Cady Drummonds, (MS Communication Sciences and Disorders, 2017) works in the Computerized Speech Lab to help a patient use better voicing skills.

March 21 - 22, 2018

March 21: Poster Presentations | Ramsey Center
March 22: Oral Presentations | University Center
Reception 5pm | Blue Ridge Conference Center

graduatesymposium.wcu.edu | #RASC18

Sponsored by
Graduate School and Research
Office of the Provost
Dear Participants,

Welcome to the Twenty-Sixth Annual Graduate Research Symposium! Since 1992, the Graduate Research Symposium, sponsored by Graduate School and Research, has provided graduate students the opportunity to showcase their scholarly research and projects, and I want to express my sincere appreciation to you for sharing your excellent work with your fellow students, colleagues, and faculty. I wish to express a heartfelt thank you to all participating faculty and staff mentors - your active student mentorship, support and encouragement of their research is the hallmark of Western’s graduate education experience.

For many students, this will be your first opportunity to share empirical findings and creative works with the academic community. Today, you take a step in becoming recognized as a scholar in your chosen discipline. The skills you learn as part of the research process and your ability to convey that research in writing and in person will enable you to share your knowledge, intellectual passion, and commitment to ideas and to your discipline and profession. Congratulations on this significant milestone in your academic development!

It is my hope that your experience inspires you to continue to contribute to our understanding of all areas of knowledge in the arts, humanities, education, health, social sciences, business, and sciences. You are helping to shape the future and the solutions to important issues facing our region, state, and world, and what you are doing today as students is just the beginning of all you can do to make a true difference.

Thank you. I look forward to meeting each of you personally and to talking with you about your important work and your plans for the future.

Please join your faculty mentors, colleagues, and members of the Graduate School at the research posters that will be viewable starting at 3:00 PM on Wednesday, 21 March, at the Ramsey Center. The concurrent oral presentation sessions will be starting at 9:00 AM in the University Center on Thursday, 22 March. This year we have featured undergraduate oral presentations leading off some of the oral sessions to better integrate our graduate and undergraduate research. Our keynote speaker, Dr. David Shapiro, WCU’s Robert Lee Madison Distinguished Professor of Communication Sciences and Disorders, will deliver his address on Thursday 22 March, at 2:00pm in the University Center Theater. Following the oral presentations, there will be a reception and awards ceremony, in your honor, in the Blue Ridge Conference Center starting at 5:00 PM, on Thursday 22 March. We look forward to seeing you and celebrating your excellence!

Brian D. Kloeppel, Ph.D.
Dean, Graduate School and Research
Dr. David Shapiro
Professional Development – A Process in Progress

Keynote Address
Thursday, March 22, 2018
2:00 pm | University Center Theater

Dr. David Shapiro is a distinguished professor of Communication Sciences and Disorders, speech-language pathologist, and specialist in fluency disorders for over 40 years. He will discuss a few of the many opportunities and challenges he has experienced, both personally and professionally. He will then share insights and suggestions for graduate students as they embark on their own careers. Throughout, he will emphasize the lifelong nature of professional development and the limitless possibilities facing every WCU graduate. Come prepared to learn, to grow, to be challenged, and to be inspired.

March 21, 2018
6:00 pm – 7:30 pm
Poster Session | Ramsey Center
Poster Judges: Debra Burke, Marianne Hollis, George Ford

Controlling Stiffness Through the Milli-Structure of a Material Using Selective Laser Melting
Terail Clonts; Sponsor: Scott Pierce, Joe Fahmy, Martin Tanaka

Detection and Removal of Chromium Metal Ions from Drinking Water
Paige Coleman; Sponsor: Channa De Silva, Jerry Miller Scott Huffman

So Disgusting, but You Can’t Take Your Eyes off the Screen: Do Personality Traits and Disgust Sensitivity Influence One’s Liking for Horror Movies
Ashley Dillard; Sponsor: Ellen A. Sigler, David McCord, Christopher J. Holden

Expected to be Strong: Mental Health Resources and African American Women at WCU
Roslyn Gowens; Sponsor: Brandi Crawford

Effects of Variations in Forest Canopy Openness, Prey Abundance, and Abiotic Factors on Bat Activity in the Nantahala National Forest
Thomas Granger; Sponsor: Beverly Collins

The Abyss: Helping Students Cope with Post-College Transition
Carrie Hachadurian; Sponsor: April Perry

Measuring Upconversion in NaYF4: Yb, Er Nanoparticles with Varying Erbium Concentrations
Weaver Haney; Sponsor: Channa De Silva, Bill Yang, Robert Adams

Mindfulness and Attentional Control in Male Inmates
Hannah Hinkel; Sponsor: Jamie Vaske

Slider Crank Power Take-off System with Wave Prediction Control Methodology Based on Autoregressive (AR) Filters
Md Rakib Hasan Khan; Sponsor: Bora Karayaka, Peter Tay, Yanjun Yan

A Comparison of Habitat Selection and Cold Tolerance of the Invasive Fire Ant, Solenopsis invicta, in Piedmont and Montane Regions of the Carolinas
Amanda Lafferty; Sponsor: James Costa

A Microwave-enhanced Green Synthesis of Eu3+-doped CaF2 Nanoparticles for Fluorescent Imaging Applications
Aaron Lipchak; Sponsor: Channa De Silva

How do you Really Feel: A Queer Campus Climate Assessment
Tyler Melvin; Sponsor: Brandi Crawford, April Perry

A Novel Valvehead Assembly Design for Four-Stroke Internal Combustion Engines
Erik Meyers; Sponsor: Tony Rizk

WCU’s Robert Lee Madison Distinguished Professor of Communication Sciences and Disorders, speech-language pathologist, and specialist in fluency disorders for over 40 years, David Shapiro has taught, provided clinical service, and conducted research on six continents.

During the keynote lecture for the WCU Graduate Research Symposium, Dr. Shapiro will discuss a few of the many opportunities and challenges he has experienced, both personally and professionally. He will then share insights and suggestions for graduate students as they embark on their own careers. Throughout, he will emphasize the lifelong nature of professional development and the limitless possibilities facing every WCU graduate. Come prepared to learn, to grow, to be challenged, and to be inspired.
Identification of Body Fluids by mRNA Analysis with MinION Nanopore Sequencing
Mary Jessamine Michaels; Sponsor: Kelly Grisedale, Brittanina Bintz

Targeted Intervention for Struggling College Students
Justin Nakhle; Sponsor: April Perry, Ellen Sigler

Stressed? Work it Out(Side)! : Indoor, Outdoor Recreation, and Psychological Benefits
Ariel Phillips; Sponsor: Brandi Hinnat-Crawford

The Genetic and Ecophysiological Diversity of Kalmia Buxifolia (sand myrtle), and Implications of Climate Change.
Ellen Quinlan; Sponsor: Katherine Mathews, Beverly Collins

The State of Writing Across the Curriculum at Western Carolina University
Jonathan Rich, Crystal Plemmons, Andrew Poole; Sponsor: Sharon McGee

Using Differential Scanning Fluorimetry (DSF) and Molecular Dynamic Modeling to Measure Changes in nBD1-ligand Thermal Stability
Christopher Robinson; Sponsor: Robert Youker

American Toads Increase Movement in the Presence of the Red-Imported Fire Ants
J. Clint Sawyer; Sponsor: Joseph Pechmann

Fatigue Characteristics of Selective Laser Melting
Riley Seyffert; Sponsor: Sudhir Kaul, Wes Stone, Patrick Gardner

The Effects of a Technology Based Self-Monitoring Checklist for Students With/Without a Disability on Academic Engagement
Angela Smith; Sponsor: Kristy Doss

Comparison of Parts Produced by Traditional CAD Software and Generative Design
Jeremy Smith; Sponsor: Martin Tanaka, Patrick Gardner, Sudhir Kaul

Mosquito Speciation using IR Spectroscopy
Lamyae Sroute; Sponsor: Scott Huffman

An Interdisciplinary Multi-Modal Resiliency Program in Medical-Surgical Nurses: Does it Decrease Burnout and Increase Quality of Life?
Patricia Traylor; Sponsor: Shawn Collins, Karen Lewis

Structural Damage Diagnostics for Additive Manufacturing
James Walker; Sponsor: Sudhir Kaul, Wes Stone Patrick Gardner

"Research is formalized curiosity. It is poking and prying with a purpose."
Zora Neale Hurston (American Novelist and Playwright, 1903-1960)
10:00 – 11:00 am
Chemistry / Biology
UC 212 – Dogwood Room
Moderator: Barbara Ballentine

Inhibition of Actinobacteria and Actinobacteriophages by ZnO Nanoparticles
   Presenter: *Monica Reece
   Sponsor: Channa De Silva; Maria Gainey

Indirect Effects of House Wrens (Troglodytes aedon) on Life History and Reproductive Traits of Carolina Chickadees (Poecile carolinensis)
   Presenter: Sarah Britton
   Sponsor: Barbara Ballentine

Are Urban Birds Born Bold? Variation in Fear Responses of Urban and Rural Eastern Bluebird Nestlings
   Presenter: Chelsea Corrigan
   Sponsor: Jeremy Hyman, Barbara Ballentine, Thomas Martin

The Impossible Salamander: Aberrant Coloration as a Result of Metal Toxicity, Crypsis, or Light Exposure?
   Presenter: Wendy Harmon
   Sponsor: Joseph Pechmann, Tom Martin, Jerry Miller

10:00 – 11:00 am
English
UC 232 – Multipurpose Room
Moderator: Brent Kinser

“What About Children?”: Toxic Heteronormativity and Family in Dorothy Allison’s “Don’t Tell Me You Don’t Know”
   Presenter: Randi Adams
   Sponsor: Annette Debo

Sin Made Manifest: Exploring the Characters of the Seven Deadly Sins in Nathaniel Hawthorne’s The House of the Seven Gables
   Presenter: Sarah Casto
   Sponsor: Mae Miller Claxton

Mortality and Moby Dick: An Analysis of Life, Death, and Nature in Herman Melville’s American Epic
   Presenter: Craig Hawley
   Sponsor: Mae Claxton

Charming Chattering Tongues: A Close Reading of Shakespeare’s Taming of the Shrew and Much Ado About Nothing
   Presenter: Jessica Masters
   Sponsor: Mary Adams

10:00 – 11:00 am
English / History / Anthropology
UC 315 - Theater
Moderator: Sharon McGee

Investigating the Causes and Effects of the Opioid Epidemic in Native American Communities
   Presenter: *Lauren Stogner
   Sponsor: Ben Steere

To Be or Not to Be Suicidal: Hamlet’s Existential Crisis
   Presenter: Hope Quinn
   Sponsor: Mary Adams

Horace Kephart: The Finicky Gentleman Camper
   Presenter: Marilyn Goble
   Sponsor: Alexander Macaulay

“Somewhere, something incredible is waiting to be known.”

11:00 – 12:00 pm
**Psychology**
UC 215 – Catamount Room
Moderator: Alvin Malesky

Comparison of 3-point versus True-False scoring on the Minnesota Behavioral Health Screen
  Presenter: Haley Hickey, Hannah Mitchell
  Sponsor: David McCord

Mindfulness and Attentional Control in Male Inmates
  Presenter: Hannah Hinkel
  Sponsor: Jamie Vaske

Social Consequences of Political Humor
  Presenter: Andrew Olah, Hannah Buie, Stephanie Mason, Riley McCallus
  Sponsor: Thomas Ford

Who is Really Psychotic? Prevalence of Psychotic Symptoms among DSM Diagnoses
  Presenter: Jacob Warszawski
  Sponsor: David McCord

11:00 – 12:00 pm
**English**
UC 226 – Raleigh Room
Moderator: Jessica Cory

“White Feminism”: Rhetorical Humor in Jane Welsh Carlyle’s Writings
  Presenter: Molly Bowman
  Sponsor: Annette Debo, Brent Kinser

This nor That: Jamaica Kincaid’s “Girl” and the Postcolonial Double Bind
  Presenter: Crystal Ellwood
  Sponsor: Annette Debo

Ophelia: The Rest is Silence
  Presenter: Tracey Gruver
  Sponsor: Mary Adams

A Woman Trapped: 19th Century Class, Gender, and Family Pride
  Presenter: Hope Quinn
  Sponsor: Mae Miller Claxton

1:00 – 2:00 pm
**Psychology / Higher Education Student Affairs / Educational Leadership**
UC 212 – Dogwood Room
Moderator: Sharon McGee

Emergent Math Skills and Personality in Preschool Children
  Presenter: *Kristin Morris
  Sponsor: Cathy Grist

Social Perceptions
  Presenter: Hannah Buie, Brooke Myall
  Sponsor: Thomas Ford

Targeted Intervention for Struggling College Students
  Presenter: Justin Nakhle, Jessie Whiteman
  Sponsor: April Perry, Ellen Sigler

Fostering Powerful Partnerships: Getting to the Core of Collaboration Between Educational Counterparts
  Presenter: Rebecca Ensley, Christopher English
  Sponsor: Robert Crowe
1:00 – 2:00 pm

**English**

UC 232 Multipurpose Room

Moderator: Laura Wright

**Memory In Memoriam: Paranoia and Forgetfulness in Shakespeare's Hamlet**

Presenter: Andrew Robinette

Sponsor: Mary Adams

**Capturing the 19th Century Through the Lens of Nathaniel Hawthorne**

Presenter: Jessica Masters

Sponsor: Mae Claxton

**Evolutional Theory that Transcends Science: The Evolutional Theory of T.H. Huxley and its Presence of Thomas Carlyle**

Presenter: Diana New

Sponsor: Brent Kinser, Annette Debo

**The Fruit of Fulfillment: Imagination, Inner Being, and Journeys Between the Binary in Jeanette Winterson's Sexing the Cherry**

Presenter: Jarred Worley

Sponsor: Annette Debo

2:00 pm – 5:00 pm

**Physical Therapy**

UC 232 Multipurpose Room

Moderator: Ashley Hyatt

**Implementation of a Core Stabilization Training Program for Prevention of Lower Extremity Injury in Collegiate Dancers**

Presenter: Marisa White, Brian Allen, Kaitlyn Dale, Helen Kirk, Whitney Ward, Elizabeth Webber

Sponsor: Jessica Graning, Todd Watson

**The Effects of Strength and Endurance on Gait Stability**

Presenter: Alexa Eure

Sponsor: David Hudson

**Cultivating Musculoskeletal Health in Farmworkers through Video-Based Learning**


Sponsor: John Carzoli

**Feasibility and Effectiveness of a Modified Otago Program for Community-Dwelling Older Adults**

Presenter: Cameron Overstreet, Ryan DeBerry, Audrey Jordan, Carly Pippin, Victoria Shelton, David Stroup

Sponsor: Lori Schrodt

**Seated Trunk Control Training in Adults Post Acute Stroke: Do Focus of Attention Strategies Impact Lateral Excursion Performance and Learning?**

Presenter: Natalie Tresslar, Emily Wilson, Hannah Pollard, Evan Kirkland, Heather Puchel, and Whitney Correll

Sponsor: Ashley Hyatt, Sue McPherson

“I enjoy my work as an actor. But to make a difference in people’s lives through advocacy and through supporting research—that’s the kind of privilege that few people will get, and it’s certainly bigger than being on TV every Thursday for half an hour.”

Michael J. Fox (American Actor, 1961-present)
3:45 – 4:45 pm
Biology
UC 212 – Dogwood Room
Moderator: Jeremy Hyman

Cloning and Expression of CAS9 in the Pathogenic Yeast, Cryptococcus Neoformans
Presenter: *Katie Spauding
Sponsor: Indrani Bose

Population Assessment of Redhorse (Moxostoma Spp.) in the Upper Oconaluftee River, Qualla Boundary, NC
Presenter: Ethan Fite
Sponsor: Thomas Martin

Identification of Body Fluids by mRNA Analysis with MinION Nanopore Sequencing
Presenter: Mary Jessamine Michaels
Sponsor: Kelly Grisedale, Brittania Bintz

Feathers as an Indicator of Quality in Urban versus Rural Eastern Bluebirds
Presenter: Kenley Patanella
Sponsor: Jeremy Hyman

3:45 – 4:45 pm
Engineering / Technology
UC 214 – Cardinal Room
Moderator: Sudhir Kaul

NRC Load Following
Presenter: *William Benson, Ghalib Shutayfi; Zachary Massey; Tanner Hollis
Sponsor: Bora Karayaka

Slider Crank Mechanism for Wave Energy Conversion (WEC): An Experimental Study
Presenter: Andrew Fowler
Sponsor: Sudhir Kaul, Wes Stone, Bora Karayaka

Linear Thermal Power Controller Design and Implementation for Efficient Electric Heating
Presenter: Jairo Nevarez
Sponsor: Bora Karayaka, Martin Tanaka, Peter Tay

Detecting Induced Surface Currents in Plasmon Excitation Fields
Presenter: Trevor Parrish
Sponsor: Weiguo Yang

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

Albert Einstein (Theoretical Physicist, 1879-1955)
3:45 – 4:45 pm

English

UC 226 – Raleigh Room
Moderator: Annette Debo

“With Flowers of Winter”: The Existence of Parallel Ecologies within Shakespeare’s Winter’s Tale and Hamlet
Presenter: Kristin Fulp
Sponsor: Mary Adams

A Poor Player Upon the Stage of Fear: Terror Management Theory and its Ecogothic Shadow Over Macbeth’s Life
Presenter: Diana New
Sponsor: Mary Adams

A Thing Most Brutish: A Study of Ariel, Caliban, and the Language of Slavery in William Shakespeare’s The Tempest
Presenter: Michael Redman
Sponsor: Mary Adams

Had She a Tongue to Speak: Disability in “Titus Andronicus”
Presenter: Yustin Riopko
Sponsor: Mary Adams

Chemistry

UC 315 – UC Theater
Moderator: Dave Evanoff

Determining if Microbacterium Foliorum and Gordonia Terrae Infecting Phages are Lysogenic or Lytic
Presenter: *Natalia Weindel, Katie Scott, Fallon Lovell, Erica Latham
Sponsor: Jamie Wallen, Maria Gainey, Megan Eckardt

Identification and Comparison of DNA Polymerases in Bacteriophages that Infect Gordonia Terrae, Microbacterium Foliorum, and Mycobacterium Smegmatis
Presenter: *Bo Wiseman, Celeste Smith; Kaitlyn Taylor; Trevor Justice
Sponsor: Jamie Wallen; Maria Gainey; Megan Eckardt

Determining the Structure and Function of Unique Regions Found in DNA polymerase Gamma of Cryptococcus Neoformans
Presenter: *Lindsey Farris
Sponsor: Jamie Wallen, Indrani Bose

Pesticides in Beeswax
Presenter: Austin Curto
Sponsor: Cynthia Atterholt
**Research Paper Competition Participants**

**Literature Review Judges:** Patricia Bricker, Dale Carpenter, Lisen Roberts  
**Academic Paper Judges:** Jonathan Bradshaw, Sharon McGee, Erin Myers

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**Retaining and Recalling Sight Words**  
Crystal Buchanan, Elementary Education – M.A.Ed.

**This nor That: Jamaica Kincaid’s “Girl” and the Postcolonial Double Bind**  
Crystal Ellwood, English – M.A.

**The TWA Method and Reading Comprehension Improvement**  
Tonya Fulk, Elementary Education – M.A.Ed.

**Internet Addiction Prevention in Schools**  
Kenneth Hummel, Social Work – M.S.W.

**The War at Home: The Psychosocial Impact that Deployment has on Military Children**  
Jennifer Miller, Psychology – M.A.

**Narrative Interplay in the Discovery of SME Fundamental Constraints to Growth**  
Alana Pierce, Non-Degree

**Had she a Tongue to Speak: Disability in “Titus Andronicus”**  
Yustin Riopko, English – M.A.

**The Effects of a Technology Based Self-Monitoring Checklist for Students With/Without a Disability on Academic Engagement**  
Angela Smith, Special Education – M.A.T.

**Project-based Learning, and the Effects it has on Student’s Attitudes Towards STEM**  
Catherine Usher, Elementary Education – M.A.Ed.

**The Fruit of Fulfillment: Imagination, Inner Being, and Journeys Between the Binary in Jeanette Winterson’s Sexing the Cherry**  
Jarred Worley, English – M.A.

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**Three Minute Thesis Award Winners**

**Judges:** Arthur Salido, Sky Sampson, Kathy Foley

**First Place**

Maci LeQuire, English  
“Only a Woman’s Pamphlet:” Caroline Norton’s Feminist Rhetoric in “A Letter to the Queen...”

**Second Place**

Mary Jessamine Michaels, Biology  
D.U.K.E.S. of Biohazard: Detecting UnKnown Evidentiary Samples with the MinION Sequencer

**People’s Choice**

Sarah Britton, Biology  
Indirect Effects of House Wrens on Reproductive Behavior of Carolina Chickadees

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“Research is to see what everybody else has seen, and to think what nobody else has thought.”

*Albert Szent-Gyorgyi (Hungarian Biochemist, 1937 Nobel Prize for Medicine, 1893-1986)*
Yesha Datas (M.S. Communication Sciences and Disorders 2017) works with a Parkinson's Disease patient on techniques to strengthen the loudness of his voice.