ABOUT THE CAS JUNIOR FACULTY SUMMER RESEARCH AWARD PROGRAM

The College of Arts & Sciences Junior Faculty Summer Research Awards program was initiated in the 2005-2006 academic year to support selected junior faculty as they develop their research and creative projects during their probationary period, a critical time in their careers. The program provides summer salary support to junior faculty for the purpose of advancing their research and creative projects and scholarship. Recipients are selected on a competitive basis. A total of 123 awards have been made since the program’s inception.

ACKNOWLEDGMENTS

Sincere thanks are due to members of the College Research & Faculty Development Committee for their diligent work in reviewing the applications and selecting the recipients. We are also indebted to Mrs. Dana Kearns, Mrs. Jessica Hawksley, and Mrs. June Settle, the Dean’s office staff who worked meticulously in handling the logistics involved in the application review process, award management, and the setting up of the poster presentation session. Last but not least, our gratitude goes to award recipients and all applicants for making the junior faculty summer research awards program the success that it is.

PROGRAM

Date: November 13, 2015
Location: First Floor Lobby, Roark Building (Refreshments served)

2.00 - 3.30 pm      Set up
2.30 - 5.35 pm      Opening remarks, Dr. John Wade, Dean
2.35 - 3.10 pm      Poster session
3.10 - 3.30 pm      Clearing

FURTHER INFORMATION

For further information please contact:

Dr. Tom Otieno
Associate Dean for Administrative Affairs & Research

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**ARTS & HUMANITIES**

**NATURAL & MATHEMATICAL SCIENCES**

**SOCIAL & BEHAVIORAL SCIENCES**
ABSTRACTS

1

A Comparative Analysis of Analog and Digital Recording Methods

Shane Hoose
Department of Music

The recurrent debate between analog and digital techniques and their distinctions has been one of the most intense contests in the recording industry. The purpose of this study is to determine whether or not there is latent value in legacy recording techniques by comparing analog and digital recording methods: direct-to-disc recording, magnetic tape recording, and DAW-based digital recording. I discuss the underlying principles of each recording method and the additional factors influencing the quality of each recording format. I have completed and analyzed a series of recordings of various instruments using the highest-resolution analog and digital formats available. This study compares the merits of both methods by examining and comparing recordings produced by analog and digital processes, and by considering their accuracy, frequency response, dynamic range, and noise level. It is hypothesized that audible differences between analog and digital recording are primarily caused by differences in frequency response. Recording and analysis is continuing and will be completed in December 2015.
Bringing Czech Vocal Music Into Accessibility: A Performer’s Edition for English Speakers

Zachary Marshall
Department of Music

Classical singers in the United States are typically expected to perform in English, Italian, German, French, and Spanish. Other languages are avoided for various reasons, including the presence of unusual sounds that are difficult to pronounce, lack of knowledge by instructors, and potential linguistic inabilities of university students. Owing to the international successes of composers such as Antonín Dvořák, Leoš Janáček, and Bedřich Smetana, Czech solo vocal music is occasionally performed in the United States. Still, a substantial amount of lesser-known composers of Czech songs have little or no profile here. The goal of this project is to provide a performer’s edition of ten to twelve solo vocal pieces in Czech, complete with English translation and a transcription using the International Phonetic Alphabet. The pieces are to be chosen based on their accessibility for young singers, relevant subject matter, and fostering of Czech language skills. At the time of this written abstract, research is ongoing as to which pieces will be included in the performer’s edition.
Proteins are an important class of biomolecules present in all organisms. For a better understanding of proteins and their functions, it is essential to know their three-dimensional geometric structures. In NMR spectroscopy, distances between certain pairs of atoms in a protein can be detected. The related mathematical problem, called the distance geometry problem (DGP), is to find the coordinates of the atoms given a set of interatomic distances. The problem can be considered in two main classes: DGP with exact distance values and DGP with distance bounds. The solution of the former one can be obtained using a geometric buildup algorithm. The algorithm determines one point at a time, with available distances from the determined points to the undetermined ones using a nonlinear least-squares approximation. We show that this algorithm can be further improved by implementing a multi-start algorithm followed by optimization of a convex distance function.

The latter class, however, is more practical as the distances from NMR are given in ranges. A new approach has recently been proposed for determining an ensemble of protein structures, given a set of distance bounds. In this approach, the protein is assumed to have an equilibrium structure while the atoms fluctuate around their equilibrium positions. Then, a generalized DGP can be formulated as a constrained optimization problem to find maximum possible spheres for the atoms, so that the distances among the atoms, when they are restricted to their spheres, are within the given distance bounds. For solving the generalized DGP, we use the existing NMR structures as initial structures. While the existing structures are documented in multi-model formats, the new single structure model can provide a different perspective for viewing and analyzing proteins.
Landscape and Labor: Trade and the Economic Regulation of Muslims in Medieval Sicily

Timothy Smit
Department of History

Given the nature of the production and survival of documents in medieval Europe, there is a paucity of evidence about the daily life of Muslims living in Sicily under Norman and Hohenstaufen rule. This period began with the Norman incursions into Sicily in the mid-eleventh century and ended with the expulsion of Muslims from Sicily and their resettlement in the town of Lucera in the mid-thirteenth century. Given that paucity of surviving evidence, and the general lack of written evidence from Norman Sicily, I focus on a narrower avenue of research: an examination of commercial relations between Sicily and Genoa.

The research I conducted was of notarial records, accumulated accounts of sales and other commercial transactions from the Italian maritime city of Genoa. Genoa played an essential part in the Sicilian economy and their records have been much better preserved than Sicilian documents of practice. My research took place at the Archivio di Stato di Genova, the state archive in Genoa, which is the repository of the most complete collection of twelfth and thirteenth century notarial records. I was able to both examine the records while resident in Genoa and to produce a significant body of digital evidence I will be able to examine for future research.

Looking at these documents provides a better understanding of the internal economic life of Sicily, such as its productive capabilities and its internal organization of trade. The interior was an economically vibrant area during this period of Christian rule and the island was bound together by local and regional networks of trade. Muslims produced the agricultural wealth of the island through the growing of grain and the cultivation of more specialized crops. They also contributed through the production of textiles, both as raw materials and as finished cloth.
5

An Exploratory Study of Incapacitated Persons with Criminal Behaviors Served by Kentucky’s Public Guardianship Program

Karen E. Martin
Department of Anthropology, Sociology & Social Work

State run public guardianship programs are legally mandated to provide custodial care for persons deemed incapacitated by the courts. Historically, the majority of state wards were elderly women residing in skilled nursing facilities. Today, those demographics are rapidly changing. This new incapacitated cohort has become less institutionalized, with a rising number of persons who have entered the program with criminal records and who continue to commit crimes. This exploratory study focuses on incapacitated persons (IP) with criminal behaviors in order to seek what intervention(s) might reduce their criminal activity. Relying on routine activity theory, differing levels of supervision were compared to those persons institutionalized 24 hours per day. The results of the study indicated that as levels of residential supervision decrease, criminal activities significantly increase. This study can assist administrators of public guardianship programs better understanding the supervisory needs of their incapacitated citizens as well as improve safety precautions for their respective communities.

6

Partisan Perceptions of Social Groups: An Overtime Analysis

Kerem Ozan Kalkan & Yamil Velez
Department of Government

Social group evaluations have always been at the center of the political thinking of both leaders and the mass electorate. In this paper, we examine how these perceptual evaluations aligned with political parties both over time and in recent years. By using the American National Election Studies data, we find that perceptual social group coalitions have grown more ideological and polarized over time. Our partisan affective bias measure shows that evaluations of liberal and conservative groups have been more political since the 1960s. Union members, feminists, people on welfare, and environmentalists have gotten warmer ratings from Democrats, and Christian fundamentalists and big business have earned more positive attitudes from Republicans over time. The second part of our paper spatially arrays the social groups within a two-dimensional space by using weighted multidimensional scaling and line-of-sight input matrix. There are three findings in this section. First, white Americans perceive social groups through an ideological perspective along with the level of political activism those groups show. Second, both Democrats and Republicans have evaluated social groups politically since the 2000s. Particularly since Obama’s election in 2008, ideology is more heavily weighted than other dimensions in the eyes of partisans’ evaluations of social groups. Last, none of the partisans perceived such minority groups as blacks, Latinos, Jews, and Asians to be part of a particular party coalition. Although the bias among Democrats is more favorable toward these groups, Republicans also see these groups as an inherent part of their coalition.
Rest Day Behaviors and Economic Impact of Rock Climbers in the Red River Gorge

James N. Maples
Department of Anthropology, Sociology & Social Work

The Red River Gorge (RRG) is a world-class rock climbing destination located partly in the EKU Service Region. The RRG attracts climbers from around the globe for multi-day climbing trips. One important element of multi-day climbing trips is rest days, or days spent relaxing aching climbing muscles. Researchers have not explored what climbers do on rest days, particularly how rest days may benefit the local economy. Although climbing is a notable source of economic impact, no previous studies examine this impact in the RRG nor the demographics of RRG climbers. In this study, I examine climbers’ rest day behaviors, interests in specific economic developments, average economic impact during a typical visit in the RRG, and demographic profile.

I find that rock climbers’ most common rest day behaviors are hiking, dining at local restaurants, visiting local tourism areas, and traveling within the region. Moreover, climbers would like to see highly specific developments in the RRG (such as more locally-owned restaurants and outdoor festivals) which would increase their economic impact. On a typical trip, climbers spend $68 on transportation, $60 dining at restaurants, and $56 on lodging. Additionally, I find that climbers are often college graduates working in skilled professions (such as engineering and computer programming) with subsequently high incomes that can generate beneficial economic impact in our service region. My study supports increasing RRG climbing area access as a strategic source of economic impact in our service region.
Integrating Cognitive Processing of Trauma and Mindfulness in a Suicide Bereavement Support Group

Melinda Moore
Department of Psychology

More than 40,000 Americans die by suicide every year and each death leaves behind approximately 25 individuals who are profoundly affected. The impact of this loss may result in depression, anxiety, suicidal ideation, and suicidal behavior if left untreated. A novel eight week protocol to be conducted in a suicide bereavement group was developed to address the traumatic impact of suicide exposure. This protocol combines cognitive processing of events around the death, emotions, and changes in relationships as the result of this death with mindfulness meditation and breathing. In order to manage the anxiety that is created by the generation of memories and emotions, mindfulness meditation and breathing are introduced and practiced throughout each of the eight sessions. During each week’s session, writing tasks that are completed outside of group are discussed. The practice of mindfulness meditation and breathing are engaged during group when a participant becomes overwhelmed and either becomes avoidant or too emotional to continue processing their experience. In this study, eight to ten suicide bereaved adults will be recruited to participate in a suicide bereavement group at Eastern Kentucky University’s Burnham House. Participants are being recruited through local mental health providers, university offices, and other community organizations. Measures of mindfulness, depression, anxiety, Posttraumatic Growth, and Posttraumatic Stress Disorder will be taken at weeks one, four, and eight. Participants are expected to have higher measurements of mindfulness and Posttraumatic Growth and lower measurements of depression, anxiety, and Posttraumatic Stress Disorder. This unique intervention will provide a manualized approach to treating the traumatic experience of losing a loved one to suicide and reduce the poor mental health outcomes that are experienced by the suicide bereaved.

Daniel Bennett
Department of Government

The Christian legal movement in the United States includes several legal interest groups dedicated to defending the interests of Christian conservatives. But despite surface similarities, these groups—Christian conservative legal organizations, or CCLOs—are distinct in their resource, strategies, and presence in the arena of law and politics. In the most in-depth treatment of this movement to date, I explain how CCLOs collaborate and compete with one another in support of a largely shared issue agenda. By analyzing a wealth of original data—including CCLO press releases and interviews with movement attorneys—I show how this community is structured and how the differences among the movement’s groups affect its dynamics. What is more, I find that while CCLOs do differ in their specific modes of advocacy, three issues consistently dominate every CCLO’s agendas: religious liberty, the traditional family, and the sanctity of life. I argue that one of these issues—religious liberty—drives CCLO advocacy across the board, acting as a lens through which the rest of their advocacy is framed and communicated. In framing their broader advocacy ultimately in terms religious liberty, CCLOs are effectively transforming how the “culture wars” are being waged in the early 21st century.