



Minot State
UNIVERSITY

2011 Faculty and Students
Research Poster Session
April 29, 2011
Book of Abstracts



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*Edited by Mikhail M. Bobilev
Associate Professor of Chemistry
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2011 MSU Research Poster Session – Book of Abstracts

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Group Caring Environment in Nursing

Elizabeth Brodell, PhD, RN

Department of Nursing, Minot State University

Recently, nursing literature has contained articles addressing the work environments in which our nursing students will practice. Caring is the heart of nursing; yet caring for our colleagues is rarely talked about. We apply the concept of care to patients, but often neglect applying these concepts to our colleagues.

The purpose of this study was to investigate student nurses' perceptions of their learning environments. One of the primary goals of nursing programs is to produce nurses who meet the needs of health care industries. Students are the focus of our work as educators and our goal is to educate nurses who are both caring and competent.

This quantitative study examined the perceptions of nursing students on caring using two survey tools developed by Linda Hughes, PhD, RN. The Peer Group Caring Interaction Scale (PGCIS) (1998) and the Organizational Climate for Caring Questionnaire (OCCQ) (1993, 2001). The PGCIS was developed to measure the climate of caring experience among student peers. The OCCQ measures caring in the learning environment, which includes both the classroom and clinical settings. Participants were nursing students accepted into an NLN-accredited baccalaureate nursing program located at a northern plains university. Students were surveyed at midterm during the fall semester of 2010.

Caring is not only an important attribute of nursing, it is a driving force for patient satisfaction. In today's health care market, satisfaction with nursing care is an important factor in rating the quality of the services received and whether patients will return as future customers. Study of caring behavior is important because students are susceptible to the attitudes of their peers, instructors and the nursing staff within the clinical agencies.

In conclusion, findings from this study provide data that supports a climate of caring between students and their peers. Students in this study rated their clinical faculty as mentors and positive role models along with providing confidence in their success.

This research study was supported by a MSU Faculty Research Grant.

Is the True Diary Too True for Today's Youth? Teaching a Banned Novel

Ashley Brossart and Ron Fisher, PhD*
English, Division of Humanities, Minot State University

Book banning and censorship has always been a controversial topic, however, what about the use of banned books and censored books in the high school classroom? A number of novels such as Sherman Alexie's *The Absolutely True Diary of a Part-Time Indian* is one of the many books that have been challenged and banned from schools and libraries across the United States. Due to the controversial language in this book, parents are raising their own concerns and demanding that this novel be taken off their children's curriculums. But what about the cultural deprivation that is occurring due to the ban of this book? Is this book being replaced by another book exposing students to this raw and authentic portrayal of Native American life? Through months of hands-on research, I have discovered 3 main ideas to follow while using this exhilarating novel in the classroom. First, create a newsletter to send home to the students' parents sharing with them what exactly is being read in class. Explain to the parents how impactful this novel will be for their children and the level of controversial material involved. Secondly, share with the students that the classroom is a safe environment and they are allowed to speak openly and accept diverse opinions. Lastly, offer the students that do not feel the book is appropriate an alternate read that offers the same amount of cultural submersion. In conclusion, I feel that banned and challenged books have an important and impactful place in the classroom.

The Ever changing, Unattainable Standard of Beauty Narrated by Playboy

Ashley Brossart and ShaunAnne Tangney, PhD*
English, Division of Humanities, Minot State University

Feeling beautiful has always been a priority for women throughout the ages, yet the standard of beauty is forever changing. From what was considered beautiful in the Middle Ages to what is considered beautiful today, I have researched the impossible standard of beauty that has been created in Western culture in the twenty-first century. Focusing on the unattainable standard, I have looked at the past fifty years of photographs captured by the popular men's magazine Playboy. From the Renaissance to the twenty-first century, the ideal waist size had shrunk 24 inches (Pettijohn and Jungeberg 1195). During the Renaissance, a more full figured woman was considered the height of sexiness. Being full figured was a sign of affluence. Throughout the years, Marilyn Monroe, Grace Kelly and Bo Derek began to set the standards of what is seen as beautiful higher and more unattainable. Women began to be more body conscious by viewing these photos. Playboy magazine was first to debut tan lines, hairless bodies, body modifications such as implants and botox, flamboyant makeup and one of the smallest waist sizes which was 18 inches (Brumberg 99). Women in this magazine have captured in photographs the continuous changes in beauty. Over and over, the standard of beauty that Western culture is creating has become more and more unrealistic and impossible as evident through Playboy. Throughout fifty years of publications, Playboy captured the women that men fantasized about. These impossible standards have been created over years of trying to be better than the last.

Work Cited

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Pettijohn, Terry F., and Brian J. Jungeberg. "Playboy Playmate Curves: Changes in Facial and Body Feature Preferences Across Social and Economic Conditions." *Mercyhurst College*. (2003): 1186-95. Web. 26 Apr 2010.

Rapid synthesis of N-[1-(4-methoxyphenyl)ethyl]formamide

Braden A. Burckhard and Mikhail M. Bobylev, PhD*
Division of Science – Chemistry

Background and Objective: Substituted 1-phenylethylamines are important intermediates in the synthesis of numerous biologically active compounds, including agrochemicals and pharmaceuticals. They can be obtained from the respective substituted acetophenones via the intermediate substituted 1-phenylethylformamides. Recently, we developed an accelerated procedure for the synthesis of formamides. It was important to investigate if the procedure can be successfully applied for the synthesis of 1-phenylethylformamides with electron-donating substituents, for example N-[1-(4-methoxyphenyl)ethyl]formamide.

Methods: The reaction was conducted on 10 mmol scale at 188-192°C. Column chromatography was used for the isolation of the products of the reaction. NMR-spectroscopy and elemental analysis were used to determine the structure of the products.

Results: The reaction was fully completed in 10 minutes and produced N-[1-(4-methoxyphenyl)ethyl]formamide in good yield. One byproduct was isolated and its structure was determined.

Discussion and Conclusions: The first rapid synthesis of N-[1-(4-methoxyphenyl)ethyl]formamide has been developed. The new reaction opens the way for the fast synthesis of N-[1-(4-methoxyphenyl)ethyl]amine and its derivatives in the laboratory practice and industry.

Support: The project is supported by NIH grant P20 RR016741 from the NCRR

The Evolution of Rock Art Research

Shawn Alexandra Graham and Linda A. Olson, MFA
Art, Division of Humanities*

Rock art is a cultural resource that provides information about the people who made it and valuable insights for our present and future world. For several reasons, interest in the study of Rock Art has increased in recent years. New methods of dating petroglyphs and pictographs have enabled researchers to tie the rock art to an individual culture, where the lack of this connection rendered rock art a curiosity. Developments over the past years, along with the realization that much rock art will inevitably be destroyed or decay through natural processes, has heightened interest in its documentation and conservation.

To preserve rock art, an effort has been made by archeologists and avocational archeologists to document and preserve the remaining petroglyphs and pictographs. Historically, no universal guidelines have regulated documentation and recordation procedures, thus many practices proven destructive to the rock art are still used today. Our poster details some of these processes and their impact, as well as modern noninvasive practices.

Analysis of a Potential Allosteric Disulfide Bond in the Protein Cytochrome c Oxidase

Jennifer Kondos and Bryan Schmidt, PhD*
Division of Science – Chemistry

The subject of investigation is a potential allosteric disulfide bond in cytochrome c oxidase (CcO). Disulfide bonds are a covalent attachment between two cysteine amino acids in proteins that help stabilize the structure of the protein. Allosteric disulfide bonds indirectly affect the chemistry a protein catalyzes when they break or form. Understanding allosteric disulfide bonds may provide a better overall understanding of infectious proteins, which often contain them, and lead to treatment options. Also, many proteins that contain known allosteric disulfide bonds contain metals, and how metals are inserted into proteins is not fully understood. If allosteric disulfide bonds are involved in metal insertion, understanding how they function could enhance our understanding of how metal-containing proteins are synthesized. To interrogate the potential disulfide bond of CcO, the amino acids making up the bond will be mutagenically removed. The gene for the mutant protein will be inserted to the bacteria *Rhodobacter sphaeroides*, and expressed. The protein will then be extracted and characterized. If the protein shows the disulfide bond has an allosteric function, further experiments will examine its role in metal insertion in this protein.

This work was supported by a Minot State University Faculty Research Grant.

Tensions of transformation of snowboarding culture: From lifestyle sporting activity to legitimate occupation

Jynette Larshus, PhD

Department of Sociology, Division of Social Science

Recently the face of sports and sporting activities has changed. There has been a dramatic increase in sports that fall outside the traditional definition of sporting activities and tend to be perceived as a lifestyle choice. They become more than a sport; they are a “lifestyle sporting activity.” Focusing on snowboarding and the mainstreaming, commodification and professionalization processes associated with it, the current research addresses some of the transformations and the resulting tensions that are underway. By conducting interviews with various snowboarders in the culture, the research explores how the mainstreaming, commodification, and professionalization processes have shaped the tensions felt by members of snowboarding culture and what resources are drawn on to address these tensions. The research has found a significant difference between the views of riders connected to their location in the snowboarding culture. A basic distinction can be made between the “Old School” and the “New School” riders. One – “Old School” – views the processes as a corruption of the culture, while the other – “New School” – views is a culture corrupting the mainstream system.

Supported by a MSU Faculty Research Grant

The Glass Ceiling in Criminology Textbooks: Myth or Reality?

Patricia A. Lomire, PhD

Department of Sociology, Division of Social Science

The concept of “the glass ceiling” is applied to a content analysis of women and crime (WAC) topics in criminology textbooks. A comprehensive review of literature suggests that considerable debate has emerged on the limited coverage of (WAC) and the debate apparently escalated as a result of a 1970’s publication “Is Crime a Man’s World? Issues in the Exploration of Criminality” by Wilson and RIGsby. Wright critiqued textbooks in the 1980’s and found less than 3 percent of the actual page coverage of textbooks incorporated WAC issues. The present study finds support for the continuation of this trend into the 21st century. This research suggests that (1) the WAC omission is not attributed to the lack of empirical research, (2) WAC publications in journals remained consistent over the last three decades and (3) WAC topics in textbooks remain semi-invisible due to apparent theoretical and methodological debates related to feminist criminology, androcentricity and stereotyping. These findings ironically support the 1980’s research of Richard A. Wright’s “Are Sisters in Crime Finally Being Booked? The Coverage of Women and Crime in Journals and Textbooks.” This research concludes that the concept of “the glass ceiling” can be applied to criminology textbooks. Recommendations are made for a revision in conceptualizing the significance of WAC topics. Implications are that students should be introduced to diverse conceptual, theoretical and methodological WAC topics for the purpose of developing an image of female presence and integration into a given discipline.

Teachers' Perceptions of Using Activity Breaks In the Classroom

Jaimie M. McMullen^{1}, PhD, Pamela Kulinna², Donetta Cotbran³, Charlene Darst², Hans van der Mars²*

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Background/Purpose. Recent literature suggests that using activity breaks throughout the school day is an effective way to increase physical activity in children and adolescents (Katz, et al., 2010; Salmon, et al., 2007; Going, et al., 2003). The purpose of this study was to learn about the perceptions of classroom teachers who incorporated activity breaks into their classrooms. Methods. Participants were seventeen teachers from one Native American school district in the Southwest United States (male [n=6]; female [n=11]). They participated in a year-long curricular change initiative designed to integrate healthy behaviors into their school. The teachers received training through a series of workshops, were provided with some basic physical activity equipment, and had ongoing external mentor teacher support. Each teacher provided a series of reflections documenting their use of, and perceptions of the activity breaks that they used in their classroom (i.e., thoughts about activity breaks, student reactions, etc.). Semi-structured interviews were conducted to allow the classroom teachers to elaborate on their experiences. Trustworthiness measures included searches for disconfirming cases, an independent reader, and data triangulation of other data sources.

Analysis/Results. Data were analyzed inductively by conducting systematic searches for emerging patterns across data types (Erickson, 1986). Several common themes emerged including: (a) classroom teachers' discomfort with chaos in the classroom, (b) their affection for simple and easy activity breaks, and (c) their reasons for buying into the idea of including activity breaks throughout the school day.

Conclusions. Teachers believe in the benefits of incorporating activity breaks into their classrooms throughout the school day.

Funding for this project was provided by the Salt River Pima-Maricopa Community Schools Healthy Living Initiative.

Modeling Multiple Strategies for Controlling HIV epidemic in South Africa

Carson Moen, Kodwo Annan, PhD*

Department of Mathematics and Computer Science, Minot State University

The intensity of Human Immunodeficiency Virus (HIV) epidemic continues to be a major global health priority with a very high rate of prevalence in South Africa and neighboring countries. We propose a new mathematical model to investigate the potential impact of intervention strategies on HIV transmission. The new model which incorporates mother-to-child-transmission (MTCT) term evaluates the effect of condom use, anti-retroviral drugs, and education/awareness for controlling the HIV epidemic. Our analysis shows that reducing the number of sexual contacts by increasing condom use and increasing education/awareness has a significant impact in reducing the rate of transmission of the disease.

Placing Dollar Values on Oak Park

Daniel Ngugi, PhD

Economics, Division of Social Science

In Minot, North Dakota, recent economic growth has led to increasing need for urban housing resulting in escalating cost of accommodation and real estate prices. This paper is based on research conducted in the fall of 2010 to determining the economic value of the city's most popular recreational facility—Oak Park.

The contingent valuation method was applied to estimate people's willingness to pay (WTP) to keep Oak Park "as is". Slightly over 400 residents and about 300 students from Minot State University (MSU) were interviewed. This paper is based on the survey of the city residents only.

During the interviews, the current state and usefulness of the park was described as well as the land constraints facing the city. Respondents were asked to imagine a hypothetical situation where selling the park to private developers was proposed as a way of raising revenue and providing more room for residential housing. Respondents were then asked if they would be willing to pay (annually) a randomly assigned sum, to keep the park in the public domain.

Descriptive statistics provided a mean and median WTP of \$123.88 and \$50 respectively per household per year. Regression analysis revealed that household income and awareness of the park are significant variables that explain WTP. It is hoped that this study will contribute to the limited empirical literature on valuation of recreational parks and increase understanding of community interest in public recreational facilities.

The study was supported by MSU Faculty Research Grant.

Rapid synthesis of N-(4-isopropylbenzyl)formamide

Halee Namanny and Mikhail M. Bobylev, PhD*
Division of Science – Chemistry, Minot State University

Background and Objective: Substituted benzylamines are important intermediates in the synthesis of numerous biologically active compounds, including agrochemicals and pharmaceuticals. They can be obtained from the respective substituted benzaldehydes via the intermediate substituted benzylformamides. Recently, we developed an accelerated procedure for the synthesis of formamides. It was important to investigate if the procedure can be successfully applied for the synthesis of benzylformamides with electron-donating substituents, for example N-(4-isopropylbenzyl)formamide.

Methods: The reaction was conducted on 10 mmol scale at 182-186°C. Column chromatography was used for the isolation of the products of the reaction. NMR-spectroscopy and elemental analysis were used to determine the structure of the products.

Results: The reaction was fully completed in 2 minutes and produced N-(4-isopropylbenzyl)formamide in good yield. Three byproducts were isolated and their structures were determined.

Discussion and Conclusions: The first rapid synthesis of N-(4-isopropylbenzyl)formamide has been developed. The new reaction opens the way for the fast synthesis of N-(4-isopropylbenzyl)amine and its derivatives in the laboratory practice and industry.

Support: The project is supported by NIH grant P20 RR016741 from the NCCR

Rapid synthesis of N-(1-naphthylmethyl)formamide

Yannick Nkuni and Mikhail M. Bobylev, PhD*

Division of Science – Chemistry, Minot State University

Background and Objective: N-(1-naphthylmethyl)amine is an important intermediate in the synthesis of biologically active compounds, including allylamine fungicides, such as naftifine, terbinafine, and butenafine. In the literature, N-(1-naphthylmethyl)amine has been synthesized by many different methods, but never from 1-naphthylcarboxaldehyde via an intermediate N-(1-naphthylmethyl)formamide. Recently, we developed an accelerated procedure for the synthesis of formamides. In this work, the accelerated procedure was applied to the synthesis of N-(1-naphthylmethyl)formamide.

Methods: The reaction was conducted on 10 mmol scale at 190-192°C. Column chromatography was used for the isolation of the products of the reaction. NMR-spectroscopy and elemental analysis were used to determine the structures of the products.

Results: The reaction was fully completed in 1 minute and produced N-(1-naphthylmethyl)formamide in good yield. Three byproducts were isolated and their structures were determined.

Discussion and Conclusions: The first rapid synthesis of N-(1-naphthylmethyl)formamide has been developed. The new reaction opens the way for the fast synthesis of N-(1-naphthylmethyl)amine and its derivatives in the laboratory practice and industry.

Support: The project is supported by NIH grant P20 RR016741 from the NCRR

Differential Equations in Action while Modeling Tumor Growth

Brett Schott, Dallas Fry, Jordan Crawford, Josh Beaudoin, Narayan Thapa, PhD
Department of Mathematics and Computer Science, Minot State University*

Explaining variation in population growth rates is fundamental to predicting population dynamics and population responses to environmental change. In this study, we first focus on several populations growth models. In particular, we develop growth model for population of tumor cells. Model parameters will be estimated by using the method of optimization and real world data. Numerical results will be presented.

Protesting Femicide in Ciudad Juárez: Cultural Resonance, Images, and Efficacy

Chelsea Starr, Ph.D.

Department of Sociology, Division of Social Science, Minot State University

Since 1994 over 400 women have been killed in Ciudad Juárez, Mexico. In Spanish, “feminicidio” is the term for “being murdered for no other cause than that you are a woman”. Femicides are random murders in which the bodies of women are mutilated, often raped, and then dumped in the desert, sometimes in mass graves. The aim of this presentation is to explore the framing of claims by Mexican and international activists who petitioned American and Mexican governments, and international human rights organizations with claims for the relief from the impunity surrounding the femicide killings. Several social movement organizations were formed to petition authorities for action and proper investigation of femicide cases. The paper will explore the efforts of femicide activists, and the way they use art, images, and cultural symbolism to frame their protest messages for Mexican and international audiences. Cultural resonance was measured according to categories established from data collected from interviews with key informants and through a literature review of Mexican culture and history. Efficacy was measured in terms of success in initiating and prevailing in legal proceedings relating to femicide. Using content analysis, it is found that protest frames with greater traditional Mexican cultural resonance resulted in greater efficacy for the organization using the resonant frame.

This research was supported by a MSU Faculty Research Grant

Parameter Estimation for Second order Hyperbolic Partial Differential Equation with Neumann Boundary Condition

Narayan Thapa, PhD

Department of Mathematics and Computer Science, Minot State University

In this paper we study an identification problem for physical parameters associated with second order hyperbolic partial differential equation with Neumann boundary conditions. The existence, uniqueness, and continuous dependence of weak solution of second order hyperbolic partial differential equation are established. The method of transposition is used to prove the Gateaux differentiability of the solution map. The Gateaux differential of the solution map is characterized. The optimal parameters are established. Frechet differentiability of the cost functional J is established. Computational algorithm and numerical results are presented.

Locating Buried Grave Markers and Unmarked Graves

Mark Timbrook

Department of History, Division of Social Sciences, Minot State University

Cemetery management includes detailed documentation and mapping of internments, as well as a commitment to landscape management and monument care. However, many cemeteries were maintained by sextons with less than efficient record systems and inadequately managed the landscape. The consequence for many older cemeteries has been undocumented burials and damaged and lost grave markers. The purpose of the 2010-2013 historical-archaeology and cultural resource surveys of the First Lutheran Church Cemetery is to introduce students to the history and evolution of the American cemetery and conservation practices for cemetery preservation. Project objectives were to determine the presence and location of lost markers and unmarked graves, documentation of the site's current condition, and provide recommendations for preservation of the historic site. Instruction and training on cemetery conservation techniques have been provided by the National Center for Preservation Technology and Training. In 2010, students used site observation methods, rod probing, and researched sexton burial records, ground penetrating radar, magnetometry, and resistivity reports to locate six buried grave markers from known burials, one unknown burial and buried grave marker, and confirmed five unmarked graves in the northeast quadrant of the cemetery. In summary, over the next three seasons, a different quadrant will be examined through 2013. A report of findings and recommendations for correcting unfavorable landscape conditions, deteriorating grave markers, and the location and documentation of discovered graves and associated markers will be provided at the end of each season. The southeast quadrant is scheduled for survey in June 2011.

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State Historical Society of North Dakota, Bismarck, North Dakota, 58505

Ward County Clerk of Records, Ward County Courthouse, Minot, North Dakota, 58701

Archaeo-Physics LLC, Minneapolis-St. Paul, Minnesota, 55406

Rapid synthesis of N-(4-t-butylbenzyl)formamide

Luke Uran, Doug M. Fredrich, and Mikhail M. Bobylev, PhD*
Division of Science – Chemistry, Minot State University

Background and Objective: Substituted benzylamines are important intermediates in the synthesis of numerous biologically active compounds. They can be obtained from the respective substituted benzaldehydes via the intermediate substituted benzylformamides. Recently, we developed an accelerated procedure for the synthesis of formamides. It was important to investigate if the procedure can be successfully applied for the synthesis of benzylformamides with electron-donating substituents, for example N-(4-t-butylbenzyl)formamide.

Methods: The reaction was conducted on 10 mmol scale at 190°C. Column chromatography was used for the isolation of the products of the reaction. NMR-spectroscopy and elemental analysis were used to determine the structure of the products.

Results: The reaction was fully completed in 1 minute and produced N-(4-t-butylbenzyl)formamide in good yield. Three byproducts were isolated and their structures were determined.

Discussion and Conclusions: The first rapid synthesis of N-(4-t-butylbenzyl)formamide has been developed. The new reaction opens the way for the fast synthesis of N-(4-t-butylbenzyl)amine and its derivatives in the laboratory practice and industry.

Support: The project is supported by NIH grant P20 RR016741 from the NCRR

Is Abscisic Acid the root derived controller of Indole-3-Acetic Acid-Induced Leaf Blade Expansion in Arabidopsis?

Sam Wagner, Amanda M. Roise, and Christopher Keller, PhD
Department of Biology, Minot State University*

Indole-3-acetic acid (IAA) is a critical developmental controller in plants long known to play a role in a range of developmental and physiological phenomena. In our lab we have shown in bean and tobacco and, most recently, in Arabidopsis, that IAA can affect leaf expansion of both excised leaf strips and the leaves of intact plants. Curiously, across a range of concentrations, exogenously applied IAA increases the growth of excised leaf strips and wounded excised leaves while inhibiting the growth of detached intact leaves, intact attached leaves and wounded attached leaves, implying that leaf growth induction by IAA is dependent on separation from the plant and on a wound-induced gene expression environment. The requirement for leaf detachment for IAA-induced growth increase implies that the IAA growth response in leaves is modulated by an unstable growth factor supplied by the rest of the plant. Such an entity is most likely supplied by the plant roots. Likely chemical candidates for our hypothesized growth modulator should include known root-derived plant hormones. Here we report the results of testing the effect of exogenous treatment with abscisic acid, a known plant hormone, on the growth of excised leaf strips from Arabidopsis also treated with and without IAA. ABA was found to be a strong growth inhibitor of excised leaf strips and blocks growth stimulating effect of IAA. These results suggest that ABA may be hypothesized IAA modulator. Further planned tests of this hypothesis are described.

This study was supported by NIH grant P20 RR016741 from the NCRR.

Current Cultural Role of a Dongba

Nathan Zochert, Billy Luetzen, and Robert Kibler, PhD
English, Division of Humanities, Minot State University*

The Naxi are a minority group of Lijiang China who are spiritually governed by the Dongbas. Dongbas hold an important place in Naxi society and are active members of the community. In this study our goal was to determine the current role that He Xiudong, a Dongba who resided next to the Dongba Research Institute, maintained in the Naxi community. Our methods for this case study involved both observation and questioning. He Xiudong was the last member of his family to become a Dongba. He began younger than most, because the older Dongbas were dying. As a result, his knowledge of their beliefs was lessened, but he still maintained a comprehensive knowledge of his role as a Dongba. More importantly, he still maintained an important and respected position in surrounding villages, as well as New Town and Old Town Lijiang. However, in some instances, outside business people seemed to have less respect for the Dongba. This could leave one to believe that as more outside business arrives in Lijiang, the position of the Dongba could possibly decline.

Support: MSU international program grants, the College of Arts and Sciences, and the Division of Humanities