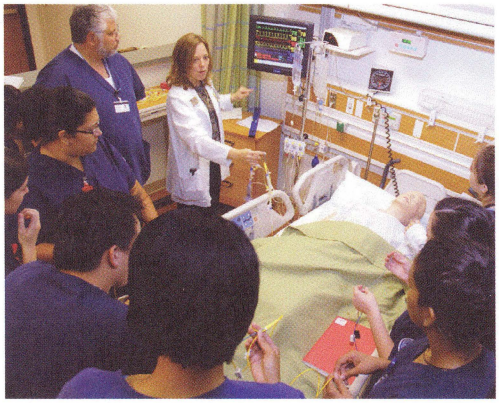
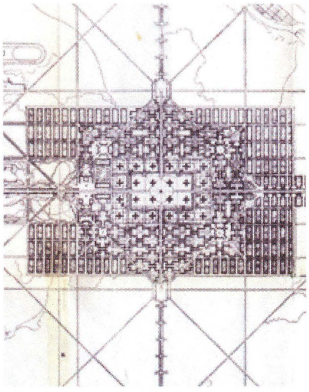
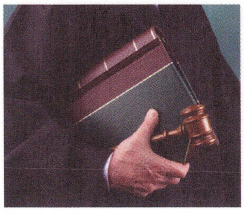
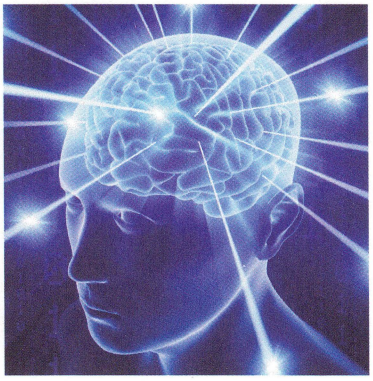
McNair Research Journal



Summer 2012 • Volume 16

THE UNIVERSITY OF TEXAS AT ARLINGTON

The Ronald E. McNair Postbaccalaureate Achievement Program is a federally funded TRiO program.

The McNair Research Journal is the annual research publication of the Ronald E. McNair Postbaccalaureate Achievement Program (McNair Scholars Program), a TRiO Program funded by the U.S. Department of Education, at The University of Texas at Arlington.

McNair Research Journal

THE UNIVERSITY OF TEXAS AT ARLINGTON

Summer 2012 • Volume 16

Message from the Vice President for Research

The complexity of our world surrounds and astonishes us. Complexity is found in our solar system down to the smallest organisms. Complexity permeates mass social systems, family dynamics, and individual personalities. It is literally everywhere. When we want to understand complex systems, we look to experts, who are almost always found in universities.

After years of rigorous academic training with mentors, a new generation of scholars emerges to unravel the complexities of our world. This process of grooming a student to become a scholar is in itself a complex and intricate process. It is what lies at the foundation of the McNair Scholars Program.

The University of Texas at Arlington has been a supporter of the McNair program for more than twenty years. Students who aspire to graduate study and meet the requirements are paired with faculty mentors who work closely with them. One key objective is to transfer the skills of inquiry via the research project from successful faculty members to newly emerging scholars. Along the way, so much more happens. Students develop lasting relationships with their mentors, discover the ability for sophisticated scholarly inquiry, and see the possibilities available to them. This experience is truly transformative for McNair Scholars.

On behalf of UT Arlington, I wish to congratulate each Scholar on your acceptance into this program and note the impressive work each of you completed under the supervision of your faculty mentor. I also extend a special note of thanks to our faculty for the important contributions they made to creating the next generation of scholars through their mentorship.

I would recommend that each of us remember the names of the Scholars listed in this journal because I fully expect that we will see more than one of them contributing to their discipline in the years to come. Congratulations on your achievement.

Carolyn L. Cason, RN, Ph.D.
Vice President for Research

Notes from the Director

During the last academic year, the McNair Scholars Program once more had the opportunity and pleasure to become acquainted with a group of very talented and motivated undergraduates from a diversity of disciplines. During the spring semester, the 2012 McNair research interns selected mentors who assisted Scholars to identify their individual research topics and to design their projects. Where required, Scholars submitted their proposals to the appropriate campus research review boards for approval. The McNair Research Institute and subsequent seminars and workshops provided them with guidance in academic research. Classes in verbal, analytical writing, and quantitative reasoning helped students prepare to take the Graduate Record Exam (GRE). However, the primary focus of their summer activities remained the implementation of the research design.

UT Arlington McNair researchers experienced a busy spring and intense summer marked by both challenges and rewards. With the support of their mentors, their peers and program staff, the 2012 McNair interns completed their papers and presented their findings in early August to an audience of faculty, staff, fellow students, family, and friends. Summer activities were followed by the annual research banquet, which celebrated the success of the interns and recognized their mentors' contributions.

I congratulate our interns on their creativity and dedication in the last six months. The skills they have developed will aid them as they make the transition to graduate study. In the meantime, they continue to benefit from the guidance of their mentors as they prepare for advanced study leading to the Ph.D. and an academic career.

For more than two decades, The University of Texas at Arlington community has been generous to this program. I would especially like to thank President James D. Spaniolo, Provost Ronald L. Elsenbaumer, former Senior Vice Provost Michael K. Moore, and Associate Director of the Library Julie Alexander for their support. Their continued commitment is an important element in the funding of the UT Arlington McNair Scholars Program for an additional five years.

Joan W. Reinhardt

Joan W. Reinhardt, Ph.D.
Director of McNair Scholars Program

McNair Scholars Program

The McNair Scholars Program (officially known as the Ronald E. McNair Post-Baccalaureate Achievement Program) came to the campus of The University of Texas at Arlington in 1990. At that time the U.S. Department of Education funded a grant proposal submitted by Kathryn Head, director of the federal Student Support Services program. The new program, created by the U.S. Congress in 1988, honored Dr. Ronald E. McNair, who had tragically perished with his fellow astronauts on the space shuttle Challenger two years earlier.

Dr. Ronald E. McNair, Scientist & Astronaut, 1950-1986

The McNair program endeavors to assist talented undergraduates—either first-generation/low-income or underrepresented students (African American, Hispanic, Native American)—to prepare for graduate study leading to the Ph.D. and the professoriate. McNair Scholars follow in the footsteps of Dr. McNair, who came from a modest African-American family in a small South Carolina town. He tenaciously pursued his dream of a life in science, earning a Ph.D. in physics at the age of 26 from the prestigious Massachusetts Institute of Technology and later joining NASA.

Since its beginning at this institution, the McNair program has encouraged and assisted more than three hundred students in various majors with their preparation for graduate study. UT Arlington McNair graduates have subsequently earned masters and doctorates not only from their alma mater but also from an impressive array of universities including Indiana University, the University of Pennsylvania, Rice University, the University of Michigan, and Southern Methodist University, among others.

Currently the UT Arlington McNair Scholars Program works with a minimum of thirty students each academic year, providing seminars and classes on topics relating to graduate school and the GRE, a May institute to heighten Scholars' understanding of the culture of research, and the opportunity to engage in a summer research internship (supported by a $3,000 stipend) as rising seniors. The program also provides guidance with the graduate school application process and travel funds for Scholars to participate in McNair (or professional) conferences and to visit prospective graduate programs.

The McNair Scholars Program enjoys strong support from the UT Arlington administration and greatly benefits from the expertise and enthusiasm of both faculty and staff. Faculty members who serve on the McNair Selection Committee or who act as research mentors to McNair interns deserve special recognition.

Acknowledgments

FACULTY MENTORS

Tuncay Aktosun, Ph.D.
Department of Mathematics
College of Science

Krystal Beamon, Ph.D.
Department of Sociology and Anthropology
College of Liberal Arts

Jeffery Demuth, Ph.D.
Department of Biology
College of Science

Rasika Dias, Ph.D.
Department of Chemistry and Biochemistry (chair)
College of Science

W. Marvin Dulaney, Ph.D.
Department of History (chair)
College of Liberal Arts

Joanna Johnson, Ph.D.
Department of English
College of Liberal Arts

Thomas Marshall, Ph.D.
Department of Political Science
College of Liberal Arts

John McDermott, B. Arch., M.A.
School of Architecture

Ronda Mintz-Binder, Ph.D.
College of Nursing

Kytai Nguyen, Ph.D.
Department of Bioengineering
College of Engineering

Faith Nibbs, Ph.D.
Department of Sociology and Anthropology
College of Liberal Arts

Jacob Resch, Ph.D.
Department of Kinesiology
College of Education and Health Professions

Michael Roner, Ph.D.
Department of Biology
College of Science

Josephine Ryan, Ph.D.
Department of Sociology and Anthropology
College of Liberal Arts

Beth Anne Shelton, Ph.D.
Department of Sociology and Anthropology
College of Liberal Arts

Jason Shelton, Ph.D.
Department of Sociology and Anthropology
College of Liberal Arts

STAFF MEMBERS

Cheri Counts
Administrative Assistant

NaKeshia Guillory
Learning Specialist II

MCNAIR SELECTION COMMITTEE
ACADEMIC YEAR 2011-12

James Grover, Ph.D.
Associate Dean, College of Science (Biology)

NaKeshia Guillory, M.B.A.
Learning Specialist, McNair Scholars Program

Laureano Hoyos, Ph.D.
Department of Civil and Environmental Engineering
College of Engineering

Raymond Jackson, Ph.D.
Associate Dean, Office of Graduate Studies

Joan Reinhardt, Ph.D.
Director, McNair Scholars Program

Debra Woody, Ph.D.
Associate Dean, School of Social Work

Christian Zlolniski, Ph.D.
Department of Sociology and Anthropology
College of Liberal Arts

Center for Mexican-American Studies (CMAS)

Friends of the Library McNair Awards

The Friends of the Library awarded $500 scholarships and plaques to Darrelle Colinot and Jeremy Johnson for their McNair research presentations and papers. To determine the winners, the Friends' McNair Scholarship Committee attended fourteen research presentations and reviewed all papers.

The Friends of the Library first recognized the achievements of McNair Scholars in fall 2005, creating an endowment that allowed this award to be offered annually. As of fall 2012, eighteen McNair Scholars have benefited from the generosity of the Friends of the Library.

The McNair Scholars Program congratulates its 2012 scholarship winners for their excellent work and thanks the Friends of the Library for their continued support of this program.

Photo courtesy of Maggie Dwyer, UT Arlington Library.

Left to right: Dr. Joan Reinhardt, Jeremy Johnson, Darrelle Colinot, Richard Browning, president of Friends of the Library.

DEAN OF THE UT ARLINGTON LIBRARY

Rebecca Bichel, Ph.D., dean
Julie Alexander, associate director

FRIENDS' MCNAIR SCHOLARSHIP COMMITTEE

Kit Goodwin; LaVerne Knezek, Ph.D; Carol Lehman

OFFICERS (2012-13)

Richard Browning, president
Kit Goodwin, 1st vice president
Melissa Deur, 2nd vice president
Carol Lehman, secretary
Sebastian Fuentes, treasurer
Shirley Applewhite, parliamentarian

FORMER AWARDEES AND MENTORS

2011

LaQruishia Gill, psychology
Mentor: Tim Odegard, Ph.D.

Steven Nunez, architecture
Mentor: Donald del Cid, M.Arch.

2010

Justin Erdmann, mechanical engineering
Mentor: Haiying Huang, Ph.D.

Bruce Rollins, exercise science
Mentor: Judy Wilson, Ph.D.

Sharie Vance, interdisciplinary studies
Mentor: Linda Rouse, Ph.D.

2009

Juandell Parker, biology
Mentor: Laura Mydlarz, Ph.D.

Crystal Red Eagle, physics
Mentors: Manfred Cuntz, Ph.D., and Zdzislaw Musielak, Ph.D.

2008

Tara McKelvy, psychology
Mentor: James Kopp, Ph.D. (deceased)

Gerrell Williams, English
Mentor: Peggy Kulesz, Ph.D.

2007

Yonathan Tafesse, biology
Mentor: Perry Fuchs, Ph.D.

Omid Zaré-Mehrjerdi, biology/chemistry
Mentor: Ellen Pritham, Ph.D.

2006

Samuel Odamah, architecture
Mentor: Gary Robinette, M.L.Arch.

Monet Joseph, biology/biomedical engineering
Mentors: Kytai Nguyen, Ph.D., and Hanli Liu, Ph.D.

2005

Bianca Canales, political science
Mentor: Victoria Farrar-Myers, Ph.D.

Rachel Hansen, biology/biomedical engineering
Mentor: Raul Fernandez, Ph.D.

Faith Nibbs, anthropology
Mentor: Josephine Caldwell-Ryan, Ph.D.

Graduate Scholar Profiles

The McNair Scholars Program would like to congratulate program alumni who earned their doctorates between summer 2011 and summer 2012:

Bridget Beamon-Robertson

Ph.D., computer science engineering, UT Arlington

Dr. Beamon-Robertson is a senior professional staff member in the Johns Hopkins University Applied Physics Laboratory in the Washington, D.C. area. Her research focuses on cyber data analytics, analysis frameworks, and algorithms for scalable high-fidelity cyber situational awareness.

Nicole Campbell

Ph.D., applied physics, University of Michigan

Dr. Campbell, who specialized in remote sensing for her doctorate, won numerous awards as a graduate student. In 2009, she was the National Society for Black Engineers' Golden Torch Graduate Student of the Year. She has accepted a position as senior systems engineer with Raytheon Missile Systems in Tucson, Arizona. She has also been invited to speak and be on a panel for the NSF/DOE Workshop on Minority Women in Material Sciences and Engineering in Arlington, Va.

Rosanne Whitten Frederick

Ph.D., chemistry, Notre Dame University

After obtaining her doctorate, Dr. Frederick began a post-doctorate position in enzymology at the University of Texas at San Antonio.

Lydia Wilhelm French

Ph.D., English, University of Texas at Austin

Dr. French teaches at the Houston Community College's central campus. She and her family celebrated the arrival of son, Parker Mark Felipe, in April.

Badia Harlin

Ph.D., nursing practice, Texas Tech Health Science Center

Dr. Harlin works with In-Patient Physician Associates to provide care to recently released patients. She also teaches in the nurse practitioner program at Texas Woman's University Dallas Center.

Rose Njoroge

Ph.D., psychology, Florida State University

Dr. Njoroge has begun a post-doctorate position with the Florida Center for Ocean-Atmospheric and Prediction Studies (COAPS) and teaches psychology at Tallahassee Community College. She is preparing research for publication and looking for a tenure-track position.

Marisol Chang Panesso

Ph.D., bioengineering, University of California, San Diego

Dr. Chang Panesso started a post-doc position this September at Stanford University, Department of Medicine/Gastroenterology and Hepatology, and recently got married.

Gerrell Williams

J. D., Indiana University

Mr. Williams is employed by Pierce and Associates in Chicago, a law firm specializing in real estate and mortgage banking law. He plans to create a non-profit organization that either assists homeowners facing foreclosure or works with sustainability/conservation issues.

Faculty Mentor Profile

Dr. Kytai Nguyen

Dr. Kytai Nguyen believes in the value of mentoring. As an undergraduate at the University of Minnesota, she participated in the McNair Scholars Program. She gained admission to Rice University where she undertook her graduate work and earned a Ph.D. in chemical engineering in 2000. Not only was she was the first female member of her family to graduate from college, but she also pursued her doctorate in a field with few women.

Dr. Nguyen's basic research targets vascular cell responses to various biomechanical, biochemical, and biomaterial environmental factors. Her work has improved our understanding of such factors in vascular biology and the pathogenesis of vascular disorders. Her applied science research focuses on the development of new strategies for drug delivery and tissue engineering applications, including the use of nanoparticles in drug delivery to treat cancer and cardiovascular diseases.

Since Dr. Nguyen arrived at UT Arlington, she has successfully mentored three McNair Scholars—Monet Joseph Atanous, Danyel Specht, and Khanh Vu. She has provided these McNair Scholars with opportunities to study a broad range of techniques and strategies in her laboratory and to benefit not only from her positive mentoring but also from feedback provided by her other students. Dr. Nguyen's major educational goal is to train students to become experts in cellular and tissue engineering research.

Dr. Nguyen is an associate professor of bioengineering at UT Arlington and an adjunct associate professor in the College of Medicine at UT Southwestern Medical Center at Dallas. She has published in various journals, including *Advanced Healthcare Materials*, *Acta Biomaterialia* and the *Journal of Biomedical Optics*. Dr. Nguyen has received significant grants from federal, state, and private funding sources to fund applied aspects of her work. For example, in her American Heart Association-funded project, she and UT Arlington colleagues Dr. Charles Chuong in bioengineering and J.-C. Chiao in bioengineering and electrical engineering are exploring how smooth muscle cells react to alterations in their environment that could clarify our understanding of how vascular disease develops. This project may prove to be a new research opportunity for future McNair Scholars.

Russell Southard

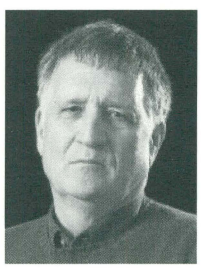
Architecture major

An Oklahoma native, Russell was born in McAlester and raised in Neshoba. He attended Eastern Oklahoma State College and Carl Albert State College, and served in the United States Army National Guard. UT Arlington awarded Russell with the Outstanding Transfer Scholarship. An honor roll student, he is a member of the American Institute of Architecture Students, Golden Key International Honour Society, and Phi Kappa Phi honor society. Russell presented his research at the 21st Annual National McNair Conference in Wisconsin.

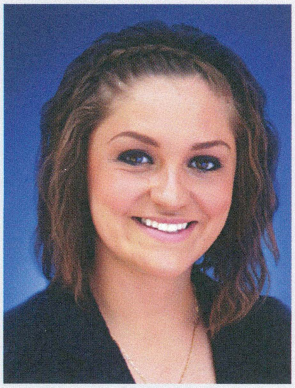
"The McNair Scholars Program has been a truly rewarding experience. I developed research and presentation skills that will be invaluable as I pursue my academics goals. I owe a great deal of gratitude to my mentor for providing me with the tools to succeed and to the McNair Scholars Program for giving me this opportunity."

An Application of Iconographic Analysis to the Unbuilt Urban Design of Le Corbusier's *Ville Contemporaine*

Iconography is a technique advanced by Erwin Panofsky in the 1930s for the analysis of paintings. According to him, it is to be used to examine the content of visual images at the formal/visual, historical/cultural, and symbolic levels. The *Ville Contemporaine*, an unbuilt city designed by Charles Edouard Jenneret (Le Corbusier) in 1922, has been described in architectural literature. Because aspects of its symbolic content have never been examined, it was chosen as the subject of this undertaking. Research outcomes showed iconographic analysis to be an effective tool for the decryption of plan drawings. One unexpected outcome, however, did emerge. Although the *Ville Contemporaine* was never built, part of it may have inspired the design of Stuyvesant Town and Peter Cooper Village, and the Robert F. Wagner Housing projects in New York City. These two post-WWII projects suggest that their designers imitated and built part of Le Corbusier's masterpiece. Apparently the designers of these and later housing projects like it only saw the *Ville Contemporaine* as an end in itself, as something to be imitated. The inability of the designers of public housing to decode the deeper levels of meaning inherent in urban designs like the *Ville Contemporaine,* and to connect them to their intentions, probably led to the practical end of public housing in America when Pruitt-Igoe in St. Louis, Missouri, was imploded in 1976.



Mentor:
John McDermott, B. Arch., M.A.
School of Architecture



Jessica Lair

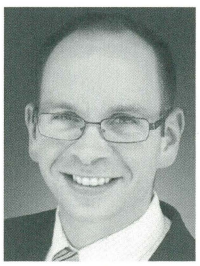
Athletic Training major

Jessica was born in California and graduated from Tyler Junior College. Jessica is a member of the Mavericks Society of Athletic Training Students and vice chair of the National Athletic Training Student Committee. She has received the Bobby Lane Scholarship, Ben Hogan Scholarship, Hugh and Anne Simmons Scholarship, Pete Carlon Leadership Award, and South Western Athletic Trainers Association Scholarship. Jessica has attended the National Athletic Trainers Association meeting, and the South Western Athletic Trainers Association. She presented her research at the 21st Annual National McNair Conference in Wisconsin.

"The McNair Scholar Program has helped me grow as a scholar. I thank the McNair staff for its hard work and dedication and the Kinesiology department for constant support. I thank my mentor for his help. It was such a relief knowing he not only cared about the research but he cared about making me better for my future."

Age and Gender Differences in Pediatric Athletes Using Sensory Organization Testing

Baseline testing of postural stability is critical when making appropriate return-to-play decisions for young athletes following sport-related concussion. Currently, a paucity of evidence exists regarding the development of postural stability and how often a baseline assessment should be completed. The objective of this study was to determine if gender and age groups influence motor control via a postural stability assessment. This study was conducted in the brain injury lab at The University of Texas at Arlington. Participants included 71 pediatric athletes consisting of 42 males and 28 females between 12 and 17 years of age (15.3±1.45 years) and of average height (168.9± 9.24 cm). Participant postural stability was assessed using the NeuroCom Smart Balance Master Sensory Organization Test (SOT). Analyses of SOT composite scores (composite balance, somatosensory, visual, and vestibular ratios) were performed using an Analysis of Variance and independent *t*-tests to compare with $\alpha = .05$. Results showed that there were no statistical differences found between age groups, gender, or gender within age groups. Our results concluded that the current recommendation to retest every two years was appropriate when conducting baseline assessments to account for motor skill development in regard to postural stability. Future research is needed with a larger sample size before definitive recommendations are made.



Mentor:
Jacob E. Resch, Ph.D.
Department of Kinesiology
College of Education and Health Professions

Angel Aymond

Anthropology major
Urban and Public Affairs minor

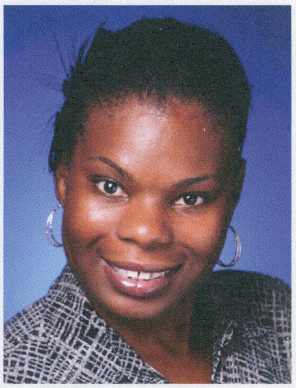
Born in Stephenville, Texas, Angel attended Tarleton State University where she participated in the Upward Bound program and received the Dick Smith and Joe R. and Teresa L. Long Scholarships. She came to UT Arlington in fall 2010 where she received an Academic Achievement Scholarship. Angel has participated with UTA Volunteers, serving as the animals and environment director in 2011-2012. She belongs to Golden Key, Sigma Alpha Lambda, and Phi Kappa Phi honor societies, and the Anthropology Club and is a mentor for UTA Hosts! She participated in a panel on undergraduate research at GradFest 2012.

"I would like to thank the McNair staff and my mentor, Dr. Josephine Caldwell-Ryan, for her inspiration and guidance. My participation in the McNair Scholars Program has been humbling and has given me the tools to be a more inquisitive anthropologist and a better writer."

Animal Services in Arlington, Texas: An Evaluation and Recommendation for Improvements

As society moves towards a world that emphasizes an environmental conscience, people must not forget about the pets with which we share the world. Canines are the number one household pet in the United States, but there is an overpopulation problem with dogs that persists despite special adoption events and various services offered. If the city of Arlington, Texas, wishes to accomplish its Comprehensive Plan to provide a better life for its citizens, it also should consider its non-human residents. Adoption programs and procedures by Arlington Animal Services strive to reduce the canine euthanasia rate, but need adjustments in order to successfully make Arlington a no-kill city. Surveys were conducted on the public's opinion of euthanasia, in addition to time spent on observation volunteer work at the Arlington shelter. Survey respondents, which included Arlington and other North Texas residents, with a few respondents from the Austin area, recognize the need for more aggressive spay and neuter programs, and public education on pet care. Survey results also revealed that people are more likely to adopt from an establishment if it is "no-kill." The city of Arlington animal shelter can become no-kill if it maximizes its resources by creating a multi-phase plan, in order to focus on one aspect of reform at a time.

Mentor:
Josephine Ryan, Ph.D.
Department of Sociology and Anthropology
College of Liberal Arts



Ceola Brown

Sociology major
Anthropology/English minors

Ceola was born and raised in Los Angeles, Calif., and is a veteran of the U. S. Air Force. She began her higher education at Citrus Community College in Glendora, Calif., and continued it in Germany, New Mexico, and Texas. She completed her associate's degree at Mountain View Community College in Dallas and entered UT Arlington in fall 2010. Ceola is the proud mother of four girls, who inspire her determination to succeed. She has been awarded the Mary Gourley Scholarship and is a member of the National Society of Leadership and Success.

"I imagined myself becoming a professor, but was not sure what was needed to become Dr. Brown. McNair provided the much-needed tools to help guide me on my way. This helps level the playing field for under-represented persons like me who are capable but who otherwise may not have the same opportunities as many other college students."

Summer Vacation and the Achievement Gap: Do Summer Activities Differ by Students' Socioeconomic Status?

This study explores how children from different socioeconomic backgrounds spend their summer vacations, as well as how teachers perceive the impact of summer activities on children's academic performance. I propose that children of higher income parents (family income of $50,000 and higher) will participate in more summer activities, especially more enriching and educational activities, than children of lower socioeconomic status (income of less than $50,000). Moreover, I expect to find that teachers will identify the lack of summer activities as a source of the summer learning loss among children of low socioeconomic status. My findings reveal that teachers and staff members agree that parental involvement plays a significant role in students' summer learning retention. Students who engage in more enriching and academic programs do, in fact, perform better upon their return to school in the fall than students who participate in fewer enriching and academic programs, according to teachers. In addition, my results confirm that parents' socioeconomic status influences the number and types of enriching and academic learning experiences in which children engage. Students from higher socioeconomic status families participate in significantly more enrichment and academic programs during the summer than is the case for students from lower socioeconomic status families.

Mentors:
Beth Anne Shelton, Ph.D., and
Krystal Beamon, Ph.D.
Department of Sociology and Anthropology
College of Liberal Arts

Jeremy Johnson

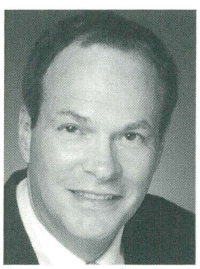
Political Science major
History minor

Jeremy was born and raised in Irving, Texas. He serves as secretary of the Kappa Pi chapter of Pi Sigma Alpha, the national political science honor society, and the Society of Political Affairs. Jeremy will present his McNair research at the Southern Political Science Association Conference in January in Orlando, Fla. In spring 2012, he received the Best Undergraduate Research Paper Award from the Political Science Department and one of two McNair Scholarships by the Friends of the Library for his research paper and presentation.

"Working in the McNair Scholars program has offered me the ability to do research of the type that I will encounter in graduate school. The best experience is being able to do research that is truly my own and being able to follow a research question from beginning to end."

Voters and Judges: How the Texas Public Chooses High Court Judges

Judicial scholars have not seriously studied Texas' statewide partisan judicial system for nearly two decades. For most of its history, Texas was a one-party Democratic state, but then moved through a short transitional stage of two-party competition, and is currently a one-party Republican state. This research examines judicial candidates according to three criteria: personal qualities, such as education and experience as a judge; endorsements from the five largest newspapers in Texas; and campaign context, such as whether or not it was a presidential year and how much money the candidates spent. Data was organized into two pooled cross-sectional databases: candidates in general elections 2004-2010 and candidates in Republican primaries, 2004-2012. Multiple regression models were used to determine each variable's effect on vote percentage and also to predict future elections. In statewide judicial elections, 2004 through 2012, Republicans now easily win all the state's judicial posts, and only partisanship helps to explain vote outcomes in general elections. In the occasional Republican primaries, incumbency and the number of challengers are both important. Truly competitive partisan elections do not now exist in Texas and are exceedingly rare in other states.



Mentor:
Thomas Marshall, Ph.D.
Department of Political Science
College of Liberal Arts

TiMar Long

Sociology major

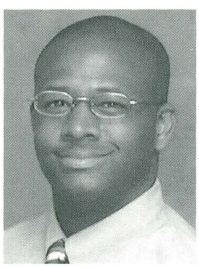
TiMar was born in Columbus, Ohio. Because his father was in the military, he traveled around the U.S. before settling in Fort Worth. After graduating from high school, TiMar attended the University of North Texas briefly and later earned an associate of arts degree from Tarrant County Community College. At UT Arlington, TiMar is a member of Sigma Alpha Lambda national leadership and honors organization and Alpha Kappa Delta International Sociology Honor Society and is co-president of the Sociology Students Association. He presented his research at the 21st Annual National McNair Conference in Wisconsin.

"I think one of the biggest things I learned from the McNair program was that research is never done. After completing my project I found myself wishing I had more time not only to add more but also to look into new avenues of my research that I discovered as I worked on the project."

Sexuality in the Twenty-first Century: A Look at Contemporary Religious Sexual Mores

This study seeks to look at the issues of abortion, contraception, and same-sex marriage in the 21st century through the lens of religion. Evangelicals will serve as the baseline of comparison for this study as we explore the beliefs of mainline Protestants, black Protestants, Catholics, and Jews. It also will take a look at "other faiths" (a catch-all category that includes Mormons, Muslims, Buddhists, and Jehovah Witnesses) and non-affiliates (those who still believe in a God but do not attend a church) in a critical analysis. This study also seeks to update the work done by Roof and McKinney in the 1980s in their book *American Mainline Religion*. Data will be collected using the General Social Survey. This data will then be cross-referenced using the RelTrad Syntax (Steensland, et al., 2000). The RelTrad Syntax serves as a more accurate and refined method of religious classification based on doctrine and changes in these religious traditions. The RelTrad makes it possible to take into account the unique approaches to religion that are seen in such groups as evangelicals and black Protestants. This study wraps up with a brief discussion of future methods that would further improve results.

Mentor:
Jason Shelton, Ph.D.
Department of Sociology and Anthropology
College of Liberal Arts



Wiliante Slater

History/Communication majors

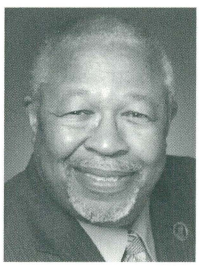
A Houston native, Wiliante attended college briefly and worked before earning an associate of arts with honors from Tarrant County College. At UT Arlington, she was awarded the Phi Theta Kappa Honors Scholarship, Transfer Honors Scholarship and Academic Enhancement Scholarship. She is a member of Phi Theta Kappa Honor Society, the Honor Society of Phi Kappa Phi, Golden Key International Honour Society, and the National Society of Leadership and Success. Wiliante attended the 2012 conference of the Association for the Study of African American Life and History and presented her research at the 21st Annual National McNair Conference in Wisconsin.

"The McNair Scholars Program allowed me to gain a better understanding of the research process on the graduate level. Working with Dr. Marvin Dulaney remains a tremendous privilege. The knowledge I gained under his tutelage has strengthened my resolve to complete additional research on Africans and their descendants."

Life, Liberty and Gender: Women and Children in Contemporary Haiti

Haiti catapulted to the forefront of modern media after the devastating earthquake in 2010 that left an estimated death toll of more than 300,000 people. Yet, long before the earthquake in Haiti, the country had been in political, social, and financial unrest. Haiti is the second republic in the New World. However, since its liberation from France, Haiti's narrative has been rife with foreign interference, economic destitution, and political conflict. The current conditions in Haiti have completely emasculated the founding ideas of this republic and have laid the underpinnings for the mass suffering of women and children. Moreover, the 2010 earthquake exacerbated the current challenges that exist in Haiti. This paper examines the origins and development of Haiti, the prosperous plantocracy created through slavery, and the revolution that established Haiti as the first black republic in the New World. Furthermore, it examines how Haiti's history and international political interference have contributed to her current social, political, and economic state, as well as Western attitudes toward Haiti. This exploration of Haiti's extensive history explains the conditions that affect women and children in contemporary Haiti. A thorough examination of Haiti's past will clarify the reasons the catastrophic earthquake of 2010 was not just another event that worsened the conditions that have resulted from her tragic past, but one that has exposed the epidemic of famine, modern slavery, poverty, and rape that is devastating the lives of women and children.

Mentor:
Marvin Dulaney, Ph.D.
Department of History
College of Liberal Arts



Amber Trent

English major
German minor

Amber grew up in the Houston area, starting her college career at Lee College in Baytown before transferring to UT Arlington in fall 2011. While at Lee, she received the Dorothy Sayle Floyd Scholarship and attended the Gulf Coast Intercollegiate Honors Council Conference and the National Conference of Undergraduate Research. Amber was a member of the All-Texas Academic Team and received the Maverick All-Texas All Academic Team Scholarship at UT Arlington.

"I cannot adequately express my thanks to the McNair program and staff. It is because of them and the program that dreams are becoming reality."

Fact or Fiction: Ethics versus Moral Lessons in Young Adult Literature

Young adult literature oftentimes imparts moral lessons in many of its stories. Sometimes these stories come under the claim of being *real*, such as with *Go Ask Alice* by Beatrice Sparks and James Frey's adult novel *A Million Little Pieces*. By claiming that a story is a true-life account, it is thought that the young adult readers will be more receptive to the moral lessons a story has to impart. However, this is not the case as the young adult readers' trust is betrayed. When the emotional response is manipulated, the young adult readers disregard the moral lesson. Sometimes fiction is able to bridge the emotional gap to the reader-response better than non-fiction. Ellen Hopkins' young adult novel *Crank* is an example of how fiction is able to bridge this gap with young adult readers. In this paper, I have examined issues surrounding *Go Ask Alice* and *Crank*, such as questions about authorship, the reader-response to each book, how time affects the readers' view of a story, and why the first-person diary format produces an emotional response from the reader. Each aspect of my research investigates how the young adult readers respond to moral lessons from these different books.

Mentor:
Joanna Johnson, Ph.D.
Department of English
College of Liberal Arts

Ayoade "Joy" Ademuyewo

Nursing major

Joy was born in Nigeria and was a dual-credit high school student in Garland, Texas, before coming to UT Arlington. She has received numerous scholarships including the Ivory Moore Undergraduate Scholarship, the Voiture Veterans Nursing Scholarship, the Honors College Presidential Scholarship, the Honors College Kay Jones Nursing Scholarship, the College of Nursing Scholarship, and an African American Faculty and Staff Association award. Joy was nominated for Who's Who among Students in American Universities and Colleges. She is a member and past president of the nursing constituency council. Joy presented her research at the 21st Annual National McNair Conference in Wisconsin.

"The McNair experience was great because of the dedication my mentor showed, allowing me to dive into the research experience and challenge myself to think in a way I had never thought before. This experience gave me the passion I needed to meet the challenge of the program."

Correlating Assertiveness and Burnout among Graduate Student Nurses

The purpose of this study is to examine the relationships between burnout and assertiveness among nurses enrolled in master's level education and make recommendations for prevention. Correlations were done between several variables such as age, years of experience, area of clinical practice, and gender in conjunction with burnout and assertiveness. Past research in other countries has shown that burnout influences work performance and that work performance influences levels of burnout (Gandi, Wai, Karick, and Dagona, 2011). Burnout prevention is an issue that should be emphasized due to the deleterious effect it has on nurses in the workplace with respect to their relationships and patient care.

The Maslach Burnout Inventory and short form of the Rathus Assertiveness Schedule were used to survey 125 subjects. Results showed that a relationship between burnout and assertiveness does exist. Of significance in this study is that our sample was exclusively made up of practicing nurses who were enrolled in a graduate nursing program. Two of the three burnout subscales negatively correlated with assertiveness levels so that as assertiveness increased, burnout decreased. Additional correlations with age, years of experience, clinical area of practice, and gender are reported and recommendations follow.

Mentor:
Ronda Mintz-Binder, Ph.D.
College of Nursing

Darrelle Colinot

Biology major
Chemistry minor

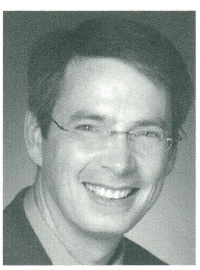
Darrelle was born in California, grew up in Ohio, and graduated from high school in Indiana. She graduated *summa cum laude* with an associate of science degree from Lamar State College-Orange in 2010. At UT Arlington, she received the Maverick All-Texas Academic Team full scholarship and the National Science and Mathematics Access to Retain Talent grant. She has served as treasurer for Golden Key International Honour Society and the Phi Theta Kappa alumni association, and as secretary of Beta Beta Beta biological honor society. Darrelle was one of two awardees of the McNair scholarship from the Friends of the Library for her 2012 research.

"Through the McNair program, I feel I have been provided a leading edge and distinction among my peers. The opportunity to work with Dr. Demuth has proven invaluable, allowing me to get a glimpse of what is expected of the graduate student in my field. My life has been positively impacted in ways that have not yet been presented."

Geographical Mapping in Texas of Medea, a Selfish Parasitic Genetic Element of *Tribolium castaneum*

We investigated the geographical distributions of the Maternal Affect Dominant Embryonic Arrest (*Medea*) genetic factors M1 and M4 in *Tribolium castaneum* populations in Texas. The *Medea* phenotype has two parts, maternal kill and zygotic rescue. *Medea* bearing mothers will poison and kill their offspring unless the offspring inherit the same M factor antidote from either parent. *Medea* acts as an autosomal dominant parasitic genetic element, inherited in simple Mendelian fashion. Because wild type alleles are disproportionally lost in offspring of *Medea* carrying mothers, *Medea* inevitably gets fixed in populations.

Medea had been relatively absent from the southern states due to hypothesized biotypes preventing gene flow from north to south. M1 had not been observed in any part of the United States and never in the absence of M4 in nature. We found evidence of M1/M4 and M1-only populations in Texas. Our results seem to confirm barriers to gene flow. We hypothesize two *Medea* introductions into the United States, M4 in the north and M1/M4 in the south. Additionally, either a recombination event occurred allowing M1 to stand alone, or an M1-only beetle migrated from an undocumented region. Most of the *T. castaneum* population in the United States is now *Medea* positive.



Mentor:
Jeffery Demuth, Ph.D.
Department of Biology
College of Science

Norma Ghanem

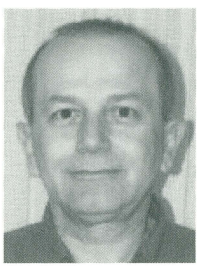
Linguistics/Mathematics majors

Norma was born in Alaska and lived in several places before moving to Texas. A graduate of Eastern Hills High School in Fort Worth, she participated in the Scholarships for Undergraduates to Reach Goals in Education program and the Louis Stokes Alliance for Minority Participation program. She is a member of the Honors College, the Association for Women in Mathematics, and Phi Kappa Phi honor society. Norma attended the Field of Dreams Conference sponsored by the National Alliance for Doctoral Studies in the Mathematical Sciences in Tempe, Ariz.

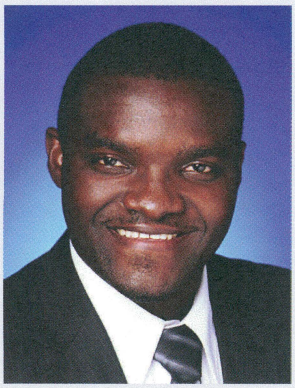
"The McNair program has been one of my most rewarding experiences as an undergraduate. I had the opportunity to work with an amazing mentor and gain valuable knowledge that will definitely help me in graduate school. I am very thankful to the McNair staff and my mentor for all they have offered me this summer."

Exact Solutions to the Langmuir Lattice Equation

Our primary goal is to develop a large class of exact solutions to the integrable nonlinear partial differential-difference equation, known as the Langmuir lattice equation (also known as the Volterra lattice equation). This equation has important applications in electromagnetic wave propagation in plasmas (ionized gases) and in one-dimensional crystals, where the nearest neighbors interact with forces that depend on the difference of their displacements. Using a recently developed general approach, we construct an exact solution formula for certain wave solutions to the Langmuir lattice equation in terms of a matrix triplet of constant matrices A, B, C of sizes $p\times p$, $p\times 1$, and $1\times p$, respectively, for any positive integer p. Such solutions represent solitary waves (solitons) with particle-like behavior. Our compact solution formula contains so-called matrix exponentials and an auxiliary constant matrix P satisfying the matrix equation $P - APA = BC$. We examine the spatial asymptotics of our solutions as $n\to\pm\infty$, and we use the software *Mathematica* to investigate the relationship between the parameters appearing in our solution formula and the physical properties of waves represented by our solutions. In particular, we analyze the relationship between the velocities of the individual solitons in our solutions and the eigenvalues of one of the input matrices.



Mentor:
Tuncay Aktosun, Ph.D.
Department of Mathematics
College of Science



Jean-Luc Nshimiyimana

Biochemistry/French majors

Born in Rwanda, Jean-Luc graduated from Abilene High School before entering UT Arlington. He is active in many organizations including the National Society of Leadership and Success and the Society for Advancement of Chicanos and Native Americans in Science. A past president of Pi Delta Phi French honor society, he has received many awards including the Taylor-Jones-Haskell County Medical Alliance Scholarship and the ACU-Upward Bound Leadership Achiever Award. In 2012, he received the Professional Advancement of Black Chemists and Chemical Engineers' Advancing Science Award and presented at its annual conference in Washington, D.C.

"As a McNair Scholar, I had many opportunities to work on a unique research project with a much respected faculty member and present my research at several conferences. I thank my mentor, family and friends for their support, mostly the McNair Scholars program for helping me achieve one step further to earning my Ph.D."

Biologically Relevant Metal Ions on Fluorinated Scorpionates

Tris(pyrazolyl)borates or Tp are one of the most employed classes of ligands in modern coordination chemistry. They are also the major component of metal ion chelators, generally referred to as scorpionates. Since their discovery by Dr. Swiatoslaw Trofimenko in 1966, such ligands have found applications in material science, catalysis, and bioinorganic chemistry (Craven, E. et al., Polyhedron 2002, 21, 553). Some of the major classes of pharmaceutical agents are constituted of metal complexes such as cobalt, manganese, zinc, silver, copper, vanadium, and platinum complexes. These possess many beneficial properties and can be used as anti-inflammatory, disinfectant, insulin-enhancing drugs, and anticancer agents. Due to similar chemical properties within the transition metals, some of the metal complexes may mimic the activity of others. My efforts are aimed toward the synthesis of metal complexes due to their wide application to and impact on medical practice. Tp ligands have been employed for the synthesis of complexes with several metals of the periodic table. Herein, we describe the synthesis of a series of transition metal complexes of the type TpMIINO3 (M = Zn, Co and Mn) supported over fluorinated Tp ligand, [HB(3,5-(CF3)2Pz)3]-. These complexes were characterized by NMR, IR spectroscopy, elemental analysis, and single crystal X-ray diffraction studies. Furthermore, these complexes will be investigated for catalytic properties (activation of C-H and O-O) and biological activities as part of my future studies.

Mentor:
Rasika Dias, Ph.D.
Department of Biochemistry
College of Science

Patricia Vignaux

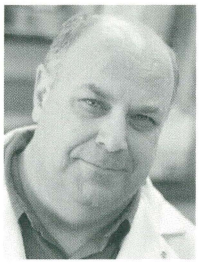
Biology major
Chemistry minor

Patricia was born in Massachusetts and later moved to Texas, where she graduated from Midlothian High School. She began her college education at UT Arlington in fall 2009, joining the Honors College. Patricia received the President's Charter Scholarship, the Top 10% Award, and an Academic Enhancement Scholarship. She is a member of the Society for the Advancement of Chicanos and Native Americans in Science, which granted her a student travel award, allowing her to present her McNair research at the national conference in Seattle, Wash.

"The training and mentoring I have received through the McNair Scholars Program have been invaluable aspects of my undergraduate career. I look forward to using the lab experience and research instruction I learned this summer in my upcoming graduate studies."

Spatial Effect of Reovirus Co-infection on Production of Rotavirus

Rotavirus is the leading cause of severe diarrhea in children under the age of five, globally causing more than half a million deaths per year. Widespread use of vaccination has decreased the occurrence of Rotavirus disease in the United States, but the cost and strict time constraints of these vaccines make them difficult to implement in developing countries. Previous studies in this laboratory have shown that Rhesus Rotavirus production is inhibited during co-infection with Reovirus serotype 3 (MRV-3DE). Using monoreassortant viruses for each gene of the segmented Reovirus genome, four genes of MRV-3DE were identified that are associated with the inhibition of Rotavirus replication during co-infection with Reovirus. Immunofluorescent staining of cells infected with each virus alone and during co-infections with both, coupled with confocal microscopy, will reveal the normal cellular compartments in which each virus replicates and assembles new progeny virus. My hypothesis is that the normal compartmentalization that occurs in singly infected cells will be disrupted in co-infected cells and these observations will serve as a basis for developing a molecular model to explain virus completion/inhibition during co-infections. This information could potentially lead to alternative treatments of Rotavirus infection in developing countries.



Mentor:
Michael Roner, Ph.D.
Department of Biology
College of Science

Khanh Vu

Biology major
Chemistry minor

Khanh was born in Vietnam and attended James Bowie High School in Arlington where she graduated from the International Baccalaureate program. In 2010 she entered UT Arlington and was awarded the Top 10%, Academic Enhancement, and Freshman Honors scholarships. Khanh is a TRIO Student Support Services Program participant and a member of the Medical and Dental Preparatory Association. A Science Ambassador, she taught math in the campus TexPrep Program and has volunteered with Hope Tutoring, Mission Arlington, and at her church. Khanh presented her research at the 21st Annual National McNair Conference in Wisconsin.

"By being part of the McNair Program, I was able to become active in the drug delivery lab on campus where I gained critical skills in the research process and built a strong relationship with my mentor. The McNair Program is an invaluable part of my life at UT Arlington."

Development of Novel Biodegradable and Multi-Functional Nanoparticles for Melanoma Treatment and Diagnostic

Melanoma remains the deadliest form of skin cancer with more than 500,000 afflicted patients annually in the United States. The challenge of melanoma treatment is the delivery of anticancer drugs to cancer cells with minimal side effects to the healthy cells. This study offers a new method to treat melanoma by utilizing newly developed biodegradable photoluminescent polymer-coated magnetic nanoparticles (BPLP-MNPs). These nanoparticles are biodegradable and biocompatible, and have capabilities of targeting, imaging, and treating the melanoma.

The synthesis of BPLP-MNPs utilizes double emulsion technique and carbodiimide chemistry to formulate water insoluble (hydrophobic) and water soluble (hydrophilic) nanoparticles, respectively. The dynamic light scattering particle analyzer was used to measure size, polydispersity index, and surface charge on the nanoparticles. Results show that the nanoparticle size was about 200nm with polydispersity index of 0.2. The stable nanoparticles had zeta potential (surface charge) of -30mV to -39mV. The nanoparticles had about 65% of iron mass as determined by iron content assays.

Cellular uptake of the nanoparticles was studied using melanoma cell lines, A431 and G361. Moreover, a dose-dependent cellular uptake of nanoparticles by skin cancer cells was observed. Interestingly, it also was found that cells took up two different particles selectively, which could be used for future targeted cancer therapy. Future studies include evaluation of magnetic and molecular targeting of these nanoparticles, as well as their in vitro imaging and pharmaceutical efficiency.

Mentor:
Kytai Nguyen, Ph.D.
Department of Bioengineering
College of Engineering

Ransom Hall, Campus Location of McNair Scholars Program

2012 McNair Research Interns and Staff

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