

the midwest journal of undergraduate research





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Dear Readers,

Undergraduate research represents, I believe, all that is best in higher education. It relies upon the curiosity and the quest for knowledge that undergird what colleges and universities do. It offers students the chance, whether they are at the laboratory bench or in the research library, to experience the thrill of discovery while learning how to use at close range tools of investigation that have enduring value across many careers. It endows those students with the confidence to challenge, in analytical and realistic fashion, what they encounter in the classroom and in their course readings, rather than merely to accept it.

The topics you will find in this fourth issue of *The Midwest Journal of Undergraduate Research* reflect the wide range of investigation undertaken by young men and women pursuing a bachelor's degree. With the kind of faculty mentoring offered at Monmouth College and similar institutions, in the Midwest and beyond, undergraduates can make important discoveries in the humanities, the social sciences, and the natural sciences. And in doing so they can also determine whether a life of research and scholarship is for them.

At the Newberry Library, we have been supporting undergraduate research for more than 125 years. Working with the Associated Colleges of the Midwest and the Great Lakes Colleges Association, we have, since 1965, operated a seminar in which talented undergraduates have been able to conduct primary-source research side-by-side with professional scholars from the world's great research universities. We share the commitment of liberal arts colleges to the kind of work you will find here in this journal.

As a teacher of college students, I take greatest satisfaction in reading the essays they produce that are based on original research; these often serve to teach me about our shared subject matter, rather than me teaching the students. As a scholar myself, I recall with great satisfaction and ongoing inspiration my early undergraduate forays into what was for me – and clearly is for the students whose research appears in this journal – the exciting world of the research scholar. As the head of a research library, I observe concrete evidence that our mission has real meaning when I encounter such fine products of the undergraduate research experience as the essays selected for inclusion in this volume.

Hearty congratulations to these young scholars, to Monmouth College, and to the undergraduate research enterprise. Enjoy your reading.

Yours sincerely,

David Spadafora

President, The Newberry Library



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Special Thanks To...

The editorial board of *The Midwest Journal of Undergraduate Research* would like to give special thanks to the faculty and deans of the ACM colleges for encouraging your students to submit to the fourth issue of our journal. We would also like to thank President Mauri Ditzler, Dean David Timmerman, the Monmouth College Board of Trustees, and our anonymous board of reviewers for providing the resources to make this journal possible. Finally, we would like to thank Monmouth College alumna Caitlin Mehta for designing our cover and logo.



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Call For Papers

The Midwest Journal of Undergraduate Research would like to invite undergraduate students from any ACM institution to submit manuscripts for our 2015 issue by **January 15th.***

Works may be submitted to:

mjursub@monmouthcollege.edu

Requirements:

- Submissions may be from any discipline as long as they are research-based.
- May use MLA, APA, or Chicago style.
- Alongside your submission you must provide the following information:
 - ◊ Name
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*MJUR guarantees review for all submissions received by January 15th.

MJUR cannot guarantee review for submissions received between January 15th and 31st.

MJUR will not accept submissions for the 2015 issue beyond January 31st

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About the Authors...

Ryan Riebe

Ripon College, 2014

Ryan is a senior Communication and Politics & Government major at Ripon College, and will begin attending law school in Fall 2014. In his free time, Ryan is an avid runner and enjoys following both sports and politics. Ryan would like to thank Dr. Steve Martin for his guidance through the various stages of this paper, as well as each of his professors in the Communication and Politics & Government departments for their continued support throughout Ryan's time at Ripon College.

Jared Johnson

Monmouth College, 2014

Jared is a senior Physics and Mathematics major at Monmouth College. He is a member of the Monmouth College Golf Team. He plans to attend graduate school at The Ohio State University to receive his Ph.D. in Materials Science and Engineering where Jared hopes to research some type of energy application. He would like to give thanks to his professors at Monmouth College, Dr. John Poirier (University of Notre Dame), and his parents for pushing him to his full potential and investing confidence in him.

Adrien Saremi

University of Alabama-Huntsville, 2014

I am a senior majoring in both Physics and Mathematics at the University of Alabama-Huntsville. My main interests are to solve computational problems by numerical and analytic solutions in diverse fields such as astronomy, engineering, and even finance. I would like to thank Dr. Poirier, my supervisor during my 2014 summer research internship, who helped Jared Johnson and me with our project as well as taught us the responsibilities and the conduct that a researcher must have.

Joshua Tenenbaum

Beloit College, 2014

Josh is a senior International Relations major and Spanish minor at Beloit College. He is currently completing an Honors Term semester as a post-graduation endeavor. Josh has taken interest in US and foreign politics, having worked in a congressional office here, and focusing on Middle East foreign policy in his major. Before trying political staffing in Washington DC, Josh will teach English in Spain for a year. Josh owes the success of this paper to the efforts of Beth Dougherty and Pablo Toral, who have mentored and nurtured his interest



in global political affairs, theory, and academic writing. Josh cannot be more grateful for the encouragement of Beloit College's political science and language programs.

Alecia Pasdera

Ripon College, 2014

Alecia is a senior Communication major at Ripon College who plans on pursuing a career in journalism after graduation. She is the Editor-in-Chief of her school's paper, and she was recently accepted into Lambda Pi Eta, the National Communication Association Honor Society. Her endless gratitude goes to Communication professors Jody Roy, Steve Martin, and Deano Pape for their constant encouragement and coaching. Without their support, she would not have developed as much as she has as a student, or more importantly, as a person.

Elizabeth McElligott

Wartburg College, 2013

Elizabeth McElligott graduated from Wartburg College in Waverly, Iowa in May 2013 with a degree in English. While at Wartburg, she enjoyed playing flute in the Wartburg Wind Ensemble, serving as co-editor of the college literary magazine, *The Castle*, and leading Wartburg's English club, Pen & Inc. This paper was the result of an independent study that allowed Elizabeth to read Jane Austen novels for fun and call it homework. Special thanks to Dr. Rachel Clark for guidance and support on this paper, and the rest of the English professors at Wartburg who helped Elizabeth through her undergraduate journey. Currently, Elizabeth is a curriculum coordinator at the University of Minnesota Medical School in the department of Family Medicine and Community Health, and hopes to pursue a Master's degree in Organizational Leadership, Policy, and Development of Higher Education.

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Macalester College, 2015

Drew is a third-year Linguistics major and Philosophy minor at Macalester College, located in St. Paul, Minnesota. One of his academic pursuits is studying the syntactic structure of the Old Germanic languages, and he has been awarded an Anderson-Grosshuesch Interdisciplinary Research Grant from Macalester for the summer of 2014 to further this interest. Drew would especially like to thank Professor Joy Laine in the Macalester Philosophy Depart-

ment, who guided the essay from the start and helped him put his leanings toward empiricism into perspective. He would also like to thank his peer reviewers Diana Chao and James Innelli for helping him focus his arguments and bring clarity to the piece.

Alex Brooks

Monmouth College, 2013

Alex graduated from Monmouth College in 2013 and is now a first year Ph.D. student at the University of Illinois at Urbana-Champaign. He currently holds a Research Assistant position under Dr. Marc Snir. His research interests include parallel runtime systems, parallel architecture, and compiler optimizations. Alex is actively involved in research projects with Sandia National Laboratories and participates in a weekly student reading group. After completing his graduate work, he plans to pursue a career in industry. Alex would like to thank Professors Logan Mayfield, Marta Tucker, and Michael Sostarecz for their valuable feedback on the project and for their support through his undergraduate career.

Mike Stees

Monmouth College, 2013

Mike graduated from Monmouth College in 2013 and is now a first year Ph.D. student at the University of Kansas. In addition to being a Self Graduate Fellow, he currently holds a Research Assistant position in the Functional Programming Group under Dr. Andy Gill. Mike's research interests include functional programming, parallelism, language design, and parallel functional programming. After completing his graduate work, he hopes to pursue a career in industry. He would like to thank his professors from Monmouth College, Logan Mayfield, Marta Tucker, and Michael Sostarecz, for their guidance on this paper and their support throughout his undergraduate career.



About the Editors...

Sara Frakes

Sara Frakes is a senior psychology major. After graduating in May, she will be attending the University of South Carolina for a M.ED in Higher Education and Student Affairs. Her research interests include educational psychology and student success research. In her free time, she enjoys working out and spending time with friends. She has greatly enjoyed her experience with the journal and would like to thank the faculty advisors and fellow editors for their hard work.

Carly Abbott

Carly is a junior Psychology major and Sociology minor from Manito, Illinois. She is a member of Pi Beta Phi Fraternity for Women, Alpha Lambda Delta Honor Society, Blue Key Honor Society, Psi Chi International Honor Society in Psychology, and Pi Beta Phi Pi Honor Society. In addition to her involvement with these organizations, Carly is also the President of Monmouth College's Student Alumni Association. This ties in closely to her job on campus as an Alumni Programs Intern for the Office of Development and College Relations where she assists staff by reaching out to alumni and preparing for alumni events hosted by the college. She has been a Statistics and Sociology tutor at Monmouth College for two years now. In her free time, Carly enjoys socializing with friends and family and playing the piano.

Lauren Becker

Lauren Becker is a December 2013 graduate of Monmouth College and a two-year editor for *The Midwest Journal of Undergraduate Research*. She studied English and completed the Honors program with a project on better incorporating English language learners into the American school system. Lauren played soccer as a Fighting Scot all four years and was active in the college's writing center. Since graduating, Lauren has been on the search for writing center-related jobs.

Keri Hannie

Keri is a junior Biochemistry major and a History minor from Pontiac, Illinois. She is a member of Alpha Lambda Delta and Circle K, a service program associated with Kiwanis. When Keri is not doing chemistry homework, she is often reading, singing, or playing her flute. Keri also enjoys drawing and painting to help relax after a difficult week. After Keri graduates from Monmouth College, she hopes to attend graduate school to obtain either her

Masters degree or Doctorate in Biochemistry. Keri's hope is to become a forensic scientist after graduate school.

Mackenzie Mahler

Mackenzie is a junior Psychology and Communication Studies double major from Bourbonnais, Illinois. She has been inducted into several honor societies including Order of Omega, Psi Chi, and Lambda Pi Eta. In her free time, Mackenzie actively participates in Alpha Xi Delta and Rotaract and serves as an editor for the school newspaper. After graduating from Monmouth College, Mackenzie hopes to go to graduate school and eventually teach at a liberal arts institution.

Chase Mowery

Chase Mowery is a senior English major from Fairbury, Illinois. He is involved in a number of campus organizations including Sigma Phi Epsilon and the school newspaper, the Courier. He also recently concluded an honors' project on a small Midwestern sect called the Apostolic Christians. Chase spent his college summers coaching the local swim team from his hometown and managing the pool. Chase reasons that the greatest choice he's ever made in his life—and he likes to think he's made at least a few good ones—was to spend a semester in India. He enjoys swimming, hiking, and simply being outdoors in the summertime.

William Terrill

Will is a senior English major from Somonauk, Illinois. Along with his major, he also participates in the Monmouth College Honors Program and the Monmouth College Educational Garden. This past fall Will was named Lincoln Laureate for the Monmouth College graduating class of 2014. After graduating from Monmouth, Will hopes to join the Peace Corps as an Agriculture Volunteer.