

McNair Scholars Journal

Volume 15 | Issue 1

Article 14

1-1-2011

Supplement

Follow this and additional works at: <http://scholarworks.gvsu.edu/mcnair>

Recommended Citation

(2011) "Supplement," *McNair Scholars Journal*: Vol. 15: Iss. 1, Article 14.

Available at: <http://scholarworks.gvsu.edu/mcnair/vol15/iss1/14>

Copyright ©2011 by the authors. McNair Scholars Journal is reproduced electronically by ScholarWorks@GVSU. http://scholarworks.gvsu.edu/mcnair?utm_source=scholarworks.gvsu.edu%2Fmcnair%2Fvol15%2Fiss1%2F14&utm_medium=PDF&utm_campaign=PDFCoverPages

McNair Scholars Journal

VOLUME 15, 2011



GRAND VALLEY
STATE UNIVERSITY



Assistant Vice President for Academic Affairs
Nancy M. Giardina, Ed.D.

Director
Dolli Lutes

Project Manager
Dolli Lutes

Editor
Heather E. Gemmen

Cover Design
Promotions Office

Photography
John Corriveau/cover
Bernadine Carey-Tucker

Graphic Design and Production
Promotions Office

Grand Valley State University
Faculty Mentors and Research Editors
Elizabeth Arnold, Ph.D.

Assistant Professor of Anthropology

Cheryl Boudreaux, Ph.D.
Assistant Professor of Sociology

Rachel Campbell, Ph.D.
Assistant Professor of Sociology

Patrick Colgan, Ph.D.
Associate Professor of Geology

Rob Deaner, Ph.D.
Assistant Professor of Psychology

Danielle DeMuth, Ph.D.
Assistant Professor of Women and Gender Studies

Lisa Hickman, Ph.D.
Assistant Professor of Sociology

Jaime Owen-DeSchryver, Ph.D.
Associate Professor of Psychology

Christine Smith, Ph.D.
Professor of Psychology

Glenn Valdez, Ph.D.
Assistant Professor of Psychology

Richard Vallery, Ph.D.
Assistant Professor of Physics

Heather Van Wormer, Ph.D.
Assistant Professor of Anthropology

Message from Nancy M. Giardina

Assistant Vice President for Academic Affairs

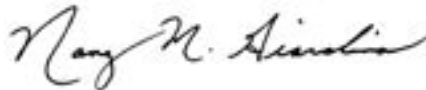
We are proud to present the fourteenth volume of the *Grand Valley State University McNair Scholars Journal*. It is the culmination of intensive research conducted by our student scholars and their faculty mentors through our Ronald E. McNair Scholars Program.

The Ronald E. McNair Scholars Program, now in its 14th year here at Grand Valley State University, provides an opportunity for students and faculty to apply much of what is learned within the classroom by engaging, outside the classroom, in research activities in a particular area of scholarly interest. These research activities provide a journey through the challenges and affirmations of scholarly work and better prepare students for graduate study and the pursuit of a doctoral degree. In addition, GVSU supports the AAC&U position that student engagement in research activities is one of the “high impact” experiences that better prepares students for academic success, transition into careers and the challenges of the 21st century.

Thank you to the faculty mentors who have worked so closely with our McNair Scholars to propel their research skills towards the next level of educational challenges.

Congratulations to the ten McNair Scholars whose research is presented here. Your journey and the challenges you have met during this scholarly activity speak to your talents and persistence in pursuing both your educational and life goals. Thank you for sharing your talents with the university community and continuing the spirit of this program.

Finally, thank you to all the people behind the scenes that work to sustain this program, guide students to success and produce this journal. Your work is valued as well.



Nancy M. Giardina, Ed.D.
Assistant Vice President for Academic Affairs



GRAND VALLEY
STATE UNIVERSITY

“Before you can make a dream come true, you must first have one.” – Ronald E. McNair, Ph.D.

Ronald Erwin McNair was born October 21, 1950, in Lake City, South Carolina, to Carl and Pearl McNair. He attended North Carolina A&T State University where he graduated Magna Cum Laude with a B.S. degree in physics in 1971. McNair then enrolled in the prestigious Massachusetts Institute of Technology. In 1976, at the age of 26, he earned his Ph.D. in physics.

McNair soon became a recognized expert in laser physics while working as a staff physicist with Hughes Research Laboratory. He was selected by NASA for the space shuttle program in 1978 and was a mission specialist aboard the 1984 flight of the USS Challenger space shuttle.

After his death in the USS Challenger space shuttle accident in January 1986, members of Congress provided funding for the Ronald E. McNair Post-baccalaureate Achievement Program. The goal is to encourage low-income, first generation students, as well as students who are traditionally underrepresented in graduate schools, to expand their opportunities by pursuing graduate studies.



Ronald E. McNair Post-Baccalaureate Achievement Program

The Purpose

The McNair Scholars Program is designed to prepare highly talented undergraduates to pursue doctoral degrees and to increase the number of individuals (from the target groups) on college and university faculties.

Who are McNair Scholars?

The McNair Scholars are highly talented undergraduate students who are from families with no previous college graduate, low-income background or groups underrepresented at the graduate level for doctoral studies. The program accepts students from all disciplines.

Program Services

The McNair Scholars are matched with faculty research mentors. They receive academic counseling, mentoring, advising, and GRE preparation. In addition to the above services, the McNair Scholars have opportunities to attend research seminars, conduct research, and present their findings orally or written via poster presentations. In the first semester of their senior year, the scholars receive assistance with the graduate school application process.

Funding

The Ronald E. McNair Postbaccalaureate Achievement Program is a TRiO Program funded through the United States Department of Education and Grand Valley State University.

Table of Contents | McNair Scholars 2011

4	Justin P. Andrews Conversation Elaboration and Emotional Well-Being In Perceived Social Support Faculty Mentor: <i>Brian Lakey, Ph.D.</i>
5	Matthew J. Berrios Phenomenology and the Rehabilitation of Philosophy Faculty Mentor: <i>Mark Pestana, Ph.D.</i>
6	Kelly Howell War and Economy Faculty Mentor: <i>John Constantelos, Ph.D.</i>
7	Ashley Lee Karcher Philosophy's Contribution Toward Learning Beyond Specialization Faculty Mentor: <i>Judy Whipps, Ph.D.</i>
8	Jeremy J. Llorence Exploring Graphic Literature as a Genre and its Place in Academic Curricula Faculty Mentor: <i>Chris Haven, Ph.D.</i>
9	Ryan M. Nicholls The Relationship Between Personality Characteristics and Acceptance of Minority Influence Faculty Mentor: <i>Christine Smith, Ph.D.</i>
10	Edwin G. Ortiz The frequency of generic and nongeneric praise in the academic and sports settings Faculty Mentor: <i>Brad Morris, Ph.D.</i>
11	Julie M. Watkins Status of reintroduced American marten in the Manistee National Forest within Michigan's Northern Lower Peninsula Faculty Mentor: <i>Joe Jacquot and Paul Keenlance, Ph.D.</i>
12	Chadwick A. Williams An Analysis of an Appalachian Metamorphic Suite Faculty Mentor: <i>Ginny Peterson, Ph.D.</i>
13	Shannon M. Williams Investigating the role of Nrg1p and Tup1p during Candida albicans Chlamyospore Formation Faculty Mentor: <i>Derek Thomas, Ph.D.</i>

Conversation Elaboration and Emotional Well-Being In Perceived Social Support



Justin P. Andrews
McNair Scholar



Brian Lakey
Psychology

Social support is an extremely diverse topic. It is the subject of approximately forty thousand scholarly articles when entered into the Grand Valley State University library database under the keyword, "social support." For example, social support has been linked to positive psychological health and low rates of disorders (Barrera, 1986; Finch, Okun, Pool & Ruehlman, 1999; Sarason, Sarason & Gurung, 2001), major depression (Lakey & Cronin, 2008), and posttraumatic stress disorder (Brewin, Andrews, & Valentine, 2000). Also, people who do not have a strong social support system are subject to general psychological distress (Barrera, 1986; Cohen & Wills, 1985; Sarason, 2001). The present study is an investigation of the mechanisms by which perceived social support is linked to better mental health. This study was conducted to explore the link between favorable affect and perceived social support by examining the extent to which conversation elaboration (CE) is highly relational and the extent to which CE can account for perceived support's link to mental health, specifically for relational influences. This was done by testing relational regulation theory (RRT) which explains the association between perceived support and mental health by using CE as the mechanism. This study examines RRT as an alternative to the stress and coping theory, which is currently the dominant mechanism for social support stress coping which occurs when people are better insulated or equipped by social support to deal with hazardous effects from stress. This was done by utilizing United States Marine Corps reservists to rate the perceived support provided and received from other Marines in their company.

Findings were consistent with RRT for relational influences: Perceived social support and CE are correlated at about .77 and both are correlated with positive affect at about .42 and with negative affect at about -.35. Perceived social support was found to be linked to high positive affect and low negative affect, and positive affect and negative affect were weakly correlated. Perceived social support's link to negative affect was lower than perceived social support's link to positive affect. Perceived social support and CE were very highly correlated and showed the same pattern of correlations with positive affect and negative affect as did perceived social support. Conversation elaboration can account for perceived social support's link to negative affect but not positive affect. This infers that there is significant recipient trait variance for each of these constructs. The current study demonstrates a useful tool for studying social influences on relational influence and affect that could easily be adopted for use in studying information processing within clinical disorder. These results may help to build the basic science needed to support interventions by providers that match a recipient's unique personality.

Phenomenology and the Rehabilitation of Philosophy



Matthew J. Berrios
McNair Scholar



Mark Pestana
Philosophy

Philosophy, as the study of ultimate principles of knowledge, has been challenged recently in history by some of the intellectual forces in modernism and post-modernism. In response to this, the movement known as phenomenology has arisen to answer the objections posed by these two intellectual movements. As a movement, phenomenology was developed in the late nineteenth-century under the German mathematician-philosopher Edmund Husserl as a response to the logical questions involved with some of the psychologistic systems of thought of the period that sought to reduce the rules and workings of logic to psychological processes of the human mind. However, because of the connections between logic, metaphysics, and epistemology, the inquiry led Husserl and his followers to a more expansive project that amounted to a new method of philosophical inquiry.

It will be shown in this paper that while the methods of phenomenology are relatively new in the history of philosophical thought, they could be viewed more as a continuation and development of the view of philosophy as first expounded by the ancient Greeks that continued through the medieval period. In addition, it will be shown how phenomenological inquiry has added valuable and novel insights of its own to philosophical thought.

Greek views concerning the nature of philosophy will be examined as well as a brief overview presented of the development of the field through the early modern period in regards to the problems that the methods of phenomenology answers. In particular,

the role of phenomenology in response to the “critical problem” of the relation of mind to world as posed by Immanuel Kant will be examined. The phenomenological method in its various aspects will be examined as well as its significance for the process of inquiry as a whole. The meaningful consequences and implications of the concept of “intentionality” will also be covered in addition to other findings such as “noesis” and “noema.”

The phenomenological concern regarding the restriction of the domain of evidence will be discussed in detail because of its relevance to the restrictions that logical positivism and other types of “scientism” have attempted to place on the scope of philosophical inquiry. In this respect, some of the logical concerns in phenomenology will also be discussed as well as the nature of the justification for ultimate principles. It will be shown that many of the findings of phenomenology and philosophy can only be pointed to and contemplated by virtue of their very nature as ultimate principles that transcend any one particular “science.” Because of this, these principles cannot logically be reduced from the start of the investigation to any sort of physical, biological, semiological, or psychological theory.

War and Economy



Kelly Howell
McNair Scholar



John Constantelos
Political Science

The activity of war has existed throughout the length of human history, occurring between and within nation-states as well as other types of political units. Although war is one of the most destructive of human endeavors, much remains to be understood about war and its effects on economies, cultures, and the environment. The human cost of war is often explored and perhaps the most obvious effect to observe in terms of the direct costs of war. However, there are other long term effects of war that have not been satisfactorily explored and that continue to deeply affect citizens, as well as their communities and their countries. These include but are not limited to the multiple effects of war on international, local, and regional political climates, cultures, state resources, environmental health as well as the health of citizens, institutional constructs, and economies. The health of a state's economy relates directly to the stability of that state and the health of its citizens. War destabilizes states and compromises the health of citizens, as well as diverts funds to war activities and away from other forms of investment. The profitability of investing in war is a topic that remains open to debate among scholars today as there remains to be found a satisfactory explanation that encompasses the costs and benefits of war. One possible benefit of war is the enhancement of state security. However, the question of whether or not war truly improves the security of states has not been definitively answered. With so many questions still unresolved about the effect of war on state economy, it is crucial to keep examining the evidence that is available.

This research explores the relationship between increases in military spending (Milex) during war and the economic performance of nation-states. As prior research is inconclusive, a statistical analysis of updated data is conducted. Data gained from previous studies regarding war spending and the growth of nation-states is utilized. The theory predicts an initial positive relationship

between military war spending and economic performance, which plateaus and is followed by a negative relationship that is inversely related to the duration of the war. The multiple regression analysis revealed no significant correlations and no linear relationship was observed between the response variables and the parameters. After computing the OLS correlations, a weak positive correlation was observed between the cost and duration of a war for all wars across the entire sample, and a slightly stronger correlation between these variables was observed for inter-state and extra-state war alone. A moderate correlation was observed between duration and battle deaths for civil wars. Utilizing simple t-tests, a significant decrease in average short-term growth rates (during war) was observed over the entire sample, averaging 1.2%. After war, the average increase in military spending across the sample is 19%, suggesting that increases that occur during war may not return to pre-war levels. The possible long-term economic impact of such increases in Milex, although a subject of contemporary examination, is in need of further exploration.

Philosophy's Contribution Toward Learning Beyond Specialization



Ashley Lee Karcher
McNair Scholar



Judy Whipps
Liberal Studies

The relationship between education and philosophy has changed dramatically between ancient and contemporary eras. In ancient times, educated citizens were encouraged to practice philosophy. Today, excessive focus on specialization marginalizes philosophy into a specialized discipline significantly decreasing students' development of philosophical capacities across curricula. Yet, developing philosophical capacities occurs beyond specialization. In this paper, I critique contemporary American higher education through a comparison of ancient Socratic and Confucian education by analyzing how philosophy's role has changed and demonstrating why implementing philosophical development across curriculums in American higher education is practical, despite tensions between both traditional vs. progressive values and the development of technical skills for job placement vs. philosophical capacities.

Currently in American public higher education, philosophy and other disciplines within the humanities are classified as having less job-market value and are therefore treated as less practical mainly because of the highly specialized and market-driven education system. Yet disciplines with higher market values such as the science, technology, engineering, and mathematics (STEM) fields and other professional programs lack sufficient focus on developing and exercising philosophical capacities in their learning objectives, which require deliberate efforts beyond what specialized expertise or technical education offers alone. Philosophical capacities include analytical analysis, logical reasoning, decision making, identifying assumptions underlying methods and beliefs, sympathetic understanding, and adroit perspective shifting.

The two primary conflicts that I investigate that contribute to philosophy's devaluation in education include traditional vs. progressive values and developing practical skills for job placement vs. philosophical development (self-development). These two conflicts are perennial conflicts that have persisted throughout the ancient eras and continue to contribute to philosophy's

present state of isolation, distorting the social conception of philosophy and misrepresenting the nature and function of philosophy's role in society and within education.

In recognizing the shift in philosophy's role between ancient and contemporary times, I compare ancient Socratic and ancient Confucian educational approaches. In the comparison of these two ancient approaches, I demonstrate that the two conflicts that currently contribute to philosophy's marginalization and devaluation were present in ancient times also. The purpose of showing that the two conflicts existed in the two ancient cultures is to demonstrate that historically, philosophical pedagogy had become a foundational component of educational approaches despite the presence of these two conflicts, while cultural traditions and practical skills remained generally intact. Furthermore, because the two conflicts existed in the two ancient cultures, I emphasize that the two conflicts that contribute to philosophy's present state in academia are unjustifiable explanations for philosophy's present state of marginalization; Both Socratic and Confucian approaches valued and implemented philosophical development within their education. Seeing that the ancient Confucian approach is relatively more traditional AND skill oriented in comparison to the ancient Socratic approach demonstrates that philosophy itself is not polarized one way or another, since both valued philosophical development and implemented it within their developmental practices.

The primary purpose of the comparison suggests that philosophy, as an activity or practice, can become integrated as a foundational component of American public higher education. By implementing philosophy into the foundations of American public higher education, students across all disciplines can encounter adequate philosophical development within their specialized fields, which can help us mediate the enduring value conflicts, rather than clinging to one extreme over the other.

Exploring Graphic Literature as a Genre and its Place in Academic Curricula



Jeremy J. Llorence
McNair Scholar



Chris Haven
Writing

The goal of this study is to identify what place, if any, graphic literature should have in academic curricula. While it is reasonably common to find courses in art and literature at any mainstream college or university, courses on graphic literature can be somewhat harder to locate. The reason for this is that academic disciplines are genres which means they are subject to constraints. These constraints work well with already established modes such as books or film but can become trouble for graphic literature. As a blend of art and narrative, it cannot fully be placed in the art or literature departments. It may be the case that without a department for graphic literature, courses in the form will remain rare.

However, some educators have found use for graphic literature in other departments. Each semester Professor Sebastian Maisel of Middle Eastern Studies at Grand Valley State University uses graphic works such as Majane Satrapi's *Persepolis* to bring a different reading experience to his MES 201 course. In order to determine the efficacy of graphic literature in this setting, I took a survey of his course. One of the questions of this survey asked students to define graphic literature. In forming these definitions some students indicated the form was more about art while others indicated the text was the more important aspect. This may suggest that different students have different experiences in the cognitive processing of graphic literature.

In order to provide solid evidence of this I replicated a test originally given by Academic Coach Wendy Marty. The test asked students to look at a simple example of graphic literature for fifteen seconds and then reproduce what they could from memory. Analysis of these tests allowed us to determine on a case by case basis whether students were better able to learn visually or textually. From our test sample we found that there is actually a pretty large mix of these types of students. If these results are indicative of anything it's that there are different learning types that professors and students may not be fully aware of.

Dale Jacobs, in his analysis of graphic literature, offers a new way of thinking of the form by placing it into the genre of multimodal literacy. The purpose of multimodal texts is to incorporate elements from all sorts of visual and audio forms. The beauty of multimodal texts is that they compensate for the difference in processing among different readers. Therefore, if the goal of academic curricula is to create the best learning experience for all students, multimodal texts need to be more prevalent. If there are indeed different styles of learning, professors must be able through their coursework to reach all of these different types of students. Graphic literature may not have its own department but because of its multimodal properties it can prove to be beneficial if incorporated into courses in a wide variety of disciplines.

The Relationship Between Personality Characteristics and Acceptance of Minority Influence



Ryan M. Nicholls
McNair Scholar



Christine Smith
Psychology

According to the literature on social influence, there is a strong relationship between exposure to minority points of view and divergent thinking (i.e., thinking characterized as fluid, flexible, and more creative). Relatedly, another body of research has established a link between creativity and certain personality characteristics, especially those that contain novelty or originality as key components (e.g., openness to experience, need for cognition). In the present study, we examined the possibility that entertaining and accepting minority points of view might be, in part, related to a variety of personality characteristics. Specifically, we predicted that individuals who score high in need for cognition and openness to experience would be more influenced by a minority source of influence than would individuals who scored relatively lower on these two measures. That is, we imagined that individuals high in openness and need for cognition might be more inclined to construe the minority source of influence as a source of creative thinking and therefore gravitate toward the point of view expressed by the minority.

In addition to measuring the above mentioned personality variables, we manipulated source status (minority/majority) and the general success of the position being argued (successful/unsuccessful). These variables were manipulated within a brief vignette read by all participants. In this vignette the source argued in favor of a policy that would require all college students to complete 4 semesters of foreign language training in the interest of making them more marketable in the global economy. Source status was manipulated by including the percentage of individuals who agreed with the new policy (i.e., 85% agreed for majority, 15% agreed for minority), and success of the position being argued was manipulated by providing information regarding the success of the foreign language policy when adopted by a distant university.

Thus, the study utilized a 2 (Status: Minority/Majority) X 2 (Success: Success/Failure) X 2 (Personality Variable: Need for Cognition and Openness to Experience: High/Low) factorial design. The dependent variables of interest included both direct (i.e., overall acceptance of minority influence) and indirect (i.e., divergent thinking) measures.

Our results support the notion that personality characteristics are related to the extent to which a minority point of view is entertained. The results indicate that individuals who were high in openness in the minority condition, were more likely to accept the proposal if it was deemed successful versus unsuccessful. However, we also found that individuals low in openness, in either status condition, were more likely to accept the foreign language proposal if it was previously deemed unsuccessful versus successful, and the same held true for those individuals who were high in openness and in the majority condition. We also found a 3-way interaction for need for cognition yielding similar results. This is a curious result that does not coincide with the existing literature. Thus, future studies should look at the relationship between individual personality characteristics and acceptance of minority influence in both successful and unsuccessful contexts.

The Frequency of Generic and Nongeneric Praise in the Sports and Academic Settings



Edwin G. Ortiz
McNair Scholar



Brad Morris
Psychology

The link between praise and motivation is well-documented. Generic praise focuses on a child's traits and abilities and implies that achievement is due to stable factors such as intelligence. Nongeneric praise focuses on the effort the child exerts to achieve a goal and implies that achievement is due to nonstable factors. Generic praise influences goals for achievement by conveying to the child that outperforming others is more important than self-improvement. A performance goal is associated with negative outcomes for children such as the development of helpless responses and attributions of ability to explain success, which lead to decreased motivation in failure situations. Conversely, children who are praised nongenerically are more likely to hold learning goals. This type of goal is associated with positive outcomes such as the development of mastery responses and attributions of effort to explain success, which lead to increased motivation in failure situations.

Although current research corroborates evidence for these outcomes, few studies have investigated the frequency of the types of praise (i.e., generic and nongeneric) children receive in natural contexts such as at home, school, and sports practices. The little observational data we have suggests that parents may use both generic and nongeneric praise types at home. Observational research in academic settings finds that praise is infrequent and often very general instead of specific and while in sports settings praise is often reported as being a frequently observed coach behavior, this research does not indicate anything about the quality of praise. The current study aims to bridge the gap in the literature by investigating the frequencies of different types of praise in academic and sports settings.

In the present study we audio recorded coaches and teachers of elementary-age children during either a sports practice or during the regular school day in 45 minute sessions and noted the frequency and types of praise used. In the 360 minutes of audio we collected, 770 praise events were recorded. The largest category of praise recorded across all participants was nongeneric praise and by far the smallest category was generic praise. Another type of praise, ambiguous praise, was also introduced in this study for praise events that did not clearly resemble neither generic nor nongeneric praise. This type of praise was also quite frequent, as evidenced by the similar use of ambiguous and nongeneric praise for teachers. The coaches in our study used significantly more praise than teachers and significantly more nongeneric than ambiguous praise. Other results demonstrated that teachers gave social praise much more sparingly than academic praise and that the majority of all participants' praise was directed towards individuals rather than groups. These results support evidence for a link between the frequency of certain praise types and different natural contexts. We suggest that future research explore praise use in other common contexts as well as the effects of ambiguous praise because of its prevalence in this study.

Status of reintroduced American marten in the Manistee National Forest within Michigan's Northern Lower Peninsula



Julie M. Watkins
McNair Scholar



Joe Jacquot
Biology



Paul Keenlance
Biology

American martens (*Martes americana*) were extirpated from the Lower Peninsula of Michigan as a result of overharvest for fur and habitat loss in the early 1900s. More sustainable logging practices, forest regeneration, and improved understanding of wildlife habitat requirements, subsequently led to suitable marten habitat restoration within the Lower Peninsula. In the mid-1980s in an attempt to re-establish a viable population in the Northern Lower Peninsula, 36 martens were reintroduced into the Manistee National Forest (MNF). In the 2011 summer field season we conducted a pilot study investigating the genetic structure of populations in Ward Hills and Caberfae in the MNF. We live trapped seven martens in Ward Hills (4 female, 3 male) and 4 martens in Caberfae (1 female, 3 male). We collected blood and hair samples for genetic analysis during health assessments. Hair snares were also deployed in Caberfae resulting in hair samples from 17 red squirrels (*Tamiasciurus hudsonicus*), 10 unidentified rodent and 8 possible martens. We extracted DNA from marten blood samples and amplified 6 microsatellite loci using the polymerase chain reaction. Using the program KINGROUP (Konovalov et al. 2004), we determined whether pairs of individuals were more likely to be parent-offspring, full-siblings or unrelated. We found 3 martens in Caberfae and 2 martens in Ward Hills who were more likely to be parent-offspring than unrelated, and 5 martens in Ward Hills that were more likely to be full-siblings than unrelated. We calculated F_{ST} , a measure of genetic differentiation between the two populations, using program Arlequin (version 3.5) and found an F_{ST} of 0.141 with a p-value of 0.05, indicating that there was moderate genetic differentiation between the sites. These results are preliminary, but suggest restricted dispersal between these sites, with some loss of genetic diversity.

An Analysis of an Appalachian Metamorphic Suite



Chadwick A. Williams
McNair Scholar



Ginny Peterson
Geology

The Blue Ridge is one of over a dozen provinces located in the much larger Appalachian Mountain Range which spans across the eastern United States. The Appalachian Mountains began to form close to 500 million years ago and rocks within the Blue Ridge Mountains have been dated to be over a billion years in age. While this mountain belt is well known, the specifics of how the rocks that are visible today ended up in their present location is still the subject of current studies. The rocks within the Blue Ridge Province can provide a good deal of information regarding the early stages of the Appalachian Mountain chain. The mineral content as well as the deformational features in the rocks here can be examined to identify the conditions under which they formed. The Central Blue Ridge can be particularly beneficial to study because the rocks here have undergone extreme deformation. The large Jake Ridge road cut is found in this province along Hwy 64 in southwestern North Carolina. This road cut exposes aluminous sillimanite-garnet rich gneisses, apparently deformed by the Chunky Gal Mountain Fault. The rocks appear compositionally similar to the granulite-facies aluminous rocks at Winding Stair Gap (~10km to the northeast) and preserve textural evidence of a complex deformation and metamorphic history.

Observations using the petrographic microscope, SEM/EDS, and preliminary microprobe data indicate a dominant mineral assemblage that consists of garnet, biotite, sillimanite, plagioclase, and quartz. The relatively larger (2-5mm) garnet grains in the slide preserve a complex textural and compositional zoning. The cores of the garnets (up to 0.5-1.0 mm) are rich with inclusions that define trails nearly perpendicular

to the external foliation. Inclusion minerals are mostly quartz with minor biotite, plagioclase, ilmenite, apatite, and monazite. A sharp boundary separates the cores from an inclusion-free zone that extends up to 1 mm to the boundaries of the grains. The garnets are unusual in that they appear to have continued to grow into the tail regions of the grains creating garnets that look like eyes. The tail portions of the garnet are mostly symmetrical and are loaded with fibrous sillimanite grains that are oriented semi-parallel to the prismatic sillimanite grains of the matrix. Preliminary zoning profiles in garnet show a decrease in Ca from core to rim and relatively flat profiles for other elements, apart from evidence of retrograde zoning near the rims. Work on thermobarometry is in progress. A final stage of deformation is suggested by fractures in garnet, approximately perpendicular to the matrix fabric. Myrmekite-rimmed K-feldspar and pale-green mica appear to have grown in these fractured domains, but not elsewhere within the rock. Evaluation of P-T conditions in the context of complex textures in the Jake Ridge samples and comparison with mylonites from the type outcrop of the Chunky Gal Mountain Fault and published P-T-t conditions for granulite facies rocks at Winding Stair Gap may help to better understand the P-T-deformation history of the fault with respect to surrounding rocks.

Investigating the role of Nrg1p and Tup1p during *Candida albicans* Chlamydospore Formation



Shannon M. Williams
McNair Scholar



Derek Thomas
Biomedical Sciences

Candidiasis represents the fourth most frequent nosocomial infection both in the US and worldwide. *C. albicans* is the most common cause of candidiasis which has unacceptably high morbidity and mortality rates and important economic repercussions (estimated total direct cost of approximately 2 billion dollars in 1998 in US hospitals alone). The pathogenic potential of *C. albicans* is intimately related to certain key processes including biofilm formation and filamentation. *C. albicans* can grow as yeast cells, pseudohyphae or hyphae and produce chlamydospores with its form being dictated by its surrounding conditions. The ability to form hyphal cells has been fundamentally linked to the disease potential of this organism. In fact, cells which cannot make this transition are avirulent. NRG1p is a global repressor of the filamentation process of *C. albicans* and associates with the co-repressor Tup1p during this inhibition of filamentation. NRG1p has also been shown to play a key role in chlamydospore formation, but the relevance of Tup1p is unknown. This study uses mutant strains and quantitative real-time PCR to analyze the roles of Tup1p and select hyphal specific genes in chlamydospore formation. We describe differences in the nature of NRG1p regulation of chlamydospore formation compared to filamentation and offer further insights into NRG1p function in *Candida albicans*. Furthermore, we establish that chlamydospore formation is independent of Tup1p.



About the TRiO Programs

To fight the war on poverty, our nation made a commitment to provide education for all Americans, regardless of background or economic circumstances. In support of this commitment, Congress established several programs in 1965 to help those from low-income backgrounds and families with no previous college graduates (first generation). The first three programs established were Talent Search, Upward Bound, and Student Support Services. Thus, they are known as the TRiO Programs.

Since then, other programs have been added, including Upward Bound Math and Science, Educational Opportunity Center, The Training Authority, and in 1989, The Ronald E. McNair Post-Baccalaureate Achievement Program. The goal of all of the programs is to provide educational opportunity for all.

The Ronald E. McNair Post-Baccalaureate Achievement Program is designed to prepare highly talented undergraduates to pursue doctoral degrees. In addition, the goal is to increase the number of students from low-income backgrounds, first generation college students, and under-represented minorities on college and university faculties.

Copyright

This is the official journal of the Ronald E. McNair Post-Baccalaureate Achievement Program, A TRiO Program, at Grand Valley State University. It is funded through the United States Department of Education (A TRiO Program) and Grand Valley State University. Copies of this publication may be obtained by contacting Advising Resources and Special Programs, TRiO McNair Scholars Program, Grand Valley State University, 1 Campus Drive, 230 Student Services Building, Allendale, MI 49401-9403; (616) 331-3441; e-mail smithala@gvsu.edu. The manuscripts are the property of Grand Valley State University and the Grand Valley State University McNair Scholars Program. All copyrights are owned by Grand Valley State University. Reproduction of this material is authorized provided that it is not sold, only used for educational purposes, and the source and author of the material is clearly acknowledged.



2011 Grand Valley State University, Allendale, Michigan

