

McNair Research Journal

THE UNIVERSITY OF TEXAS AT ARLINGTON

Summer 2008 • Volume 12



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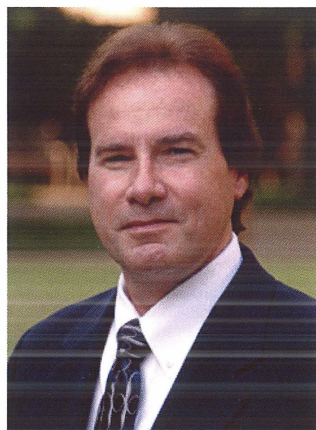
The McNair Research Journal is the annual research publication of the Ronald E. McNair Postbaccalaureate Achievement Program (McNair Scholars Program), a TRiO Program funded by the U.S. Department of Education, at The University of Texas at Arlington. The journal consists of summaries of papers written by McNair Scholars who participated in the McNair Research Internship the preceding summer. Journal contents solely reflect the research and opinions of the individual authors. Presentation of this material was made possible by a limited license grant from the authors who have retained all copyrights in the contributions. All other elements of the journal such as its structure and organization are also protected by copyright. The University of Texas at Arlington holds copyright to the journal but permits reproduction of its contents (not to exceed 100 copies) for non-commercial or educational purposes.

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Message from the Vice President for Research and Federal Relations	2	NURSING	
Notes from the Director	3	Mayra Rodriguez, Nursing	16
McNair Scholars Program	4	An Examination of Nursing Staff's Participation in Study Recruitment on a Spinal Cord Unit	
Acknowledgments	5	SCIENCE	
Friends of the Library McNair Scholarship Awards	6	Rhonesia Johnson, Psychology	17
Graduate Scholar Profile	7	Students in the News: A Study of the Black Sheep Effect	
Mentor Profile	8	Antonio Lopez, Mathematics	18
LIBERAL ARTS		Solitons and Nonlinear Partial Differential Equations	
Mary Stephanie Cook, Philosophy	9	Sonya Lopez, Biology	19
Bringing Information Theory to Bear on Justified True Belief		The Evolution of Sex Determination in the Nematode <i>Pristionchus pacificus</i>	
Anastasia Hayes-Stoker, History/German	10	Tara McKelvy, Psychology	20
Literature as a Vehicle of Memory: The Nazi Past in East German Literature		Using Conspicuous to Establish Stimulus Control of Responding in Zebrafish (<i>Danio rerio</i>)	
Brenda Jackson, Spanish	11	Bryan Motwani, Psychology	21
The Cultural Significance of the U.S./Mexican Border as Portrayed in Film		Predictors of Cognitive Therapy Drop Out in a Community Setting	
Tasia Milton, English	12	Omid Zaré-Mehrjerdi, Biology	22
Mammy Dearest: An Examination of Motherhood in Toni Morrison's <i>The Bluest Eye</i> , <i>Sula</i> and <i>Beloved</i>		Biodegradable Nanoparticle Delivery Systems in Neurodegenerative Disease: A Comparison of Novel PK3 with Established PLGA	
Arlene Steadman, Public Relations	13	SOCIAL WORK	
A Historical Review of the Buffalo Soldiers		Ranita Norwood, Social Work	23
Diana Sudduth, Spanish	14	After Twelve Years: The Impact of the Personal Responsibility and Work Opportunity Reconciliation Act (PROWRA) of 1996 on the Quality of Life for Women and Children in Poverty	
Colombian Immigrants in the United States: Counteracting Stereotypes with Facts			
Gerrell Williams, English	15		
Larry McMurtry's <i>Lonesome Dove</i> : Adapting the Myths of Western Fiction			

Message from the VP for Research and Federal Relations



Ronald McNair was a man who reached for the stars. As an African-American who grew up in the South during the 1950s, he overcame tremendous obstacles to earn a Ph.D. in Physics from MIT, and ultimately served his nation as a

NASA astronaut. Despite his death in the 1986 explosion of the space shuttle Challenger, he remains an example of how anyone from any background, with the desire, dedication and drive, can succeed when given an opportunity. It was from his passion to succeed that the McNair Scholars program was born.

What better way to pay tribute to a true American hero such as Ronald McNair than by encouraging future generations of talented men and women to pursue their dreams? As participants in the McNair Scholars program, UT Arlington students are given the opportunity to explore the world around them by engaging in original research under the guidance of a faculty mentor. By accepting the challenges that come with engaging in original scholarship,

the undergraduate students who participate in the McNair Scholars program have taken that all important first step in engaging in true discovery and original research. Upon completion of the program, the students present the results of their research, sharing their accomplishments with the community. This program is truly rewarding for the mentors, students and their families, as it fosters a genuine sense of achievement. Most importantly, these budding scholars are now poised for success as graduate students and as lifelong learners. With their demonstrated commitment to intellectual inquiry, McNair Scholars are equipped for a lifetime of discovery, which will undoubtedly lead to positive contributions to society.

While Ronald McNair is no longer with us, he continues to serve as a role model for perseverance, hard work, and a commitment to excellence. As he once said, "Whether or not you reach your goals in life depends entirely on how well you prepare for them and how badly you want them." Dr. McNair epitomizes the principles upon which our nation has been built, proving that anyone truly dedicated to a dream can succeed – even in a quest to reach for the stars.

A handwritten signature in cursive script that reads "Ronald L. Elsenbaumer".

Ronald L. Elsenbaumer
VP for Research and Federal Relations

Notes from the Director



It is with much pride and admiration that I congratulate the Summer 2008 McNair Scholars at The University of Texas at Arlington on their outstanding research efforts.

As the summaries on the following pages suggest, our scholars have shown uncommon commitment to the pursuit of new knowledge in their respective fields. Their scholarly achievements deserve recognition and praise.

The UT Arlington McNair Scholars Program is pleased to showcase the high caliber of research which can be accomplished by talented undergraduate students through the guidance and direction of interested faculty mentors

and with the encouragement and support of program staff. The following papers represent eleven weeks of research accomplished jointly by scholar and mentor. Each scholar wrote and presented his or her paper at a formal campus event and in various following venues. We hope the growth and academic development of our scholars through the research experience has better prepared each to continue pursuing academic excellence.

For their ongoing support and assistance, we wish to thank President James D. Spaniolo, Vice President for Research Ronald L. Elsenbaumer, Senior Vice Provost Michael K. Moore, and each of our faculty mentors who gave unselfishly of their time, talent and knowledge.

Good luck, McNair Scholars, as you continue your academic journey...we wish you much success!

A handwritten signature in black ink that reads "Kathryn Head". The signature is written in a cursive, flowing style.

Kathryn Head
Director of SOAR/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.

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 almost 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.



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

Staff Members



Joan Reinhardt, Ph.D.
Associate Director



Cheri Counts
Administrative Assistant



Najla Khan
Graduate Research Associate

Acknowledgments

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James Kopp, Ph.D., Department of Psychology
Peggy Kulesz, Ph.D., Department of English
Charles Nussbaum, Ph.D., Department of Philosophy
Lisa Ottomanelli, Ph.D., SCI-VIP Project, Dallas VA Medical Center
Andre Pires da Silva, Ph.D., Department of Biology
Laurin Porter, Ph.D., Department of English
Georgia Seminet, Ph.D., Department of Modern Languages (Spanish)
Jennifer Sippel, Ph.D., SCI-VIP Project, Dallas VA Medical Center
(Co-Mentor)
Christian Zlolniski, Ph.D., Center for Mexican-American Studies/
Department of Sociology and Anthropology

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Wendy Barr, Ph.D., School of Nursing
(on behalf of Mayra Rodriguez)

McNAIR SELECTION COMMITTEE (FALL 2007-SUMMER 2008)

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Department of Psychology
Joan Rycraft, Ph.D., School of Social Work
Sandra Westmoreland, Ph.D., Department of Biology
Kathryn Head, M.L.A., Director, SOAR/McNair Scholars Program
Joan Reinhardt, Ph.D., Associate Director/McNair Scholars Program

Friends of the Library McNair Scholarship Awards

Four years ago, the Friends of the Library at UT Arlington generously created two scholarships for McNair Scholars based on the content and delivery of their late summer research presentations, the culmination of the McNair Research Internship. To insure that the awards would be offered annually, the Executive Board of the Friends established an endowment supported by an ongoing fund-raising effort. On August 7, 2008, members of the Friends' McNair Scholarship Committee devoted a full day to viewing student research presentations on a variety of topics from diverse disciplines. Several months later, at their November 7 meeting, the Friends of the Library awarded two scholarships to those students that they felt had excelled in their scholarly presentations. The winners—Tara McKelvy and Gerrell Williams—each received a \$500 scholarship, a beautiful plaque, and the good wishes of those present. The UT Arlington McNair Scholars Program congratulates both Tara and Gerrell on their excellent work and thanks the Friends of the Library for their ongoing encouragement and financial support of the students in this program.



Najla Khan, Kathryn Head, Tara McKelvy, Gerrell Williams, Joan Reinhardt

PREVIOUS McNAIR SCHOLARSHIP AWARDEES

FALL 2007

Yonathan Tafesse (Biology)

Mentor: Dr. Gary Fuchs (Psychology)

Omid Zaré-Mehrjerdi (Biology/Chemistry)

Mentor: Dr. Ellen Pritham

FALL 2006

Samuel Odamah (Architecture)

Mentor: Prof. Gary Robinette

Monet Joseph (Biology/Biomedical Engineering)

Mentors: Drs. Kytai Nguyen and Hanli Liu

FALL 2005

Bianca Canales (Political Science)

Mentor: Dr. Victoria Farrar-Myers

Rachel Hansen (Biology/Biomedical Engineering)

Mentor: Dr. Raul Fernandez, ARRI

Faith Nibbs (Anthropology)

Mentor: Dr. Josephine Caldwell-Ryan

DEAN OF THE UT ARLINGTON LIBRARY

Dr. Gerald Saxon

FRIENDS OF THE UT ARLINGTON LIBRARY

McNair Scholarship Committee

Richard Browning

Kit Goodwin

LaVerne Knezek

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Betty Clark, 1st Vice President

Tommie Wingfield, 2nd Vice President

Greg McKinney, Treasurer

Linda Simmons, Secretary

Bill Stallings, Parliamentarian

Graduate Scholar Profile

Padmini Veerapen, M.S.

Padmini P. Veerapen joined the McNair Scholars Program in spring 2004. A native of the island nation of Mauritius, off the coast of Africa in the southwest Indian Ocean, she is married to Chawki Belhadi, also a UT Arlington graduate student in sociology (M.S. Psychology, 2006). Padmini earned two bachelor's degrees from this institution: a B.A. in philosophy and a B.S. in psychology, with a minor in mathematics. A recipient of the UT Arlington Academic Excellence Scholarship, she was also a member of the Honors College. Padmini's McNair research project, conducted in the summer of 2004, was entitled *Influence of Victimization on Adjustment: Psychic or Somatic?* (mentored by Dr. Lauri Jensen-Campbell). She also worked with Dr. Ira Bernstein on her Honors thesis. In February 2005, Padmini presented her McNair research at the Texas National McNair Scholars' Conference hosted by the University of North Texas. She also participated in the Annual Celebration of Excellence by Students (ACES), the annual UT Arlington graduate and undergraduate research symposium in spring 2005.

After graduating in May and winning an Honors College Bridge to Graduate School Fellowship, Padmini entered the master's program in mathematics at UT Arlington in fall 2005. In May 2008, she completed her master's thesis, "Rank of Noncommutative Quadratic Forms on Two Variables," under the supportive guidance of Dr. Michaela Vancliff. Padmini was accepted into the doctoral program in mathematics in spring 2008 and



passed her first two preliminary exams in August of that year. In addition to continuing as a teaching assistant (college algebra, calculus I and II labs), Padmini received a federal GAANN* Fellowship this semester through the Mathematics Department.

For her dissertation, Padmini is planning on generalizing the findings from her master's thesis to the n-variable case, again under the direction of Dr. Vancliff. She hopes to conclude her graduate studies and obtain the Ph.D. in 2011/2012. To manage stress, Padmini practices yoga and works out whenever she can. As she continues to work toward her Ph.D., she will have company, as her husband has also decided to return to the field of evolutionary psychology to pursue the doctorate at UTA, after he completes his master's degree in sociology.

Padmini's advice to current scholars, as they enter graduate school, is:

"To, first of all, expect adversity. Nothing worthwhile comes without its share of it. The important thing is to persevere and not get discouraged too much. Getting back up and persevering is what sets successful students apart. Setbacks are opportunities to get better. Expect them and persevere through them.

What also helps is being passionate about the work you do. You wouldn't really want to do anything else. Passion provides an endless supply of motivation and drive towards working and meeting your goals."

* Graduate Assistance in Areas of National Need

Mentor Profile

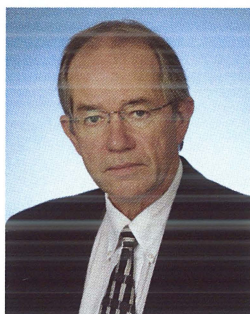
Robert Magnusson, Ph.D.

Dr. Robert Magnusson, an expert in the field of photonics, has returned to UT Arlington this semester to accept the Texas Instruments Distinguished University Chair in Nanoelectronics, funded by a \$5 million endowment. He resumes a career that began at UT Arlington in 1984, where he taught electrical engineering until 1998, and then served as department chair until 2001. For the past seven years, Dr. Magnusson has taught and conducted research at the University of Connecticut, where he also chaired the Electrical and Computer Engineering Department.

A native of Iceland, upon graduation from high school he garnered an American Scandinavian Foundation Fellowship.

Thus he went to Florida to live with his aunt and uncle and to attend school there. He received his BSEE from the University of Central Florida, where his uncle was a professor of fine arts. After working as an electrical engineer for one year on the NATO base in Iceland, he returned to America and earned his Ph.D. in electrical engineering from the Georgia Institute of Technology in Atlanta. After returning home and working for five years as a power systems engineer, he found himself back in the United States as a faculty member. His first exposure to UT Arlington was as a visiting professor, but he was soon offered a tenure-track position in electrical engineering.

As early as 1988, Dr. Magnusson had formulated the innovative concept of using photonic, nanostructured chips as foundational elements in a new class of photonic devices. These resonance chips are, for example, indicators of real-time chemical change. Such devices also have a variety of other uses, for example, in lasers, solar cells, and display technology. In the summer of 1997, McNair Scholar Debra Wawro ('97 BSEE, '99 MSEE) had the



exciting opportunity to work with Dr. Magnusson as her McNair research mentor. They had previously collaborated in the lab when Ms. Wawro held a Research Experiences for Undergraduates (REU) position funded by the National Science Foundation. Dr. Magnusson emphasized in his recent interview that he strongly encourages women to enter engineering and become engaged in research.

As a result of their work together, in December 2004 Magnusson and Wawro founded the company known as Resonant Sensors Incorporated (RSI), in which they serve as Chief Technology Officer and CEO/Chief Scientist, respectively. RSI currently rents lab and office space at UT Arlington

through an agreement with the Arlington Technology Incubator. It is also a member of Tech Fort Worth, a local business accelerator program. RSI has received several NSF small-business grants, funding from the Texas Emerging Technology Fund, and other outside investments. Also related to Magnusson and Wawro's research activities is the newly established RSI Analytical (a division of RSI), located at the University of North Texas Health Science Center. RSI Analytical provides diagnostic services using the nanostructured photonic devices developed by Magnusson and Wawro that offer the potential to radically impact both medicine and drug research.

The Nanotechnology Research and Teaching Facility at UT Arlington provides a great environment for moving Dr. Magnusson's research forward. His policy has always been to see that undergraduates engage in research, take the opportunity seriously and attempt to produce concrete results. A published paper is also a strong recommendation for graduate school.

Bringing Information Theory to Bear on Justified True Belief



M. Stephanie Cook

Philosophy major

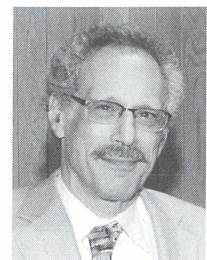
A native of Fort Worth, Stephanie was inducted into Phi Theta Kappa Honor Society at Tarrant County College. Upon transferring to UT Arlington, she became a member of the Honors College. The recipient of several awards, including the UT Arlington Outstanding Transfer Scholarship, Stephanie is also a member of the campus Philosophy Club. In November Stephanie presented her McNair research at the 17th Annual National McNair Scholars Conference in Wisconsin.

“If we knew what it was we were doing, it would not be called research, would it?”

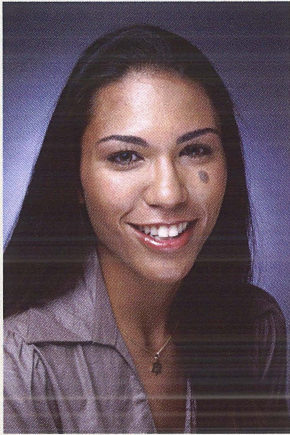
– Albert Einstein

There is a curious paradox in the discipline of philosophy arising from the current definition of knowledge as justified true belief. The general public highly respects the scientific community. Proof of this is in the larger research budgets in the fields of science and engineering and higher incomes for those working in those disciplines compared to liberal arts. Theoretical physics and molecular biology are often regarded as having acquired large amounts of knowledge. However, once we begin to consider knowledge to be defined as a justified true belief, we are forced to admit that physics and biology really “know” very little. Scientific theories are made to be tested and are expected to be falsified or revised to more adequately reflect reality. Humanities and the liberal arts are not subject to such scrutiny, but often their knowledge is legitimate in the light of justified true belief. How could this be? How can Sir Isaac Newton have known so little, and yet make such a huge contribution to the wealth of human understanding? In everyday life we can know a lot without knowing anything of much interest. We can come to know with relative ease that it is raining in Oregon. While this is vital to our accurate record keeping, it does very little to advance human knowledge. How can we account for the fact that almost right, but not entirely accurate, theories can be groundbreaking and advance science in such leaps but be false, strictly speaking? I attempt to resolve such paradoxes in this paper by qualifying the justified true belief theory with informational-analysis theory. This will add weight to those theories which are vital to human understanding but which may not yet be entirely accurate.

Mentor:
Charles Nussbaum, Ph.D.
Department of Philosophy



Literature as a Vehicle of Memory: The Nazi Past in East German Literature



Anastasia Hayes-Stoker

History major/German minor

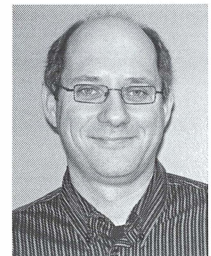
Born in Grand Prairie, Texas, Anastasia earned her associate degree from Tarrant County College before coming to UT Arlington. She is a member of Phi Theta Kappa Honor Society and received the Outstanding Transfer Student Scholarship. In spring 2007, she was chosen by the Department of Modern Languages as the Outstanding First Year German Student. Anastasia is a member of the Honors College and is currently vice president of the Honors College Council.

“Action springs not from thought, but from a readiness for responsibility.”

– Dietrich Bonhoeffer

In 1949, four years after the end of World War II, a unified German nation ceased to exist, and instead Germany became two separate states. Amidst the Cold War, distinctions grew between the societies of the two Germanys. The most apparent difference was how they remembered the Nazi past. Memory studies have become an important part of cultural history. They explore how groups remember certain events or periods in time such as the French Revolution, Civil War, or the Third Reich. This paper examines the public memory of East Germany. In East Germany, public memory centered on Antifascism which was characterized by Communist heroes and resistance. In focusing on Antifascism, it neglected other aspects of the past such as denunciation, the Holocaust, and Germans' everyday lives during the Third Reich. Films, literature, memorial sites, history, and commemoration all help to create public memory. History and literature as mediums both explore the past. This paper specifically looks at the depiction of the Nazi past in East German literature from the 1950s to the 1970s. Traditionally society places more faith in history's representation of the past. However, history had to adhere to a Marxist interpretation of Nazism. As fiction, literature did not have to follow this interpretation. There existed this tension between history and literature and their renderings of the past. In contrast to historians who were limited in their analysis by orthodox Marxist ideology, writers had more leniency in discussing topics such as individual guilt and responsibility. East German novels often provided an alternative view of the past, one that was more subjective and complex.

Mentor:
Thomas Adam, Ph.D.
Department of History



The Cultural Significance of the U.S./Mexican Border as Portrayed in Film



Brenda J. Jackson

Spanish major/business administration minor

Brenda was born in Oklahoma City but grew up in Fort Worth. After earning a B.A. in accounting from Texas Woman's University, Brenda came to UT Arlington for a second baccalaureate in Spanish. A member of Alpha Chi Honor Society, she was also awarded the Vivian White Memorial Scholarship (UTA Wesley Foundation) and the Tony Litsey Memorial Scholarship (Modern Languages Department). Brenda graduated in August 2008, after completing her McNair summer research internship. In fall 2008, she entered the master's program in the Department of Modern Languages and currently serves as a graduate teaching assistant. She plans to spend summer 2009 studying in Cuernavaca, Mexico.

"The price of inaction is far greater than the cost of making a mistake."

– Meister Eckhart

The history of the United States has been immortalized on film, from the early colonization of America to the War on Drugs. Hollywood has successfully created heroes from within the dominant Anglo culture while the marginalized groups have been portrayed as villains and fools. The pervasiveness of these negative stereotypes has been criticized, but unfortunately minority histories do not share proportionately in the successes of the film industry.

The United States has grown and splintered throughout history, and though many of the battle scars have healed, we continue to bleed from what Gloria Anzaldúa has characterized as an "open wound." This metaphorical description of the U.S./Mexico border remains appropriate since the wound caused by racism and ethnocentrism still oozes intolerance and indifference. The border's unique blend of ethnic groups and cultures represents the best of what makes our country great and it should be celebrated, embraced and shared. Instead, over the years violence, poverty and crime along the border have only fueled the vision of the region as separate from the rest of the United States. Popular portrayals of border culture have willingly magnified its difference, its "absolute alterity" rather than embrace its hybrid national identity.

Many films have ridiculed, stereotyped, criticized and distorted the lives, problems and contributions of the whole subculture of people along the border who continue to wait for the acceptance and understanding that has been slow in coming and the healing that is long past due. Recent films such as *Lone Star* (1996), directed by John Sayles, and *The Three Burials of Melquiades Estrada* (2006), directed by Tommie Lee Jones, go a long way toward starting the healing process by "demythifying" the stereotypes and giving voice to the multiple histories that comprise the border region.



Mentor:

Georgia Seminet, Ph.D.

Department of Modern Languages (Spanish)

Mammy Dearest: An Examination of Motherhood in Toni Morrison's *The Bluest Eye*, *Sula*, and *Beloved*



Tasia Milton

English major/history & sociology minors

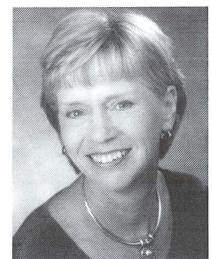
Tasia was born in Lubbock, Texas. She was awarded several scholarships at UT Arlington including the Robert D. Riley Freshman Scholarship and the Liberal Arts Scholarship for Academic Excellence. Tasia was president of the English Student Association and served as a student representative on the One Book Committee. She has tutored in the Math Clinic and continues to tutor in the English Writing Center. Last year Tasia was admitted to *Who's Who among Students in American Universities and Colleges* and selected as a University Scholar. Recently Tasia presented her McNair research at the 17th Annual National McNair Scholars Conference in Wisconsin.

"There was never yet an uninteresting life. Such a thing is an impossibility. Inside of the dullest exterior there is a drama, a comedy and a tragedy."

— Mark Twain

Motherhood is a guiding force of identity formation for both mother and child and is a theme that can be traced in three of Toni Morrison's most critically acclaimed works, *The Bluest Eye*, *Sula*, and *Beloved*. This analysis examines how the past oppressions of slavery and the Jim Crow period impact the black mothering experience and the formation of identity for both mother and child. In *The Bluest Eye*, Morrison challenges the privileging of the nuclear family paradigm by depicting how for the black family this model has been both unrealistic and inadequate. She also resists the stereotyping of the black mother as the Mammy or the matriarch by whites or the "strong black woman" figure by blacks. In *Sula*, Morrison explores two women's efforts to define themselves in relation to the roles of wife and mother, choosing either conformity to or repudiation of these roles. In *Beloved*, Morrison especially engages the topic of motherhood by exploring how slavery complicates the achievement of self-actualization by inhibiting the formation of close mother-child relationships.

Although current literary criticism mostly emphasizes structuralist and formalist approaches that examine *only* the text in question without delving into the work's cultural context, when exploring the topic of black motherhood this approach proves to be inadequate. This study examines the sociological and historical contexts of the novels as well as employs a range of critical methodologies to ultimately result in a humanizing portrait of the black mother that neither denigrates nor overly exalts her.



Mentor:
Laurin Porter, Ph.D.
Department of English

A Historical Review of the Buffalo Soldiers



Arlene Tracy Steadman

Public Relations major

Although born in Brooklyn, N.Y., Arlene came to UT Arlington from the city of New Orleans, L.A., where she attended Delgado Community College and then Tulane University.

“Nine-tenths of education is encouragement.”

– Anatole France

The Ninth Cavalry Regiment, also known as the Buffalo Soldiers, became an important part of the U.S. Army through the mechanisms of public relations and communication. My historical review of the Buffalo Soldiers will confirm that this combination of elements forever changed the image of the Negro soldier. The first public relations campaign was organized by Major Guy Henry and William C. Church, the editor of the privately owned *Army and Navy Journal*. Major Henry’s campaign efforts to rid the Buffalo Soldiers of the negative stereotype that had hindered them since slavery also had a positive effect on other Negro citizens because it improved the way in which white citizens viewed them. The widespread racial discrimination at the beginning of the nineteenth century against Negro soldiers changed after the Buffalo Soldiers rescued Colonel J. Forsyth and the Seventh Cavalry from almost certain disaster by their timely arrival. After that incident the mainstream newspapers began to change their opinions of the Buffalo Soldiers and other Negro men that served in the U.S military. Since newspapers were the main form of information for the American public and were held in high regard by white citizens, this led to a change in their impressions of Negro soldiers in particular, and the Negro population in general.

Mentor:
Earl Andresen, Ph.D.
Department of Communication



Colombian Immigrants in the United States: Counteracting Stereotypes with Facts



Diana Sudduth

Spanish major/Center for Mexican-American Studies minor

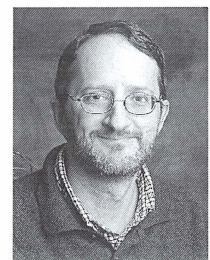
A native of Bogota, Colombia, Diana earned her associate degree at Houston Community College before transferring to UT Arlington. She has received the Simmons-Blackwell Endowed Scholarship (UT Arlington Alumni Association) and the Tony Litsey Scholarship (Department of Modern Languages). Diana was the vice president of Delta Beta Kappa (the National Collegiate Spanish Honor Society) and is currently president of La Sociedad Hispánica. She also serves as a Spanish tutor for SOAR Learning Services.

“Success is not measured by the heights one attains, but by the obstacles one overcomes in its attainment.”

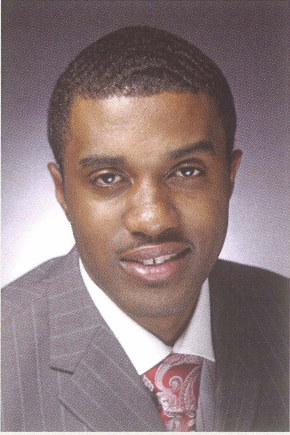
– Booker T. Washington

This study analyzes in a historical context the factors that force Colombians to migrate to the United States and the negative stereotypes they often encounter there. It uses 2000 U. S. Census data to compare Colombians and other Latino immigrant groups in the United States regarding language skills, education, income, poverty levels, and the labor force. The results show that Colombians are better educated and hold more managerial positions at the professional level, giving them a competitive edge on wages. Colombians’ strong skills in the English language also allow them to integrate more easily into the U. S. labor market and society. The evidence presented in this paper shows that Colombians have been often subjected to erroneous stereotypes and that, in fact, they might serve as a role model for other immigrant groups.

Mentor:
Dr. Christian Zolniski
Center for Mexican American Studies/
Department of Sociology and Anthropology



Larry McMurtry's *Lonesome Dove*: Adapting the Myths of Western Fiction



Gerrell Williams

English major/philosophy minor

Born in Dallas, Gerrell attended Tarrant County College prior to enrolling at UT Arlington. He is currently president of Sigma Tau Delta, the English Honor Society. Gerrell recently presented his McNair research at the 17th Annual National McNair Scholars Conference in Delavan, Wisconsin. He was also a winner of the Friends' of the Library McNair Scholarship, awarded at the organization's November 7 meeting.

"If you would be a real seeker after truth, it is necessary that at least once in your life you doubt, as far as possible, all things."

– Rene Descartes

Western fiction, writing involving the land west of the Mississippi River and east of California, has traditionally revolved around what Jane Tompkins labels as "arch-images of the genre—the gunfight, the fistfight, the chase on horseback, the figure of the mounted horseman outlined against the sky, the saloon girl, [and] the lonely landscape itself" (*West of Everything*). Many of these works revolve around iconic cowboys who accomplish heroic feats of mythical proportions. Larry McMurtry's Pulitzer Prize winning novel *Lonesome Dove* has often been simply classified as just a Western novel. While this classification is technically true, the term "Western novel" does not begin to capture the many distinctions which make McMurtry's narrative truly exceptional. While McMurtry's tale does contain elements of the Western myth, the novel departs from the more sensationalized depictions that are prototypical of the Western genre in numerous ways. *Lonesome Dove* separates itself from other works within the Western genre by not only deconstructing the mythic Western hero, but by also adapting the heroic notion of the spectacular journey archetype. This study will show how McMurtry changes the script of the traditional Western heroic novel by incorporating elements that are not typically assigned to characters within Western fiction, while the second part of the study will analyze how McMurtry reinterprets the journey (or quest) archetype to create a truly unique Western epic that challenges romanticized perceptions of life in the Old West.

Mentor:
Peggy Kulesz, Ph.D.
Department of English



An Examination of Nursing Staff's Participation in Study Recruitment on a Spinal Cord Unit



Mayra Rodriguez

Nursing major

Born in Los Angeles, Cali., Mayra attended Tarleton State University and Cedar Valley College before entering UT Arlington. She is a member of Phi Theta Kappa Honor Society and was a Hispanic Scholarship Fund/ Lilly Endowment, Inc./Dallas Hispanic Chamber of Commerce Foundation Scholar.

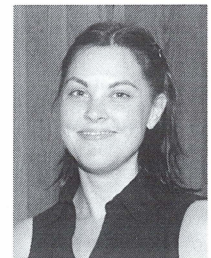
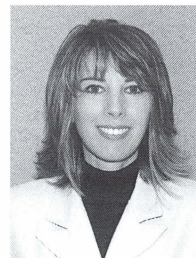
"If I have the belief that I can do it, I shall surely acquire the capacity to do it, even if I may not have it at the beginning."

—Mahatma Gandhi

Returning to work following a diagnosis of a spinal cord injury can be a very daunting and difficult process. The VA-funded, multi-center trial, "A Spinal Cord Injury Vocational Integration Program (SCI-VIP): Implementation and Outcomes" is a research study focused on helping veterans gain employment. Looking at the nationwide clinical sites for the SCI-VIP study, it is unclear why nursing referrals and enrollment are low. The purpose of this study is to evaluate the spinal cord nurse's knowledge, behaviors and perceptions of research, specifically at the Dallas SCI-VIP clinical site. An intervention was developed to try to increase the knowledge, the recruitment behaviors, and the awareness of the nursing staff of the SCI-VIP study. The study is a pre-test, post-test design used to measure the effectiveness of the intervention. Using pre-test and post-test surveys, data was collected on 26 subjects during the pre-test and 28 subjects in the post-test. Nationwide, nursing recruitment to the SCI-VIP study was found to be low and this was true of the Dallas SCI Center. Post-test results showed favorable results increasing the knowledge of the nursing staff, as well as increasing their recruitment behaviors following the intervention. The nursing staff failed to improve in the post-test findings on confidence of knowledge and comfort of speaking with patients about employment opportunities. This study demonstrated that a simple educational intervention could impact nursing staff's knowledge and participation in research in a relatively short time frame. Further controlled studies are needed to test the best methods of increasing and maintaining participation by nurses in ongoing clinical research activities.

Mentors:

Lisa Ottomanelli, Ph.D., and
Jennifer Sippel, Ph.D. (Co-Mentor)
SCI-VIP Study, Dallas Veterans
Administration Hospital



Students in the News: A Study of the Black Sheep Effect



Rhonessia Johnson

Psychology major/business administration minor

Rhonessia was born in Port Arthur, Texas, and was awarded the city's Industrial and Commercial Leaders Scholarship. She has served as treasurer to the Psychology Society. Last spring she attended the 10th Annual Texas National McNair Scholars Research Conference at the University of North Texas and this fall she presented her research at the 17th Annual National McNair Scholars Conference in Wisconsin.

"As we let our light shine, we unconsciously give other people permission to do the same. As we are liberated from our own fear, our presence actually liberates others."

– Marianne Williamson

This research examined the black sheep effect and the effects of public versus private responses. The black sheep effect refers to the tendency for group members to evaluate another unlikeable member more harshly than a similarly unlikeable out-group member. The general aim was to test the black sheep effect, in a non-laboratory setting, and to examine the differences between public versus private responses. In this experiment, an online study about a student selling drugs on campus was given to UT Arlington students. The student committing the crime was described as either a UT Arlington student or a UT Dallas student. According to random assignment, participants were told that their responses were going to be made public or kept private. Thus, participants (N=25) were randomly assigned to one of four conditions (1=in-group, private; 2=out-group, private; 3=out-group, public; 4=in-group, public). The researcher anticipated that the black sheep effect would occur, and that it would be minimized in the public condition, in comparison to the private condition. The results of the study (so far) show that UT Arlington students rate their in-group member's behavior more negatively in private than in public. These tentative results suggest an identity-protection strategy in public settings.

Mentor:
Jared Kenworthy, Ph.D.
Department of Psychology



Solitons and Nonlinear Partial Differential Equations



Antonio Lopez

Mathematics major/physics minor

Antonio, who was born in Puebla, Mexico, is a member of the UT Arlington Honors College and has also participated in the Math Department's Research Experience for Undergraduates (funded by the National Science Foundation). He was awarded the UT Arlington Academic Achievement Scholarship, the John A. Gardner Scholarship (Mathematics), in addition to the Math SURGE Scholarship. Antonio has presented at numerous local and national math conferences including MathFest 2008 in Wisconsin, last summer. He is a member of the National Society of Collegiate Scholars and Golden Key.

"If you're trying to achieve, there will be roadblocks. I've had them; everybody has had them. But obstacles don't have to stop you. If you run into a wall, don't turn around and give up. Figure out how to climb it, go through it, or work around it."

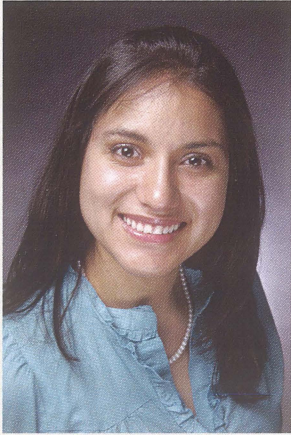
– Michael Jordan

Solitary wave solutions (soliton solutions) to four nonlinear partial differential equations are investigated and their applications in various areas are studied. The four nonlinear partial differential equations under study are the Korteweg-de Vries (KdV) equation, the nonlinear Schrödinger (NLS) equation, the sine-Gordon (SG) equation, and the modified Korteweg-de Vries (mKdV) equation. These equations and their soliton solutions have important applications in various areas. For example, the Korteweg-de Vries equation is used to describe propagation of surface waves in shallow waters, blood flow from the heart, and acoustic waves in plasmas. The nonlinear Schrödinger equation models wave propagation along optical fibers and propagation of surface waves in deep waters. The sine-Gordon equation describes electron tunneling in a magnetic field in a Josephson junction (the gap between two superconductors). We apply a recent method developed by Aktosun, Demontis, and van der Mee in order to present the N -soliton solution formulas in a compact way in terms of a constant $N \times N$ matrix A , a constant $N \times 1$ matrix B , and a constant $1 \times N$ matrix C . The advantage of this method over other available methods is the explicit nature of the formulas in displaying soliton solutions. Besides the analysis of theoretical and analytical aspects, the symbolic software *Mathematica* is used to develop computer programs to animate and display such solutions explicitly.



Mentor:
Tuncay Atkosun, Ph.D.
Department of Mathematics

The Evolution of Sex Determination in the Nematode *Pristionchus pacificus*



Sonya Lopez

Biology major

Sonya is from Dayton, Ohio. As an Honors College member, she has served in many capacities, including that of HC Council officer. Last year Sonya also participated in research funded by the Louis Stokes Alliance for Minority Participation. In summer 2008, she attended the *C. elegans* Developmental and Evolution Meeting in Wisconsin, and she and her mentor also participated in the National Institutes of Health Current Topics in Genomic Research Short Course in Maryland. Sonya is a member of Golden Key Honor Society.

“You look at science (or at least talk of it) as some sort of demoralising invention of man, something apart from real life, and which must be cautiously guarded and kept separate from everyday existence. But science and everyday life cannot and should not be separated. Science, for me, gives a partial explanation for life. In so far as it goes, it is based on fact, experience and experiment.”

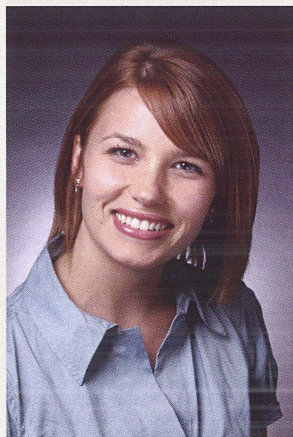
—Rosalind Elsie Franklin

The sex determination systems direct the male or female identity of a developing embryo. The sex determination system is very well studied in the nematode *Caenorhabditis elegans*. Comparative analyses of sex genes within the *Caenorhabditis* genus have provided some information on evolutionary patterns of sex determination in closely related species. To fully understand the evolution of sex determination pathways, it is important to make comparative analyses with more distantly related species. *Pristionchus pacificus* is a nematode that diverged 200-300 million years before *C. elegans* and is therefore ideal for this purpose. So far, the *C. elegans* sex determination gene *tra-1* has been identified in *P. pacificus*. Functional analysis of *tra-1* provides evidence for evolutionary conservation of the most downstream sex determination gene. A *tra-3* ortholog was also identified in the *P. pacificus* genome. The *P. pacificus tra-3* mutants provide a great deal of potential for functional and evolutionary studies. Due to a large evolutionary gap between the two species, *P. pacificus* has many developmental differences when compared to the more well established genetic system of *C. elegans*. It is possible that more upstream *P. pacificus* sex determination genes have significantly changed in structure and function. In order to test this, we used many of the classical *C. elegans* forward and reverse genetic techniques to isolate *P. pacificus* sex mutants.



Mentor:
Andre Pires Da Silva, Ph.D.
Department of Biology

Using Conspecifics to Establish Stimulus Control of Responding in Zebrafish (*Danio rerio*)



Tara McKelvy

Psychology major, English minor

Born in Azle, Texas, Tara previously attended the University of Oklahoma. At UT Arlington she was awarded the Academic Scholarship for Continuing Students and has been very active in many campus organizations and volunteer activities. She is also a member of the National Society of Collegiate Scholars Honor Society. This fall Tara presented her McNair research at the 17th Annual National McNair Scholars Conference in Wisconsin and also received one of two McNair Scholarships awarded for best research presentation by the Friends of the Library. Tara is currently president of the UT Arlington Psychology Society.

“Nothing great was ever achieved without enthusiasm”

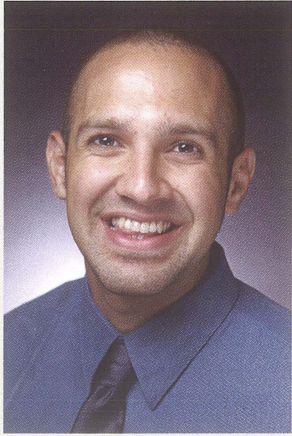
– Ralph Waldo Emerson

Zebrafish are a favorite among geneticists because they are relatively inexpensive in comparison to other test subjects, are easy to maintain and reproduce very quickly. However, despite the growing amount of research on zebrafish and genetics, there is still limited research concerning zebrafish and their ability to learn. This experiment focuses on zebrafish and their capability to learn a simple association with the presentation of a rewarding stimulus; for our purposes the rewarding stimulus was a mirror image which served to act as a conspecific, conspecific meaning belonging to the same species. We wanted the zebrafish to learn to associate the reward with a discriminative stimulus, in this case a red light source. Zebrafish were trained to swim through an invisible beam of light when paired with a red light source to receive a 5-second mirror presentation. Zebrafish also underwent extinction trials where they received no reinforcement and no red light source. The results showed that two of the four zebrafish responded more in the reinforcement trials and that the other two zebrafish responded more in the extinction trials. However, after calculating the rates of response for each zebrafish, it is apparent from the higher rates of responding in the reinforcement trials that the zebrafish did in fact learn the association. Therefore, we suspect that extinction bursts and a limited amount of time for research may have been limiting factors in our study and with further research we may see more responses in the reinforcement trials in all cases.



Mentor:
James Kopp, Ph.D.
Department of Psychology

Predictors of Cognitive Therapy Drop Out in a Community Setting



Bryan Motwani

Psychology major/English minor

Bryan was born in Fort Worth and attended Abilene Christian University and Tarrant County College before enrolling at UT Arlington. A member of the Honors College, Bryan has also been very active in community service projects through his church in the metroplex and elsewhere. In October, Bryan presented a poster based on his McNair research at Research Day 2008 sponsored by the College of Science. Bryan is president of the UT Arlington Triathlon Club.

“We stand upon the brink of a precipice. We peer into the abyss—we grow sick and dizzy. Our first impulse is to shrink from the danger. Unaccountably we remain. . .”

— Edgar Allan Poe

The purpose of this study was to identify factors that contributed to patient drop out from psychotherapy in community health centers across Texas. The sample consisted of $N=29$ patients diagnosed with major depressive disorder (MDD), both dropouts and treatment completers. Dropouts ($n=15$) were defined as those completing less than 9 of the allotted 20 sessions, and completers ($n=14$) were those concluding at least 18 sessions. Differences between these two groups were evaluated. The variables analyzed were demographic factors (gender, marital status, ethnicity, and education), the regularity of therapy attendance for the first five sessions, and therapeutic alliance (TA). No significant differences were found between the two groups in any of the demographic variables or in the evaluation of TA. A significant difference was found between the average therapy session intervals over the first five-week duration between dropouts (10.65 days) and completers (8.84 days). The larger average gap of days between visits might suggest future drop out.

Mentor:
Monica R. Basco, Ph.D.
Department of Psychology





Omid Zaré-Mehrjerdi

Biology and chemistry major

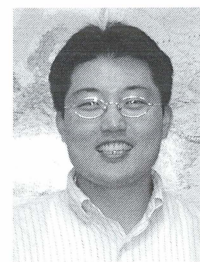
Omid was born in Stillwater, Okla., and attended Tarrant County College before transferring to UT Arlington. He is a member of Phi Theta Kappa Honor Society and Tri-Beta Biology Honor Society among other organizations. Omid received the Outstanding Transfer Student Scholarship and in 2007 was also awarded a McNair Scholarship by the Friends of the Library for his summer research with Dr. Ellen Pritham (Biology). In fall 2007 he also presented his work at the 16th Annual National McNair Scholars Conference in Wisconsin.

“Life is not easy for any of us. But what of that? We must have perseverance and above all confidence in ourselves. We must believe that we are gifted for something, and that this thing, at whatever cost, must be attained.”

– Marie Curie

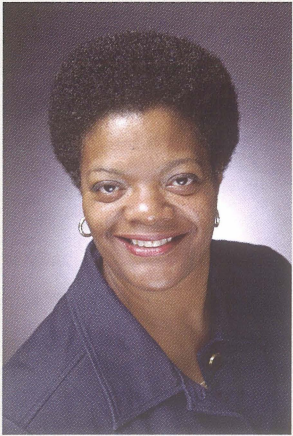
Biodegradable Nanoparticle Delivery Systems in Neurodegenerative Disease: A Comparison of Novel PK3 with Established PLGA

Alzheimer’s disease and other neurodegenerative diseases affect millions of persons worldwide costing billions of dollars in direct and indirect care. The exact cause for these neurodegenerative diseases remains unknown. Neurodegenerative diseases are typically characterized by the loss of function for the afflicted individual ranging from an inability to form new memories or recall past memories to the loss of fine motor control, or worse. Potential therapies that could restore an afflicted individual’s ability to operate and function as a normal member of society could greatly reduce the strain on the healthcare system both financially and in terms of time spent caring for these individuals. One potential therapy for neurodegenerative disease calls for the implantation of cellular islands impregnated with anti-inflammatory drugs encapsulated in biodegradable nanoparticles. It is important for these therapies that the nanoparticle not have an adverse effect on the implanted tissue or the host tissue in order for the implantation to be successful. This study evaluated two biodegradable nanoparticles, PLGA and PK3, to determine which nanoparticle had a reduced inflammatory response. Due to the chemical nature of PK3 it was hypothesized that it would have a greatly reduced inflammatory response as compared to PLGA. This was not found to be the case. Possible reasons may include the concentration of nanoparticle solution delivered, among others. Further work will determine if a substantial difference exists between the two nanoparticles in order to determine the best possible drug delivery system for the treatment of neurodegenerative diseases.



Mentor:
Young-Tae Kim, Ph.D.
Department of Bioengineering

After Twelve Years: The Impact of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 on the Quality of Life for Women and Children in Poverty



Ranita Norwood

Social Work major

Originally from Kansas City, Kan., Ranita attended Central Missouri State University and Tarrant County College before entering UT Arlington. She is a member of Phi Theta Kappa Honor Society and has served as an instructor for the ADAPT Class at the Resource Recovery Center. Recently Ranita and her mentor attended the Council on Social Work Education 54th Annual Meeting in Philadelphia.

"We learn wisdom from failure much more than from success. We often discover what will do, by finding out what will not do; and probably he who never made a mistake never made a discovery."

— Samuel Smiles

Throughout the centuries, regulation and relief of the poor have been associated with social policy. The Elizabethan Poor Laws distinguished between those deemed "able-bodied" and the "impotent poor" (Slack, 1984). During President Roosevelt's New Deal, the first federal emergency relief programs required recipients obtaining public assistance to prove need and to go to work. This philosophy was central to the changes implemented by the Personal Responsibility and Work Opportunity Reconciliation Act (PROWRA) in 1996 and may be viewed as harsh. The government entitlement program, Aid to Dependent Children (ADC), later named Aid to Families with Dependent Children (AFDC), was transformed to a transitional program known as Temporary Assistance to Needy Families (TANF).

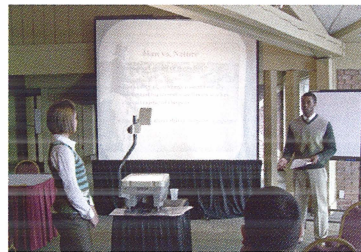
Recent studies indicate that families are not achieving self-sufficiency, which is the primary goal of the PROWRA. Families are spiraling into poverty after being sanctioned for exhausting the 60-month time limit or for not complying with work or administrative requirements. Although this study identifies areas of least support for TANF families such as counseling, child support, transportation and SSI benefits, regulations quickly move TANF recipients along the continuum towards employment regardless of circumstances. This study concludes that most welfare myths are not justifiable. Most TANF recipients are motivated to gain employment; however, many need expanded educational opportunities to derive a sustainable income level above that of most low-level service jobs.

Mentor:
Doreen Elliot, Ph.D.
School of Social Work

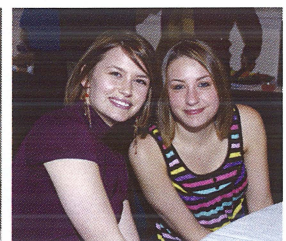
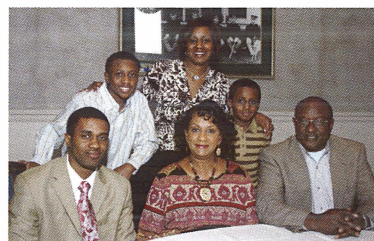
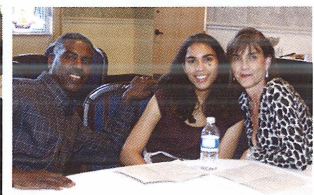
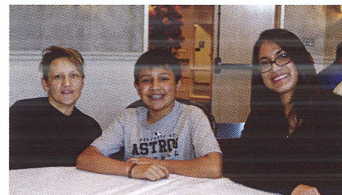


Year at a Glance

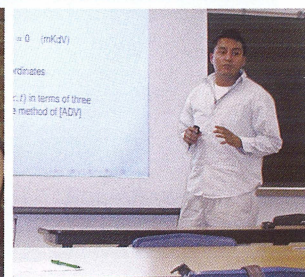
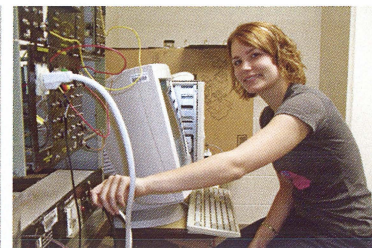
National McNair Conferences (Texas and Wisconsin)



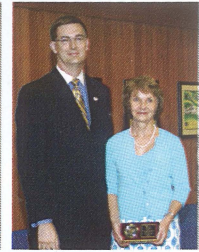
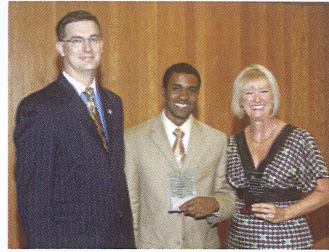
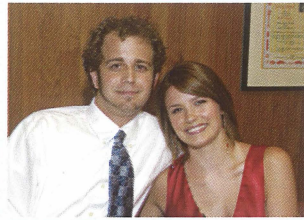
New Scholar Reception



Research and Presentations



Summer Research Banquet



Various Program Events

