from Michigan State University in 1988. His current research projects include assembly of icosahedral RNA viruses, cell to-cell movement of plant viruses, viral gene expression, and protein-RNA interactions.

DNA is essential for all organisms. DNA and proteins have a relation to one another. DNA contains the genetic material that can be found in plants, animals, and microorganisms. Plasmids are special DNA molecules found in bacteria. These bacteria could be used to introduce foreign genes into bacterial cells. The purpose of this research was to introduce foreign genes and express them in bacterial cells in order to produce the proteins of interest. Each step of the experiment has to be executed precisely to ensure accurate results. The expression of these proteins was a direct result of the bacterial cells used and the foreign genes that were introduced to these cells.

The Physiological Ethology of Stress and Creativity



Sigga Jagne

Dr. Neil Greenberg

Sigga Jagne
Kentucky State
University
McNair Fellow
Summer 1997

Sigga Jagne graduated from Kentucky State University in August 1998. Sigga is currently applying to M.D./Ph.D. programs, and she would ultimately like to engage in research in the areas of biomedical science, neuroscience, and microbiology.

Dr. Neil Greenberg
Mentor

Dr. Neil Greenberg is a professor of ecology and evolutionary biology at the University of Tennessee, Knoxville. He received his B.A. from Drew University and his Ph.D. from Rutgers University. Dr. Greenberg's current research focus areas are the causes and consequences of social stress and the ethology of teaching and learning.

Today, our world is ever changing. Since stress is generated whenever an organism experiences change in its environment, we often experience stress. If the location of the areas in the brain responsible for creativity are determined, then there may be a means of enhancing creativity in humans. Creativity involves the way we perceive, think, and act upon things.

Thus, creativity is at the ear of education, since learning involves the same processes. Learning occurs when one perceives new information, links it with already-stored memory, then retrieves this information at a certain time. Increasing creativity in an individual will also result in an increase in learning ability.

Some literature supports the theory that there are physiological similarities between some aspects of stress and creative experience, such as insight and facial recognition. It is proposed by the authors that such creative acts stimulate such physiological reactions as a rise in temperature, change in blood pressure, and pupil dilation/contraction. These reactions are similar to those that occur as a result of stress. In both cases, we believe these

phenomena are due to certain parts of the brain being activated. The authors conducted a two-part investigation to clarify which responses are common to creativity and stress and which parts of the brain are activated. The investigation was named the AHA project. (The name AHA denotes the moment when one gains a creative insight.)

Autonomic nervous system reflexes—galvanic skin response, temperature change, blood pressure change, and extent of pupil dilation—while experimental subjects were engaged in a test of creative behavior were first examined. Subjects were seated in front of a computer/television screen with an unknown, shapeless image. They were given buzzers and asked to press them as soon as they recognized the image. The images gradually took the shape of the face of a celebrity. Autonomic responses of subjects were measured while they were trying to determine the image. Their electroencephalograph (EEG) was recorded in order to measure the electrical fields produced by brain neuron activity. Positron emission tomography (PET) and magnetic resonance imaging (MRI) were used to identify the parts of the brain activated when subjects experienced creative insight. PET measures the location and amount of physiological activity in the brain. The subject was injected intravenously with radioisotope oxygen-15. The MRI scans detected areas in the brain that were activated.

The results of this experiment yielded that, as the subjects' problem-solving proceeds, a gradual increase in activation of the sympathetic nervous system peaks just before the moment of conscious insight. EEG readings indicated activation of the temporal area of the cerebral cortex. It is believed that a person subconsciously gains insight into a problem before they consciously realize that they had actually done so. The sympathetic nervous system is gradually activated at the moment that the subject subconsciously gains insight and peaking occurs just before the moment of conscious insight.

Intracellular Calcium Regulation of Triglyceride Synthesis in Human Adipocytes



Dana Mason-Owens Dr. Michael Zemel

Dana Mason-Owens Tennessee Technological University McNair Fellow Summer 1997

Dana A. Mason-Owens is a Knoxville native and a 1997 graduate of Tennessee Technological University with a B.S. in chemistry (biochemistry concentration and food, nutrition, and dietetics minor). Currently, she is pursuing her M.A. in education at Tennessee Technological University and will graduate in the fall of 1999. After finishing her degree, she plans to attend medical school or pursue a Ph.D. in nutrition.

Dr. Michael Zemel Mentor

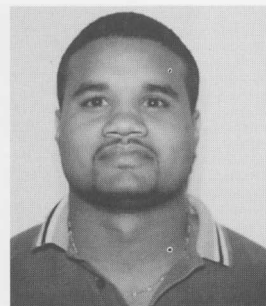
Dr. Zemel is a professor of medicine and physiology and also head of the Nutrition Department in the College of Human Ecology at the University of Tennessee, Knoxville. Dr. Zemel's current research interest is alterations in intracellular calcium ($[Ca^{2+}]_i$) transport and metabolism that increase the susceptibility to obesity, diabetes, and hypertension.

This research defined guidelines for a pilot study in which the main purpose was to determine whether varying intracellular calcium concentrations, ($[Ca^{2+}]_i$), would affect triglyceride synthesis in human fat cells. The author proposed that agouti stimulation, caused by $[Ca^{2+}]_i$, may result in increased triglyceride synthesis by a Ca^{2+} -dependent mechanism because (1) human agouti protein, cloned five years ago, is 85% homologous to the mouse agouti protein, (2) agouti stimulation of Ca^{2+} influx results in FAS stimulation in A^y mice, and (3) there was a high correlation between $[Ca^{2+}]_i$ and the degree of obesity in dominantly agouti-allele mice. Human adipocytes were treated for 48 and 72 hours with Calcium A.

Elderly African-American Men's Service Use

Alexander Santos State University of New York College at Brockport McNair Fellow Summer 1997

Alexander Santos is a 1998 graduate of the State University of New York—Brockport, where he received a Bachelor of Science degree in nursing. Alex's goals include pursuing a Ph.D. in nursing and teaching at the college level.



Alexander Santos

Dr. Inez Tuck Mentor

Dr. Inez Tuck was previously as associate professor in the College of Nursing at the University of Tennessee, Knoxville. During her tenure at UTK, Dr. Tuck's research focus included a study on Chronic Fatigue Syndrome and the effectiveness of parish nursing. She is currently an associate professor and chair of the Department of Community and Psychiatric/Mental Health Nursing at Virginia Commonwealth University. Her current research concerns parish nursing.



Dr. Inez Tuck

Dr. Debra Wallace Mentor

Dr. Wallace is an Associate professor of nursing in the College of Nursing at the University of Tennessee, Knoxville. Dr. Wallace's research focus areas include the effectiveness of parish nursing, cardiovascular disease in minority elders, psychometric properties of the quality-of-life index, the cultural context of caregiving with elders, and black and white diabetic elders' use of home- and community-based services.



Dr. Debra Wallace

The purpose of this research was to determine differences in number, type, and predictors of community-based service use among African-American elders. Existing data from a regional area agency on aging were used, and the sample ($N=251$) included vulnerable elderly African-American men. The data shows that the services most frequently used were case management, congregate meals, outreach, home-delivered meals, commodity distributions, homemaker services, transportation, and recreation. The services that will be assessed for predictors of use are home-delivered meals, commodity distributions, homemaker services, and recreation. Residence, transportation capability, payment distributions, homemaker services, and recreation were also assessed as predictors of use. Residence, transportation capability, payment source, and function were the most frequent predictors of use.

Policy Practice and Experiential Learning In Social Work



Cynthia Poole-Honoré

Dr. Cynthia Rocha

Cynthia Poole-Honoré
Southern University at New Orleans
McNair Fellow
Summer 1997

Cynthia Poole-Honoré is a graduating senior at Southern University at New Orleans in Louisiana. She is a social work major and is pursuing enrollment in an MSW program. Cynthia would like to pursue a Ph.D. in public health administration, in which she plans to teach at the college level.

Dr. Cynthia Rocha
Mentor

Dr. Cynthia Rocha is an assistant professor of social work in the College of Social Work at the University of Tennessee, Knoxville. Dr. Rocha's current research efforts include a study that examines the impact of plant closings on family well-being and research in the area of health-care reform.

Social work has been said to have a scientific base. However, when social workers have to become advocates for the clients they serve, they become policy practitioners. If experiential learning increases political activity for social workers, social work educators should learn to incorporate this method into their curriculum. Does the use of experiential learning (also referred to as action learning) in a policy practice course increase political activity in post-education for future social workers? This research addresses the problem of future social workers' training for becoming active in policy change.

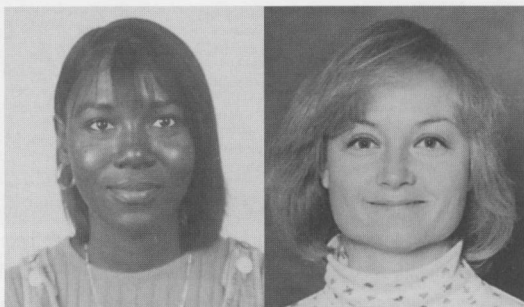
Many social work educators have written about the need for preparing students for political activity and leadership roles in the community but have still not identified a concrete method of teaching skills and strategies for changing policies. One problem in policy education is related to the selection of interdisciplinary knowledge and skills for the curriculum. The lack of information and training in policy practice leaves the graduates of social work uncertain about their expertise and easily paralyzed by the common misconception that social policies are dictated by economic imperatives that cannot be altered. However, social workers' commitment is to advocate for the interest of deprived constituencies. For social workers to achieve social justice,

they must have direct involvement in the formation and modification of social policy.

The population selected for this research study consisted of 119 MSSW students who graduated from the University of Tennessee, Knoxville between the fall of 1994 and the spring of 1996. A mail-out survey was distributed to each of them. This survey was designed to measure the values, self-reported levels of competency, and activity levels related to social policy skills of students who participated in the experiential class, as well as those who did not. There were three sections of the survey that were used to calculate value, competency, and professional and personal political activity.

The results of this experiment revealed that there is a significant difference in the competency level and personal political activity of those who took the experiential learning and those who had traditional learning. There is not a statistical difference in the value level and professional political activity. Therefore, more studies should be conducted to determine whether there is a practical or educational significance in the value level and the professional political activity of students who had policy practice with experiential learning as a primary mode of teaching. If social work educators integrate experiential learning in their curriculum and if experiential learning enhances the personal political activity of students, that will help educators graduate more policy-informed and policy-active professionals. Experiential learning is a method that should be integrated in the policy practice curriculum. This method can be utilized in many ways by educators to teach skill-based courses. It is imperative that students who graduate in social work have the knowledge base as well as the skills to create change. This method of teaching may have a great significance for the education of future social workers.

Effects of Tillage, Row-Spacing, And Cultivars on Microbial Parasites of the Soybean Cyst Nematode As It Relates to Sudden Death Syndrome Of Soybeans



Latonja Slaughter

Dr. Bonnie Ownley

Latonja Slaughter
Jackson State
University
McNair Fellow
Summer 1997

Latonja Slaughter is a graduate of Jackson State University, where she received a bachelor's degree in biology. After graduating, Latonja went on to pursue a master's degree in environmental science at the University of Alabama, Birmingham. She plans to continue into a Ph.D. program, and she has expressed her desire to be a college professor and ultimately to lead her own research team.

Dr. Bonnie Ownley
Mentor

Dr. Bonnie Ownley is an associate professor of entomology and plant pathology in the College of Agricultural Sciences and Natural Resources at the University of Tennessee, Knoxville. Dr. Ownley's research includes studies on biocontrol and epidemiology of soil-borne plant pathogens and ecology and populations dynamics of soil microorganisms.

Sudden Death Syndrome (SDS) of soybeans is a growing problem for soybean farmers in the United States. The disease is caused by a blue-pigmented fungus, *Fusarium solani*. The problem is worsened by certain environmental factors, such as cool temperatures and too much moisture. Three of the main variables affecting the disease are tillage, cultivars, and the soybean cyst nematode (SCN). Tillage practices are conventional till, in which the top layer of soil is mixed, and no-till, in which the soil is not disturbed. Cultivars are different varieties of soybeans.

The soybean cyst nematode is one of the main pests affecting soybeans in the United States. When coupled with the soilborne pathogen *F. solani*, it is extremely hazardous to soybeans. The disease causes a decrease in crop yield for farmers, which in turn affects the market value of the bean, as well as the

availability of the crop. This disease is a relatively new observation, but many researchers are searching for ways to control it. No fungicide is effective against the causal pathogen; the only control method currently available to growers is the use of resistant cultivars.

The purpose of this study was to conduct a microbiological survey of the SCN for parasites and to determine the relationship between treatment (tillage, row-spacing, and cultivars) and microbial parasites of the SCN for possible biocontrol agents of sudden death syndrome (SDS) and the SCN. Biocontrol agents will allow farmers to control SDS, which currently causes a much lower crop yield than expected. In this experiment, soybean cysts were isolated from soil and transferred to prepared media in an effort to determine what species of microorganisms would arise from the cysts.

Researchers planted soybeans at the Milan (Tennessee) Experiment Station in a Falyoa silt loam (pH 6.3) on May 16, 1996. Plots were either conventionally tilled or no-tilled, and row spacing was varied with either 7.5 inches or 30 inches between each row. The two cultivars of soybeans planted were either resistant or susceptible to SDS. Soil samples were taken from each plot and labeled with repetition number (1–6) and treatment (tillage, row-spacing, or cultivar).

Cysts were extracted from each soil sample using the centrifugal sugar flotation method. The cysts were then examined under a dissecting microscope and removed individually from the soil using a 20-lambda mm³ pipette. The cysts were then placed into test tubes filled with 4 ml of sterile deionized water. Each test tube was marked with the number of the soil from which the cysts were extracted (to reduce confusion). After incubation, the plates were examined for microorganisms. After the organisms had time to grow they were identified.

The results of this research indicated that there was a significant difference in the amount of the fungus *Phytophthora* when the variable was tillage. The SCNs from the no-tilled soil had a significantly higher amount of *Phytophthora*. This may be due to the higher moisture content in the no-tilled system. The data also indicated that there was a significantly higher amount of the fungus *Fusarium* in the SCNs from the cultivars that are susceptible to sudden death syndrome. Because disease development and severity are greatly increased with the presence of the cyst, a biocontrol for the cyst may actually lessen the severity and development of the disease.

Sudden death syndrome of soybeans is a very important issue. Until some kind of control mechanism is found for the disease, farmers will continue to have lower yields and lower crop quality. This is a problem because the soybean has such a wide variety of uses, including food for humans and animals.

The Purification of cDNA Of Jun and Fos Plasmids In Preparation for Transfection



Zakia Williams

Dr. Wesley Wicks

Zakia Williams

Rust College

McNair Fellow

Summer 1997

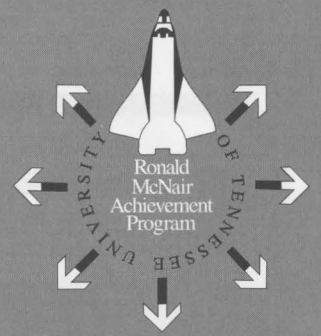
Zakia Williams is a 1996 graduate of Rust College in Holly Springs, Mississippi, where she received a bachelor's degree in biology. She is currently enrolled in graduate school at the University of Mississippi in Oxford, where she is pursuing a master's degree in health and wellness. Zakia plans to pursue a Ph.D. in a health-related field upon completion of her master's program.

Dr. Wesley Wicks

McNair

Dr. Wesley Wicks is a professor of biochemistry and molecular molecular biology in the College of Arts and Sciences at the University of Tennessee, Knoxville. Dr. Wicks is currently engaged in research on control of gene expression, DNA binding proteins, and protein phosphorylation.

The purpose of this research was to create the necessary conditions to transfect cDNA of Jun and Fos plasmids (Jun and Fos) into mammalian cells. Such a transfection would allow for investigation into the mechanisms by which transcription factors in the development of the immune system. A major part of the experimental design used to create the appropriate conditions was the purification of cDNA of Jun and Fos. The chloroform was used to separate the bands of cDNA for both Jun and Fos.



FELLOWS OF THE '97 AND '98 PROGRAMS

a brochure

McNair Fellows, Summer 1997

Nikita Armstrong (Agricultural Business, Sophomore)

University of Tennessee, Knoxville

Mentor: **Dr. Handy Williamson, Jr.**, Professor of Agricultural Economics

University of Tennessee, Knoxville

"An Analysis of the Tomato Market: A Price Comparison of Shipping, Wholesale, and Retail Levels"

The purpose of this study was to examine the price differences that occur between the shipper, wholesaler, and retailer in the tomato industry.

Alicia Bonaparte (Sociology, Senior)

Spelman College

Mentor: **Dr. Thomas Hood**, Professor of Sociology

University of Tennessee, Knoxville

"How the Social Problem Known as Toxic Pollution Evolved as a Social Problem During a 40-Year Period"

This analysis entailed an investigation of articles concerning seven researcher-constructed themes.

Abram Brown (Occupational Therapy, Junior)

Tuskegee University

Mentors: **Dr. Debra Wallace**, Associate Professor

University of Tennessee, Knoxville

Dr. Inez Tuck, Associate Professor and Chair of the Department of Nursing Systems, Community and Psychiatric/Mental Health Nursing
Virginia Commonwealth University

"Functional Difficulties Among Elderly African-American Men"

The purpose of this study was to determine the level of activities of daily living (ADL) and instrumental activities (IADL) difficulties in the elderly African-American male population.

Kenneth Buck (History, Graduate)

Livingstone College

Mentor: **Lorman Ratner**, Professor of History

University of Tennessee, Knoxville

"The Republic As Witnessed by the Clergy, 1856-1863"

The purpose of this research was to explore the ideas of the American Republic from the point of view of northern and southern clergy.

Pamela Cannon (Psychology, Senior)

Tennessee State University

Mentors: **Dr. Bridgett Bellot**, Psychologist, and

Dr. Suzanne Newbold, Psychologist, Student Counseling Services

University of Tennessee, Knoxville

"What Brings You Here Today? Changing Trends of Problems Presented at University Counseling Centers"

This study investigated the reasons why counseling centers are receiving visits from students with more serious problems.

Equana Cooper (Political Science, Junior)

Rust College

Mentor: **Dr. Anthony Nownes**, Professor of

Political Science

University of Tennessee, Knoxville

"Are There Different Voting Patterns Between African-American Men and Women?"

The research examined voting patterns to determine whether a difference in fact exists.

Cambrean Gray (Agricultural Business,

Sophomore)

University of Tennessee, Knoxville

Mentor: **Dr. Handy Williamson, Jr.**, Professor of Agricultural Economics

University of Tennessee, Knoxville

"A Price Correlation in the Tomato Industry: A Comparison of the Grower, Wholesale, and Retail Markets"

This study focused on the price adjustments between the FOB (shipping), wholesale, and retail levels for fresh tomatoes.

Lisa Jones (Biology, Junior)
 University of North Carolina, Pembroke
 Mentor: **Dr. Lisa Pullen**, Assistant Professor, College of Nursing
 University of Tennessee, Knoxville
“Utilization of Health Services”
The purpose of this study was to determine the differences in the number, type, and predictors of community-based services used among elderly African-American males.

Patrick Mobley (History–Liberal Arts, Junior)
 Livingstone College
 Mentor: **Dr. John Hodges**, Associate Professor of Religious Studies
 University of Tennessee, Knoxville
“The Color Line and the Law”
This research investigated court cases in which color was a major factor for both the plaintiff and the defendant, focusing on transportation, education, and white-female–black-male relationships.

Terita Norton (Electrical Engineering, Sophomore)
 Florida State University
 Mentor: **Dr. Igor Alexeff**, Professor Emeritus of Electrical Engineering
 University of Tennessee, Knoxville
“Microwaves and the Effect of Corona Discharge on Non-woven Fabrics”
The purpose of this research was to electrically charge plastic cloth in an attempt to form electrostatic charges that would last for years.

Terri Norton (Civil Engineering, Junior)
 Florida State University
 Mentor: **Dr. Marianne Breining**, Professor of Physics
 University of Tennessee, Knoxville
“The University of Tennessee Internet Spectograph Experiment”
The purpose of this research was to show that the Internet can effectively be used as a teaching tool by developing a World Wide Web–based physics experiment for high school students.

Adisa Onu (Computer Science, Sophomore)
 Southern University
 Mentor: **Dr. Christian Halloy**, Director, Joint Institute for Computational Science (JICS)
 University of Tennessee, Knoxville
“Parallel Systems”
This research entailed an investigation the most efficient methods of harnessing the power of parallel computing.

Charles Pagan (Mathematics, Junior)
 Xavier University of Louisiana
 Mentor **Dr. George Siopsis**, Assistant Professor of Physics
 University of Tennessee, Knoxville
“The Production and Decay of the Higgs Particle”
The purpose of this project was to determine if there is a fifth force in the universe called the Higgs Particle.

Chavis Rachel (Business Management, Sophomore)
 University of North Carolina, Pembroke
 Mentor: **Dr. David Patterson**, Associate Professor and Director of the Graduate School of Planning
 University of Tennessee, Knoxville
“Comparing Poor Blacks and Poor Whites in Knox County”
The purpose of this research was to determine whether there were significant differences between poor whites and blacks in the areas of educational attainment, household incomes, and children in poverty.

Levi Ross (Psychology/Sociology, Junior)
 University of West Florida
 Mentor: **Dr. Warren Jones**, Professor of Psychology
 University of Tennessee, Knoxville
“Assessment of Attitudes Toward Mixed-Race Individuals”
The purpose of this study was to investigate whether differences exist in the level of prejudiced attitudes toward the various combinations of mixed-race individuals in the United States.

Cora Smith (Psychology, Junior)

Wittenberg University

Mentor: **Dr. Rhoda Barnes**, Assistant Professor,
Rehabilitation and Deafness Education

University of Tennessee, Knoxville

**“Family Income Influences Parent Involvement
with Children’s Schooling”**

This study investigated the effects of African-American parents’ socioeconomic status on their involvement with their children’s schooling.

Lawanda Talley (Mathematics and Computer
Science, Junior)

Tennessee State University

Mentor: **Alden Coleman**, Team Leader, Computing
and Academic Services

University of Tennessee, Knoxville

“Is Society Ready for Electronic Commerce?”

This research proved that virtual enterprise by means of electronic commerce is an excellent business tool for society and that the Internet is the best way to perform this operation.

Elton Thomas (Political Science, Junior)

Livingstone College

Mentor: **Dr. Jeffery Berejikian**, Associate Professor
of Political Science

University of Tennessee, Knoxville

“Who Wins in Economic Disputes?”

This research will examine the politics involved in economic disputes using existing international political theories of realism and two-level games to investigate how and why international threats determine the victor of economic disputes.

Mia Williams (Biology, Junior)

Knoxville College

Mentor: **Dr. Roberto Pereira**, Associate Professor of
Entomology and Plant Pathology

University of Tennessee, Knoxville

“Isolation of Entomopathogenic Fungi from Soil”

*Using a selective medium, the entomopathogenic fungi *Beauveria bassiana* and *Metarhizium anisopliae* were isolated from seven types of soil.*

Tommie Young (Psychology, Senior)

University of Tennessee, Knoxville

Mentor: **Dr. Pearl Gordon**, Associate Professor of
Audiology and Speech Pathology

University of Tennessee, Knoxville

**“Speech-Associated Attitudes of Non-Stuttering
African-American Adults”**

The purpose of this research studied the speech-associated attitudes of non-stuttering African-Americans using Andrews’ and Cutlers’ S-24.

McNair Fellows, Summer 1998

Erika R. Artis (Psychology, Graduate Student)

Spelman College

Mentor: **Dr. Cynthia Rocha**, Associate Professor of Social Work

University of Tennessee, Knoxville

"The Effects of Plant Closings on Individual Well-Being"

The aim of the study was to measure the effects of plant shutdowns on well-being.

Adrienne Bailey (English, Senior)

Bennett College

Mentor: **Dr. Janet Atwill**, Associate Professor of English

University of Tennessee, Knoxville

"Analysis for Mammy Stereotypes"

This paper served to raise questions and review the literature about the image of black females in film as it relates to the mammy stereotype.

Candis M. Cox (Finance, Junior)

University of Tennessee, Knoxville

Mentor: **Dr. Harold A. Black**, Professor of Finance
University of Tennessee, Knoxville

"The Effects of Consumer Lending: A Measure of Thrifts' Risk and Common Stock Returns"

This paper studied the effects consumer lending has on the thrift industry.

Blanca I. Diaz Perez (General Sciences, Junior)

University of Puerto Rico

Mentor: **Dr. Neil Greenberg**, Professor of Ecology and Evolutionary Biology

University of Tennessee, Knoxville

"Innovations As a Coping Strategy for Stressful Environments"

This study suggested that innovative behaviors in animals are triggered by environmental changes.

Jeannette Y. Drayton (Biology, Sophomore)

Kentucky State University

Mentor: **Dr. Neil Greenberg**, Professor of Ecology and Evolutionary Biology

University of Tennessee, Knoxville

"Does Stress Affect Creativity?"

This study sampled 15 people who volunteered to have their electrodermal responses tested to get some clarification as to whether stress has an effect on creativity.

Juliana Dykes (Anthropology/Religious Studies, Junior)

University of Tennessee, Knoxville

Mentor: **Dr. Richard Jantz**, Professor of Anthropology

University of Tennessee, Knoxville

"Proposal to Analyze the Heinz Data"

This study analyzed the existing dermatoglyphic data by genetic, geographic, and language distance comparisons within and between the represented Native American groups.

Bryan T. Fisher (Psychology, Junior)

Tennessee State University

Mentor: **Dr. Engin Serpersu**, Associate Professor, Biochemistry/Cell and Molecular Biology

University of Tennessee, Knoxville

"Separation, Identification, and Purification of Aminoglycosides Antibiotics"

The purpose of this research was aimed at separation of enzymatically modified aminoglycosides for the study of the characterization and elucidation of each modified aminoglycoside structure.

Melissa Floyd (Psychology, Junior)

Livingstone College

Mentor: **Dr. Thomas Hood**, Professor of Sociology
University of Tennessee, Knoxville

"Beauty: At What Cost?"

This research focused on the two factors of beauty, personal assessment and social interaction, within the American culture.

LaTonya Foreman (Guidance/Counseling, Graduate Student)

Middle Tennessee State University

Mentor **Dr. Mark Hector**, Professor of Rehabilitation and Deafness Program
University of Tennessee, Knoxville

“The Use of Existential Phenomenology in Research”

This study presented existential phenomenology as an alternative or as a desirable tool in performing research.

Rahman Gardner (Criminal Justice, Graduate Student)

Livingstone College

Mentor: **Dr. James Black**, Professor of Sociology
University of Tennessee, Knoxville

“Murder for Hire...Hittin’ on the Hit Man”

The purpose of this research was to open the eyes of the public to this hidden element of murder.

Quarean Gray (Mathematics, Sophomore)

University of Tennessee, Knoxville

Mentor: **Mr. Alden Coleman**, Team Leader, Computing and Academic Services
University of Tennessee, Knoxville

“The Advantages and Disadvantages of Electronic Commerce”

This research examined electronic commerce and the relationship between the consumer and the supplier.

Chrystal A. Osborn (Mathematics, Sophomore)

St. Paul’s College

Mentor: **Dr. Marianne Breinig**, Professor of Physics
University of Tennessee Knoxville

“Testing Central: An Online Survey and Testing System”

This research paper presented an online survey and testing system called Testing Central.

Evrose Philias (Health Science, Senior)

University of Florida

Mentor: **Dr. Susan M. Smith**, Assistant Professor, Health, Leisure, and Safety Sciences
University of Tennessee, Knoxville

“Reducing the Risk of Carpal Tunnel Syndrome in Sign Language Communicators”

This study examined the significance of certain risk factors as they relate to the occupational use of sign language.

Aireka Reeves (Sports Medicine/Pre-Pharmacy, Junior)

Eastern Michigan University

Mentor: **Dr. Debra Wallace**, Associate Professor, College of Nursing
University of Tennessee, Knoxville

“Factors Related to Length of Stay and Survival in Sepsis Study Patients”

The objective of this research was to determine the factors that are associated with the length of stay and survival in sepsis study patients.

Anthony Rutherford (English Education, Sophomore)

Livingstone College

Mentor: **Dr. Janet Atwill**, Associate Professor of English

University of Tennessee, Knoxville

“The Migration to Chicago by Southern African-Americans Between the Years of 1900 and 1920: How Successful Were They?”

The research analyzed the migration and success rate of Southern African-Americans who migrated to Chicago during the early 1900s, examining the following factors: lynch mobs, a dependent agricultural system in the South, and unfair, unethical treatment.

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COVER PHOTO: UTK McNair graduate school visit to Washington, D.C., Spring 1998. Pictured are the McNair Fellows, the McNair staff, and Sen. Fred Thompson (R) of Tennessee.