

**Goshen College 11th Annual Undergraduate
Student Research Symposium
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Abstracts**

Jenna Buller
Department of Nursing

**Physical & Mental Health Care Needs of Children and Adolescents in Elkhart County who are
Socioeconomically Disadvantaged**

Health care access is limited for the socio-economically disadvantaged families and their children, especially in Elkhart County, Indiana. Nationwide, children and adolescents have suffered disproportionately with mental and physical illnesses because of the lack of access to health care services due to poverty, educational opportunity and family dynamics. This population will continue to suffer if something is not done about the lack of communication and efficiency between local, state and federal programs. Therefore, this paper explores available programs, and education empowerment strategies already being used as well as possible future opportunities to improve the situation of children and adolescents in Elkhart County.

Nate Burmester
Departments of International Education and Biology

Facing Economic Issues with Natural Resource Management on Ometepe

Nicaragua is the second poorest country in Central America, and this poverty is quite evident among the rural peoples especially. There is a trend that as a country has more and more money; environmental issues get dealt with. This is because they are seen as second to basic needs like food and a means to support your family, which often times means exploitation of natural areas. There is a way to balance these two sides however, and perhaps it is not too far from a reality on the island of Ometepe. Through methods such as non-timber harvesting, sustainable logging, and agroforestry, Ometepe could turn its economic situation around. Another means of income that could be embraced on Ometepe is Ecotourism. A few critical steps must be taken first before this great wealth can be tapped into though. The people of Ometepe have the potential to greatly increase their financial status, all that really needs to happen is to get the ball rolling and for the people to work together.

Meaghan Bylsma & Tina Hestand
Department of Psychology

Social, Religious and Political Attitudes of College Students

The purpose of this study was to examine religious, social and political attitudes in two student bodies, a small, Christian, liberal arts college and a large state university. The researchers

explored relationships between voting behavior, religious affiliation and demographic variables, both within and between the two populations. The researchers hypothesized that the students at the small college would exhibit more “conservative” attitudes than those at the state university and also that there would be relationships between religious affiliation/attitudes, political attitudes and voting behavior. Using an online survey, Katz’s Socio-Political-Religious scale was used to measure these attitudes. Implications of these finds are discussed.

Alex Caskey
Department of International Education

Rural Development Projects in Nicaragua: Candelaria - A Case Study

There are numerous locations in Nicaragua where people are living in impoverished conditions, without electricity, and in some cases without an adequate water supply. The remoteness and small populations of these villages pose challenges for development efforts. It is difficult and expensive to transport materials, and the results of these efforts only benefit a small percentage of the population. Furthermore, there is little government support. Non-government organizations (NGOs) that rely on international funding are responsible for a vast majority of development in these rural communities. The village of Candelaria and its relationship with ASOFENIX (a Managua-based NGO) are used as a case study for the implementation and success of sustainable rural development.

Rebecca Friesen and Kathy Steiner
Department of Physics

Calculating the Chemical Potential and Predicting Sterol Diffusion Rates of a Cholesterol Infused Bilayer

Multiple experiments suggest cholesterol forms superlattices in a lipid bilayer at cholesterol concentrations corresponding with geometrically predicted superlattice patterns. A theoretical model was constructed using a Monte Carlo procedure to mimic the effects of these experiments. In the work reported here the model has been used to match the experimentally measured chemical potential of cholesterol infused bilayers and predict the diffusion rates of cholesterol. Because the chemical potential of a system drives its diffusion rates, changes in the model’s chemical potential should indicate changes in cholesterol diffusion rates. The chemical potential was calculated from the theoretical model using Kirkwood’s coupling parameter method, while theoretical diffusion rates could be observed by recording the duration times of simulated superlattice diffusion. Despite no visible changes to the superlattice structure at 40% cholesterol, a rise in chemical potential corresponding to a similar rise in both theoretical and experimental diffusion duration times was observed at this concentration. This data is puzzling, as a rise in chemical potential should cause a rise in diffusion rates and subsequently a drop in duration times, suggesting that many aspects of the model remain to be explored.

Keywords: cholesterol, Monte Carlo, chemical potential, diffusion rate

Emmy Gibson
Department of Physical Education

The Effects of Music on Speed, Heart Rate and
Rate of Perceived Exertion During a One Mile Run/Walk

There are many studies that support the positive effect music has on exercising, but there are also a few that have shown no positive impact on exercising. In my study I will be breaking my subjects into two different groups, a control group and an experimental group. Each group will run or walk one mile twice a week for four weeks. While running, each subject will wear a heart rate monitor that they will not be allowed to view until completing their mile. Once completed, their heart rate will be recorded as well as their rate of perceived exertion using Borg's Scale. The control group will know that they are also being timed, whereas the experimental group will not know they are being timed. The first week they will run with no music. In the weeks following, they will listen to rock, easy listening, and pop music. Once all of my data has been collected, I will compare and analyze each subject's heart rate, rate of perceived exertion, and mile time when not listening to music to that of when they were listening to each of the three different music genres.

Rachel Halder
Departments of Women's Studies and International Studies

Prostitution, Violence, & Poverty: Linking Chimbote Women to a Broader World Issue

"The place where God calls you is where your deep joy and the world's deep hunger meet." -- Frederick Buechner. Traveling to Chimbote, Peru, for my service portion of SST, I did not anticipate finding my "life calling." I went there with an open heart and a desire to work with women. My desire was to engage with the lives of Chimbote women, particularly young adults (ages 12-18). I wanted to participate in their lives in an attempt to gain an inside look at the everyday struggles, pains, and realities they face. I also knew that recording the stories of these women, particularly of the younger generation, would be a key aspect to my comprehension. While in Chimbote, I did not expect the women to be so open with me, but they began to share stories that had never been told before. In the end, the time we shared together caused us to form very tight bonds. I concluded my SST study with a 15-page ethnographic study on the women of Chimbote, which included my research methodology, results, and my own analysis and conclusion of the information. To give back to the women and girls I cooperated with a youth coordinator, Benjamin, to set up a bracelet-making business with the girls. This business expanded to not only include the young women I worked with, but also a group of prostitutes and another group of older, middle-aged to elderly women. In addition, the group of prostitutes and I created a "support" group, of sorts. We would sit down a few times a week for a few hours and give space for women to share their life stories. Many of these stories included details of lives stuck in cycles of poverty, drugs, and abuse. Upon returning to the States, the women of Chimbote and I have created a "fair trade" bracelet business in which we have successfully made \$3,000. I continue to send these profits back to the young-adult women, prostitutes, and broader group of women in Chimbote to create a functional fund for their lives' needs. Also after returning, I decided to take this project a step further. This past fall semester I worked on an extensive literature survey related to poverty, prostitution, and violence. I wanted to understand the problem of prostitution as a more world-focused issue, and I desired substantial book-researched information instead of

mainly anecdotal. I divided my 20-page research into three sections: A) How home life conditions of abuse and violence correlate with women entering into prostitution; B) Home life circumstances of poverty influencing prostitution; C) Acts of violence & "Who are the Perpetrators?" Through both my ethnographic study and my research project I discovered how interconnected prostitution and poverty are, and how we need to look towards systemic changes to address poverty rather than scapegoating the "problem" of prostitution.

M. Caitlin Helmuth
Department of Social Work

Wilderness therapy: Challenges and Obstacles

Wilderness therapy is a unique intervention plan for many individuals. The concept of wilderness therapy started in 1942 when Kurt Hahn created the first Outward Bound program. These programs came to the United States in the 1960s and have been a backbone and foundation for wilderness therapy. In order to be the most effective and successful in the practice of wilderness therapy, one must be aware of the practice issues and challenges that come along with it. In this paper, some of these practice issues and challenges will be discussed, including the lack of competent staff leaders, challenges with group work, dealing specifically with female clients or clients with a history of abuse, and discharge planning. By being aware of and understanding these practice issues, one will be a more competent and integral part of social work's role in wilderness therapy.

Ben Jacobs
Department of English

Romancing the War: Nostalgia as Grounds for Imperialism in Bronson Howard's *Shenandoah: a Military Comedy*

Bronson Howard's theatrical hit, *Shenandoah: a Military Comedy*, captivated American audiences from its opening in 1889 to the brink of World War I. Though on the surface *Shenandoah* focuses on romance, Howard's play addresses several prominent Gilded Age concerns. These include: diminished faith in meaning of death (and life), the expansion of the American colonial project, and the threat to traditional values cause by the modern economy. Key to this paper is the melodramatic trope of "Virtue Triumphant"--the belief in the persistent victory of good over evil--and the ways *Shenandoah* uses this trope to appeal to the absolute, unquestionable authority of mythic America. Though basically unperformable today, Howard's *Shenandoah* is just familiar enough to resonate with readers in 2009 while still foreign enough to reveal the anxieties inherent in America's mythic identity.

Dara Joy Jaworowicz
Department of Bible, Religion and Philosophy

Musical Theology: Mychael Danna's Intentional Scoring of 'The Nativity Story'

This paper attempts to do a critical analysis of the musical score of *The Nativity Story* composed by Mychael Danna. By explaining key music theory concepts and their relation to music history, non-musicians are introduced to the musical genius behind Danna's score, and the intentionality behind it. With this knowledge, the reader will be given an enhanced understanding and appreciation of the music for this film. At the same time, bible scholars will be presented with the importance of intelligent scoring for films with religious themes.

K. L. Arienne Johnson
Department of Bible, Religion and Philosophy

Holy Blasphemy: Interpreting the Unforgivable Sin,

This paper provides a contextual analysis of what has often been referred to as the "Unforgivable Sin" found in Matthew 12:31-32, and Luke 12:10. In these scriptures, Jesus states that to blaspheme the Holy Spirit is unforgivable. Throughout the history of Christianity, these verses have puzzled Christians in unsettling ways. This paper takes a look at what Jesus meant when he directed his harsh admonitions to the Pharisees by evaluating Jesus' ministry as one that consistently advocated for an "Upside Down Kingdom" of God. Using this lens, Jesus' address to the Pharisees is proposed to be one that follows Jesus' mission of flipping the Jewish notions of God's kingdom upside down, emphasizing the need to move beyond merely following the laws of the Pharisees, and instead to focus on the motives that drive each individual's actions. Gaining an understanding of the enormity of the Pharisees' intentional accusations of Jesus helps us to understand a more comprehensive picture of what Jesus' intent was in these warning scriptural passages. This paper argues that to blaspheme the Holy Spirit in an unforgivable way would take a very conscious rejection of God's good works at the expense of other peoples' faith.

David Stolfus Jost
Department of History

Policing in the Soviet State: 1917-1945

This paper represents an attempt to recount the role, methods, and agenda of the Soviet Union's police forces between the Russian Civil War and the end of World War II. The U.S.S.R. quickly distinguished itself early on with its ruthless use of the Cheka (an enormous organization of police) to tame its new territories. It used the same force to push a breakneck process of industrialization on millions of citizens, herding them into urban (or slave camp) settings where the police could even better control them. As Stalin succeeded Lenin, he centralized his rule with paramilitary police forces to crush opposition, speed industrialization, and run Soviet diplomacy. The Soviet police also became the strong right arm of the U.S.S.R. at war, coordinating the country

at war against Nazi Germany. All throughout, they cemented increasing domination of the Soviet state and pursued their power agenda.

Daniel Moya Urueña
Department of Peace, Justice and Conflict Studies

Deuteronomic Justice in the book of Job

Job's reaction to his experience of suffering, poverty and marginalization is a dissonant voice in the book. It is a voice that makes a theological rupture with the established retribution theology and the sense of justice and social order of his time. Job's insertion into poverty and marginalization allows him to rethink the concept of deuteronomic justice, and this allows him to see and hear God. It is from this new experience that Job meets God and God meets Job. God's response to Job's rebellion leaves many questions unanswered, but it deals with the complexity of reality and how God is involved in it. Job's rebellious voice is a clear demand for deuteronomic justice, it is a protest against those at the top who transgress against the poor. It is a voice that is heard by a God who hears the poor and responds.

Matthew J. Plummer
Department of Bible, Religion and Philosophy

Reinterpreting Original Sin through the Word,

This paper reconsiders the doctrine of Original Sin, contextualizing the doctrine in the structures and ideologies of our fallen society. Considered in such a context, sin is seen to be present and generational in the very structures of society in which humanity is a part; thus the inherited properties of sin are not innate in humanity but innate in the structures humanity is forced to live under thus making humanity culpable, to some extent, insofar as it engages its own structures. By reinterpreting Original Sin in such a way, a new soteriology emerges. Christ is redemptive insofar as by his ministry, his stories and his parables, he offers alternative structures and a more just way to live. The concept of the Word, then, becomes central in the way it is empowered to change our reality if we choose to live into it and make the Word the basis of our new society.

Case W. Snyder, Alana S. Kenagy, and Rachel Halder,
Department of Communications

Black Representations in American Video Media

In a consumption-driven and highly mediated society, individuals and groups are constructing their identities and perceptions based on the powerful stories produced and disseminated by media institutions. Many of our ideas about other people and cultures are based on the images, symbols, and narratives in radio, television, film, music, and other media. We learn what gender, race, socio-economic status, geography, religion, and culture means for our own sense of identity as well as construction of understanding of others – and how identity is commodified. Media, in short, is central to what ultimately come to represent our social realities.

Our submission is a documentary entitled "Black Representations in American Video Media." This documentary, which runs about an hour in length (but could be excerpted for presentation purposes), is based on research undertaken as a final project for the Fall 2008 Communication and Society class, taught by Assistant Professor of Communication Rachel Lapp. The intent of the project was to research perceptions of race based on media construction of social realities and to present, in an accessible way, examples of ways in which black people are consistently reproduced in televised contexts. The documentary utilizes video clips chosen as examples of three significant media genres – Music Videos, Action Films and Sitcoms – along with self-produced video footage and interviews with students. Offering contextualizing commentary to help frame the issues is Goshen College Assistant Professor of Sociology Regina Shands Stoltzfus, who has studied racial justice issues. Through reflection on questions about racial and cultural stereotypes, our research is focused on understanding how stereotypes specifically about black people are interpreted by viewers, specifically college students on this campus.

Janna Reiff
Department of Nursing

Adolescent Pregnancy: Aggregate Needs Analysis

United States national statistics support a decline in teen pregnancy following its peak in 1991. (Meschke, L., Bartholomae, S., & Zentall, S., 2000, p. 146). Still, compared to other industrialized countries the United States has a higher teen pregnancy rate of two to fifteen (Hillis, S. et al., 2004, p. 320). Difficulties associated with adolescent pregnancy involve psychosocial preparedness, socioeconomic resource deficiencies, and biological adverse effects. Public health may be further concerned with the fiscal strain associated; as 9.1 billion is spent annually on the support of teenage pregnancies (CDC, 2008).

This study looks specifically at a nurse's role in relation to the diverse needs of pregnant adolescents. A literature review was collected to provide information regarding current statistics and interventions. Additionally, the knowledge base was expanded through interviews with two school nurses and a midwife. Lastly, nursing diagnoses are applied to this aggregate followed with interventions that attempt to address this issue.

Kathryn Schlabach
Department of Biology

Ultrastructural Analysis of Radiation Effects from Liver Cancer Therapy

Selective internal radiation treatment (SIRT) is a novel form of treatment for liver metastases using radioactive microspheres in the hepatic artery to irradiate tumors. However, the effects of SIRT on liver ultrastructure are largely unknown. Liver tissue from a patient treated with SIRT for liver metastases was studied via electron microscopy in an attempt to compare tissue adjacent to treatment areas to more distant tissues 100-500 microns from radiation. Damage was found to be limited primarily to the portal triad, with degenerative areas and fibrosis observed. Endothelial tissue of the hepatic vein and artery were heavily damaged, as were bile ducts, which were often not present. A large number of leukocytes were also observed in the triad area, suggesting chronic inflammation. Hepatocytes in the immediate area appear to have sustained little damage, with

healthy nuclei and organelles. Healthy hepatocytes were also found at 100 microns, 250 microns, and 500 microns from the radiation site. This supports current pathological reports of portal triaditis with limited parenchyma damage. Keywords: liver metastases, microspheres, electron microscopy

Amy Showalter
Department of Bible, Religion and Philosophy

Called to Meeting Grounds: Aspiring beyond Cultural Sensitivity

Intercultural exchange is rightly concerned with cultural sensitivity. Too often this has led to a focus on non-impositionalism rather than the positive meeting of cultures. There is room for Christian and cultural conviction within these encounters. Embracing cultural meeting grounds as contexts of both challenge and possibility where conviction is to be shared might lead to more meaningful engagement with others.

Elizabeth Speigle
Department of Bible and Religion

Understanding *Satan*: The Origins and Implications of the Devil in Christian Theology

The idea of “Satan” has been a topic of much debate among Christian theologians in the past, and discussion continues today in the larger church. Popular culture throughout history has had an influence on understandings of Satan, including Milton’s *Paradise Lost* and Goethe’s *Faust*. There are several references to Satan in the Hebrew and Christian Scriptures, but there have also been many things regarding Satan that have been read back into the text, that were not originally intended by the authors. In this paper, I will look at the “original biography” of Satan as found in the Hebrew Scriptures and how the “new biography”—the current assumptions about the being of Satan—originated. In addition, I will discuss the societal impact of different beliefs about Satan in our world today.

Carolyn Stigge
Department of Nursing

Reducing the Risk for Unintended Pregnancy in Adolescent Females of Low Socioeconomic Status

Teenagers of low socioeconomic status make up 40% of the U.S. teenage population, but account for over 80% of the population’s unintended births (UNICEF, 2001, p.15). This disparity among classes highlights the failure of the national campaign to meet the needs of this cohort and bring the rates of low-income pregnancy down. This paper sought to examine young women aged 13 to 19 years whose family income was less than 149% of the federal poverty level, placing them in the low socioeconomic status. The focus was to address the needs of this aggregate to lower their risk of and to protect them from an unintended pregnancy.

Information was gathered via a literature review and interviews with community nurses working directly with this cohort. It was found that the greatest needs of these young women

included protection from STDs, contraceptive education, and proper role modeling. Ultimately this aggregate needs a safe place or girls' group to discuss concerns and be given positive feedback and *options* – something many girls in this aggregate feel they do not have. This can be done in the school setting in the 7th grade often before sexual activity has been initiated and in the 9th grade when the opportunity and risks increase dramatically.

Haly F. Williamson
Department of Education

Trends between male and female mathematical self-efficacy and mathematical achievement

In our society, there exists a significant achievement gap between the mathematical success of males and females. While some studies indicate that males are more mathematically inclined, we are becoming increasingly aware of the impact that one's perception of his/her ability may have on his/her actual ability. Studies have shown that females tend to feel less mathematically competent, even though they may be equally or even more mathematically gifted than their male counterparts.

This study seeks to understand the correlation between male and female mathematical self-efficacy and mathematical achievement. Students from a ninth grade Algebra class in an urban high school were surveyed regarding their own perception of their mathematical ability and their survey scores were correlated with their actual success in the class. The results were very interesting in that the females not only had a higher mathematical achievement level than the males did, but also had a higher mathematical self-efficacy. These results may indicate that given a certain environment, males may feel less mathematically competent than females.

Lindsay Yoder
Department of Nursing

Obesity in Children in Goshen Schools

Childhood obesity is a growing problem among the nation's youth and is quickly becoming a global issue. Children overweight or at-risk for overweight have numerous threats to their health, both immediate and long-term. In Goshen Community Schools the kindergarten through ninth grade population is 22.1% overweight and 19.6% at-risk. Continual obesity is associated with attaining a lower educational level, deprived employment and relationships, occurrence of psychological symptoms, and serious medical risks. This paper discusses the study of obese and at-risk school age children in Goshen schools to identify a causal relationship or contributing factors that enable childhood obesity. Identifying causative factors opens the door to recognition of needed action and intervention.

Jason Yoder
Department of Mathematics

Automated Intelligent Play of Coalition Games

In game theory, a game is where two or more players compete by making decisions until the game reaches an end. The goal for this project was to explore these types of games and create automated computer playing strategies that could be played against one another in hopes of learning something about various strategies and they might perform against one another. This presentation will summarize the development of the game protocol, strategies, population dynamics, and attempts at using an evolutionary algorithm.