

Curriculum Vitae

Mario A. Davidson

Contact Information

Vanderbilt University
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Education

Ph.D. Statistics/Mathematics Education; Dissertation: Understanding the Burdens of Race at a Predominantly White University: The Experiences of Underrepresented Students in an Introductory Statistics Course Co-Advisors: Patricia Brosnan and Peter Demerath, The Ohio State University, Columbus, OH June 2007

M.A. Statistics/Mathematics Education
The Ohio State University, Columbus, OH June 2005

M.S. Statistics
The Ohio State University, Columbus, OH June 2002

M.S. Mathematics
Tennessee State University, Nashville, TN May 1998

B.S. Mathematics
Tennessee State University, Nashville, TN May 1996

Work Experience

Instructor of Biostatistics for Vanderbilt University. 2009 – Present

Biostatistician III for Vanderbilt University. 2007 - 2009

Research Specialist (Statistician) for the James Hospital at The Ohio State University. 2005 – 2007

Research Associate for the Populations Sciences at the James Hospital at The Ohio State University. 2003 – 2005

Research Associate for the Women's Health Initiative site at The Ohio State University. 2002 – 2003

Marketing Analysis Intern for Nationwide Insurance. 2002 - 2005

Software Quality Engineer for Boeing. 1998 - 2000

Research Associate for Tennessee State University/NASA. 1995 – 1998

Teaching and Lecturing Experience

Lecturer for the Patient, Profession, and Society I. 2009

Lecturer for the Patient, Profession, and Society II. 2008

Lecturer for the Emphasis Program at Vanderbilt University. 2007 - Present

Instructor for the Mathematics Department at Columbus State Community College. 2006 - 2007

Teaching Associate for the Department of Statistics at The Ohio State University. 2001 - 2002

Instructor for the Mathematics Department at Tennessee State University. 1997

Unofficial Teaching Associate for Mathematics' advisor at Tennessee State University. 1996

Tutor at Tennessee State University, Temple Baptist Church, The Ohio State University, Mount Olive, City of Refuge First Church of God, and Independently. 1991 - 2004

Manuscripts

Demerath, P., Lynch, J., Davidson, M. (2008). *Dimensions of psychological capital in a U.S. suburb and high school: Identities for neoliberal times*. Anthropology and Education Quarterly

Paskett, E.P., Alfano, C.M., Davidson, M.A., Andersen, B.L., Naughton, M.J., Sherman, A., McDonald, P., Hays, J. (2008). *Breast cancer survivors' quality of life: Racial comparisons*. Cancer

Demerath, P., Lynch, J., Milner, R., Peters, A., and Davidson, M. (in press). *The secrets of their success: A middle-class logic of individual advancement in an American suburb and high school*. Teachers College Record

Riesel, J., Ochieng, F., Wright, P., Vermund, S., and Davidson, M (in press). *High prevalence of soil-transmitted helminths in Western Kenya: Failure to implement deworming guidelines in rural Nyanza Province*. *Journal of Tropical Pediatrics*

Published Conference Proceedings

Davidson, M. (2008). *The burden of race for underrepresented students in an introductory statistics course at a predominantly White university*. Paper presented at the US Sino Workshop, Murfreesboro, TN

Davidson, M. (2005). *Factors involved in the failure of underrepresented students in statistics*. Paper presented at the First United States Conference on Teaching Statistics, Columbus, OH

Lew, J. S., & Davidson, M. (1998). *Effects of uncertainty of identified parameters on structural damage detection*. Paper presented at the Third National Student Conference, The NASA University Research Centers, Huntington, AL

Davidson, M. (1997). *Some queuing models in discrete event dynamical systems*. Paper presented at the First National Student Conference, The NASA University Research Centers, SC

Presentations

How a Biostatistician Can Help Medical Education Researchers; Vanderbilt University School of Medicine: CORE Conversations 2009

Designing a Questionnaire; Vanderbilt University School of Medicine: Global Health 2009

The Basics of Research in Medical Education; Generalist Conference 2008

Designing a Project; Vanderbilt University School of Medicine: GIVME Grant Meeting 2008

Choosing the Correct Statistical Test; Vanderbilt University School of Medicine: CORE Conversations 2008

Creating a Poster; Vanderbilt University School of Medicine: GCRC 2008

What is Hypothesis Testing?; Vanderbilt University School of Medicine: GCRC 2008

What is Hypothesis Testing?; Vanderbilt University School of Medicine: Neonatology 2008

Journey to Becoming a Statistician; Tennessee State University: Mathematics Department 2008

Understanding the Burdens of Race in an Introductory Probability and Statistics Course; Middle Tennessee State University: US Sino Workshop 2008

Introductory Biostatistical Topics; Vanderbilt University School of Medicine: Global Health 2008

Conducting a Literature Review; Vanderbilt University School of Medicine: GCRC 2009

Computer Languages and Tools

R, SAS, Stata, Sweave, LaTeX, Minitab, PS, nQuery, Texas Instruments-83 Calculator, Data Desk, TestGen, SeerStat, C, Microsoft Office (Excel, Publisher, Word, and PowerPoint), EndNote, NUD*IST, QSR Nvivo

Professional Development

Regression Modeling Strategies; Nashville, TN, February 2009

US Conference on Teaching Statistics; Columbus, OH, May 2007

Preparing Future Faculty, Columbus OH, 2006

US Conference on Teaching Statistics; Columbus, OH, May 2005

Mathematics, Science, and Technology Educators & Researchers of The Ohio State University. Proceedings of the Annual Spring Conference; Columbus, Ohio, May 2002

Public Health Reports

Ohio Cancer Incidence Surveillance System & Ohio Department of Health and The Ohio State University (2005). Stage at diagnosis for selected cancer sites & types in Ohio, 1998 – 2002

Ohio Cancer Incidence Surveillance System & Ohio Department of Health and The Ohio State University (2005). Stomach cancer in Ohio, 1998 – 2002

Ohio Cancer Incidence Surveillance System & Ohio Department of Health and The Ohio State University (2005). Leukemia, lymphoma & multiple myeloma In Ohio, 1998-2002

Ohio Cancer Incidence Surveillance System & Ohio Department of Health and The Ohio State University (2005). Oral cavity and pharynx cancer in Ohio, 1998 – 2002

Ohio Cancer Incidence Surveillance System & Ohio Department of Health and The Ohio State University (2006). Lung and bronchus cancer in Ohio, 1999 – 2003

Ohio Cancer Incidence Surveillance System & Ohio Department of Health and The Ohio State University (2006). Kidney and renal pelvis cancer in Ohio, 1999 – 2003

Ohio Cancer Incidence Surveillance System & Ohio Department of Health and The Ohio State University (2006). Testicular cancer in Ohio, 1999 – 2003

Ohio Cancer Incidence Surveillance System & Ohio Department of Health and The Ohio State University (2006). Uterine Cancer in Ohio, 1999 – 2003, Columbus, Ohio

Ohio Cancer Incidence Surveillance System & Ohio Department of Health and The Ohio State University (2006). Colon & Rectum Cancer in Ohio, 1999 – 2003, Columbus, Ohio

Ohio Cancer Incidence Surveillance System & Ohio Department of Health and The Ohio State University (2006). Thyroid Cancer in Ohio, 1999 – 2003, Columbus, Ohio

Awards and Honors

Selected as one of the Spring quarter distinguished statistics teacher's associates at The Ohio State University. 2002

Selected for a fellowship to The Ohio State University. 2000

Received an AT&T scholarship/award at Tennessee State University. 1992

Philosophy of Teaching

Mario A. Davidson
Mathematics/Statistics Education
Vanderbilt University School of Medicine
Department of Biostatistics

Around my junior year at Tennessee State University, I took my first probability and statistics class. It was taught by a professor who would become one of my favorite mathematics professors. We learned about how to calculate the expected value, variance, and standard deviation. We learned about the various discrete and continuous probability density functions. It was great! For the first time in my college career, I was learning a mathematics subject that I did not have to ask the question, “What’s the purpose?” “Where am I going to use this?” In my mind, the purpose was as clear as the nose on my face. After all, my father was a sportswriter, and in the past, I had many opportunities to read the “stat” sheets. My mother was always – and still is, I add – telling me about the research results. “Don’t eat too much of” “They say it causes....”

When I decided to major in Statistics at The Ohio State University, I had a rude awakening. I found out quickly that while I could calculate the variance and standard deviation with “little” effort, I conceptually had no idea of what it was. I did not know that it was a fundamental component of almost all, if not all statistics. How could I have not understood such an important concept? How many other concepts had I “missed the boat” on?

The point of my story is I believe that there should be a purpose to teaching and the students should know it. I teach through practical real world examples. Probability and statistics tend to have a bad reputation of being difficult. Some students are afraid before entering the course. Their minds are closed to the benefits and use of the subject. Probability and statistics is one of a few select subjects that can couple with almost any other subject. Demonstrating to the student the uses and practicalities of the subject are often as easy as understanding the student’s interests, hobbies, and daily lives and portraying it through the lesson.

Besides teaching from a practical standpoint, I believe in having fun, being enthusiastic encouraging, joking, telling stories, and giving examples. In fact, I believe that some of my best lessons have come through having fun. One day while teaching my statistics class, I allowed them to discover what an outlier was. Afterwards, while sticking out and wiggling my thumb, I said, “An outlier sticks out like a sore thumb,” and then asked them to raise their thumbs as a reminder. Later on during class, we took numerous small samples of the students and asked each person to give their expected yearly income in five years and find the average of the group as a lead in to variability and the Empirical rule. Out of pure coincidence, I chose to demonstrate the Empirical rule with the group with the lowest average expected income by constructing a “confidence interval.”

Unfortunately, even a 99.7% interval did not capture any of the other people in the class' expected income. I laughed and told the ladies in the group, "Well...unfortunately you ladies are not very representative of the population." Many of the students laughed and stuck out their thumbs. It is important to me that the student feels relaxed in the course. It is important that they feel comfortable approaching me. By having fun, I believe that they will not only learn the subject matter easier, but they will retain the subject matter better.

As an instructor, I feel that I am patient and nurturing. I believe in the classroom as a community and I encourage them to think the same. Often times I use a problem based or discovery learning style that allows the students to work together in groups while I facilitate. I believe in a style of teaching that allows the students to discover and construct their own knowledge (constructivism). It is my opinion that these methods foster learning, critical thinking, and learning retention. Furthermore, I think these methods assist in problem solving and transferability to a host of subjects.

However I do not restrain myself to only these learning styles. Given the right atmosphere, I may use music, art, sports (multiple intelligences), or other means such as technology, software, and calculators to illustrate concepts. For example, because the students in one of my elementary statistics classes tested as being visual learners in the pre-quarter survey, I often taught with visual aids. One day, we were learning about the different types of experiments. I decided to draw pictures of a blind-folded person, two blinded-folded people, a person balancing some objects, and some dice. The pictures represented blinded, double-blinded, controlled, and randomized studies. The class laughed at my silly pictures. My response, "That's OK, someone will ask you about the different types of studies and my funny pictures will come to mind."

I have high expectations of all of my students, and I challenge them to learn independently. I do this through group work, tutoring, and talking to them both before and after class. This conversation is sometimes class related but is often times not. I enjoy learning about their backgrounds and reciprocating knowledge. From my experience, all of this mannerism leads to a mutual trust and respect which forms our classroom community. By having a classroom community, the students learn to value one another's opinions; learn from each other; become accountable to others for their learning; and form friendships that help make them feel connected to the school. A very nice compliment that I once heard as a state community college faculty who primarily serves non-traditional students was, "Your class is like the only class I've had here were I got to know other students."

In closing, I feel that the formation of such communities enhances student learning and motivation as illustrated by the following example about a student who, in my opinion, epitomized the idea of "doing your best. My relationship with her reinforced the ideas of having a community of caring, patient learners and teachers.

One quarter, I had the pleasure of teaching statistics laboratory to a young lady who was a Chinese major. During the first week of class, she had no problem telling me that while she was an A student, she was mathematically challenged. The course was required for

her major; however, unlike most other students in different majors, she only needed a D in the course to fulfill her program's requirements. I let her know that other than a minimal amount of knowledge on fractions and perhaps some algebra, the course was not mathematically intensive.

This young lady was always one of the first to class and last to leave. In fact, after a few weeks in my class, she did not leave at all. Somewhere within the first few weeks, she approached me and asked whether or not she could stay attend the next laboratory directly after mine. The young lady told me that by going to the same lab twice, she would hopefully be able to learn the things that perhaps slipped past her the first time. I talked to my colleague who was in charge and she agreed. This young lady scheduled office time with me. She also came to the statistics help room when I was there or some of my other colleagues. She did not hesitate to come to any extra sessions that I would often conduct before major examinations. Very rarely have I seen anyone who tried so hard, and I admired her for it.

Despite her effort, by the time final examination approached, she was on the borderline for obtaining her D. During her scheduled two hour exam, she got up after about forty minutes and approached me and another colleague who had been helping her extensively. My colleague and I both looked at each other as she walked toward us knowing that she could not have finished the exam in that amount of time. She graciously thanked us and said that, "I guess I'll see you next quarter." My colleague and I both encouraged her not to give up. We let her know that she could do it, and that she had over an hour left. We let her know that we did not want her to go through that ordeal again. Our encouragement persuaded her to continue to try.

After the exam, I could not wait to know what grade she received. Because of my concern, I must have subconsciously memorized the exact score she needed to obtain a D. At the end of a long night in which all of the instructors and teacher's associates graded the exams, I found out her fate. She scored just enough for a D. It was the best D that I ever gave anyone. It would be easy to tell of my many students who received good grades, but I do not believe any capture my community philosophy quite as this does.

As I said in the beginning of this statement, I believe that teaching should have a purpose and the students should know what that purpose is. Because I view this document as a way to teach the reader a little bit about what it is like to be in my classroom, let me reiterate: The point of my stories is that quality teaching requires many things. The teacher needs to be able to relate to the students the importance and practicality of the subject; show them the big picture. Students need an instructor who will help them think critically. Teachers should use various teaching styles. Furthermore, I believe that having a sense of community created through nurturing, being patient, laughing, and relating to their lives is beneficial to the students and instructors.